# Books for All:

# Accessible curriculum materials for pupils with additional support needs.

**Report to:**
**Scottish Executive Education Department**

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# EXECUTIVE SUMMARY

The Books for All project has investigated the need for and availability of learning resources in accessible forms for pupils in Scotland who have print disabilities[1].

The project has found that availability of books and other resources in Braille, Large Print and audio formats, for the relatively small number of blind and partially-sighted pupils, while not complete, is good, in comparison to the availability of accessible books for the much larger number of pupils with physical disabilities, specific learning difficulties, learning difficulties, or hearing impairment. These pupils may require, for example, adapted printed materials, digital versions that can be accessed by switch or read out by a computer, audio recordings, or signed multimedia resources.

Responsible bodies, including local authorities, national government and other relevant agencies, are obliged to consider the needs of all pupils with disabilities, and should therefore make provision of accessible learning resources and services for all pupils who have literacy support needs, not just those with a visual impairment. The project has reviewed two possible models for developing such provision, and is recommending one for consideration by the Scottish Executive, local authorities and other relevant agencies.

The proposed model aims to support local authorities address current inequalities of provision and to reduce existing duplication of effort and inefficiencies by developing mechanisms for sharing resources both within and between local authorities and other service providers.

# 1    Numbers of pupils with literacy support needs

1.1    Around 5% of pupils in Scotland (over 34,000) aged 5-18 have some form of support plan in place to help them access the curriculum[2]. These pupils have additional support needs as a result of a disability or impairment[3]. Because they have difficulty accessing standard print and/or demonstrating their knowledge and understanding, many of this core group of pupils are likely to benefit from materials being made available in alternative formats, either in addition to or instead of standard text.

1.2    Within this 5%, those with a significant hearing impairment or a significant visual impairment are in the minority. Moderate learning difficulties (21.3%)

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[1] "People with a print disability are those who cannot obtain access to information in a print format because they:
• are blind or vision impaired;
• have physical disabilities which limit their ability to hold or manipulate information in a printed form;
• have perceptual or other disabilities which limit their ability to follow a line of print or which affect their concentration;
• cannot comprehend information in a print format due to insufficient literacy or language skills."
Witcher, S. (2006) Report of the Disability Working Group. Scottish Executive. ISBN: 0-7559-5141-7. Available from http://www.scotland.gov.uk/Publications/2006/10/16092613/0
[2] Scottish Executive Statistical Bulletin Education Series Edn/B1/2006/1 Feb 2006.
[3] 'Additional Support needs' now includes but is not restricted to needs as a result of factors related to disability or health.

and specific learning difficulties (20.9%) are the most common reasons reported for having a support plan; while 3.8% of the 34,680 pupils have a significant physical or motor impairment, and 1.5% have a significant visual impairment as their main difficulty in learning.

1.3 7% (10,650 pupils) of all candidates who sat SQA examinations in 2006 used some form of assessment arrangement (extra time, reader, scribe, adapted paper in a different format, use of ICT, etc) because they had difficulty in reading the standard written paper or writing and recording their responses. Many of these pupils could benefit from using curriculum materials in accessible, alternative formats. Pupils with specific learning difficulties were the largest identifiable group (6,965 pupils; 65% of candidates who used assessment arrangements; 4.5% of all candidates), while those with visual impairment numbered 302 (3%).

1.4 In addition to the above, a variety of evidence points to other pupils potentially benefiting from materials being made available in alternative formats[4]. Including those with a support plan in place, around 15% of pupils have difficulty following a standard curriculum or demonstrating their knowledge and understanding. Only some of this group, however, are likely to benefit from access to materials in different formats.

1.5 Conclusion: Services established to produce, store and disseminate materials in accessible formats should address the needs of all pupils with literacy support needs, not just those with a visual impairment.

## 2    Materials required

2.1 Both primary and secondary schools require a (different) range of curriculum materials including reading books, textbooks, fiction, workbooks, commercial worksheets, teacher produced worksheets, SQA assessment materials and examination papers, etc. This is equivalent, approximately, to 375 books in each of the primary and secondary sectors.[5] Materials span age, stage and subject matter, including examination and testing.

2.2 Substantial overlap occurs in requirements for materials: pupils in different schools in the same authority, and in different authorities often require similar materials.

## 3    Alternative formats

3.1 A range of curriculum materials in alternative formats is required for pupils who have difficulty: physically handling books and/or turning pages; reading; seeing print; understanding what is written; writing; spelling. There is a need

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[4] Evidence includes local authority returns on literacy figures on entry to S1; sample returns from mainstream schools; responses to two questionnaire formats; data from Her Majesty's Inspectorate for Education (HMIE) on those not in employment, education or training (NEET) after leaving school.

[5] Figures reported by RNIB Scotland following analysis carried out on the curriculum materials used by primary and secondary pupils who are visually impaired.

for printed, audio and digital multimedia formats. Enlarged text on paper or on screen, text spoken out by the computer, as well as text with pictures and symbols are the formats that support the largest numbers of pupils. Thereafter, and in descending order of frequency: switch accessible digital formats, Braille and sign language are least frequently required formats to support literacy.

3.2 Formats that are accessible to some pupils with one type of impairment are not necessarily accessible to other pupils, even those with the same impairment. Each pupil's requirement for an alternative format may be highly individual and require in-depth knowledge of that pupil.[6]

3.3 ICT can contribute on a large scale to meet the range of support required through production of accessible formats. ICT offers economies, both at a local level e.g. in-school production of individualised worksheets, and at an authority or national level e.g. in production and storage of master electronic file versions of core books and other materials.

3.4 In order to produce the widest range of accessible formats the single most important step is to produce an intermediary electronic version, with structure, that can be edited reliably using Microsoft Word. All other accessible formats can be produced from such files.

3.5 The quickest and cheapest digital accessible format to produce is the widely used Adobe PDF because most publishers of the original materials can provide a digital version in PDF. Some PDF files can be accessed by some pupils but many files will require further adaptation or conversion before they can be used. PDF files can be converted to other formats, such as DOC and HTML. Some pupils require more specialised digital formats such as DAISY, switch accessible books or video with British Sign Language.

# 4 Benefits

4.1 The Curriculum for Excellence aspires to enable all people to become successful learners, confident individuals, responsible citizens and effective contributors. Better, more efficient access to a wider range of accessible printed, audio and/or digital multimedia formats will help this process and enable pupils to work more independently. Readers and scribes represent substantial investment of school and authority resources and a smaller number of readers and scribes would be required if more pupils had curriculum resources in accessible formats.

# 5 Equity

5.1 The vast majority of alternative format learning resources currently available are in Braille, Large Print and audio formats for pupils with visual impairment. Compared to other print-disabled pupils, there is significantly

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[6] For example, the large print requirements of pupils in one service for pupils who are visually impaired varied from 14 point through to >48 point, some requiring further adaptations to line spacing, page colour and style of font.

better availability of alternative formats for those with visual impairment, through local authority VI and sensory services, by national providers such as RNIB, and through over 100,000 titles from providers listed on Revealweb[7], the online UK catalogue of Braille, Large Print, audio and electronic materials. Around half of pupils with significant visual impairment have additional, often multiple, impairments. Few of them are supported by the formats available on Revealweb or from commercial providers or produced by VI services in Scotland.

5.2    Copyright law is inequitable: the law permits materials to be adapted for pupils with visual or physical impairments, or a physical difficulty focussing or tracking with their eyes, but not for other pupils who have difficulty with printed material such as those with language, hearing, dyslexic or learning difficulties.

5.3    There are very few sources of accessible resources for print-disabled pupils who are not visually impaired. Commercial items that do exist are more expensive than conventional paper books or accessible versions available for visually impaired students.

5.4    Schools and individual staff do make materials in formats for pupils with physical, reading or understanding difficulties on a one-off basis but there are legal obstacles to sharing these resources. Currently there is no mechanism for cataloguing and distribution.

5.5    Out-of-copyright books are often available freely on the internet. In most cases they require further adaptation to be accessible. There is no provision in local authorities to do this.

5.6    RNIB Scotland have proposed establishing a National Transcription Consortium to provide accessible learning materials for blind and partially sighted pupils in Scotland. It could be argued that this already exists: Revealweb (http://www.Revealweb.org.uk) is the catalogue of materials, and suppliers listed on Revealweb such as H.M. Prisons and RNIB itself offer transcription services across the UK. RNIB Scotland have indicated that any materials produced by a Scottish Consortium would be available throughout the rest of the UK.

5.7    Local authority transcription services in Scotland have already produced a large bank of resources, none of which are listed on Revealweb. There is therefore scope for services to improve efficiency by using Revealweb or some other mechanism to share catalogues and resources.

5.8    However, because a) Revealweb providers can only support pupils who are copyright-exempt, b) copyright is a reserved matter for Westminster, and c) most Revealweb providers only support visually impaired people, it is not a satisfactory mechanism for addressing the literacy support needs of print-disabled pupils in Scotland.

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[7] Note that not all titles listed on Revealweb are for children or education

# 6 Provision of accessible learning resources

6.1 The Books for All project has considered whether a model of service delivery for producing accessible formats should address only one small group of pupils. Or, whether it should address one or more of: those who are covered by copyright exemption but for whom materials are not made available in accessible formats; those who are not covered by copyright exemption but for whom a support plan is in place; those who are not exempt from copyright, do not have a support plan but do have literacy support needs.

6.2 The results and conclusions obtained through the project regarding the range of pupils with print disabilities, the learning materials required, current provision and unmet need were used to devise a set of criteria for considering models of service provision of accessible learning materials. These criteria are:

- Inclusion and equity – the service models should address literacy support needs of all print-disabled pupils in Scotland.

- Range of Alternative Formats – materials are required in a range of alternative formats to meet the access needs of all pupils with print disabilities.

- Support to local authorities to fulfil legal responsibilities - the model should support local authorities in carrying out duties under education and disability legislation.

- Copyright - the model should address copyright inequity, by negotiating suitable licences with publishers and the Copyright Licensing Agency in order that all print-disabled pupils will have equal access to accessible materials in an appropriate format.

- Feasibility and efficiency - implementation of the service model should be feasible, practical, cost effective and achievable within a reasonable time scale. It should reduce the current widespread duplication of effort whereby schools and local authorities across Scotland create accessible versions of the same materials.

- Scalability - the model of provision should allow for future development and expansion to pupil groups who may not be covered by disability equality legislation, but who can still benefit from educational materials in alternative formats.

6.3 Two possible service models were considered: a model specifically designed to meet the criteria above (a 'Scottish Accessible Learning Resources Network'); and a UK-wide model based upon recommendations contained in a report commissioned by the Museums, Libraries and Archives Council. The MLA model only addresses the needs of people with visual impairment and would require extension to meet the needs of other print disabled groups. A model based upon a 'Scottish Accessible Learning Resources Network' is therefore preferred.

6.4 Education authorities and corporate local authorities have a range of duties under the Education (Scotland) Act 1980; are obliged to provide adequate and efficient education for each pupil under the Additional Support for Learning (Scotland) Act, 2004; and have duties under the Education (Disability Strategies and Pupils' Educational Records) (Scotland) Act 2002, SEN and Disability Act 2001 and corporate duties to promote equality for disabled people under the Disability Discrimination Act 2005. The Scottish Accessible Learning Resources Network model is designed to stimulate and support local authorities to fulfil these duties. At the same time, the model addresses the requirements of schools and individual departments within schools as these have devolved budgets for purchasing curriculum materials.

6.5 The model of provision is designed to develop economies of scale at two levels: to ensure Best Value within local authority structures in order to meet existing support needs and to build capacity to meet the support needs of a wider group of pupils; secondly, there are opportunities to share practice, skills and materials between authorities and providers.

6.6 The Scottish Accessible Learning Resources Network would establish coordinated provision of accessible learning materials for approximately 5,500 pupils whose support needs arise from physical disability or visual impairment. It is likely that pupils with specific learning difficulties (up to an additional 7,000) will also benefit from accessible curriculum materials. In addition, we estimate that a majority of the other 22,000 pupils in Scotland who have an additional support plan in place (e.g. those with learning, speech and language or communication difficulties and hearing impairment) will also be helped by having improved access to accessible curriculum materials.

# 7 Implementation

7.1 The Scottish Accessible Learning Resources Network would:

- Offer advice, consultancy and staff development to local authorities, to develop coordinated structures and services for the provision of accessible learning materials.

- Liaise with relevant national bodies, local authorities and publishers associations in order to negotiate licences to create and provide learning materials in accessible formats for all print-disabled pupils.

- Develop mechanisms for local authority services to catalogue and share accessible resources.

7.2 One possibility would be to develop the Scottish Accessible Learning Resources Network in collaboration with three local authorities, to test and evaluate provision, and if the pilot is successful, to extend it across Scotland. An outline of development is given below:

- A Symposium or Conference to report findings of the Books for All project and propose and consult on ways forward. Such an event would build on

the Symposium on Accessible Digital Curriculum Resources that was funded by the Scottish Executive in 2006.

**Phase 1**

- Establish Scottish Accessible Learning Resources Network team.

- Meet with SEED and relevant bodies to agree and establish a development plan.

- Identify and liaise with three local authority partners with whom to develop the pilot network.

- Meet with publishers, publishers associations and the Copyright Licensing Agency to explore possible licensing schemes for providing accessible learning resources for print-disabled pupils who are not copyright exempt.

- Begin development of Accessible Learning Resources 'toolkit' with guidance and staff development resources.

- Develop mechanisms for cataloguing and sharing digital files within and between local authorities.

**Phase 2**

- Establish Accessible Learning Resources Networks in three local authorities.

- Establish CLA licence to enable accessible materials to be made for print-disabled pupils who are not copyright-exempt.

- Complete Accessible Learning Resources Toolkit and deliver in local authorities.

- Local authority networks begin collating, creating and providing access to bank of accessible resources.

- Establish procedures and mechanisms for sharing materials between local authorities.

**Phase 3**

- Continued roll-out of Accessible Learning Resources Networks in three local authorities.

**Phase 4**

- Continue process of cataloguing and sharing materials between local authorities.

- Conduct evaluation of impact of Accessible Learning Resources Networks on learning and teaching, for possible wider implementation.

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*"There needs to be an initiative at national or at least authority level which sets the standards for the requirements of accessible resources."*
*Support for Learning teacher, mainstream secondary school*

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## SECTION 1    INTRODUCTION

## Background

The strategic context for Scottish schools is set out in a series of documents and measures to improve the ambitions of schools and pupils. *Ambitious, Excellent Schools* and *A Curriculum for Excellence* together emphasise the need to develop opportunities to create a curriculum which will prepare young people more effectively for life after school. In part this requires analysis of the content of the curriculum but it also requires that curriculum to be accessible and for those who are to access it, to have ways to demonstrate their knowledge and understanding.

## Policy environment

Several important steps have been taken in the past few years to reduce disability discrimination and to improve Scottish pupils' access to the curriculum. As a result the policy environment is now much more disability friendly than it was compared to even 5 or 10 years ago. A range of duties now apply to education authorities and other providers in order that they can improve access to all areas of education for disabled pupils in schools across Scotland. Key areas of policy developed to improve equity for disabled people of particular relevance to education in schools include the Special Educational Needs and Disability Act (SENDA) 2001, Education (Disability Strategies and Pupils' Educational Records) (Scotland) Act 2002 and the Disability Discrimination Act 2005 which includes disability equality duties for public bodies.

### SENDA 2001

The Special Educational Needs and Disability Act 2001 inserted a new Part IV into the Disability Discrimination Act 1995. SENDA 2001 duties are placed on bodies responsible for education establishments including independent and grant-aided schools, local authorities, colleges, universities and providers of adult education.

The two key duties ensuring that education establishments do not discriminate against disabled learners are:

- a duty on education providers not to treat disabled pupils and students less favourably than non-disabled pupils and students, unless the less favourable treatment can be justified;
- a duty on responsible bodies to make reasonable adjustments to avoid putting disabled learners at a substantial disadvantage compared with other learners.

This duty is to all current disabled learners and is anticipatory so education bodies need to think ahead.

## Education (Disability Strategies and Pupils' Educational Records) (Scotland) Act 2002

With education devolved to the Scottish Parliament, responsibility for planning duties was taken up by the Scottish Executive and the Education (Disability Strategies and Pupils' Educational Records) (Scotland) Act 2002 was passed by the Scottish Parliament (OPSI, 2002). Disability Strategies describes the planning duties that need to be carried out by local authorities, independent and grant-aided schools in Scotland to meet legal requirements introduced by the Special Educational Needs and Disability Act 2001 (SENDA) and Disability Discrimination Act (DDA). Each local authority and other education provider – the so-called responsible body – has to set out how it plans to improve accessibility in an 'Accessibility Strategy'. These are prepared on a 3-yearly cycle and local authorities in Scotland had to submit their first 3-yearly plan by 1 April 2003.

The Scottish Executive Education Department produced valuable guidance (Scottish Executive, 2002) for local authorities to help them prepare their accessibility strategies, applying to the three areas of improvement needed in relation to disabled pupils:

- Improving access to the physical environment;
- Improving access to the curriculum;
- Improving access to communication and delivery of school information.

Scottish Executive Education Department issued guidance on what education authorities should consider in their accessibility strategies, extracts from which include:

> … Similarly, [local authorities] could consider implementing a strategy to make curriculum resources, that are currently paper-based (such as textbooks or worksheets), available in common electronic forms to assist pupils with visual or learning difficulties. [para. 41]

> …Consideration should be given to whether class work or homework could be given in alternative forms and, also, consider how any homework, or other work pupils do in alternative forms, can best be marked/commented on by school staff. [Para. 50]

> …Responsible bodies should ensure that any information that is important to enable pupils to learn or to be able to participate in school activities can be provided in an alternative form if the pupil may have difficulty reading information provided in standard written form. [Para. 64]

## Disability Equality Duty

21st January 2006 marked the date the new Disability Equality Duty was laid before Parliament; another important milestone in making the UK a more disability-friendly place to live and work. The general duty came into force on 5th December 2006 affecting all public authorities.

Public sector bodies now have to pay due regard to promoting equality for disabled people in every area of their work. 'Due regard' means that authorities should give due weight to the need to promote disability equality in proportion to

its relevance. They now need to take an organisational approach, embedding disability equality into the everyday work of the organisation, particularly in relation to formulating policy and practices around both service delivery and employment, but also in relation to other functions such as setting budgets, making public appointments, funding and regulatory roles.

The general duty applies to all public bodies. Additional specific duties are also introduced to support most public bodies to achieve the outcomes required by the general duty. Also where a contractor performs a public function, on behalf of a statutory body, then it is considered a public authority and is subject to the general duty in respect of the public functions carried out.

If the contractor is not performing a public function but provides services on behalf of the public authority, the duty sits with the public authority doing the contracting. This means that the contracting public authority, and in particular its procurement divisions commissioning a service, need to build relevant disability considerations into that process. That way the authority can ensure it meets the duty even when the service is actually carried out by an external contractor.

## Education (Additional Support for Learning) (Scotland) Act 2004

Almost in parallel with developments in disability discrimination legislation across the UK, Scotland swept away education legislation relating to special educational needs and Record of Needs. In its place we now have a framework based around additional support needs. A complex piece of legislation with accompanying code of practice, the ASL Act sets out local authority duties on what authorities need to do to identify, assess and make provision for children and young people with additional support needs.

## Copyright legislation

Current UK copyright law permits the conversion of paper to digital resources for people who meet the definition of 'visually impaired' under the Copyright (Visually Impaired Persons) Act 2002. Other people with a print disability[8] do not currently have these rights, and so schools are prevented from sharing adapted resources. Huge duplication of effort is therefore taking place across Scottish schools: staff in neighbouring schools are spending hours scanning books and creating identical resources because they are unable to legally disseminate them. This situation may change: the Right to Read Campaign is lobbying for a change in the law, the Copyright Licensing Agency is considering how schools can obtain legal access to Digital Learning Resources (Dyer, 2002). Electronic publishers are currently developing DRM (Digital Rights Management) to enable digital resources and electronic books to be disseminated. Copyright is discussed in more detail later.

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[8] People with a print disability are those who cannot obtain access to information in a print format because they:
• are blind or vision impaired;
• have physical disabilities which limit their ability to hold or manipulate information in a printed form;
• have perceptual or other disabilities which limit their ability to follow a line of print or which affect their concentration;
• cannot comprehend information in a print format due to insufficient literacy or language skills. [Witcher S (2006)].

## Implications for accessible formats

Local authorities should therefore already be considering how they can provide learning and curriculum resources in suitable alternative formats for disabled pupils. Many local authorities have procedures, structures and specialist teams to provide materials in Braille, enlarged text or audio format to visually impaired students and this new legislation requires consideration of how provision can be extended to <u>any</u> disabled pupil who has difficulty reading or accessing information.

Key considerations for local authorities include:

- Which formats are required and by whom (e.g. Braille, enlarged and adapted print, symbolised print, audio tape, audio MP3, PDF, Word, switch accessible, etc?)
- How will materials be adapted and who will do it?
- How will materials be distributed to schools and accessed by pupils?
- How can copyright issues be addressed?
- What training is required for staff?
- How might economies of scale be obtained?

These and other questions were discussed at the UK *Symposium on Accessible Digital Curriculum Resources for Children and Young People with Additional Support* funded by the Scottish Executive[9] in 2006. The Symposium brought together local and central government, commercial firms, publishers and voluntary organisations, to discuss how digital versions of curriculum resources could be created and accessed by pupils with additional support needs. It was agreed that while much had been achieved to make the curriculum and its materials more accessible, much remained to be done. Pockets of good practice existed but progress was slow, uneven and considerable duplication of effort took place.

In order to address these and other questions the Scottish Executive Education Department Additional Support Needs Division requested the Communication Aids for Language and Learning (CALL) Centre at the University of Edinburgh to carry out a scoping exercise, an outline of which is set out in Section 2 of this report.

Books for All therefore is set in a context of emerging policy, the need to consider technical solutions and challenges, identifying the support needs of end users and how those who support them can themselves be enabled to do so. The project has features in common with those set out in relation to visually impaired people and described helpfully by Stephen King:

"…in tackling access issues it was vital to take an integrated approach which simultaneously combines researching user needs; finding technical solutions; working on industry standards; and pushing for legislation. A technical solution on its own doesn't work, it's just a pilot. A standard on its own doesn't work: it needs legislation. And a regulatory framework on its own doesn't work, there needs to be a technical solution. So we need to take an integrated approach." Stephen King (2000) writing in the E-Access Bulletin. Issue 4 April'

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[9] Details, presentations in multiple formats and discussions are available at http://www.callcentrescotland.org.uk/digitalcurriculum/

# SECTION 2 BOOKS FOR ALL PROJECT OBJECTIVES

The project set out to determine the approximate numbers of pupils with additional support needs in Scotland who have difficulty reading printed curriculum materials, or writing / recording their responses, and who may benefit from having printed materials in alternative formats for reading, study, writing or recording; furthermore to consider models of service delivery to ensure pupils can most effectively obtain such materials in a format accessible for them. The project took place between September 2006 and February 2007, reporting to the Scottish Executive on 28 February 2007.

To allow a degree of formative evaluation the project was carried out in two project phases. The aims and objectives for the two phases are listed below.

## Project Phase 1: Establishing the need for accessible curriculum materials for all pupils with additional support needs.

**Aim:** In this phase of the project we determined the approximate numbers of pupils with additional support needs in Scotland who have difficulty reading printed curriculum materials, or writing / recording their responses, and who may benefit from having printed materials in alternative formats for reading, study, writing or recording.

**Objectives for Project Phase 1:**

- Submit proposal to Scottish Executive Education Department for funding to carry out investigation.

- Establish tasks and methods to address objectives, outcomes, timescales, submit to SEED, obtain agreement.

- To identify the approximate number of pupils who have identified support needs in accessing printed materials and who may benefit from alternatives to writing text.

- To ascertain the nature of these literacy support needs.

- To identify the range of curriculum materials that need to be accessed by pupils with additional support needs.

- To identify methods by which schools can support pupils who have difficulty reading and accessing printed curriculum materials

- To ascertain the current availability of accessible curriculum materials and what needs these are addressed to meet.

- To provide approximate figures of likely unmet need, both identified and unidentified.

- To ascertain examples of best practice used in Scottish schools and cite selected examples from other countries.

- To compare accessibility and compatibility of existing systems.

- To provide indicative costings for comparing costs of producing materials in a range of accessible formats.

- To highlight key issues of copyright exemption and restriction and to suggest what options are available to address these issues.

## Project Phase 2: Establish possible mechanisms for providing accessible curriculum materials.

**Aim:** In this phase of the project we evaluated potential models of service delivery for making curriculum materials available to pupils in an accessible format.

**Objectives for Project Phase 2:**

• To design and evaluate different models of service provision for providing accessible curriculum materials especially local v. national forms of delivery or some combination thereof.

• To forecast implications of systems of production for staffing needs, including where staff reductions, increases and specialisation may be required.

• To produce a CD to illustrate difficulties and examples of good practice.

• To produce a summary and report in accessible language, including recommendations.

• In consultation with the Scottish Executive Education Department to publish the findings for peer review and disseminate to the wider Scottish schools population.

## SECTION 3    APPROXIMATE NUMBERS OF PUPILS

**Objective 3:    To identify the approximate number of pupils who have identified support needs in accessing printed materials and who may benefit from alternatives to reading and writing text.**

**Outcome:        Information acquired from multiple sources on the number of pupils with additional support needs who have difficulty accessing printed materials or writing and recording.**

## Summary

1) Official Scottish Executive and Scottish Qualification Authority (SQA) returns converge on a core cohort of around 4-5% (over 34,000) of pupils aged 5-18 who may benefit from provision of materials in alternative formats, either in addition to or instead of standard text.

2) Within this 4-5%, those with a significant hearing impairment or a significant visual impairment are in the minority. Moderate learning difficulties (21.3%) and specific learning difficulties (20.9%) are the most common reasons reported for having a support plan; while 3.8% of the 34,680 pupils have a significant physical or motor impairment, and 1.5% have a significant visual impairment as their main difficulty in learning.

3) Scottish Qualification Authority returns indicate an increase in the percentage of pupils sitting examinations who require alternative Assessment Arrangements, from under 6% in 2003 to over 7% (10,650) in 2006. Comparing 1995 with 2006 there has been a 340% increase in requests.

4) The proportion of candidates who request alternative assessment arrangements falls as the level of the examinations increases (e.g. proportionately fewer requests for Highers than for Standard Grades). This may indicate either greater difficulty for candidates to demonstrate their knowledge and understanding or, pupils may be less able to attempt higher level awards.

5) A variety of evidence suggests that an additional 10% of pupils (approx. 70,000) have difficulty following a standard curriculum or demonstrating their knowledge and understanding. Not all will need or could benefit from access to materials in different formats though a proportion of this broader group of learners may benefit. A model of service delivery to deliver such formats for one group of pupils – those with a support plan in place – should not prevent capacity building so that others, without a support plan, may also benefit.

# Background to Section 3

There is as yet no central record held of the number and profile of pupils who have difficulty accessing printed materials or writing. There are a number of reasons why these figures are not readily available or, if they are available, can be open to different interpretations. As we will see, a framework based around identifying, assessing and making provision for pupils' additional support needs has the potential to offer a way of understanding what the effect of impairments can be rather than focusing on the impairments themselves. For information of this type to become useful for the purposes of planning service delivery there needs to be a change in the type of statistical returns provided by schools and authorities to the Scottish Executive. One of the spin-offs of this report is, we hope, that it will help identify the sort of information that will be useful.

## Methods used

Because no centralised source of statistics on support needs was available we took a number of different approaches to ascertain approximate figures for the numbers of pupils who experience difficulties in accessing materials. We did this by:

1. Finding out the numbers of pupils who have Records of Needs[10] and / or Individualised Educational Programmes (IEP) and the main difficulty in learning that led to a Record or IEP.

2. Establishing the nature of additional support needs, in particular those which relate to literacy, of those for whom a Record or IEP is available. Taken together (1) and (2) provide a core set of those who are most likely to have some form of difficulty in accessing the curriculum or in demonstrating their knowledge or understanding. For reasons that we will discuss the figures are likely to be an underestimate.

3. Obtaining the numbers of pupils who require special or alternative assessment arrangements to sit Scottish Qualifications Authority examinations and the reasons for requests.

4. Obtaining estimates for National Assessment Board (NAB) returns for all pupils.

5. Approaching sample local authorities to determine approximate numbers of pupils who on entering secondary school had significant[11] literacy difficulties as assessed by standardised testing.

6. Approaching a small number of sample schools to find out how many pupils on entering S1 have significant difficulties accessing print or writing and recording their work.

7. Sending out questionnaires to schools to invite comment on numbers of pupils who experience difficulties in accessing curriculum resources.

8. Estimating numbers undertaking 5-14 testing for whom results indicate performance significantly below average for their age.

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[10] The Educational (Additional Support for Learning) (Scotland) Act 2004 and Code of Practice introduced a new legislative framework, ending the use of Records of Needs. The act came into force on 14 November 2005 therefore data collected in September 2005 reflects the earlier legislative framework of Records of Needs. IEPs continue to be part of the new framework of additional support needs.

[11] The term 'significant' is used in a statistical sense of those who are at least one or two standard deviations below the average reading level for that age.

9. Ascertaining from sample service provider(s) the number of pupils in their caseload and literacy support needs of that caseload.

10. Ascertaining numbers of pupils leaving school but not in employment, education or training (so-called NEET group).

Each approach is described in more detail below and at the start of each we present a rationale to say why this particular approach is likely to be useful. We expected that the approximate figures obtained from these ten different approaches to collecting information would give up to ten, possibly very different, perspectives on information. Consistency in findings obtained from the different perspectives, or clear reasons for differences in findings, offered a way of triangulating information rather than relying on one source.

# 1. Main impairment of pupils with Record of Needs and/or IEP

## Rationale

The rationale behind this approach to finding out who might benefit from materials in alternative formats is that these statistics include pupils who are known to have some form of a support plan in place, part of which may be an identified literacy element. Such pupils would include for example those with a visual impairment but will also feature pupils with specific learning difficulties including dyslexia and others.

All schools in Scotland provide statistical returns to the Scottish Executive for a specific week in September, a report on which is published in February of the following year. As with previous years the statistical bulletin (Scottish Executive, 2006) provides figures for the main impairment of all those with a Record of Needs or for whom an Individualised Educational Programme (IEP) has been prepared.

## Findings

In total, for 2005-6, over 34,000 pupils had a Record of Needs and/or IEP. The types of main impairment, numbers and percentages of the total number of pupils with Records or IEPs are shown in Table 3.1. The table is sorted from most prevalent to least prevalent cause of difficulty.

The table shows that in terms of school returns to the Scottish Executive, the percentage of main impairments ranged from returns for:

- those reported as deafblind or dual sensory impaired: 0.2% of 34,577[12];
- through to those with specific learning difficulties including dyslexia at 20.9%;
- and those with Moderate Learning Difficulties at 21.3%.

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[12] Note that the total figures, 34,577 differs slightly from the summary total reported in Statistical Bulletin of 34,680 pupils. Both figures feature in the above Statistical Bulletin, hence they are reported here.

Pupils with other low incidence impairments such as visual impairment and hearing impairment are represented at around 1.5% (503) and 1.8% (624) of the total, respectively.

| Difficulty | Abbrev-iation | No. of pupils | % |
|---|---|---|---|
| Moderate | MLD | 7374 | 21.33 |
| Specific – in language and/or mathematics (including dyslexia) | SpLD | 7231 | 20.91 |
| Social, emotional and behavioural difficulties | SEB | 4445 | 12.86 |
| Autistic spectrum disorder | ASD | 3484 | 10.08 |
| Other | Ot | 3001 | 8.68 |
| Moderate learning difficulties & significant additional impairments or disorders | MLD+ | 1824 | 5.28 |
| Significant language and speech disorder | SLI | 1679 | 4.85 |
| Significant physical or motor impairments | PhI | 1298 | 3.75 |
| Severe | SLD | 1192 | 3.45 |
| Severe learning difficulties & significant additional impairments or disorders | SLD+ | 1091 | 3.16 |
| Significant hearing impairment | HI | 624 | 1.80 |
| Profound learning difficulties & significant additional impairments or disorders | PLD+ | 548 | 1.58 |
| Significant visual impairment | VI | 503 | 1.45 |
| Profound | PLD | 146 | 0.42 |
| Dual sensory impairment | DB | 72 | 0.21 |
| Not known / Not disclosed | NK | 65 | 0.19 |
| **Total** | | **34577** | **100** |

Table 3.1    Pupil main impairment figures for those with a Record of Needs and/or IEP. Statistical Bulletin 2006.


**Interpreting the findings**

These figures must be treated with caution. For example, if you compare figures from one year to the next, interesting changes become apparent. There appears to have been an explosion in autistic spectrum disorder (ASD) in the past few years. Over the same period, however, there was a reduction in returns for certain other impairments. Although one rise is not matched by a corresponding reduction, the changes in reporting are similar in scale.

A second reason for treating the school census returns on main impairment with caution can be seen with a little more digging into the figures. An example will help illustrate this point using information on returns for those whose main difficulty in learning is severe visual impairment, as summarised in Table 3.2 below.

| Source | Authority | Total with Record of Need and/or IEP | Hearing impairment as Main difficulty of learning | Visual impairment as Main difficulty of learning |
|---|---|---|---|---|
| Primary Schools (Table 7.5) | Edinburgh, City | **662** | 8 | 5 |
| | E. Lothian | 164 | 0 | 0 |
| | Midlothian | 257 | 0 | 0 |
| | W. Lothian | 688 | 6 | 0 |
| Secondary Schools (Table 6.8) | Edinburgh, City | **949** | 19 | 9 |
| | E. Lothian | 97 | 0 | 0 |
| | Midlothian | 177 | 0 | 0 |
| | W. Lothian | 415 | 7 | 0 |
| Special Schools (Table 8.5) | Edinburgh, City | **732** | 0 | 0 |
| | E. Lothian | 0 | 0 | 0 |
| | Midlothian | 107 | 0 | 0 |
| | W. Lothian | 230 | 0 | 0 |
| **Totals** | | **4478** | **40** | **14** |

Table 3.2      Returns for main impairment by Record of Need and/or IEP for four authorities

Table 3.2 shows returns for main impairment by Record of Need and/or IEP for four authorities – Edinburgh, East, Mid and West Lothian. Pupil numbers for primary, secondary and special schools are shown together with the source for these figures.

Consider first City of Edinburgh. The authority reports 2,343 pupils with a Record of Needs and/or IEP (in primary, secondary and special schools). With a pupil roll of 46,353[13] pupils attending publicly funded schools in Edinburgh City, this results in just over 5% of pupils having a Record of Needs or IEP. If we add in returns for E. Lothian, Midlothian and W. Lothian to that for City of Edinburgh we find a total of 4,478 pupils with a Record of Needs and/or IEP, or 4.5% of school population. Individual local authority figures are in line with the total figures for all pupils with a Record of Needs and/or IEP as a percentage of all pupils across Scotland (4.9%).[14]

This percentage, comparing all pupils with Records and/or IEPs in a single authority with all pupils across Scotland, might be internally consistent; it is however unlikely to be an accurate representation as can be seen when we consider returns for individual impairments for sample authorities. The third and fourth columns of Table 3.2 shows returns for the same four authorities this time providing information only on numbers of pupils with severe hearing impairment and severe visual impairment as main difficulty in learning.

Forty pupils are reported as having severe hearing impairment and fourteen reported with severe visual impairment across the same four authorities. As we will see later, we would expect that Edinburgh plus the three other authorities combined would have many more than 14 pupils with significant visual impairment

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[13] Statistical Bulletin Table 5.2.
[14] Based on 34,680 pupils with Record or IEP as a percentage of 711,836 pupils in Scotland.

and more than 40 with significant hearing impairment. This highlights the fact that the statistical bulletin records the main difficulty in learning, and that many pupils have more than one difficulty. For example, 503 pupils were reported to have visual impairment and RNIB estimate that there are 1,100 pupils with sight loss in Scotland – the other 55% of the 1,100 pupils are likely to be reported as having a physical, learning or other impairment as their main difficulty in learning.

Although there remain doubts about the accuracy of returns for pupils with Records and/or IEPs the figures are still helpful in giving some idea of the numbers of pupils with different sorts of impairments as a main difficulty in learning. This becomes clearer from Table 3.3, which shows the relative prevalence of impairments per 1,000 pupils.

| | Female | Male | Total | Rate per, 1,000 pupils | | |
| --- | --- | --- | --- | --- | --- | --- |
| | | | | Female | Male | Total |
| **Total** | **10,445** | **24,132** | **34,577** | **29.8** | **66.6** | **48.5** |
| Significant hearing impairment | 261 | 363 | 624 | 0.7 | 1.0 | 0.9 |
| Significant visual impairment | 218 | 286 | 504 | 0.6 | 0.8 | 0.7 |
| Significant physical or motor impairments | 506 | 792 | 1,298 | 1.4 | 2.2 | 1.8 |
| Significant language and speech disorder | 428 | 1,251 | 1,679 | 1.2 | 3.5 | 2.4 |
| Autistic spectrum disorder | 486 | 2,998 | 3,484 | 1.4 | 8.3 | 4.9 |
| Social, emotional and behavioural difficulties | 803 | 3,642 | 4,445 | 2.3 | 10.0 | 6.2 |
| Learning difficulties: | | | | | | |
| Moderate | 2,728 | 4,649 | 7,377 | 7.8 | 12.8 | 10.3 |
| Severe | 462 | 729 | 1,191 | 1.3 | 2.0 | 1.7 |
| Profound | 68 | 78 | 146 | 0.2 | 0.2 | 0.2 |
| Specific - in language and/or mathematics (including dyslexia) | 2,135 | 5,097 | 7,232 | 6.1 | 14.1 | 10.1 |
| Complex or multiple impairments: | | | | | | |
| Dual sensory impairment | 32 | 40 | 72 | 0.1 | 0.1 | 0.1 |
| Moderate learning difficulties & significant additional impairments or disorders | 627 | 1,197 | 1,824 | 1.8 | 3.3 | 2.6 |
| Severe learning difficulties & significant additional impairments or disorders | 412 | 679 | 1,091 | 1.2 | 1.9 | 1.5 |
| Profound learning difficulties & significant additional impairments or disorders | 253 | 295 | 548 | 0.7 | 0.8 | 0.8 |
| Other | 1,008 | 1,993 | 3,001 | 2.9 | 5.5 | 4.2 |
| Not known / Not disclosed | 18 | 43 | 61 | 0.1 | 0.1 | 0.1 |

Table 3.3      Relative prevalence of impairments per 1,000 pupils [Source: Scottish Executive Statistical Bulletin Education Series Edn/B1/2006/1 Feb 2006.]

There are many possible reasons why the number of Records of Needs and/or IEPs may not be an accurate measure of impairments and an analysis of these reasons is beyond the scope of this report (though see for example Thomson et

al, 1987). Indeed the inherent inaccuracy in reporting figures for Records of Needs is one of the factors that led to a change in the legislative framework to one that considers additional support needs.

### Summary of findings on main impairment of pupils with Record of Needs and/or IEP

Later we will return to discuss these figures in more detail but for now it is helpful to note that 2006 Statistical Bulletin returns indicate as main difficulty in learning of pupils with a Record of Needs and/or IEP the following examples:

- 7,377 pupils with moderate learning difficulties, representing a rate of 10.3 per 1,000 pupils;
- 7,232 pupils with specific learning difficulties in language and/or maths including dyslexia, representing a rate of 10.1 per 1,000 pupils;
- 1,298 pupils with significant physical or motor impairments, representing a rate of around 1.8 per 1,000 pupils;
- 503 pupils with a significant visual impairment, a rate of around 0.7 per 1,000 pupils;
- for every pupil who is visually impaired there are 2.5 times as many with significant physical impairment; 14.3 times as many with specific learning difficulties; and 14.7 as many with moderate learning difficulties.

As noted however the individual figures reported for each impairment as main difficulty in learning should be treated with caution given that many pupils have more than one difficulty in learning.

## 2. Estimating pupils' additional support needs

### Rationale

Additional support needs are defined more broadly than special educational needs through the Education (Additional Support for Learning) (Scotland) Act 2004 (HMIE, 2006).

Main impairment data referred to above in (1) is based on information on main impairment and data on Record of Needs associated with previous legislation under the Education (Scotland) Act 1980, which was based on pupils' special educational needs. The ASL Act aims to ensure that all children and young people are provided with the necessary support to help them work towards achieving their full potential. It is legitimate therefore to ask what is the nature and extent of pupils' additional support needs. If ASN are not the same as impairments, then what are they?

The first set of annual education statistics featuring proxy measures for additional support needs appeared in the Scottish Executive 2007 Statistical Bulletin. It is too early to say how well they will aid understanding of literacy as a support need. Meanwhile the 2006 information gives pointers to literacy support needs.

### Findings

With this new concept of ASN in mind, we can revisit the 34,680 pupils with a Record of Needs or IEP. Statistics reported on their main impairment are not all

that helpful in identifying what kind of support they require in order to meet the additional needs arising from their impairments. Impairments are not the same as support needs. A pupil can have similar support needs arising from different impairments (or from other factors) and the same impairment can give rise to different support needs.

For example two children whose main impairment is noted as deafblindness may have entirely different support needs. One may use British Sign Language as a first language, have later become visually impaired and learned Braille; the other may use spoken English as a first language, use large print and benefit from text to speech software on a computer.

Two pupils with very different main impairments may require very similar, or indeed very different provision, to address their support needs. A pupil with a physical impairment may require specialised software to turn pages or to navigate the text of documents. But in order to read and access the curriculum he or she may require software that converts the text into speech. He or she may also require specialised switch operated software to demonstrate knowledge and understanding. A second pupil with a specific learning difficulty, for example dyslexia, may not need specialised software to turn pages but use the same text to speech software in order to read the text and access the curriculum. This second pupil may also require supportive writing software, though not using switches.

## Summary of sample additional support needs

In subsequent sections we will consider the nature of these support needs more fully, at least as they relate to accessing the curriculum and demonstrating knowledge and understanding. At this stage though it is helpful to give some idea of what might be considered as support needs.

A pupil might require for example one or more forms of support, such as in:

- moving and assisting
- reading text
- seeing text
- understanding text
- finding text
- holding books
- turning pages
- recording work e.g. handwriting
- etc.

The list is not intended to be exhaustive but to indicate the sorts of difficulties pupils might have with accessing the curriculum and demonstrating knowledge and understanding, with respect to text. We will return to discuss additional support needs under Section 4.

# 3. Pupils requesting Assessment Arrangements in SQA examinations

## Rationale

Students who have difficulty with reading or handling examination question papers, or writing or recording their answers, may use an 'Assessment Arrangement' when sitting an SQA external assessment (Standard Grade, Intermediate 1 and 2, Higher and Advanced Higher) (SQA, 2004). The type of arrangement requested is determined by the nature of the pupil's support needs and the assessment in question, and may include, for example: extra time; use of human reader or scribe; a modified or adapted paper (large print, on coloured paper, a different font, Braille, or digital papers); transcription of the paper; paper signed to the candidate; use of a word processor or ICT.

Information on the assessments and examinations accessed by pupils, and any accommodations or arrangements used, will therefore provide a good indication of the number of candidates who have difficulty using standard printed materials.

When schools apply to use assessment arrangements they specify the pupil's impairment(s). SQA provided us with figures for the number of pupils with a particular condition, the examinations taken, and the type of arrangement used.

## Findings

Since 1995 there has been a 340% increase in the number of candidates requesting Assessment Arrangements for SQA external assessments, from 3,094 students in 1995, to 10,650 in 2006 (SQA 2006). Approximately 7% of all candidates sitting examinations use Assessment Arrangements (Table 3.4).

### Number of candidates requesting assessment arrangements

| Year | Number of candidates requesting AA | Total number of candidates (entries for Access 3 through to Adv. Higher) | % of candidates who requested AA | Number of AA requests | Total number of entries | Requests as % of entries |
|------|------|------|------|------|------|------|
| 2003** | 8,350 | 139,457 | 5.99% | 39,183 | 734,273 | 5.34% |
| 2004** | 9,904 | 140,012 | 7.07% | 45,680 | 728,129 | 6.27% |
| 2005** | 9,814 | 142,158 | 6.90% | 41,454 | 716,222 | 5.79% |
| 2006 | 10,650 | 147,429 | 7.22% | 43,291 | 732,794 | 5.91% |

Table 3.4:    Number of candidates and requests for Assessment Arrangements, 2004 – 2006
** Figures based on requests rather than uptake

### Factors leading to the requests for assessment arrangements

Table 3.5 and Figure 3.1 summarise the main difficulties that lead to requests for Assessment Arrangements and the number of entries made by the candidates. (The total number of candidates in Table 3.5 differs from the totals in Table 3.4 because candidates may have different support needs that relate to different

subjects.) The majority of candidates (between 64% – 68%) have Specific Learning Difficulties (SQA, 2003, 2004, 2005).

| Difficulty | 2003 | | 2004 | | 2005 | | 2006 | |
|---|---|---|---|---|---|---|---|---|
| | Candidates | Entries | Candidates | Entries | Candidates | Entries | Candidates | Requests |
| Specific Learning Difficulties | 5,742 | 27,532 | 6,660 | 31,545 | 6,625 | 28,419 | 6,965 | 29,002 |
| Various other difficulties (including temporary difficulties) | 2,506 | 11,116 | 3,238 | 13,563 | 2,531 | 10,122 | 3,393 | 12,932 |
| Visual difficulties | 102 | 535 | 473 | 2,084 | 713 | 2,913 | 302 | 1,357 |
| **Total** | **8,350** | **39,183** | **10,371** | **47,192** | **9,869** | **41,454** | **10,660** | **43,291** |

Table 3.5:     Numbers of candidates for whom Assessment Arrangements were made.
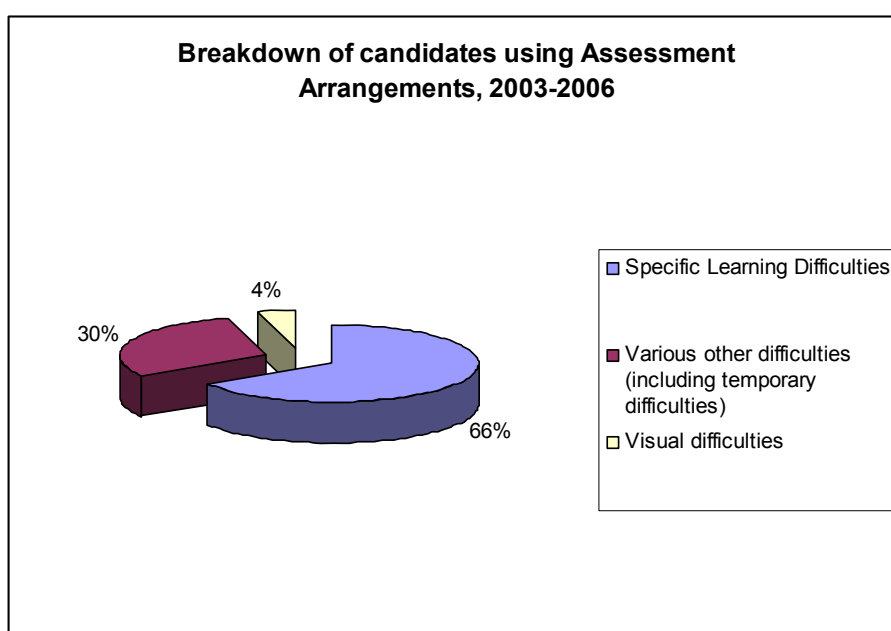


Figure 3.1:     Difficulties underlying requests for Assessment Arrangements

Comparing the results shown in Figure 3.1 and Table 3.1 (main impairment) with SQA returns, a number of points emerge. Over two-thirds of requests for alternative assessment arrangements submitted to SQA are on behalf of pupils with specific learning difficulties including dyslexia. Children with moderate learning difficulties are not specifically presented in Table 3.5 or Figure 3.1 because the numbers of such pupils requiring Assessment Arrangements is relatively small, even though this group are the largest identifiable group in the Scottish Executive statistical returns. Some might argue that pupils with MLD don't require books because of their difficulty understanding text, but later sections of the report will shows that this is not true: pupils with MLD can access books written in simple language, or with support from symbols.

Table 3.6 offers a further breakdown into more precise categories of impairment or difficulty for 2006. Note that the totals here are slightly different to those given above because the latter records the number of actual arrangements made, which are usually greater than the number of requests submitted to SQA by schools.

Table 3.6 demonstrates again that by far the largest group of pupils who have difficulty with reading SQA question papers and writing or recording answers are those with specific learning difficulties (66%). The next largest group are those pupils with general learning difficulties (8%) followed by 'other disability' at 4% and physical disability at just under 4%. The other disability groups represent relatively small percentages of the total number of pupils who require assessment arrangements.

| | Candidates | Percentage of total no of candidates using AA | Requests |
|---|---|---|---|
| Specific Learning Difficulties/Dyslexia | 5,601 | 52.71% | 23,636 |
| General Learning Difficulties | 878 | 8.26% | 2,924 |
| Specific Learning Difficulties/Other | 872 | 8.21% | 3,181 |
| Specific Learning Difficulties/Dyspraxia | 522 | 4.91% | 2,185 |
| Other Disability/Difficulty | 429 | 4.04% | 1,530 |
| Physical Disability | 412 | 3.88% | 1,602 |
| Other Health Problems | 358 | 3.37% | 1,557 |
| Autistic Difficulties | 317 | 2.98% | 1,401 |
| Visual Impairment | 302 | 2.84% | 1,357 |
| Social, Emotional and Behavioural Difficulties (EBD) | 270 | 2.54% | 984 |
| Hearing Impairment | 206 | 1.94% | 721 |
| Attention Deficit Hyperactivity Disorder (ADHD) | 188 | 1.77% | 870 |
| Speech and Language Impairments | 174 | 1.64% | 720 |
| Mental health problems | 78 | 0.73% | 215 |
| Epilepsy | 60 | 0.56% | 277 |
| Myalgic Encephalomyelitis | 36 | 0.34% | 126 |
| Other | 2 | 0.02% | 4 |
| EAL | 1 | 0.01% | 1 |

Table 3.6:      Difficulties of candidates requesting Assessment Arrangements in 2006

**Analysis by level of assessment**

Figure 3.1 shows that the proportion of candidates for whom Assessment Arrangements are requested falls as the level of the examinations increases: a greater percentage of candidates request Assessment Arrangements at Intermediate 1 (around 9%) and Standard (6%) than at Higher and Advanced Higher.

There are two possible reasons why requests decrease with difficulty of exam: candidates with difficulties may be less able to attempt higher level awards; and/or less able to demonstrate their attainment at higher levels. Either way the question must be posed: are there ways that pupils may be supported to achieve at higher level exams?

A greater percentage of candidates working at lower levels therefore require support to read and answer assessments, and so it is likely that the overall

percentage of pupils who have difficulties and who are taking Access courses, rather than externally examined courses, is larger.

**Assessment Arrangements across examination levels**



| | Standard Grade | Intermediate 1 | Intermediate 2 | Higher | Advanced Higher |
|---|---|---|---|---|---|
| 2004 | 6.3% | 10.6% | 7.4% | 5.0% | 4.3% |
| 2005 | 5.8% | 9.3% | 6.2% | 4.8% | 4.2% |
| 2006 | 5.9% | 8.8% | 6.1% | 5.2% | 4.3% |
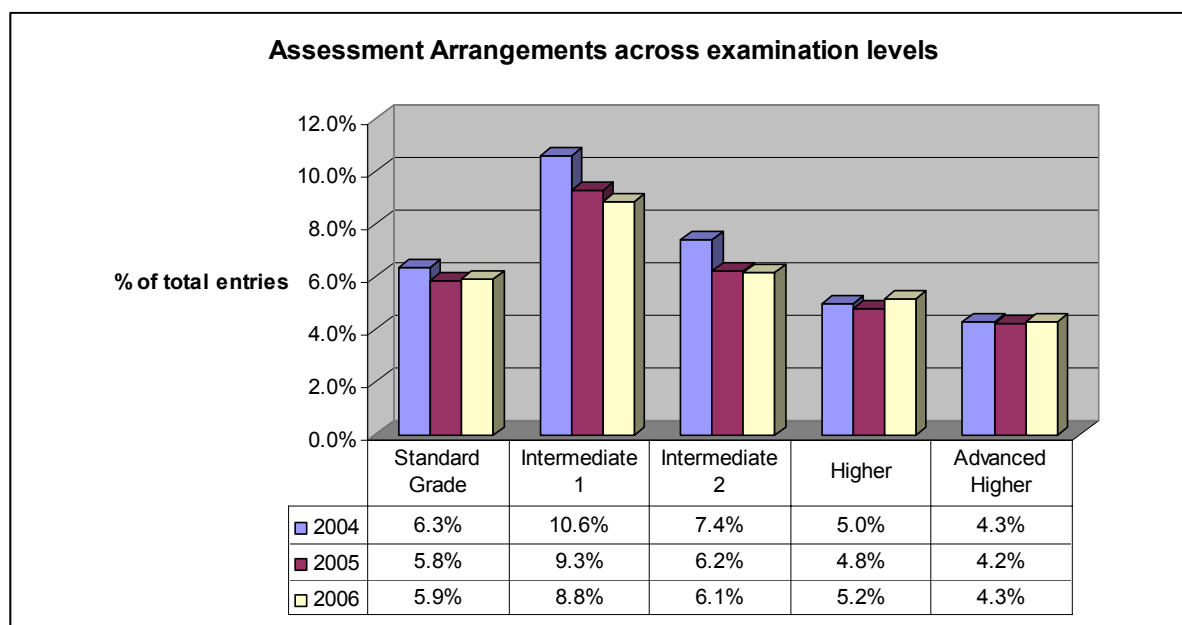
Figure 3.2    Assessment arrangements requests by level of examination, showing decrease with difficulty of exams.

## Pupils with English as a second language

Pupils with English as a second language are not covered by disability legislation (unless of course they have a disability) but  they may well be considered to have additional support needs.  SQA will allow such pupils to use an English/Native Language dictionary, and in most cases, extra time also. The numbers of pupils who have used these accommodations are shown in Table 3.7 (SQA 2006).

| | 2003 | 2004 | 2005 |
|---|---|---|---|
| Number of candidates | 802 | 938 | 1,002 |

Table 3.7:    Candidates with English as a second language

Note that the number of candidates in this category is larger than any of the impairment groups who requested assessment arrangements with the exception of specific learning difficulties.

## Interpreting the findings

The SQA data provides one indication of the number of pupils who have reading and writing or recording difficulties. But it does not represent the total number of students who have reading and writing difficulties and who might benefit from learning materials in alternative formats, because not all students sit SQA external examinations. It is likely that a larger percentage of those who do not sit Standard Grade examinations will have reading and writing difficulties compared to those who do sit the examinations.

# 4. National Assessment Bank (NABs) Assessments

## Rationale

Assessment of attainment for SQA National Courses usually consists of three subject-related National Units which are internally assessed by the school or college, plus an external assessment (e.g. the Standard Grade examination). Internal assessments are conducted using National Assessment Bank (NABs) 'Instruments of Assessment'. NABs feature in Standard Grade, Intermediate, Higher and Advanced Higher examinations. Each subject is associated with three NAB tests.

## Findings

To give an indication of scale there are around 5,000 subjects presenting at Intermediate 1, 2 or Higher level. As there is some overlap between subject papers not as many as 15,000 NABs are required but the scale of NAB requirements is potentially several thousand.

SQA can supply NABs in alternative format and so we asked for a breakdown of the requests received in recent years. SQA staff reported that:

"We seldom get requests for adapted format materials. Over the past three diets we have only had a dozen. They range from Braille copies to changing the font size of the materials.

- We have had three requests for Braille 1 versions.

- Four requests for TNR [Times New Roman] font size 14.

- And half a dozen requests for specific changes such as removal of italics, unboldening and enlarging diagrams."

### Interpreting the findings

The true figure for pupils undertaking NABs and who require assessment arrangements is therefore difficult to ascertain: schools are responsible for making assessment arrangements for NABs and data on arrangements made is not available.

An obvious question arises: if a pupil requires NABs at a certain level in order to sit an external exam, how many are prevented from obtaining qualifications because a) NABs are not requested in alternative formats and b) the infrastructure is not in place so that pupils who might benefit from NABs in alternative formats can do so.

As we will find, this is a potential mark of unmet needs and is a recurring theme. We will return to this point in Section 8.

# 5. Sample local authorities

## Rationale

Up to this point we have mostly reported on data that is relatively straightforward to obtain. Figures reported on main impairments, associated additional support needs derived from impairments figures and examination assessment arrangements are all straightforward to trace (less so NABs), even though they have not to our knowledge been combined in this way before.

The first and third deal mostly with known support need – that is pupils who have some form of support plan in place. What about other pupils: is there evidence that pupils other than those with recognised impairments have difficulties with literacy? Specifically, is there any evidence that there are pupils who do not have a Record of Needs or an IEP but who do have difficulty in either accessing the curriculum or in demonstrating their knowledge and understanding? Rather than measuring met or known support needs, it is important to establish some indication of unmet or unknown support needs and to bring these to the surface.

## Findings

Local authorities record pupil attainment levels and report to the Scottish Executive on an annual basis. The findings from one sample authority are shown in Table 3.8, indicating that the percentages of pupils who achieved Level D in three main subject areas on entry to S1 were as follows:

| % of pupils attaining Level D at end of primary 7 in one sample local authority | |
|---|---|
| Reading | 77.5% |
| Writing | 62.6% |
| Maths | 73.1% |

Table 3.8        Percentage of pupils achieving Level D on entry to S1 for one authority.

Table 3.8 indicates that around one quarter of pupils do not attain the expected Level D in reading, writing or maths at the end of primary school on entry into S1. Comparing the numbers with those who have a recognised main impairment and a Record of Needs and/or IEP it is clear that a far larger number of pupils have some difficulty with literacy but do not have a formal support plan.

It is worthwhile noting that figures for Scottish local authorities are somewhat similar to findings in England published by the Department for Education and Skills (DfES). In their 2005 Statistical First Release on SEN they note:

"70% of children left primary school with Level 4 reading or above in English – this means that about 180,000 children started secondary school without the ability in English that ministers believe is critical to their success at GCSE." Interactive, issue 66 October/November 2006. [DfES, 2005]

**Interpreting the findings**

It is important to be aware that there are problems in using such returns to inform how many pupils will benefit from alternative formats for materials. Some of the factors to consider include:

- At which point should we set a level below which pupils are considered likely to benefit – if at all – from offering text in alternative formats?

- It is one thing to know that there are a larger number of pupils experiencing difficulties in accessing the curriculum, and/or demonstrating knowledge and understanding than those who have support plans in place. It is quite another to say that any or all of them will benefit from materials in alternative formats.

# 6. Sample secondary schools: S1 pupils who have difficulty accessing print or writing and recording

## Rationale

Obtaining national figures on main difficulties in learning, interpolating support needs and finding out local authority figures as a whole represent different ways of finding out how many pupils may benefit from some sort of support to access the curriculum or demonstrate knowledge and understanding. It is also helpful to obtain information on individual schools. Data from individual schools can help to provide a more detailed breakdown on particular profiles of needs.

## Findings

### Secondary mainstream school

In one secondary school both spelling and reading tests are carried out with pupils entering S1. Results are collated and marked, then compared against the pupil's chronological age as well as against other information forwarded by the primary school. The school follows up pupils with a 2-year discrepancy i.e. reading level 2 years below the pupil's chronological reading age. The school expects that S1 to S2 children will achieve Level D or above, so are looking to identify children who are at Level B or below.

In this secondary school, which draws from a mixed rural and urban area, 28 pupils were found to have some form of literacy or numeracy difficulty (the latter measured by maths diagnostic testing). With a school entry year group of 180 children, this represents around 15.5%. This figure did not include those pupils who were identified as having a specific learning difficulty or dyslexia, which resulted in an additional 10 pupils. As seen in Table 3.9, out of 180 pupils entering S1, 38 therefore had significant difficulties with literacy, a figure of 21.1%

In this particular year (2006-7) the sample school reported more children working at Level B than ever before, that is pupils who cannot follow the standard curriculum. (The 15.5% figure included those working at Level A.)

| Sample Secondary School | Numbers | % | Identified ASN? |
|---|---|---|---|
| S1 Year Group entry | 180 | | |
| Screened at Level B (2 SD discrepancy) | 28 | 15.6 | No |
| Specific Learning Diff or other | 10 | 5.6 | Yes |
| **Total Single School S1** | **38** | **21.1%** | **Mix** |

Table 3.9        Sample secondary school S1 entry literacy figures

### Special school, urban area

One special school reported a school roll of 63 pupils aged 5-18 years. Of these pupils all experienced significant difficulty in reading and understanding text. This affected all areas of school work and the pupils had similar difficulty in recording work.

### Interpreting the findings

When assigning literacy levels for S1 entrants much will rest on the particular definition of functional literacy one chooses to adopt. For example if one were to set functional literacy at a 9-year-old level and apply it to S1, then problems in literacy would all but disappear as almost all pupils entering S1 would achieve Level B. Doing so allows certain statements to be made on attainment of literacy levels. Setting the S1 literacy entry level higher may result in a much greater number of pupils appearing not to achieve functional literacy – even though the same proportion of pupils may achieve that particular level of literacy e.g. Level B. Because the cut-off point is arbitrary a larger (or smaller) number could appear to be being identified as not achieving functional literacy.

The figures for one average mainstream secondary school demonstrate that there is little point in lowering the benchmark for functional literacy if that level does not allow pupils to follow the standard curriculum.

## Summary of findings on sample secondary schools

When deciding on a number or percentage of pupils who require support to access the curriculum or to demonstrate knowledge and understanding, in which confidence can be placed, we also recognise that a wider number may also benefit.

In terms of policy development and service delivery, planning should consider ways in which developments that meet the needs of one group (e.g. those with a support plan in place) may also benefit others (e.g. the far greater number of those who do not have a support plan but who do have significant difficulties in literacy).

At the very least the model of service delivery should not prevent the second larger group benefiting. At best a single process could address both the group for whom a support plan is in place, and the larger group of those with unmet literacy support needs, perhaps through the curriculum in a regular fashion.

We discuss models of service delivery in Sections 13 and 14 of this report, but a core principle is the view that getting the model correct should allow the 'business to grow' to meet the demands of a wider group, rather than require radical

restructuring and relocation to meet those with as yet unmet, and to some extent, currently disregarded needs.

# 7. Questionnaire returns on number of pupils who experience difficulties in accessing literacy

## Rationale

We compiled both a short form and long form of questionnaires (Appendices 2 and 3) in which we invited people to provide information on:

- role of respondent e.g. class teacher, and setting worked in primary class;

- numbers of pupils the individual worked with and whether completed on behalf of a school, authority, class or pupil group;

- pupils' reported difficulties e.g. reading text;

- what kind of support pupils were given e.g. reader, scribe etc.;

- how much time was spent creating accessible materials;

- how many materials were created and which types;

- what developments are desired in regard to curriculum materials in alternative formats.

### Short questionnaire

Because of limited time available to undertake the first phase of the project (September to December 2006) the short questionnaires could only ever provide indicative clues and form part of a broad approach to finding out how many pupils required support in literacy including materials in alternative formats. In order to generate statistical reliable returns, we would have required clear methods and routes for disseminating questionnaires to ensure that individual classes or schools, and service providers at a local authority level, were not counted more than once. Detailed permission would have had to be sought, meetings held and presentations made to authorities or clusters of authorities. All of this would have eaten into time available to carry out the project.

We therefore used the short questionnaires in an opportunistic fashion, presenting them to individual delegates at three different conferences and via the CALL web site – ensuring that the same people did not return questionnaires twice.

### Long questionnaires

The long questionnaires were also not designed to produce statistically reliable or valid results. The time available to carry out the investigation, obtain permissions, send out pilot questionnaires and ensure full data integrity and carry out statistical analysis precluded the use of questionnaires as anything more than giving overall impressions. Nevertheless, both short and long questionnaires generated useful insights and in Sections 5 and 6 we discuss in some detail the results obtained from responses to the questionnaires.

## Findings

### Short questionnaires

In this section we report only the numbers of pupils who were described as experiencing difficulty in accessing the curriculum or in demonstrating knowledge and understanding. In later sections we return to discuss other findings from returns.

Forty-four questionnaires were returned. Respondents were mostly learning support teachers but included four class / subject teachers, two teachers of visually impaired pupils and two pupils who reported on their own school. A breakdown is given in Table 3.10.

| Role | No. of Respondents | No. Pupils with difficulties |
|---|---|---|
| Learning support teacher | 0 | 0 |
| | 2 | 1-5 |
| | 3 | 5-10 |
| | 5 | 10-20 |
| | 17 | >20 |
| | Total 27 | > 400[15] |
| Class / subject teacher | 3 | 1-5 |
| | 2 | 5-10 |
| | Total 5 | 20 |
| Teacher of VI pupils | 1 | 10-20 |
| | 1 | >20 |
| | Total 2 | >30 |
| Pupil | 1 | 5-10 |
| | 1 | >20 |
| | Total 2 | >20 |
| EAL teacher | 1 | >20 |
| Head Teacher | 1 | >20 |
| Other | 1 | 1-5 |
| | 1 | 5-10 |
| | 2 | 10-20 |
| | 1 | >20 |
| Not noted | 1 | 10-20 |

Table 3.10  Number of respondents to short questionnaire together with number of pupils worked with.

From this small sample of respondents we can see that, of the small number of respondents, the majority (27 out of 44) were learning support teachers working

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[15] Because the figures are not in any way statistically reliable the totals for each type of respondent represent a mix of most common reported for that type of respondent with an approximate weighting accorded to the number of respondents reporting number of pupils with difficulties e.g. the majority of learning support teachers (17) reported working with more than twenty pupils each.

BOOKS FOR ALL

with over 400 pupils with difficulties in reading, holding or manipulating books. The short questionnaire did not invite respondents to state the number of pupils in the school, class or authority with whom they worked, so it is not possible to derive percentages from these figures. Instead they give some indication of relative weighting.

**Long questionnaires**

As mentioned above, time limitations did not allow for engagement with local authority senior managers to ensure detailed tracking of a fully representative range of respondents. Rather than comparing figures from questionnaires across all authority population figures and age structures therefore, we report below on returns for one authority.

In order to avoid biasing results elsewhere in the report we report only this authority's responses to the long questionnaire returns. We do not report on this authority as one of the four VI service authorities, nor does it feature in our reports on S1 literacy entry figures. In this way we provide results from across a representative spread of schools, services and authorities.

In this one authority questionnaires were returned on behalf of two primary and two secondary schools with pupil numbers shown in Table 3.11.

|  | Primary | | Secondary | |
|---|---|---|---|---|
| **Numbers** | **School 1** | **School 2** | **School 3** | **School 4** |
| School roll | 170 | 80 | 370 | 250 |
| Reading difficulty | 24 | 10 + 3 Romanian | 45 | 30 |
| Seeing difficulty | 4 |  |  | 1 |
| Understanding difficulty | 7 | 11 + 3 Romanian | 45 | 30 |
| Difficulty holding or turning pages |  | 1 |  |  |
| Writing or recording difficulty | Much higher | Much higher | 45 | 30 |
| Other |  | About 8 |  |  |
| **% with difficulty** | **14%** | **13%** | **12%** | **12%** |

Table 3.11      Sample return from one local authority showing number and school percentages of pupils with difficulties in reading, seeing, understanding, holding or turning pages or writing and recording.

Respondents were asked to note how many pupils experienced difficulties with reading text, seeing text, understanding text, holding or turning pages, recording work or other. Table 3.11 shows difficulties across a range of different measures. As it was possible, in some case likely, that the same pupil had difficulty with more than one aspect of literacy, the overall percentage figure counts the pupil only once. For example, the percentage of pupils who have difficulty in School 2 is given as 13% - 11 out of 80 – and we have not included the three Romanian pupils. The percentages shown are calculated from whichever was the higher number of pupils with a difficulty in reading, seeing, understanding etc.. This probably underestimates the numbers who experience some form of difficulty (it was clear from notes provided by respondents that the numbers they reported referred to different pupils).

With this in mind the 12-14% is remarkably consistent and not dissimilar from other returns. What is clear is that the figure reported is substantially higher than the 5% who, according to official returns, have some form of support plan in place (discussed in the first part of Section 3).

**Interpreting the findings**

It is striking that the percentage is similar across both primary and secondary sectors. Clearly the same children don't attend both sectors at the same time so it is not possible, from this information alone, to say that the children in the primary sector will continue to have literacy difficulties into secondary school, or whether the children with such difficulties in secondary would be a different group. The findings from (5) and (6) would suggest that children who have difficulties in secondary also had difficulties in primary.

# 8. Numbers with below average performance on 5-14 testing

Referring to figures presented under (5) above, we see that over 20% of pupils do not achieve the level of attainment for their age on entry to secondary school. There is some indication that this may be improving slightly in that measures of reading, mathematical and scientific literacy of 15-year-olds in OECD countries shows that Scotland has narrowed its gap in reading literacy (see HMIE, 2006, para 8), though not by a statistically significant amount.

# 9.    Pupil caseloads from sample service provider(s)

## Rationale

We approached a small number of service providers to ascertain the nature of the impairments and additional support needs of pupils they worked with.

While we will go into more detail in later sections of the report it is helpful to note here that we approached:

- one visual impairment service that provides a service to four local authorities (representing approximately 15% of the Scottish school population);

- one service provider working with pupils with reading difficulties in one local authority (approximately 10% of the Scottish school population).

## Findings

### Visual Impairment Service

The service supports approximately 200 children and young people with significant visual impairment. (In addition, just over 50 pupils with significant visual impairment attend independent or grant-aided special schools. The latter will receive support from outwith this VI service. Of the 50 who attend schools outwith the public sector more than half have complex additional support needs.) Of the 200 children, around 125 have additional, often complex impairments. The VI service has a staff of 3 full time teachers and 2 full time technicians. Approximately 30 pupils are served by the transcription service.

**Service for pupils with reading difficulties**

This service, separate from the VI service, supports around 45 dyslexic children in primary schools in the local authority. The service has two FTE staff working on a peripatetic basis and also creating accessible resources.

# 10. Pupils leaving school not in employment, education or training (so-called NEET group)

## Rationale

The so-called NEET (Not in Employment Education or Training) group have been the subject of intensive discussion and reporting in recent years (see for example HMIE, 2006). Sub-groups include young carers, leavers; those with family disadvantage and poverty; those who are substance abusers, young offenders; pupils with additional support needs and educationally disaffected. Risk factors include deprivation and financial exclusion, low attainment, weak support networks and stigma of others (HMIE, 2006). Given that low attainment features strongly as one of the risk factors and that NEET is associated with educational disaffection it is reasonable to propose that difficulties with literacy features somewhere as cause or effect.

## Findings

There could therefore be a broader range of learners who might potentially benefit from accessing the curriculum through alternative formats e.g. possibly a subset of the so-called NEET (not in employment, education or training) group.

While there continues to be debate around what percentage of NEET are at risk of low attainment, the figure of 13%-15% of young people in the 16-25 age group is often quoted (e.g. HMIE 2006). Reports by HMIE indicate that this figure is falling and there are already a number of strategies in place to further reduce this percentage.

## SECTION 4 LITERACY SUPPORT NEEDS

## Objective 4: To ascertain the nature of these literacy support needs.

**Outcome:** **Indicate underlying reasons why students have difficulties accessing printed school information, including: handling books and turning pages; reading; seeing print; understanding what is written; writing; spelling; other.**

## Summary

1) Pupils' capacity to access the curriculum and demonstrate their knowledge and understanding requires as a minimum abilities in reading, seeing, understanding, holding books and turning pages, finding words and phrases and in recording work e.g. through handwriting.

2) There is no clear relationship between impairment and type of literacy support need. Different impairments give rise to additional support needs in any one or more of the areas outlined in (1).

3) Different impairments affect each type of literacy support need in different ways and to a different degree. For example, around half of pupils with significant visual impairment have additional, often multiple impairments. The literacy support needs of those with multiple impairments may have much in common with pupils who have severe or profound learning difficulties.

4) Students require Assessment Arrangements in SQA external examinations primarily as a result of difficulties with reading (as opposed to seeing or understanding) papers and writing and recording answers. The most common methods of supporting these needs (apart from allowing extra time) are use of readers and scribes. There is considerable potential to reduce such reliance on human support through the use of question papers in accessible formats.

5) Considering literacy support needs in terms of different kinds of provision designed to meet these needs can be revealing. Of seven different approaches – sign language, signing systems, pictures & symbols, text to speech, adapted or large print, Braille and switch access – text to Braille and sign language are the least required formats. Yet Braille and Large Print are the most widely available type of alternative formats.

6) Text to speech, picture and symbol support, and text to adapted or large print, are formats required by the largest number of pupils with a range of impairments.

# Background to Section 4

There is as yet no direct way of finding out the extent of additional support needs in Scotland. This is reasonable as the ASL Act only came into force in November 2005. At the time of writing the first set of published figures for ASN had just been just published but did not cast light on what might constitute literacy support needs.

Although reasonable not to have ASN figures on literacy available it isn't all that helpful. We know that a support need isn't the same as an impairment but we don't yet know what the full range of support needs are. How then do we get from impairments, on which official annual returns are published and are up to date (though as we have seen may not be all that accurate), to support needs, for which there are as yet no official published data and therefore cannot be up to date? And how might this be expressed in terms of literacy?

## Methods used

We used official figures on impairments to arrive at some understanding of ASN in several linked steps as follows. We:

- Identified a range of literacy support needs.
- Drew on information that was known about main impairments of pupils with Record of Needs and/or IEP to predict literacy support needs and provide approximate figures on ASN.
- Contacted Scottish Qualifications Authority to find out nature of requests made to them for alternative assessment arrangements.
- Contacted a small number of service providers who respond to requests from schools, or who proactively establish the need for, curriculum materials to be produced in alternative formats.
- Sent out questionnaires to a small number of schools asking them to estimate the likely uptake of curriculum materials available in different formats.
- Ascertained the literacy support needs of pupils leaving school but not in employment, education or training (so-called NEET group).

# 1. Identifying literacy support needs

The language of additional support needs introduces some interesting new dimensions to thinking. Instead of thinking only in a language of impairments it is necessary to begin to think about the additional support needs that arise from those impairments. This isn't particularly radical and is something that people in the 'disability movement' have been urging should happen for many years.

ASN can arise from a number of factors: social and economic, disability or health, family circumstances or from the learning environment itself. In school, addressing ASN might include for example having to:

- make adaptations to the timetable;

- ensure correct moving and assisting;

- support access to written information through pictures and/or symbols;

- provide text in large print or adapted print format;

- use sign language e.g. BSL;

- support communication using sign systems;

- convert text to speech;

- convert text to Braille.

If we focus only on ASN related to literacy we find there are a number of reasons why students may have difficulty in accessing printed school information. We have categorised them as follows in Table 4.1:

| Difficulty | Example |
|---|---|
| Reading | The pupil has problems reading the text but is able to understand the content. |
| Seeing | The pupil has difficulty seeing the text but can understand the content. |
| Understanding | The pupil has difficulties in understanding or remembering the information contained in the text. |
| Finding text | The pupil has difficulty finding particular words or sections in the text |
| Holding books and turning the pages | The pupil has a physical difficulty and cannot hold the book, turn the pages or otherwise manipulate it. |
| Recording work | The pupil has difficulty writing or recording either as a result of a physical impairment, motor coordination issues resulting in slow or untidy handwriting, poor spelling, or difficulty in planning and organising work. |

Table 4.1:     Support needs related to literacy.

While the list may not be comprehensive and it does not say what has to be done to address a particular ASN, it does offer a useful starting point. We can use it to revisit the data on main difficulty in learning. For ease of reference, figures on main difficulty in learning of pupils with a Record and/or IEP, first set out in Section 3 [see for example Table 3.1] are shown in Table 4.2.

| Total | 34,577 |
|---|---|
| Significant hearing impairment (HI) | 624 |
| Significant visual impairment (VI) | 503 |
| Significant physical or motor impairments (PI) | 1,298 |
| Significant language and speech disorder (SLI) | 1,679 |
| Autistic spectrum disorder (ASD) | 3,484 |
| Social, emotional, behavioural difficulties (SEB) | 4,445 |
| *Learning difficulties:* | |
| Moderate (MLD) | 7,374 |
| Severe (SLD) | 1,192 |
| Profound (PLD) | 146 |
| Specific – in language and/or mathematics (including dyslexia) (SpLD) | 7,231 |
| *Complex or multiple impairments:* | |
| Dual sensory impairment (DB) | 72 |
| Moderate learning difficulties & significant additional impairments or disorders (MLD+) | 1,824 |
| Severe learning difficulties & significant additional impairments or disorders | 1,091 |
| Profound learning difficulties & significant additional impairments or disorders | 548 |
| Other (Ot) | 3,001 |
| Not known / Not disclosed (N/K) | 65 |

Table 4.2:    Impairment as main difficulty in learning[16]


# 2. Using main difficulty in learning to predict ASN

We can combine the information from Table 4.2 with literacy support needs in Table 4.1 to arrive at an approximation for the type of ASN that would need to be addressed in the core 5% group of pupils with some form of identified additional support plan. For transparency we do that in four steps:

- Step 1, we present the main impairment outline information in rows, combined with type of literacy support need, in columns of Table 4.3.

- Step 2, we provide an overall impression of whether each main impairment is likely to be associated with each literacy support need, using shading of table cells. This step is depicted in Table 4.4.

- Step 3, Table 4.5 provides relative shadings in order to convey a weighting for the impact of each impairment on literacy support need.

- Step 4, we provide a simplified overview displaying pie charts of relative size.

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[16] Scottish Executive Statistical Bulletin Education Series Edn/B1/2006/1. Pupils in Scotland 2005. Table 1.7: Main difficulty in learning of pupils with a Record of Needs and/or an Individualised Educational Programme in primary, secondary and special schools, 2005.

## Step 1: Main impairment and literacy support need

Table 4.3 shows each main impairment as individual rows together with the range of different literacy support needs displayed in columns. We now have a more direct way of finding out how impairments give rise to literacy support needs.

| ASN<br><br>Main Impairment | Read Text | See Text | Under-stand Text | Finding text | Hold books | Turn pages | Record Work e.g. writing |
|---|---|---|---|---|---|---|---|
| Significant hearing impairment | | | | | | | |
| Significant visual impairment | | | | | | | |
| Significant physical or motor impairments | | | | | | | |
| Significant language and speech disorder | | | | | | | |
| Autistic spectrum disorder | | | | | | | |
| Social, emotional and behavioural difficulties | | | | | | | |
| Learning difficulties: | | | | | | | |
| Moderate | | | | | | | |
| Severe | | | | | | | |
| Profound | | | | | | | |
| Specific language and/ or maths (incl dyslexia) | | | | | | | |
| Complex or multiple impairments: | | | | | | | |
| Dual sensory impairment | | | | | | | |
| Moderate learning diffs & significant additional impairments /disorders | | | | | | | |
| Severe learning diffs & significant additional impairments / disorders | | | | | | | |
| Profound learning diffs & significant additional impairments / disorders | | | | | | | |
| Other | | | | | | | |
| Not known / Not disclosed | | | | | | | |

Table 4.3:      Main impairments combined with literacy support needs.

Table 4.3 is intended to give the impression that different impairments can be associated with a range of literacy support needs. What Table 4.3 does not show is which impairments are associated with which literacy support needs. We address this point next. This is presented solely in illustrative form in the table below by presence or absence of shading.

## Step 2: Effect of impairment on literacy support needs

Shaded boxes in Table 4.4 indicate that each literacy support may or may not be associated with an individual impairment.

| ASN Main Impairment | Read Text | See Text | Under-stand Text | Finding text | Hold books | Turn pages | Record Work e.g. writing |
|---|---|---|---|---|---|---|---|
| HI | ■ |  | ■ | ■ |  |  | ■ |
| VI | ■ | ■ | ■ | ■ |  |  | ■ |
| PI | ■ | ■ |  | ■ | ■ | ■ | ■ |
| SLI | ■ |  | ■ | ■ |  |  | ■ |
| ASD | ■ |  | ■ | ■ |  |  | ■ |
| SEB |  |  |  |  |  |  |  |
| *Learning difficulties:* |  |  |  |  |  |  |  |
| MLD | ■ |  | ■ |  |  |  | ■ |
| SLD | ■ |  | ■ | ■ |  |  | ■ |
| PLD | ■ |  | ■ | ■ |  |  | ■ |
| SpLD | ■ | ■ | ■ | ■ |  |  | ■ |
| *Complex or multiple impairments:* |  |  |  |  |  |  |  |
| DB | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| MLD+ | ■ |  | ■ | ■ |  |  | ■ |
| SLD+ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| PLD+ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Ot |  |  |  |  |  |  |  |
| N/K |  |  |  |  |  |  |  |

Table 4.4:     Effect of impairment on literacy support needs. The legend in column 1 refers as follows: Significant hearing impairment (HI)l Significant visual impairment (VI); Significant physical or motor impairments (PI); Significant language and speech disorder (SLI); Autistic spectrum disorder (ASD); Social, emotional, behavioural difficulties (SEB); Learning difficulties of which Moderate (MLD), Severe (SLD), Profound (PLD), Specific – in language and/or mathematics (including dyslexia) (SpLD); Complex or multiple impairments of which Dual sensory impairment (DB), Moderate learning difficulties & significant additional impairments or disorders (MLD+), Severe learning difficulties & significant additional impairments or disorders, Profound learning difficulties & significant additional impairments or disorders; Other (Ot); Not known / Not disclosed (N/K).

The table shows that there is no one-to-one correspondence between impairment and ASN. An impairment may give rise to several areas of support needs, a particular support need may be associated with several impairments – and may be addressed in different ways. Understanding the table is perhaps helped by examples.

*Example 1*:  a hearing impairment is likely to be associated with some level of difficulty in reading text, finding a particular word or phrase in the text, possibly in understanding text. A hearing impairment will not in itself be associated with any difficulty in seeing the text.

*Example 2*: Significant physical impairment is likely to be associated with difficulty finding text, holding books, turning pages and demonstrating knowledge and understanding i.e. writing or otherwise recording work. Of itself a physical impairment will not affect seeing text. (Of course many pupils with significant physical impairment will also have a sight impairment; we discuss this shortly.)

Knowing that certain impairments are associated with particular additional support needs goes some way towards identifying support needs that can in principle be met – or perhaps 'known' support needs would be a more accurate term. (Known support needs are not necessarily the same things as support needs that are being met.) However, this new framework omits two important pieces of information.

Just because an additional support need is associated with a particular impairment does not allow you to predict the extent of that support need. Nor will knowledge of impairments and associated support needs tell us how many pupils with that particular main impairment will have each of the possible support needs

An example will help to illustrate this difference. There are approximately 1,400 children and young people aged 0-18 years in Scotland who are reported to have significant visual impairment (Scottish Executive, 2006; Visual Impairment Scotland, 2003). Of this figure some (approximately 50%) will have additional often multiple impairments (Pavey, 2004). Those who do *not* have additional impairments are likely to have support needs in seeing text and finding text. Of the others - those with multiple impairments - support needs may be in reading text, understanding text, holding books and recording work. The literacy support needs of the latter may be better met by approaches that have more in common with those designed to address impairments other than visual impairment. We will return to this point in later sections.

Furthermore, there is more than one way to address each of the additional support needs noted in columns 2 to 8. We return to this point when we discuss alternative formats in Section 6 of the report.

## Step 3: Weightings between impairment and literacy support need

In Table 4.5 we estimate a combination of the effect of the severity of the impairment, with the likely number of pupils with that impairment, on support need.

Table 4.5 introduces an element of weighting to give some idea of the effect a particular impairment has on broad characteristics of literacy. Weighting is considered in two ways: the likely effect of the impairment on a support need and an estimate of the numbers with that impairment who have that support need. The example from physical impairment, introduced in Step 3, is developed below.

Some children have this difficulty (0 to 33%) and/or moderate effect

- Many children (34 – 66%) and/or moderate effect
- Most children (67 – 100%) and/or profound effect

| ASN<br><br>Main Impairment | Read Text | See Text | Under-stand Text | Find text | Hold books | Turn pages | Record Work e.g. writing |
|---|---|---|---|---|---|---|---|
| HI | dark grey | light grey | dark grey | dark grey | light grey | light grey | dark grey |
| VI | dark grey | black | dark grey | black | light grey | light grey | dark grey |
| PI | light grey | light grey | light grey | black | black | black | black |
| SLI | black | white | black | black | white | white | black |
| ASD | dark grey | white | dark grey | dark grey | white | white | dark grey |
| SEB | white | white | dark grey | white | white | white | dark grey |
| *Learning difficulties:* | | | | | | | |
| MLD | light grey | white | light grey | white | white | white | light grey |
| SLD | dark grey | white | dark grey | dark grey | white | white | dark grey |
| PLD | black | light grey | black | black | dark grey | dark grey | black |
| SpLD | black | light grey | light grey | black | white | white | black |
| *Complex or multiple impairments:* | | | | | | | |
| DB | black | black | black | black | white | white | black |
| MLD+ | black | white | black | black | white | white | black |
| SLD+ | black | black | black | black | black | black | black |
| PLD+ | black | black | black | black | black | black | black |
| Ot | white | white | white | white | white | white | white |
| N/K | white | white | white | white | white | white | white |

Table 4.5:     Weighting given to combined effect of severity of impairment and numbers affected on each literacy support need. The strength of shading signifies severity and number. Darker equals more severe and/or greater number.

*Example 1*: Some pupils with a physical impairment (by no means all) are known to have difficulties associated with reading; particular kinds of words, phrases, sentences. These difficulties are often associated with cerebral palsy. For this relatively small group the effect can be severe, so the weighting is accorded light shading – a combination of small number with severe effect. Physical impairment will also result in many experiencing difficulty finding text, holding books, turning pages and recording work e.g. handwriting. Not only will many be affected but the effect on these support needs is likely to be severe for many. Therefore the combined weighting for severity and number has dark shading.

*Example 2:* What about pupils who are visually impaired? Certainly the effect of visual impairment on ability to see text and to find text is great. Visual impairment by itself does not affect understanding of text though around half will be affected in this way. Reading printed text is severely affected, though not text in certain other formats.

## Step 4: Overview using pie charts of relative size.

In this final step we offer a way of thinking about how a particular impairment is associated with a particular support need, in terms of how that support need might be addressed. In doing so we anticipate some of the discussion that will be developed in later sections on what might be done to address particular support needs.

An example will help to illustrate the approach:

Pupils with a hearing impairment may have difficulty reading text, understanding text, finding text and with recording their work. A range of methods will be used to support the pupils. Depending on the pupil's other difficulties this may include full sign language support, limited sign support, text to speech, pictures and symbols support for words, text to adapted/large print or switch access support.

But pupils with a hearing impairment or who are Deaf are not the only ones who will be supported by some of these methods. For example, someone described as having a significant speech and language disorder may also be supported by text to speech and by pictures and symbols.

How might we present this information in a way that captures information about both the number of pupils supported in that way and at the same time indicates the type of main impairments involved? To do this we drew on the data available through the Statistical Bulletin (and described extensively in Section 3) and estimated the numbers of pupils likely to be supported through particular approaches.

Figure 4.1 illustrates the findings in the form of pie charts drawn to a relative scale. The bigger the pie the more pupils are supported by that form of provision. The colours depict (not seen on photocopied versions) particular main impairments.

Abbreviations used in Figure 4.1:

- Text-Speech: digital text read out by the computer;

- Pics Symbs:  printed or digital resources with pictures and symbols;

- Signsys: signing systems such as Makaton;

- Text-LP: large and adapted printed text materials;

- Switch access: switch-accessible digital multimedia resources;

- SignLang: Sign language such as BSL;

- Text-Braille: printed Braille 1 and 2 and Moon.
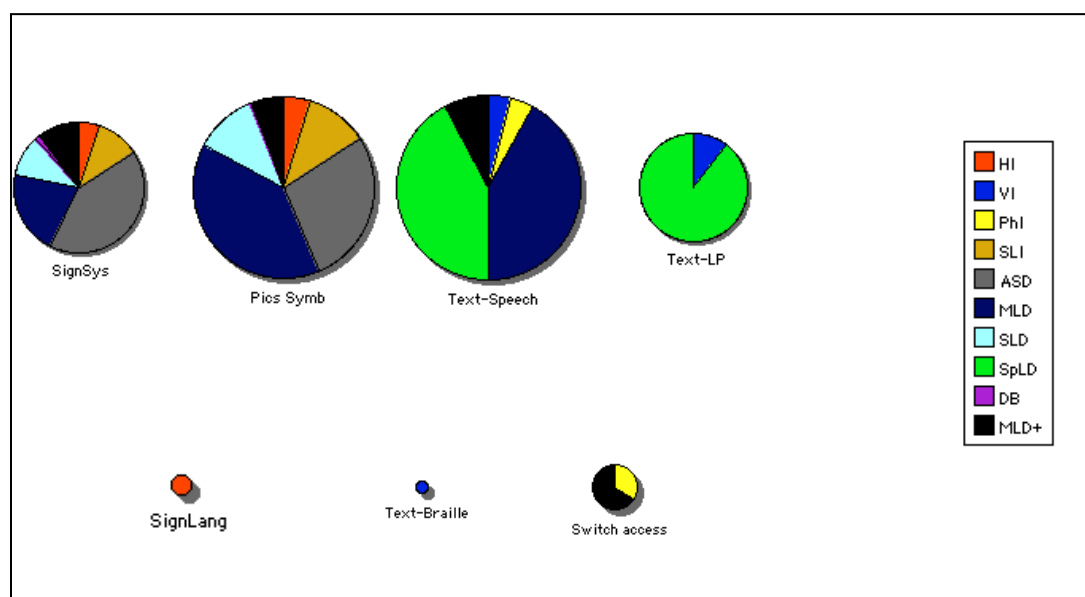
Figure 4.1: Relative weightings representing how a support need might be addressed

The relative size of the pie charts give an approximation for the number of pupils who might be assisted by one of the approaches mentioned. As can be seen text to Braille or sign language are the least required support formats, partly because each is associated with one particular relatively small incidence main impairment: hearing and visual impairments respectively.

In contrast, text-to-speech, picture and symbol support and text-to-large/adapted print are relatively important forms of support. Pupils with several different types of impairment are supported by these methods.

The slices in each pie represent the numbers of pupils with a particular main impairment who may have that particular ASN. Only visually impaired or blind children are likely to have a support need for text-to-Braille. However, pupils with a main impairment of specific learning difficulty, moderate learning difficulty, moderate learning difficulty plus physical impairment, as well as those who are visually impaired may have a support need in the form of text-to-speech. A close second in terms of support needs is access to pictures and symbols to support literacy. In terms of impairments this support need is represented by pupils described as having moderate learning difficulties, as well as many of those with autistic spectrum disorder, speech and language impairment, moderate learning difficulty plus physical impairment as well those who are hearing impaired.

It is worth reiterating that there is no one-to-one correspondence between impairment and ASN. An impairment may have several areas of support needs, while a particular ASN may be represented by several impairments.

Clearly there are many issues that this perspective will raise. But it does help to paint a very different type of picture about which ASN needs should be addressed and how. No amount of impairment analysis can hope to reveal this kind of information. Only an analysis that considers additional support needs can do so. As a result of the ASL (Scotland) Act the Scottish education system is particularly well placed to make significant progress: the legislative framework leads the way.

In order to provide some form of triangulation on information for support needs we also compared figures from the 2007 statistical bulletin (Scottish Executive, 2007). Following implementation of the ASL 2004 Act, SEED considered how additional support needs might be reported on and presented in annual returns and reported interim figures in 2007. Table 4.6 extracts sample information from the relevant tables in the 2007 Statistical Bulletin and presents returns for pupils under both the old system of reporting (column 2 in Table 4.6) and from the new system of reporting on additional support needs (column 3), allowing us to compare:

- numbers of pupils with a visual impairment (row 1);

- pupils with identified physical impairment (row 2 to 3);

- those likely to have physical impairment because it features as one of the significant additional impairments or disorders (rows 4 to 6).

| | Table 1.7 Main difficulty | Table 1.9 Reason for support | Totals | Percentage[1] | Copyright Exempt?[2] |
|---|---|---|---|---|---|
| Significant visual impairment | 309 | 576 | 885 | 15.9% | √[3] |
| Physical or motor impairment | 609 | 1,670 | 2,279 | 40.9% | √ |
| Physical health problem | | 894 | 894 | 16.0% | √ |
| MLD+ significant additional impairments or disorders | 767 | | 767 | 13.8% | √ |
| SLD+ significant additional impairments or disorders | 573 | | 573 | 10.3% | √ |
| PLD+ significant additional impairments or disorders | 276 | | 276 | 5.0% | √ |
| | | | 5,574 | 101.9% | |

Table 4.6: Column 2 "Table 1.7" refers to Table 1.7 Main difficulty in learning of pupils with Additional Support Needs, by gender, 2006. Column 3 "Table 1.9" refers to Table 1.9 Reasons for support for pupils with Additional Support Needs, by gender. Both are to be found in Scottish Executive Statistical Bulletin Education Series Edn/B1/2007/1.

[1] Figures rounded to one decimal point, hence total greater than 100.

[2] Copyright exempt refers to exemption under the Copyright (Visually Impaired Persons) Act 2002. A tick refers to the fact that this group is likely to be exempt.

[3] Refers to the fact that materials in accessible formats are produced for this group.

These groups were chosen to illustrate the point that copyright exemption (discussed in more detail in Section 12) which applies to 'visual impairment' actually covers both those with a visual impairment and those who have a physical difficulty holding books or turning pages.

In terms of impairments those with a significant physical or motor impairment or physical health problem are the ones most likely to have difficulty holding a book or turning pages. It would also include those with significant additional impairments or disorders accompanying moderate, severe or profound learning difficulties. Table 4.6 therefore includes each of these groups which gives rise to 5,574 pupils who, either because of visual impairment (receiving services or deemed to receive services from teacher of visual impairment pupils), or because of physical impairment are likely to be exempt from copyright under the copyright VIP act.

As we will see in Section 8 where we discuss unmet support needs, accessible formats are currently prepared only for those with a visual impairment; that is 885 out of 5,574 pupils; 15.9% of the total.

However, the exemption also covers pupils who have difficulty focusing or moving their eyes to the extent that would normally be acceptable for reading. Some have argued that this would cover pupils with 'visual dyslexia': for example, those who perceive the text to flicker or move, who have difficulty scanning accurately along the text and moving from line to line, and as a result, experience headaches and eyestrain when reading for any length of time, because these visual problems are often due to difficulties in focussing or tracking.

With this possible expansion of copyright exemption in mind (even if no change in the law were to take place), making provision for accessible formats on the basis of the support needs of 5,574 pupils would be restrictive. Not only pupils with a visual impairment, or significant physical or motor impairment or disorder (with or without learning difficulties) could be covered under copyright exemption but also an as yet undetermined number of those described as having specific learning difficulties (e.g. dyslexia).

In Section 3 Table 3.1 we noted 7,231 pupils reported to have specific learning difficulties including dyslexia. The 2007 figures are similar report the same order of magnitude at 5,743 pupils (Tables 1.7 and 1.9).

Without further analysis these figures can only be estimates. The body of evidence on what constitutes a support need is still developing and the figures described above and in Tables 4.3 to 4.5 are derived from experience and from central government returns. That said, it is widely accepted that analysis of impairment has not got us very far to date in terms of predicting and planning to meet children's educational needs. A framework based on additional support needs, rather than on impairments, is one on which planning can more soundly be based, though support-need planning should always be tempered by understanding of the impairments giving rise to support needs.

# 3. Literacy support needs and SQA examinations

The SQA collects data regarding the underlying difficulty or impairment that gives rise to an additional support need and also the type of support that is requested in order to meet those needs. In 2006 there were requests for assessment arrangements on behalf of 10,650 pupils (7.22% of all candidates) for use in 43,291 examinations (5.91% of all entries) (SQA 2006). In most cases, more than one type of support is requested, and so there were 77,374 individual requests for different types of support (data provided by SQA to the Books for All project team).

The types of arrangements requested are given in Table 4.7 and discussed in more detail in Section 6 of this report.

| Type of support requested | No of requests | Literacy support need | | | | |
|---|---|---|---|---|---|---|
| | | Reading | Seeing | Understanding | Handling | Writing |
| Extra Time | 34,803 | ✓ | ✓ | ✓ | ✓ | ✓ |
| Reader | 16,815 | ✓ | ✓ | ✓ | ✓ | |
| Scribe | 15,059 | | ✓ | | ✓ | ✓ |
| Use of ICT | 3,063 | ✓ | ✓ | ✓ | ✓ | ✓ |
| PA Referral | 2,480 | | | | | ✓ |
| Coloured Paper | 1,327 | ✓ | ✓ | ✓ | | |
| Transcription with correction | 1,190 | | | | | ✓ |
| Calculator | 892 | | | | | ✓ |
| Enlarged Print | 889 | ✓ | ✓ | | | |
| Transcription without correction | 678 | | | | | ✓ |
| Question Paper signed to candidate | 69 | ✓ | | ✓ | | |
| Candidate Signs Responses | 56 | | | | | ✓ |
| Braille | 28 | | ✓ | | | ✓ |
| Use of tape recorder for responses | 25 | | | | | ✓ |

Table 4.7: Type of requests for Assessment Arrangements and support need

### Extra time (34,803 requests)

Extra time was used in 84% (34,803 out of 43,291) of instances by students with a wide range of impairments. Extra time might be requested because the student is a slow reader, requires more time because they are using other support methods such as reader or scribe, or because they require more time to generate and write answers.

### Reader (16,815 requests)

A Reader is the next most common type of support requested. A reader may be required because a candidate has difficulty seeing the text on the paper as a result of visual impairment or perceptual difficulties, because of a specific reading difficulty (for example due to poor phonological skills), or because of a difficulty in physically handing the paper.

**Scribe (15,059 requests)**

The third most common type of support requested is a scribe. Scribes may be used because a candidate is physically unable to hold a writing implement, or because he or she is unable to see in order to write, or because the candidate's handwriting or spelling is very poor. Scribes are used twice as much as all other methods to support students with writing.

**Use of ICT (3,063 requests)**

ICT is most commonly used by candidates who have support needs with writing and recording and in most cases this involves the student using a word processor. ICT is not often used to help children to read the paper although in 2006 a small number of candidates did use digital question papers in the course of a CALL Centre/SQA pilot trial.

**Referral of the paper to the Principal Assessor (2,480 requests)**

Candidates who have substantial difficulty with written communication may have some of their examination scripts referred to the principal assessor. This accommodation may be used by candidates who have difficulty with the mechanical aspects of writing and recording (e.g. handwriting) but also candidates who may have idiosyncratic use of language for example as a result of a hearing impairment.

**Coloured paper (1,327 requests)**

Approximately two thirds of requests for coloured paper were for question papers to be printed on white paper, in most cases to improve contrast. The remainder were requests to print papers on other shades - usually for students with a particular colour sensitivity. 52% were on behalf of students with a specific learning difficulty; 40% of requests for coloured papers were for students with a visual impairment.

**Transcription with correction of spelling and punctuation (1,190 requests)**

This arrangement is intended for candidates who have writing and recording difficulties, including difficulties with spelling and punctuation, and who cannot use ICT effectively. The majority of requests (85%) for transcription with correction are on behalf of pupils with specific learning difficulties.

**Enlarged Print (889 requests)**

Most requests (72%) for large print are on behalf of candidates with a visual impairment, with 15% requested for pupils with specific learning difficulties.

**Transcription without correction (678 requests)**

This arrangement is intended for candidates who have writing and recording difficulties and who cannot use ICT effectively. It is most commonly used by candidates with handwriting difficulties as a result of dyspraxia, for example.

**Question Paper signed to candidate (69 requests)**

There were 62 requests for the question paper to be signed to a candidate with a hearing impairment (out of a total of 721 requests for support for students with hearing impairment) and one request for a candidate with dyslexia (it is likely that the same candidate had both dyslexia and a hearing impairment).

**Candidate Signs Responses (56 requests)**

All candidates who signed responses had a hearing impairment.

**Braille (28 requests)**

There were 28 requests for Braille papers. All requests were on behalf of pupils with a visual impairment, as one would expect.

**Use of tape recorder for responses (25 requests)**

Hearing impaired pupils used tape recorders to record responses in 21 instances, while recorders were used by pupils with autistic or physical difficulties in another 4 instances.

## Summary

The largest identifiable group of students with literacy support needs sitting SQA examinations are those who have difficulty with reading the question paper and who need extra time, a human reader, or the paper in an accessible format. Most candidates who need support with reading have specific learning difficulties or dyslexia. The smallest requested method of reading support is provision of Braille papers, with 28 out of 19,100 requests (not including extra time) for reading support. Braille papers represent 1.5% of adapted papers provided by SQA (SQA, 2006).

The second largest identifiable support need is for students who have difficulty writing and recording, and the most common support used is extra time followed by a scribe. Again, candidates with specific learning difficulties are the largest single group of candidates who require writing support. Evidence from the recent CALL/SQA project (Nisbet et. al. 2006) which trialled digital question papers suggests that more students could work independently of human support if the question papers were made available in a digital accessible format.

## 4. Evidence from service providers on range of literacy support needs

Not surprisingly, VI services reported that the pupils they support had most difficulty with seeing the text. This affected understanding text and finding text. When presented in alternative format such as audio, large print or Braille, then pupils could read it – at least those who were receiving a service could read the text in alternative format.

Evidence from those providing services to pupils with specific learning difficulties indicated that difficulties were experienced in reading, understanding, finding text, and recording or demonstrating their knowledge and understanding.

## 5. Results from questionnaires on nature of literacy support needs

The most common reports from questionnaire returns (available in Appendix 1 and 2) were of difficulties in reading, understanding, finding text and of recording work. Some were associated with visual difficulties but most respondents reported

this support need to be secondary to others (other than, of course, those working with pupils with significant visual impairment).

This is an important finding. It indicates that many pupils could physically 'read' materials but that they had difficulty understanding or remembering the content.

## 6. Literacy support needs of those not in employment, education or training (so-called NEET group)

This is a relatively unexplored area though to its credit the Scottish Executive is actively exploring how best to raise attainment in this group. Some evidence points to attainment in reading as a significant resilience factor for looked-after and accommodated children.

## SECTION 5    CURRICULUM MATERIALS REQUIRED

**Objective 5:    To identify the range and quantify the amount of curriculum materials that need to be accessed by pupils with additional support needs.**

**Outcome:    Have an understanding of the scope of the problem in terms of range and quantity of curriculum and other materials that may need to be made accessible.**

## Summary

1) Pupils across primary and secondary school age require a range of curriculum materials including reading books, textbooks, fiction, workbooks, commercial worksheets, teacher produced worksheets, SQA 5-14 and NAB assessments, and examination question and past papers.

2) The specific materials identified by both a visual impairment service and an individual secondary school were generally consistent. Materials used or that were popular with one school are likely to be used by other schools.

3) VI transcription services were in a position to report on and document books and other materials that they had converted into alternative media. The secondary school we approached was able to indicate in advance what materials they would need to produce.

4) A pupil who is visually impaired will require the equivalent of around 375 books through primary school and a similar number in secondary.

5) Quality and design of some printed learning resources is a significant issue. The factors making it difficult for some pupils who are visually impaired to access worksheets (faded print, multi-generation copying, inappropriate text size and style, image quality, inadequate line spacing) also make it difficult for others to access these materials.

6) The skills needed by teachers to produce materials of moderately acceptable quality require development and training.

7) Pupils would benefit from having materials available in accessible formats. Evidence points to a substantial need for materials to be made available in alternative formats. Many resources need to be interactive: e.g. worksheets, textbook questions, assessments and examination papers.

8) A common request was for materials in simplified language.

# Background to Section 5

We needed to identify what kinds of curriculum materials may need to be adapted and converted into accessible formats. It is not enough to know what kinds of support needs might be assisted by having access to materials if we don't know which materials will be accessed. Best value decisions would be informed by knowing which materials should be made accessible.

### Methods used

To address this objective we again approached it from a number of different perspectives in order to triangulate information. We:

1. Approached a small number of schools to establish the range of materials used across the curriculum in both primary and secondary schools. Asking schools what curriculum materials they used would help to establish the likely demand for materials.

2. Contacted a small number of service providers who respond to requests from schools, or who proactively establish the need for curriculum materials to be produced in alternative formats.

3. Contacted Scottish Qualifications Authority to find out which of their materials needed to be converted into alternative formats and how many.

4. Based on the results of 1), 2) and 3) we sent out questionnaires to a small number of schools asking them to estimate the likely uptake of curriculum materials available in different formats.

# Approach to schools

## Rationale

We asked a small number of schools in both primary and secondary sectors what range of curriculum materials a typical pupil needed to access. We considered this as a simple pilot exercise which we could then use to obtain more in-depth information from the other sources described in the above list. We made informal approaches to a small number of schools, and asked delegates attending courses and conferences. The following initial information on curriculum materials needed was obtained:

- Books i.e. books used to teach; reading and fiction books;

- Worksheets with no electronic source i.e. handwritten though these are now increasingly rare;

- Material to be copied from the blackboard/whiteboard;

- Assessments and tests;

- SQA materials (Access, Standard Grade; Intermediate, Higher; Advanced Higher);

- Past exam papers and prelims.

## Secondary school S1

We then followed this pilot up and asked one secondary school to list the materials they considered would be needed by a pupil entering into S1. This pupil had a physical disability and needed to have materials made available electronically as he could not hold books or turn pages.

The school was able to say what the pupil would need though none of the materials was as yet available in a format that would have suited his support needs. Table 5.1 shows the results. The school was unable to quantify the materials needed as they were only just embarking on this process at the time of our approach and had no similar models to call on. Note that the list applies only to S1.

| Materials required |
| --- |
| Text book, worksheets and others |
| English - Various novels; school devised worksheets from novel |
| Maths - SMP interact book 1 and T1 and T2. Omega mental arithmetic books; worksheets associated with workbooks |
| Geography - Basics Foundations, Interactions, Connections – Nelson Thorne; school made worksheets |
| Modern Studies - Power to the people; school worksheets |
| History - The Romans, Heinemann Foundation, 20th Century World, Scotland in the early modern age – Pulse; school worksheets |
| Text books for dipping in and out of |
| ICT |
| Booklets made up by school from commercially produced materials as well as own worksheets |
| Home Economics - work booklets made up by school available electronically |
| Science - Starting Science books 1 and 2; Worksheets which accompany text book and also school worksheets |
| Religious Moral Education - worksheets commercial and school made |
| Music - some school made worksheets |
| French - Metro 1; associated worksheets and school worksheets |

Table 5.1:     Books and other materials required by secondary school

## Special school

One special school contacted noted that even though many of their pupils cannot 'read text' they still enjoy using reading books. Talking books are made on computer which the pupils can access using switches or a mouse. The school would welcome more materials, especially age-appropriate books that use simplified language. The school observed that it is very difficult to obtain materials that are age appropriate for senior pupils that suit their level of understanding. One teacher noted the need for materials with content suitable for 11-12 year olds but demanding an ability range of 18 months to 3 years. Other teachers noted similar ability requirements with content changed to suit other age groups.

It could be argued that publishers rather than schools or other service providers should respond to a demand for age-appropriate but simplified materials. At the same time, it is worth noting that because the school has to spend so much time

converting existing materials to suitable formats, they have less time to create new materials at suitable reading levels.

The school required curriculum materials in accessible formats covering:

- independence skills;

- life skills;

- worksheets;

- lots of books with real photos and short simple sentences that the computer can read;

- simple stories 'symbolised' e.g. 'We're going on a bear hunt…';

- Oxford Reading Tree books in 'signed' format i.e. not full British Sign Language.

> *"Children with c.l.d. [complex learning difficulties] are often excluded from literacy experiences when a few simple modifications to books could help support parents in sharing books with their children. Also emphasising enjoyment of sharing books as a real literacy experience and finding ways to support parents of children with c.l.d. in these experiences is vital."*
>
> *Teacher in special school*

# Evidence from service providers

It is helpful to know what service providers think the demands will be from the schools for which they produce curriculum materials in alternative formats. We were aware though that responses were likely to be very different from service providers with an established role to provide materials in accessible formats, as opposed to a provider who had perhaps not yet considered this in any strategic way. If nothing else the former is more likely to have set up a system to track demand and supply and to have documented that demand and supply.

## Visual impairment service 1

Sorenson is reported (RNIB Scotland, 2005) to have ascertained the following requirements for an average pupil going through primary school followed by 6 years of study at secondary school.

"An average pupil will require approximately 375 texts to complete primary education. This is based on 7 years of primary schooling with each pupil requiring core texts for Language and Communication, Numeracy, Environmental Studies etc plus additional required reading material for each subject per year.  For example, a primary 3 pupil requires 3 Maths books, 19 English books, 11 Topic books and a dictionary. In Primary 5, the pupil requires 3 Maths books, 13 English books, 60 Worksheets (equivalent to 3 English books), and 15 Topic books. The average pupil also has access to a school library as well as his/her local library for leisure reading, a facility which is very rarely available to visually impaired pupils and never available to a blind pupil who would have to rely on texts provided by support staff, RNIB or the National Library for the Blind."

"At secondary school level, an average pupil will require over 750 texts to complete 6 years of study."

Table 5.2 presents the breadth and depth of curriculum materials required.

| Books required for seven years of primary schooling | | Books required for six years of secondary schooling | |
|---|---|---|---|
| **Primary 1** | | Advanced Higher English | 28 |
| 9 Maths books | 9 | Advanced Higher French | 18 |
| 7 Topic books | 7 | Advanced Higher German | 68 |
| 5 Reading books each with 15 associated smaller books | 80 | Higher Maths | 17 |
| **Primary 2** | | Higher History | 94 |
| 9 maths books | 9 | Higher RMPS | 88 |
| 8 English books | 8 | Standard Grade Biology | 21 |
| 21 Topic books | 21 | Standard Grade Music | 11 |
| **Primary 3** | | S1/2 Science | 17 |
| 3 Maths books | 3 | S1/2 R.E. | 4 |
| 19 English books | 19 | S1/2 Geography | 13 |
| 11 Topic books | 11 | S1/2 Modern Studies | 25 |
| 1 dictionary | 1 | S1/2 Home Economics | 4 |
| **Primary 4** | | S1 – 6 PSD | 41 |
| 4 Maths books | 4 | | |
| PCM booklets | 46 | | |
| PCM booklets | 96 | | |
| 1 Nelson Spelling | 1 | | |
| 1 Topic books | 1 | | |
| 1 dictionary | 1 | | |
| **Primary 5** | | | |
| 3 Maths books | 3 | | |
| 12 English books | 12 | | |
| 50 – 60 grammar worksheets | 60 | | |
| 1 Nelson Spelling | 1 | | |
| 1 Password | 1 | | |
| 15 Topic books | 15 | | |
| **Primary 6** | | | |
| 4 Maths books | 4 | | |
| 15 English books | 15 | | |
| 1 Nelson Spelling | 1 | | |
| 9 Topic books | 9 | | |
| 1 dictionary | 1 | | |
| **Primary 7** | | | |
| 4 Maths books | 4 | | |
| 16 English Books | 16 | | |
| 1 Topic books | 1 | | |
| 1 dictionary | 1 | | |
| **Total Primary** | **461** | **Total Secondary** | **449** |

Table 5.2:     Books documented by visual impairment service

Although it appears that almost 500 separate texts are prepared for the primary sector Sorenson helpfully notes that 60 worksheets compare to 3 English books. Other similar comparisons have been made to arrive at a figure of around 375 texts needed to complete seven years of primary schooling.

## Visual impairment service 2

A second visual impairment service also helpfully provided a breakdown of the curriculum materials produced by their service. Rather than including here the detailed breakdown provided to us for this report we summarise the figures below:

- 460 reading books, subject textbooks or fiction books in large print;

- 180 plus reading books, subject textbooks or fiction books in Braille.

## Secondary school: example of service delivery issues

In this section, up to this point we have attempted to quantify the range and number of materials that need to be made accessible. It is also important that the quality of material produced is not compromised, as shown in an audit carried out by one secondary school learning support department.

In this case a learning support department looked at the sorts of difficulties experienced by pupils using text materials. Specifically they looked at the production of worksheet material.

Departments were asked to provide examples of worksheets and booklets used in years S1 – S6. The audit looked at several factors that would affect the quality of booklets and worksheets, including: quality of presentation, size and style of text, use of italicised text, reading age, quantity of text, and line spacing, amongst other factors. Some of the findings are reported in Table 5.3.

This example does not assess production of materials in alternative formats. What it does is to flag up three areas of concern, each to do with product quality.

First, the current practice of producing materials in standard formats may particularly disadvantage pupils with additional support needs.

Second, if materials are to be produced in alternative formats, then steps need to be taken to monitor quality. There is no point in increasing production if quality of material is sacrificed at the expense of increased production.

The third point raised by this small study is that the skills required to produce good quality materials are not necessarily learned at the same time as word processing. An element of training is required even for something as apparently straightforward as producing a worksheet.

| Audit issues | Findings |
|---|---|
| Quality of presentation of worksheets. | Many worksheets were very old – some over 10 years, poorly photocopied. The text did not always allow for clear reading. Computer prepared worksheets in the past 3 years are clearer. |
| Size and style of text. | Teachers need to know how to use text for the best effect and also which text is most suitable for dyslexic learners. Majority of worksheets (over 90%) used unsuitable text styles. Several worksheets designed more recently used "WordArt" which was often inappropriate. Handwritten worksheets were often not possible to read, especially after several generations of photocopying. |
| Italic text | Some used italics a great deal. This is harder to read. |
| Age readability of text | Both in worksheet and text books paragraphs of text often required a reading age higher than that of pupil's ability. |
| Amount of text on a page. | Most worksheets used too much text on one page. Pupils with eye fixation problems have difficulty focusing on such pages. |
| Line spacing | Often too close together |
| Quality of images. | Poor – in over 90% of worksheets. Either not appropriate for the text or of poor quality. |
| Quality of reprographics. | Poor in over 90% of worksheets. Constant photocopying of low quality images resulted in low quality worksheets. |
| Additional comments | Teachers were conscious that worksheets could be improved but were unclear how to do this effectively in order to produce differentiated material and no time to rewrite old worksheets. |

(Rinaldi, F., 2004; personal communication)

Table 5.3 Factors affecting quality of worksheets used in one secondary school

# SQA examinations and assessment materials

## 5-14 National Assessments

"National Assessments are assessment materials designed to be used by teachers in Scottish schools to confirm their judgments about pupils' levels of attainment in English language (reading and writing) and mathematics 5-14."[17]

National assessments are provided for the six levels (A to F) for English language and mathematics. There are two assessment units for Reading, and three for Writing, giving a total of 30 assessments for English language across all levels.

In Mathematics, a National Assessment at any level comprises two units, resulting in 12 units from Levels A to F.

A pupil who achieves all six 5-14 levels will therefore require 7 assessments at each level, or 42 units in total for all six levels.

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[17] General introduction to National Assessments 5-14, http://www.aifl-na.net/na/general_intro.aspx

## Access 1 & 2

"Access 1 and 2 qualifications are all about providing opportunities for candidates who require additional support for their learning."[18] There are 100 National Units at Access 1 and 145 Units at Access 2 level, with 22 Clusters at Access 2 (3 Units per Cluster). Each Unit is designed to be completed in 40 hours of study. Assessment of candidates against a Unit Performance Criteria is undertaken by the teacher or lecturer. The instrument of assessment used may be the exemplar given by SQA in the Unit specification, or the assessor may devise their own. Many different personal and practical skills are assessed in Access 1 and 2 units and so the methods of assessment also vary. Consequently it is not possible to quantify the number or nature of assessments required by students in any meaningful way. However, it is clear that students taking Access courses will require to complete assessments and that accessible versions will be required.

## National Assessment Bank (NAB) Assessments

Assessment for an SQA National course usually consists of three internal assessments (conducted and marked by the school) together with an external assessment (e.g. an Intermediate or Standard Grade examination). Internal Assessments are carried out using National Assessment Bank 'Instruments of Assessment' (NABs). A pupil taking 8 Standard Grade courses, for example, would therefore require to access 24 instruments of assessment over the usual two years of the Standard Grade course.

## External assessments (Standard Grade, Intermediate, Highers, Advanced Highers)

External assessments are conducted by means of a traditional question paper, or by practical test. The number of papers varies depending on the subject and the level: a student sitting Standard Grade English, for example, might require 5 papers (Reading Text and Reading Questions at Foundation and General, say, and the Writing paper), while Higher History will require 2 papers.

By way of example, a student sitting 8 Standard Grade examinations in English, Maths, History, Physics, Chemistry, French, Craft and Design and Computing is likely to use 23 separate question papers (and additional answer booklets). A student sitting Higher examinations in English, Maths, Physics, History and Computing, say, will require 8 question papers and 8 additional answer booklets.

## Assessments and tests to be accessed

A pupil who attends school from Primary 1 to 6th year of secondary may therefore require to access 116 tests and assessments:

- 42 5-14 assessments;

- 24 NABs;

- Approximately 50 examination question papers and answer books.

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[18] About Access 1 and 2 qualifications, http://www.sqa.org.uk/sqa/3530.501.html

# Questionnaires

Based on the results of approaches in 1, 2 and 3 we included questions in both the short and long versions of questionnaires described in earlier sections of the report (blank questionnaires are included in Appendix 2 and 3):

- an open question that asked: "Are there any specific textbooks or other resources that you would want in an accessible format?"

- a closed question in table format which asked respondents to say whether the following were needed: Text books, Reading books, Commercial worksheets, Teacher produced worksheets, Exam papers / prelims, Assessments: 5-14 Assessments: NABs, Other (please specify)

## Results from short questionnaire

Forty-three responses were received from a variety of teachers, learning support teachers, teachers of visually impaired pupils and others. All of the respondents reported that pupils they worked with would benefit from materials available in accessible formats; half noted that in their view more than 20 pupils they worked with would benefit from alternative format resources.

Respondents were invited to indicate approximately how many materials would be required, including textbooks, fiction / reading books and others. Collectively the 44 respondents noted the need for the type of materials and quantities shown in Table 5.4

| Type of materials required | No. |
|---|---|
| Textbooks | 160 |
| Fiction/Reading Books | 150+ |
| Teacher Worksheets | 1000 |
| Commercial Worksheets | 370 |
| Assessments (eg. NABs) | 155 |
| Exams | >50 |

Table 5.4: Quantities of various types of materials required

Additional comments included:

- "too difficult to predict numbers required";

- "for national tests there were too many to specify";

- "much would depend on the subject areas in which the pupil was involved".

The approach of asking teachers to tell us how many books and other materials were needed could not tell us anything about the particular materials that were needed. We therefore asked teachers to specify which particular textbooks and other materials they would require if it were possible for them to do so. A range of suggestions was offered. Rather than reporting on each response we have grouped examples into subject areas as shown in Table 5.5

| Specific materials required: | |
|---|---|
| **Early Reading:**<br>Oxford Reading Tree stages 5-8.<br>Ginn 360<br>Nelson spelling & grammar | **Science:**<br>Spotlight on Science and others |
| **Reading**:<br>Novels and reference materials | **Maths:**<br>Scottish Heinemann Maths, Maths in Action in enlarged print on coloured paper. PIPS tests in large print format. Money and time worksheets |
| **History, Geography, Modern Studies:**<br>Course material in first and second year History, Geography and anything on Scottish Modern History (1800-2006). Topic work e.g. Tudors, Romans, Vikings etc | Study guides / prelim and practice papers, NABS particularly. |
| All subjects in secondary school | "All" and "Too many to mention" were often quoted. |

Table 5.5: Table showing materials required for various Subject areas

Two respondents noted that in order to acquire good SQA qualifications pupils have to be able to read and understand large quantities of text. If they have difficulty reading they have difficulty with accessing almost all areas of the curriculum.

One noted that getting access to materials is too often subject and teacher dependent. Another reported that getting prelim and practice papers in digital format is problematic. One teacher noted that with increasing numbers of pupils from other countries, particularly from Poland, there was a need for translations for Polish pupils to use while learning English. Finally, one respondent noted that there was a need for adult interest level material with a reading age of 10-12 years.

Comparing the table above with Table 5.2 (the list of materials from a visual impairment service), substantial overlap can be seen. At least some of the materials produced in alternative formats for one group of pupils (those who are visually impaired) are also required by other pupils who for the most part are not visually impaired. This is not too surprising as pupils follow a similar curriculum under 5-14.

## Sample results from long questionnaires

As the longer form questionnaires were designed to provide no more than a snapshot or overview of the situation in schools it is not appropriate to subject returns to statistical analysis. Instead we will return to the results from one authority which reported on two primary schools and two secondary schools. Responses noted that all of the materials listed earlier were required plus a few others:

- Reading books; i.e. books used around which to teach reading and comprehension.

- Textbooks in a variety of subject areas. Also on specific topics covered by primary; e.g. Victorians, World War II, History, Science topics (e.g. produced by Renfrewshire).

- Fiction books or novels (especially high interest ones and class novels).

- Workbooks; e.g. Oxford Reading Tree materials based on the reading books with resources for, for example, matching pictures to words. Or Heinemann Maths activities and resources.

- Commercial worksheets similar to workbooks used to develop skills.

- Worksheets with no electronic source; i.e. handwritten though these are now increasingly rare.

- Tests both class and national (NABs).

- SQA materials (Standard Grade Foundation, General and Credit; Higher; Advanced Higher).

- Study notes and past papers for exams (SQA & Leckie & Leckie).

- Personal Social Development especially on citizenship.

- Access, Standard Grade, Intermediate, Higher and Advanced Higher.

- Magazines.

- Homework.

- Web information.

A few comments from the respondents are noted in the accompanying insert.

| Are there any specific textbooks or resources that you would want in an accessible format? |
| --- |
| "This list is endless."<br>"Interactive would be <u>so</u> useful." – [as well as pupils needing to access the curriculum they also need to be able to demonstrate their knowledge and understanding.]<br>"Infinite"<br>"All materials in schools should be available aurally and digitally for access by all pupils. Even more able pupils could benefit from such materials." |

Table 5.6:     Comments from respondents in one local authority

## SECTION 6     ACCESSING PRINT MATERIALS

## Objective 6:     To identify methods by which schools can support pupils who have difficulty reading and accessing printed curriculum materials.

**Outcome:**     **Knowledge of the range of methods schools can use to support pupils to access the curriculum and school information, and report on the advantages and disadvantages of those methods.**

**Summary**

1) A range of formats is required to suit individual pupils including those with difficulty handling books and turning pages; reading; seeing print; understanding what is written; writing; and spelling.

2) Pupils' literacy support needs can be highly individual and require knowledge of the pupil. Similar support needs may require a range of different methods in order to address them effectively. Support need cannot predict methods used (and impairment is even less useful as a predictor of method to address that support need).

3) In all sectors, teachers of pupils with support plans in place request materials in different formats. Wider access to alternative formats would increase pupils' independence, confidence and motivation. ICT has the potential to contribute on a large scale to produce the range of formats required.

4) Methods are required not just for accessing the curriculum but so that pupils can demonstrate their knowledge and understanding.

5) Readers and scribes represent substantial investment of school and authority resources. Fewer would be needed if accessible formats were available. Every pupil would benefit from redeploying staff, from reading and scribing for individuals, to other types of support

6) Reading and writing difficulties affect access to all areas of the curriculum; e.g. in maths reading difficulties affects reading questions and topic information not just ability to use mathematics.

7) The lack of availability of materials in alternative formats and the inability to create them has a large adverse effect on pupils' access to the curriculum.

## Background to Section 6

As well as knowing what kinds of curriculum materials are required in accessible formats we also needed to find out what sort of formats schools could and already do provide materials in, and what methods are used to support pupils to access curriculum materials. Best value decisions would be informed by knowing which materials to focus on making accessible.

Specific examples of alternative accessible formats are presented in Section 9. In this section we concentrate instead on identifying the formats required and methods used.

## Methods used

Because different support needs might have different format requirements we needed to ensure that the full range was represented. To answer this question we again approached from a number of different perspectives in order to triangulate information. We:

1. Approached a small number of schools to establish which formats pupils required.
2. Contacted a small number of service providers to find out which alternative formats were required to suit the support needs of pupils they worked with.
3. Contacted Scottish Qualifications Authority to find out which and how many alternative formats and methods of support were requested.
4. Sent out questionnaires to schools asking for estimates of the likely demand for different formats.

Teachers use many approaches to support pupils who have difficulty accessing the curriculum and demonstrating knowledge and understanding. These include strategies to improve reading, spelling and writing skills (e.g. Alpha to Omega (Horsnby et al), Toe by Toe (Cowling & Cowling, 1994); Catch Up; Nessy; SpeedUp handwriting (Addy, 2004); etc). Rather than considering such rehabilitative approaches – attempting to improve on conventional methods of reading and writing – we consider here methods of support that depend on using alternative formats. Before doing so however it is worth considering whether it would be better to spend scarce resources on improving these skills by rehabilitation rather than looking into the use of alternative formats.

Aside from the not insignificant obligations under Disability Strategies legislation and the ASL Act requirement to address the support needs of **each** pupil in an adequate and efficient manner, there is evidence that doing more of the same is not necessarily the best approach to take.

In a study of what schools felt they wanted out of input from educational psychologists, Boyle & Mackay (1994) found that teachers working with pupils with a range of learning difficulties responded differently depending on whether they worked with primary or secondary age pupils. Teachers in primary sector reported that pupils were more accepting of attempts to remediate difficulties. In contrast teachers in secondary schools reported that pupils were more likely to 'buy into' strategies that did not simply provide more of the same. In the primary

sector there was greater emphasis on remediation, an expectation that something can be done to remedy learning difficulties if only the best advice was available on teaching methods. However by the time a pupil reaches secondary age it is unlikely that similar expectation remains. The emphasis shifts from remediation to compensation to help pupils to cope with or bypass their learning difficulties. (An update of the original study is due out soon.)

A number of methods can be used to support pupils who have difficulty reading and accessing printed material and/or writing and recording their work. Table 6.1 summarises these and the main reason the method is used to support pupils.

| Support given with: | Reading text | Seeing text | Under-standing text | Holding book / turning pages | Recording work e.g. handwriting |
|---|---|---|---|---|---|
| **Human support** | | | | | |
| Reader | ▓ | ▓ | | ▓ | |
| Scribe | | | | ▓ | ▓ |
| Signing | | | ▓ | ▓ | ▓ |
| **Printed formats** | | | | | |
| Different font | ▓ | ▓ | | | |
| Large print | ▓ | ▓ | | | |
| Coloured paper | ▓ | ▓ | | | |
| Simplified language | ▓ | ▓ | ▓ | | ▓ |
| With symbol support | ▓ | | ▓ | | ▓ |
| Braille | | ▓ | | | |
| Coloured lenses/ film | ▓ | ▓ | | | ▓ |
| Magnifier/ low vision aid | ▓ | ▓ | | | ▓ |
| **Audio formats** | | | | | |
| Tape | ▓ | ▓ | ▓ | ▓ | ▓ |
| Audio CD | ▓ | ▓ | ▓ | ▓ | ▓ |
| MP3/digital audio file | ▓ | ▓ | ▓ | ▓ | ▓ |
| **Computer formats** | | | | | |
| Digital version on computer | ▓ | ▓ | ▓ | ▓ | ▓ |
| Digital version read by computer (text to speech) | ▓ | ▓ | ▓ | ▓ | ▓ |
| Word processor or other writing software | | | | ▓ | ▓ |

Table 6.1: Type of support suitable to pupils with different support needs. The shaded cells indicate that that type of support is typically associated with a support need.

# Evidence from schools

## Secondary school learning support department

Table 6.2 below shows the range of formats with which the learning support department of one secondary school was familiar and that were used with pupils.

| Access to materials supported by: | Access to materials supported by: |
| --- | --- |
| Human Support | Audio formats |
| Reader | Tape |
| Scribe | CD |
| Signing | MP3 file |
| Prostheses | Computer formats |
| Coloured lenses/ film | Digital resources on computer |
| Magnifier/ LVA | Scanned into computer |
| Printed formats | Read by computer (text to speech) |
| Different font | Word processor or other writing software |
| Large print | |
| Coloured paper | |
| Simplified language | |
| With symbol support | |
| Braille | |

Table 6.2:    Range of formats with which a Learning Support Department were familiar

In terms of scale this secondary school volunteered that the most useful thing that could be done to aid access to print and to the curriculum was to use a different font for all materials. They considered that all pupils in this mainstream secondary school (almost 1,000) would benefit. They further noted the following requirements:

- All new materials produced by teachers should be done on computer.

- Availability on audio to be made standard.

- Materials must be available electronically for text-to-speech software.

- Correct choice of the typeface.

- Enough space between lines.

- Colour of text, background & images.

- Appropriate word readability.

- Appropriate use of desktop publishing layout.

Specific adaptations were recommended for pupils with specific learning difficulties including dyslexia, following Hannell's guidelines (Hannell, 2004):

- Larger font minimum 12 point.

- Arial / Comic font.

- Space round items.

- Tinted / off white paper.

- 1.5 spaced / double line space.

- Small quantities of text.

- Bullet points to cover main issues.

## Special school

One special school was approached in City of Edinburgh and invited to indicate what formats were suitable for its pupils. The school noted that:

- many of its pupils could "not read at all";

- 3 or 4 can read with some difficulty but not at an age appropriate level;

- all have difficulty understanding text and recording their work;

- in addition "quite a few" of the pupils have a visual impairment.

The school produces printed and 'talking' books on computer using Clicker 4[19] to lay out appropriate pictures, symbols and simplified text with an easy read font at a larger size. Examples of the paper books produced are shown in Figure 6.1.



Figure 6.1: Paper versions of Clicker talking books produced by one special school in Edinburgh

The talking books on the computer can be accessed by pupils who use switches to turn the pages where they cannot use a mouse. The computer reads out the text using either a computer voice or where a human voice has been recorded.

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[19] A popular software package which can be used to support children across curricular areas. www.cricksoft.com/uk/

Staff at this special school note the following requirements:

- symbol supported reading materials that are switch accessible;

- materials in simplified language;

- use of photos;

- some staff can spend more than 75% of their time producing materials;

- as well as books on computer they requested tape and CD format.

The materials produced by staff in this school are not shared with other schools or pupils, even though it is very likely that they could be of benefit. In the main, this is because there are no or inadequate mechanisms for sharing materials.

## Evidence from service providers

| Alternative formats provided for VI pupils | Number of pupils | % VI Service covering four authorities |
|---|---|---|
| **Edinburgh & Lothians** | 230 | 100% |
| Braille Current[20] | 3 | 1.3% |
| Braille Future | 3 | 1.3% |
| Large Print various formats | 27 | 11.74% |
| DAISY users current | 0 | |
| DAISY users estimated | | |
| **Total VI pupils for whom alternative formats are required** | **30** | **13%** |

Table 6.3 Alternative formats required for one well-established VI service

In contrast, City of Edinburgh, in collaboration with neighbouring authorities, has authority-wide provision of materials for pupils with a visual impairment. All pupils noted in Table 6.3 have in place some arrangement for materials to be made available in formats that suits them. This does not mean that all pupils have their format needs fully met but that they are known, planned for and are in the process of being met.

At least two questions arise from the results shown in this table. First, does one form of large print meet all needs? And second, are there other format needs required by the pupils who are on this VI service caseload but not in place? We discuss these two questions separately.

## Does one size fit all?

Discussions about alternative formats leads inevitably to the question of whether each respondent uses the same interpretation of 'alternative format'. More specifically, when one respondent indicates use of Large Print, will that have the same meaning for all respondents? And from the child's perspective is it a case of 'one size fits all', i.e. that there is a certain large print format that suits everyone.

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[20] Three pupils who require Braille will leave schooling over the next one to two years. Thereafter it is estimated that three pupils maximum might require Braille (all are in pre-school / P1 period at present)

While research has been undertaken to find out what is the most likely size of large print to suit most people with a visual impairment (Aitken, Ravenscroft & Buultjens, 2000), this is not the same as asking whether a particular size of large print will suit a particular child.

This is an important question. If one form of Large Print suits all pupils then it is much easier to plan, design, produce, and disseminate materials in one font and size, confident that all pupils can use the materials. We therefore asked one visual impairment service to list the specific outputs produced for individual pupils. Table 6.4 reports on this. Column 1 lists the particular primary or secondary class attended by each pupil. Alongside this is shown the particular format preferred by that pupil. Additional information is given such as preferred colour of paper. [The term 'decluttered' does not refer to the amount of rubbish but is a technical term referring to the need to keep visual information simplified.]

Table 6.4 shows that:

- 4 pupils required large print size 18

- 1 pupil required large print size 20

- 12 pupils required large print size 24

- 4 pupils required large print size 36

- a variety of other changes were required including text in **bold**, three colours of paper green yellow and pink (using the precise shade is important);

- 1 used audio;

- 3 used Braille and there were 3 potential future Braille users (by which time the current 3 will have left school);

- simplified graphics are helpful;

- some materials had been prepared in other formats including: 14 point, 30 point, 40 point, 48 point, 50 point and 65 point (the larger fonts in landscape orientation).

Out of a caseload of around 200 – 250 visually impaired pupils, alternative formats were provided for approximately thirty pupils. This service noted that the production of materials in alternative formats had to be local so as to meet individual children's needs.  They acknowledge that some items could be partly prepared centrally, but would still need adjustment at a local level for the individual child. They further noted that it was "nice for the children to know people who produce their books and vice versa".

| CLASS | TYPE | ADDITIONAL DETAILS |
|---|---|---|
| P1 | LP 24 | |
| P1 | LP 36 | Decluttered |
| P1 | LP 36 | |
| P2 | LP 24 | Decluttered |
| P3 | LP 18 | |
| P3 | LP 24 | |
| P3 | LP 36 | |
| P4 | LP 24 | |
| P4 | LP 36 | Green Paper |
| P5 | LP 24 | |
| P5 | LP 24 | |
| P5 | LP 24 | |
| P6 | | |
| P6 | LP 18 | |
| P6 | LP 24 | |
| P7 | | Graphics Change |
| P7 | LP 18 | Yellow Paper |
| Pre-school | (future Braille user) | |
| Pre-school | (future Braille user) | |
| Pre-school | (future Braille user) | |
| S1 | Braille | |
| S1 | LP 24 | Bold |
| S2 | LP 20 | |
| S2 | LP 24 | Bold |
| S2 | LP 24 | |
| S3 | Braille | |
| S3 | LP 18 | |
| S4 | Audio | Tactile Diagrams - no Braille |
| S5 | LP 24 | |
| S6 | Braille | |

Table 6.4: Particular Format Requirements of pupils in Primary and Secondary classes

## Other formats required by visually impaired pupils?

Recall that around 200 pupils are known to this particular service. Of the 200, 30 pupils require material in the formats described above. What about the other 170+ pupils on the caseload? Do these formats described above suit all of the pupils? Are arrangements in place to provide these formats?

No other formats were produced although the VI service recognised that a number of pupils were likely to require them. As we will see in Section 8 some of the remaining 170+ pupils would likely benefit from different formats.

| Other formats required for pupils with VI and additional disabilities | Number requiring (sample VI Service) |
|---|---|
| Switch accessible | Not Known |
| Symbol supported literacy | Not Known |
| Other estimated | Not Known |

Table 6.5:       Number of users of Alternative formats known to a VI Service

## Pupils requiring curriculum materials in Braille

We also approached some members of Scottish Association for Educators of Visually Impaired (SAVIE) to identify the number of pupils requiring materials to be produced in Braille Grade 1 or 2. The Scottish Sensory Centre notes that around 80 to 85 pupils in Scotland require materials in Braille (1 or 2). Sorenson found a similar figure whereby 88 Scottish pupils were listed as using Braille as their preferred primary format.

This figure is supported by research reported in the British Journal of Visual Impairment by Clunies-Ross (1997). She estimated over 19,000 VI children across the UK, of whom almost 5% were Braille users. This translates to around 70 Braille users in each year group across the UK - 6 per year group in Scotland, or 90 in total across primary and secondary school sector.

# Access to 5-14 National Assessments

Schools download 5-14 assessment tests in either PDF or Microsoft Word format and then usually print and copy them for pupils to use. If the standard print size is not suitable the school may adapt it:

"If visually impaired pupils need to have assessments with enlarged text or on coloured paper, etc, then schools should make arrangements to prepare copies themselves. Schools are free to adapt the appearance of an assessment to suit the individual needs of pupils with visual impairments."

http://www.aifl-na.net/na/guid_asn.htm

It is assumed that this advice and dispensation is also applicable to other children with visual difficulties who may require the text double-spaced or in another font.

It is acceptable to make adjustments to the assessment arrangements provided the assessment is not compromised. SQA provides the following helpful guidance:

> *"Reading*
> *Pupils may have the text of the questions read to them and use the services of a scribe but **not** have the passage read to them as the aim is to assess reading comprehension and not simply listening or recall.*
> *Writing*
> *A pupil who normally has the services of a scribe or uses a computer may have the same degree of support when writing for a national assessment. For pupils with specific learning difficulties such as Dyslexia, the spelling bullet within the writing criteria can be ignored.*
> *Mathematics*
> *It is important that a pupil's ability to cope with the language demands of the assessment units does not interfere with her/his ability to carry out the mathematical problems set. While it is not anticipated that pupils will have difficulty in reading the written questions in National Assessments, teachers may, at their discretion, read individual questions to pupils to facilitate understanding.*
> ***It is important that any additional support a pupil requires to demonstrate their level of achievement is recorded and reported to all interested parties e.g. pupil, parents, and subsequent teachers." [21]***

Pupils can also use the digital version of the assessment in either Microsoft Word or Adobe PDF provided the assessment is not compromised (e.g. a text-to-speech reader could be used to read the questions but not the text in an English test). In practice, few schools seem to be aware that they are able to adapt the printed assessment or use the digital original.

## National Assessment Bank

National Assessment Bank tests are used by schools internally at the end of a course unit. The assessments are downloaded in PDF from a secure SQA web site, and the 'Instrument of Assessment' is printed off for use by students. Students who have difficulty with the printed paper can use 'Assessment Arrangements' (AA). SQA provide guidance for Assessment Arrangements (SQA, 2004) which applies to both internal assessment using NABs and external assessment via SQA examinations. The main principles of this guidance are to allow reasonable adjustments to be made where candidates have difficulty accessing questions or presenting written responses, while ensuring that any adjustments do ***not compensate for a candidate's inability to meet set standards***. In addition, these arrangements should be ***tailored to meet the individual needs of candidates*** and should ***reflect, as far as possible, the candidate's normal way of learning and producing work***.

The school is responsible for identifying students who will require assessment arrangements and for deciding on what type of arrangement to use. The pupil may use: a modified paper (e.g. printed on coloured paper, in a large or different font; in Braille); low vision aids; coloured overlays; ICT; reader, scribe or signer; prompter or helper; amplification; extra time; and transcription of responses.

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[21] Guidance on support that can be given to pupils with additional support needs, http://www.aifl-na.net/na/guid_asn.htm

The school need only contact SQA "for an adjustment to the published assessment arrangements if it changes the assessment arrangements in any significant way." (SQA, 2004).

SQA will provide NABs in adapted alternative formats such as Braille and minority languages on request. They are also able to provide NABs in Microsoft Word format. However, we suspect that few schools are aware of this provision because SQA report that they have only had 12 requests for adapted NABs over the past three years.

# Support requested for SQA examinations

Table 6.9 gives a breakdown of the different types of support requested for the SQA 2006 examination diet and the underlying impairment.

In most cases, schools will request more than one type of Assessment Arrangement for a pupil, so that 43,291 requests resulted in a total of 77,374 individual instances of support.

Given that "Any adjustment to the assessment arrangements should reflect, as far as possible, the candidate's normal way of learning and producing work" (SQA, 2004), the requests provide an indication of the methods that schools use to support pupils with reading and writing difficulties.

## Supporting reading, seeing, understanding and/or handling papers

| Method of supporting Reading, Seeing, Understanding and/or Handling the paper | No of requests |
|---|---|
| Extra Time | 34,803 |
| Reader | 16,815 |
| Coloured Paper | 1,327 |
| Enlarged Print | 889 |
| Question Paper signed to candidate | 69 |
| Braille | 28 |
| **Total number of requests** | **53,931** |

Table 6.6: Number and type of requests to support students in seeing, reading, understanding or handling the paper.

The most common support is more time, either because pupils are slow readers (due to dyslexia, for example), or they take longer to navigate or manipulate the paper (e.g. because the paper is in Braille or the pupil has a physical difficulty) or because they take longer to write (due to dyspraxia or a physical impairment) or to plan and compose (due for example to difficulties organising ideas or concentrating).

The next most common method is to use a human reader, and this occurred in 16,815 instances – over 7 times as many readers were used as adapted papers. There are many advantages with using a reader, particularly in the pressured examination situation, but there are also issues concerning independence and so an obvious question that should be asked here, with regard to unmet need, is how

many pupils could be using some form of accessible adapted paper or other technique independently, rather than a human reader? The CALL Centre's recent project to develop and trial digital question papers is of interest in relation to this: in one school pupils with reading difficulties used a PDF digital paper with text-reading software in almost half (48%) the examinations; a human reader was used in the others.

SQA provided 5,369 adapted format question papers in 2006 (more than one paper is often required for an examination) (Table 6.7).

The largest category (2,600 out of 5,369, or 48%) of adapted papers produced were in alternative colours (white rather than pastel, or another colour specifically requested for the pupil). 52% of these papers were requested for pupils with specific learning difficulties; 40% for visually impaired pupils and the remainder (7%) for pupils with physical, general or other learning difficulties.

The second largest category of adapted papers is large print, where 1,996 papers were produced, mostly for visually impaired pupils (72%) with the remainder produced for pupils with specific learning difficulties (15%), followed by a range of other difficulties.

The smallest category of adapted papers produced was Braille: 80 papers (1.5%).

| Adapted Papers provided by SQA in 2006 | Number of papers |
|---|---|
| White paper | 1,662 |
| Large print | 1,071 |
| Colour copies | 938 |
| N14-18 font | 562 |
| Reader copy | 408 |
| N20-28 font | 259 |
| Adapted content | 139 |
| N36-48 font | 104 |
| Digital question papers | 146 |
| Braille | 80 |
| **Total** | **5,369** |

Table 6.7:     Number and format of SQA papers provided in 2006

## Support for writing

Table 6.8 analyses methods of supporting writing or recording.

| Method of supporting writing and recording answers | No of requests |
|---|---|
| Extra Time | 34,803 |
| Scribe | 15,059 |
| Use of ICT | 3,063 |
| PA Referral | 2,480 |
| Transcription with correction | 1,190 |
| Transcription without correction | 678 |
| Candidate Signs Responses | 56 |
| Use of tape recorder for responses | 25 |
| **Total** | **57,354** |

Table 6.8:     Number of requests and methods to support writing

Again, the most popular type of support is extra time. It is not possible to differentiate between requests for extra time as a result of a difficulty with reading compared to extra time to compensate for difficulty with writing – in most cases extra time would be requested for both reading and writing.

The second most popular method is the use of a scribe, with pupils using a scribe in 15,059 instances.

Use of ICT is third. Furthermore, analysis of the statistics over the past few years shows that ICT is being used more frequently. However, if we discount the use of extra time, use of scribes constitutes 67% of instances of writing support requested. If we further consider the requests where a pupil is writing independently (i.e. using ICT, signing and a tape recorder), compared with receiving assistance from a member of staff (i.e. scribe, referral of the paper to the principal assessor, transcription) then we find that the pupil is working independently of a member of staff in only 14% of instances. Certainly, we should question the use of transcription of the paper in 1,868 instances and ask why these pupils are not using ICT or some other independent means of writing and recording.

Because the method of support used in examinations follows the support used in class, we suggest that these statistics reflect unmet need: if the statistics reflect classroom practice, then human support may be being used too readily and there is a need for other more independent methods using accessible, alternative formats.

Again, results of the CALL Centre / SQA digital papers project (Nisbet *et al* 2006) may give an indication of the potential for materials to be provided and answered using ICT. 8 schools took part in the project and the percentage of pupils using independent writing support methods (ICT, digital papers, tape recorder) varied from 17% to 85% of the pupils who required assessments arrangements, with an average of 57%.

Table 6.9 details the types of support requests to help students write or record their answers.

| Table 6.9: 2006 SQA requests for Assessment Arrangements | SAA requests | Extra Time | Reader | Scribe | Large Print | Braille | Question Paper signed to candidate | Candidate Signs Responses | Tape recorder for responses | Coloured Paper | Transcription with correction | Transcription without correction | Calculator | PA Referral | Use of ICT | Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Visual Impairment | 1,357 | 965 | 339 | 213 | 642 | 28 | 0 | 0 | 0 | 527 | 15 | 32 | 5 | 16 | 105 | 2,887 |
| Hearing Impairment | 721 | 589 | 176 | 72 | 13 | 0 | 62 | 56 | 21 | 6 | 7 | 0 | 9 | 54 | 15 | 1,080 |
| Epilepsy | 277 | 248 | 34 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 2 | 0 | 19 | 359 |
| Myalgic Encephalomyelitis | 126 | 106 | 3 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 6 | 138 |
| Other Health Problems | 1,557 | 1,005 | 75 | 166 | 1 | 0 | 0 | 0 | 0 | 13 | 8 | 5 | 3 | 6 | 107 | 1,389 |
| General Learning Difficulties | 2,924 | 2,401 | 1,605 | 1,354 | 23 | 0 | 0 | 0 | 0 | 10 | 56 | 12 | 41 | 46 | 58 | 5,606 |
| Specific Learning Difficulties/Dyslexia | 23,636 | 19,954 | 11,663 | 9,638 | 138 | 0 | 1 | 0 | 0 | 564 | 790 | 119 | 656 | 1,988 | 1,337 | 46,848 |
| Specific Learning Difficulties/Dyspraxia | 2,185 | 1,811 | 441 | 761 | 6 | 0 | 0 | 0 | 0 | 14 | 67 | 100 | 26 | 62 | 392 | 3,680 |
| Specific Learning Difficulties/Other | 3,181 | 2,597 | 905 | 832 | 6 | 0 | 0 | 0 | 0 | 118 | 151 | 80 | 65 | 184 | 282 | 5,220 |
| Social, Emotional and Behavioural Difficulties (EBD) | 984 | 341 | 186 | 156 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 6 | 7 | 25 | 725 |
| Attention Deficit Hyperactivity Disorder (ADHD) | 870 | 570 | 264 | 231 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 14 | 4 | 35 | 1,119 |
| Concentration Difficulties | | | | | | | | | | | | | | | | 0 |
| Mental health problems | 215 | 106 | 2 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 117 |
| Speech and Language Impairments | 720 | 635 | 329 | 268 | 3 | 0 | 0 | 0 | 0 | 8 | 22 | 11 | 11 | 34 | 23 | 1,344 |
| Autistic Difficulties | 1,401 | 1,118 | 463 | 466 | 8 | 0 | 0 | 0 | 2 | 0 | 11 | 27 | 24 | 13 | 70 | 2,202 |
| Physical Disability | 1,602 | 1,457 | 225 | 647 | 40 | 0 | 0 | 0 | 2 | 18 | 1 | 21 | 13 | 9 | 284 | 2,717 |
| EAL | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Other Disability/Difficulty | 1,530 | 899 | 105 | 179 | 9 | 0 | 6 | 0 | 0 | 49 | 60 | 261 | 15 | 54 | 301 | 1,938 |
| None | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 4 |
| Totals | 43,291 | 34,803 | 16,815 | 15,059 | 889 | 28 | 69 | 56 | 25 | 1,327 | 1,190 | 678 | 892 | 2,480 | 3,063 | 77,374 |

# Evidence from questionnaires

## Short questionnaire

### Formats required

Respondents were asked to note in what specific formats they would require materials so that pupils could access the curriculum. The following were required in order of number of requests:

- Microsoft Word;

- Adobe PDF;

- DAISY;

- Enlarged texts, clear fonts;

- Audio / MP3, but taggable;

- BrowseAloud (a text-to-speech program for reading web pages).

The references to DAISY were made by people who had either used DAISY or had heard of it though had never seen it.

### Methods of support currently offered

Table 6.10 gives the type of support respondents currently offered to pupils.

| Type of Support | No. |
|---|---|
| Reader | 34 |
| Audio tapes/CD/MP3 | 25 |
| Adapted colour/font/size | 21 |
| Electronic/digital/computer | 16 |
| Other | 3 |

Table 6.10:    Type of support respondents currently offered to pupils

### Types of formats required

We asked people to state what type of format would be most useful for the pupils they work with.

| Type of Support | No. |
|---|---|
| Electronic/digital/computer | 30 |
| Audio tapes/CD/MP3 | 22 |
| Adapted colour/font/size | 20 |
| Other e.g. translated and simplified with visual support | 3 |

Table 6.11:    Number and type of formats required for pupils worked with

When asked to note which formats other than those listed they would like to use comments included, for example, text translated and simplified with added visual support (although the comments did not say which kind of visual support we assume this meant graphics in the form of either pictures or symbols, or both).

**Comments**

Respondents were also invited to add any comments and the textbox shows a few examples:

"It's essential for inclusion."

"[Need to] reduce copyright problems."

"Resources are always a problem. Copyright problems. Manpower."

"It would be useful to get round the copyright difficulties by encouraging publishers to provide accessible resources as a matter of course."

"Would be wonderful [to have materials in accessible formats]."

"Need to have backup of senior manager at school and prioritise and perhaps new legislation [reference to ASL Act, DDA and Disability Strategies legislation] will help."

"Could versions of standard textbooks also have a range of print and reading age standards incorporated?  e.g. less print on the page, just the main points covered, larger font sizes etc?"

"Why is it so difficult for publishers to provide texts in accessible formats?"

"Bear in mind that we have an increasing number of Polish and Portuguese pupils in Moray schools as well as other Eastern European pupils who may speak little English."

"[Pupils with literacy difficulties] should have the same access to reading and work materials as other children do."

Table 6.12:    Comments on the need for alternative formats

Comments indicate that respondents are aware of copyright issues and the effect this has on pupils' access to the curriculum and the opportunities they have to demonstrate their knowledge and understanding. Furthermore they recognize the opportunities offered by arrangements under the ASL Act, the DDA and under the Disability Strategies legislation.

## Long questionnaire

As with previous sections of this report, rather than carrying out statistical analysis of results obtained for the long questionnaire, we will focus on one authority whose results we have tracked through for two primary and two secondary schools. We asked respondents to include information on the formats in which they currently produce materials as well as to say what formats pupils would benefit from in an ideal world. We asked them to do this in respect of all forms of support given (e.g. reader, scribe, large print etc.) to meet each type of support need (e.g. difficulties reading text, seeing text, understanding text etc).

Rather than providing totals of what were very detailed responses we report here on the main points:

- most of the pupils who had difficulty with literacy (i.e. around 12% to 14% of pupils) were expected to be assisted by having text available in alternative formats;

- different pupils require different formats;

- voice recording of answers was suggested as a means of writing and recording;

- use of visual tools e.g. mindmapping to record ideas;

- homework: MP3 players for pupils to record book reviews, personal projects;

- reading & writing difficulties affect access to all areas of the curriculum e.g. in maths reading difficulties affects reading questions, topic information.

- accessible resources would help a larger number of children than those currently designated as having a specific or labelled difficulty;

- bleached white paper is not helpful to many pupils under fluorescent lighting;

- simplified language in differentiated worksheets is sometimes available, but also used and needed by others performing below average;

- there is a need for symbol supported materials;

- the lack of availability of materials in alternative formats and the inability to create them has a large adverse effect on pupils' ability to access the curriculum;

- accessible formats would increase independence of pupils, increase their confidence and motivation;

- the benefits of [audio] CD for able reluctant readers throughout school as well as less able readers;

- less able pupils without specific difficulties would be able to access the materials either individually or as part of a mixed ability group;

- every pupil would benefit from the redeployment of staff that could follow from more pupils working independently;

- a smaller number of readers and scribes would be required if audio / computer formats were made available. In an ideal world youngsters would gain independence with audio/computer formats, freeing up staff to work in other support areas;

- what is good practice for ASN would benefit even high level achievers.

## SECTION 7    AVAILABILITY OF ACCESSIBLE MATERIALS

## Objective 7:    To ascertain the current availability of accessible curriculum materials and what needs these are addressed to meet.

**Outcome:**    **Better understanding of what materials are available in accessible formats, what these formats are and which pupils are likely to benefit.**

**Summary**

1) Although blind and partially sighted pupils have difficulty in obtaining accessible books[22], compared to pupils with other impairments this group is relatively well-served by local authority VI and sensory services, by national providers such as RNIB, and through the 110,000 titles from providers listed on Revealweb, the UK catalogue of resources in alternative formats.

2) The Braille, large print and audio materials that are available are not suitable for all pupils who are visually impaired: many visually impaired pupils have additional learning or physical impairments and require other formats such as symbolised books or switch-accessible digital resources.

3) Pupils with physical impairments who are covered by copyright exemption are not supported either in terms of the formats listed on Revealweb, or by the majority of Revealweb providers. Most suppliers listed on Revealweb only support children with a visual impairment. There is no equivalent of Revealweb for pupils with physical, learning or other literacy difficulties even though substantially more pupils could benefit than those who are visually impaired.

4) For pupils who are not covered by copyright exemption (pupils with mild, moderate, severe or specific learning difficulties, hearing impairment, speech and language difficulties, or other issues), there are very few sources, either commercial, government-funded or in the voluntary sector, of accessible resources. A few commercial items do exist but these are more expensive than paper books or accessible versions available for visually impaired students.

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[22] Where's my book? Tackling the textbook deficit faced by school pupils with sight loss, RNIB

# Background

To investigate the availability of learning materials in accessible format, we researched materials available from voluntary organisations such as those listed on Revealweb, those made by local authorities and school, commercial publishers and suppliers, and sources of materials on the internet.

# Revealweb

Revealweb (www.Revealweb.org.uk) is an online database that lists over 100,000 titles in alternative formats from 146 suppliers in the UK. Revealweb is intended to be the UK national mechanism by which creators and users of alternative formats can:

(a) satisfy the legal requirement under the Copyright (Visually Impaired Persons) Act to notify publishers when an accessible copy has been made;

(b) satisfy the obligation to check to see if an accessible copy exists before creating one;

(c) share resources and therefore improve service provision and reduce duplication.

Revealweb is the largest source of information about accessible formats in the UK and so is one of the best places to begin when searching for materials.

A brief analysis of the materials available on Revealweb was carried out. We wanted to find out:

• the type of resources and formats available for pupils in schools;

• which children can benefit from these resources.

Of the 146 suppliers listed on Revealweb, 92 offer accessible materials for pupils in education. A wide range of suppliers is listed on Revealweb: national organisations and transcription services such as RNIB; individual schools; transcription services in prisons, etc. Table 7.1 summarises the type of materials offered by the 92 suppliers.

| Type of material | No of sources of accessible formats |
|---|---|
| Fiction | 84 |
| Non-fiction | 87 |
| Textbooks | 21 |

Table 7.1:  Type of materials available from Revealweb providers

Table 7.2 lists the numbers of suppliers who provide materials for children with different types of impairments. 40 of the 92 (43%) will only supply to children who are visually impaired; 6 state that they will supply to children covered by the 2002 Copyright (Visually Impaired Persons) Act (i.e. visually impaired, physically unable to hold a book or turn the pages or to physically focus or track with their eyes); and the population served by the remaining 46 providers is not always specified,

but most (e.g. the eighteen H.M. Prison transcription services provide Braille, Large Print, Moon and/or raised diagrams) only supply materials for children who are visually impaired.

| Pupils supported | No of sources of accessible formats |
|---|---|
| Visually impaired only | 40 (43.5%) |
| No specified group; mostly visually impaired | 46 (50%) |
| Pupils covered by the 2002 Copyright VIP Act: (visually impaired, physically disabled, difficulty visually focusing or tracking) | 6 (6.5%) |

Table 7.2: Children served by Revealweb providers

In terms of the alternative formats available from Revealweb providers, 68% of the providers supply Braille; 61% supply large print, and the majority of the suppliers listed on Revealweb offer formats that are suitable for children with a visual impairment (Table 7.3). Revealweb lists over 100,000 titles: most of these are Braille, large print or audio for blind and partially sighted children.

For example, only people with a visual impairment are eligible to join the RNIB Talking Books service and access the 9,500 titles in Daisy audio.

Out of 92 suppliers, 19 offer digital resources and only three of the 19 suppliers offer electronic files that can be used to create resources for children with physical impairments. There are no providers specifically serving children with physical disabilities even though there are far more children in Scotland who could benefit from digital materials accessible by keyboard, mouse or switches, than who need Braille.

| Accessible formats | No of sources of accessible formats |
|---|---|
| Braille | 63 |
| Large print | 56 |
| Moon | 15 |
| Audio tape | 39 |
| Audio CD | 24 |
| Electronic text file | 19 |
| Moon | 15 |
| Daisy audio book | 11 |
| MP3 audio file | 2 |
| Daisy text book | 0 |
| PDF file | 0 |
| HTML file | 0 |
| Word file | 0 |
| Switch accessible formats (e.g. Clicker) | 0 |
| Symbol supported formats | 0 |

Table 7.3: Formats listed by Revealweb providers

Given that Revealweb exists in part to satisfy the requirement in the 2002 Copyright VIP Act for organisations to first check whether accessible formats exist, and to notify the publisher when an accessible copy is made, and that the Act covers children with physical difficulties and visual perceptual problems as well as those with visual impairment, it is disappointing that the majority of resources listed on Revealweb are intended for children with visual impairment only.

There are several reasons why this is likely to be the case. Firstly, Revealweb is operated and managed by RNIB and NLB (who merged in January 2007), and therefore it is not surprising that it focuses on those with a visual impairment. However since it is funded by[23]:

- The Department of Culture, Media and Sport (DCMS).

- Resource, the council of museums, libraries and archives.

- The British Library Co-operation and Partnership Programme.

- The Lloyds TSB Foundation.

- The Ellerman Foundation.

- The National Library for the Blind (NLB).

- The Royal National Institute of the Blind (RNIB).

we suggest that it should have wider scope beyond visual impairment to include all people covered by the 2002 Copyright VIP Act.

As part of this project we contacted Deborah Ryan, Revealweb manager to ask if the catalogue could be extended to include formats that are designed for children with physical difficulty (Revealweb does accept listings for materials in electronic text or Daisy but these are not accessible for switch users, for example). At the time of writing we understand that Revealweb is willing to accept a wider range of formats and so it is necessary for organisations and agencies who produce digital resources that are designed for children with physical impairments to collaborate and agree on standards and formats that should be used.

It would also be necessary for Revealweb to take active steps to advertise its service beyond the visual impairment world, and for Revealweb to engage with providers of other formats in order to specify the most appropriate formats for their own audience.

Alternatively, similar databases and services should be established to serve other groups of children using other formats.

Interestingly, none of the Scottish local authority Braille or large print transcription services are listed as suppliers on Revealweb. This is because they produce and distribute material for children within their local authority and therefore are not obliged to notify the publisher when an accessible copy is made. However, there is clear potential to improve efficiency and avoid duplication of effort in Scotland by encouraging transcription services to use Revealweb or other mechanism.

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[23] http://www.Revealweb.org.uk/about/funding.htm#content

## Commercial Publishers and Suppliers

### Audio books

Commercial audio books are available on CD from many sources such as bookshops and internet retailers such as Amazon.com. Audio books are now also available as downloadable files (e.g. MP3) from suppliers such as Apple iTunes (over 20,000 audio books) or Audible.com (www.audible.co.uk – 11,000 audio books). These audio books can be played on computers, iPods and other MP3 players and mobile phones. The majority of these titles are reading books or novels: few if any are textbooks. By way of example, an audio CD set of Harry Potter and the Prisoner of Azkaban costs £35 in a bookshop or around £10 online (in comparison, a blind or partially-sighted pupil could buy the same book in Daisy format on CD from RNIB for £5.99).

### eBooks

Electronic downloadable books in Adobe and Microsoft Reader format are now available from some retailers such as WH Smith (http://ebooks.whsmith.co.uk/) but the majority of the titles are for adult readers, and most are protected by Digital Rights Management software that prevents them from being accessed by text or screen readers. They are therefore only suitable and accessible for children with physical difficulties and good reading skills. Most titles are reading books or novels; *Sabriel* by Garth Nix, for example, in Adobe PDF, Microsoft Reader or Mobipocket Reader formats costs £10 from the WH Smith eBook online shop.

### Electronic texts from publishers

We contacted a number of educational publishers to investigate whether they would be able and willing to provide electronic versions of text books and other materials for use by pupils with additional support needs. Harcourt (Heinemann, Ginn, Rigby and Payne-Galloway), Oxford University Press, and Leckie and Leckie all responded that they would be willing to provide PDF copies of books. RNIB are currently conducting a project with publishers in the UK whereby publishers provide a source text which is then converted into XML, Daisy text and audio format. The project has yet to report, but progress to date suggests that most publishers are amenable to providing digital source texts for conversion into accessible formats for use by children with additional support needs[24].

The accessibility of books provided by publishers in PDF is variable (see Section 10). In most cases, PDF files from publishers are unstructured and "untagged" and while they may be reasonably accessible for pupils with moderate reading difficulties and physical impairment, they are often not suitable for those with more severe difficulties because they lack structure, navigation and other features. Untagged PDFs usually require some adaptation and conversion in order to be accessible to these children. However, provision of books in PDF at least avoids the need for staff in schools and other agencies to scan the books into the computer.

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[24] http://www.pls.org.uk/ngen_public/article.asp?aid=337
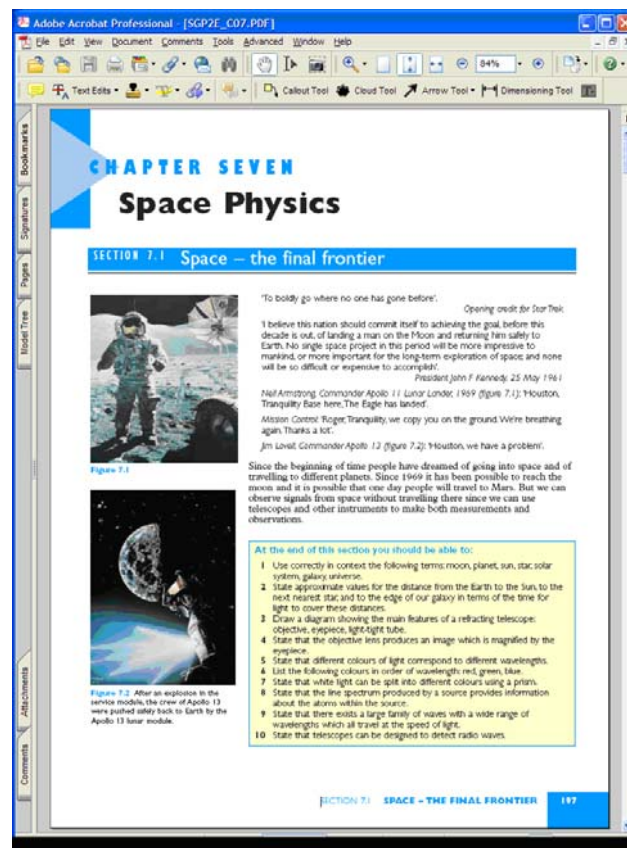
Figure 7.1: PDF page from Physics textbook provided by the publisher

## Specialist formats from educational publishers

Several educational publishers do supply materials in digital interactive or audio formats. Very few materials are available and those which do exist are usually much more expensive than the equivalent paper book. There are of course very many resources available only in a digital form, i.e. they do not have a paper equivalent. While many of these are excellent resources, we have only included a few examples because the focus of this project is on accessible versions of paper materials which are in common use in school.

Pupil Activity Software from **Scottish Heinemann Maths**, for example, offers interactive and motivating activities on CD (£50 licence for the Primary 5 CD). However this type of resource is intended to complement the paper textbooks and workbooks and so the activities themselves are not the same as those contained within the textbooks and workbooks.

**Oxford Reading Tree Talking Stories** are CDs with six ORT stories and accompanying activities (www.oup.com/uk/catalogue/). Pupils can listen to the story and click on the buttons to turn the page. Each CD costs £50 for a single licence (compared to a pack of 6 paper books which costs from £12.50 to £16.) These CDs are suitable for many pupils with reading and learning difficulties, and some with visual and physical difficulties, but they are not accessible to pupils who use switches.
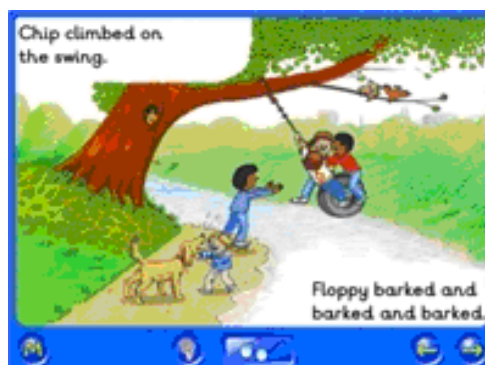
Figure 7.2:  ORT Talking Story on CD

Some Oxford Reading Tree stories are also available in **Clicker 5** format from Crick Software (www.cricksoft.com/uk). The text is highlighted as it is read back (with a human voice – Tony Robinson, the actor) ; there are a large number of interactive activities; and the books are accessible to switch users. Each CD costs £50 for 6 stories.

Crick software also publish other resources that run with Clicker, such as **Clicker books** which come with paper books and Clicker versions, and the **Find Out and Write About** series.

The **Start to Finish** Resources from Don Johnston are relatively unusual in that they are readers aimed at older pupils (9-14) who have poor literacy skills, and are provided in paper, audio CD and computer text with audio. The resources are popular with staff and pupils but they are relatively expensive: £45 per title.

Inclusive Technology (http://www.inclusive.co.uk/) sell many excellent resources which are fully accessible for children using mouse, touchscreen, keyboard or switch, such as the SwitchIt! And Choose and Tell series.

Widgit Software (www.widgit.co.uk/), a company specialising in software for symbol users, have low cost resource packs with ready-made symbol supported materials to print out.

## Local authority services

In Scotland, many local authorities have transcription services for visually impaired pupils and these can be an excellent source of adapted materials. The Edinburgh and Lothians VI service is a good example and this service has now produced 440 large print books and 173 Braille books. Many common textbooks from series such as Oxford Reading Tree, Scottish Heinemann Maths, Nelson's Skills and Maths in Action have been created and digital source texts for these resources exist in Edinburgh.

The other Scottish transcription services in Aberdeenshire, East Renfrewshire, Fife, Glasgow, Highlands, North and South Ayrshire, Shetland, Scottish Borders, South Lanarkshire, Stirling, West Dunbartonshire and The Royal Blind School also have catalogues of materials.

Not all local authorities operate their own transcription services but all have specialist teachers of visually impaired pupils who may create materials and/or source resources from national providers through service level agreements or Revealweb.

RNIB report that there is still a shortfall in provision of accessible learning resources for pupils with sight loss[25]. Since none of the Scottish transcriptions services are listed on Revealweb or any other source there is no efficient way for resources to be shared. A recent positive move in this regard is the development of an online database hosted by the Scottish Sensory Centre, listing Braille materials created at Uddingston Grammar VI Unit and Edinburgh. If all transcription services in Scotland supplied listings to this database and undertook to share their digital source files, considerable duplication of effort would be avoided.

It is worth noting that there are **no** local authority transcription services providing accessible materials on this scale for the far larger number of pupils with reading, physical or learning difficulties.

## Schools

If pupils need accessible resources which are not available, staff in many schools will create the materials themselves, and sections 6 and 9 of this report give some examples.

We are aware that the Support for Learning Departments in Broughton High School in Edinburgh, Kinross High in Perth and Kinross, Earlston High in Scottish Borders, and no doubt many others make audio recordings of materials for pupils with reading difficulties. But in other schools, this provision is not made due to lack of awareness, skills or resources, and yet these schools will also serve pupils who could benefit. Lack of coordination both at local authority and national levels, and legal restrictions, prevent accessible materials being shared between schools and local authorities and cause duplication of effort (it is likely that the three schools mentioned above have all at some time created recordings of the same material).

Similarly, staff at Stranraer Academy, for example, have been creating digital materials for pupils with physical and reading difficulties for several years. The books are scanned in using Kurzweil 3000 software[26] and accessed by pupils on personal laptops or school desktop computers. Stranraer have now created 129 separate resources but the books are not made available to other schools in the local authority, in Scotland or the UK. The Copyright Licensing Agency licence that permits creation of these resources allows distribution to other pupils anywhere in the local authority provided the pupil is covered by the 2002 Copyright VIP Act (see section 12) but there is no mechanism at the present time for such distribution. The local authority are now aware of the issue and are taking steps to encourage cooperation between schools. Legally, the books can only be given to pupils who meet the 2002 copyright dispensation (i.e. who are visually impaired, physically unable to turn the page, or physically unable to focus or track with their eyes); provision to other pupils with additional support needs who might benefit (such as those with language difficulties, some types of dyslexia, English as a second language, etc) can only be undertaken if the school or local authority obtain permission from the rightsholder of every one of the 129 books.

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[25] Proposal to the Scottish Executive to Establish a National Consortium for the Transcription of Educational Materials in Scotland, RNIB Scotland 2006.
[26] Kurzweil 3000, http://www.sightandsound.co.uk/, http://www.kurzweiledu.com/

The availability of accessible learning resources in schools cannot be determined exactly and this requires further research, but it is clear from the responses to the Books for All questionnaires that schools cannot meet the need for such materials themselves.

## SQA Assessment and examination papers

SQA provide downloadable 5-14 assessments in both DOC (Microsoft Word) and PDF from the National Assessments 5-14 web site[27]. We believe that staff in many schools are not aware that they can modify these downloadable resources – for example, by changing the font size or type, or that children with additional support needs can use the downloaded digital versions in place of paper copies.

National Assessment Bank tests (NABs) are available in PDF from the SQA web site, and also in other formats such as MS Word or Braille on request. Again, we suspect that staff are not aware of these possibilities (SQA report that they have only received 12 requests for adapted NABs in the past three years.)

There is therefore a need to raise awareness of the need, potential and availability of these accessible assessments.

SQA will provide examination question papers in Braille, large print, on coloured paper, with alternative fonts, and from 2007, in PDF on CD. See sections 6 and 9 for more details.

In many respects SQA are leading the way and developing and demonstrating good practice:  for example, we believe that SQA are the first examination board to offer digital question papers for pupils with additional support needs. Unlike many organisations, SQA provide 5-14 tests, NABs and examination question papers in accessible formats that are suitable for many different groups of children with additional support needs, not just those who are blind or partially sighted.

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[27] National Assessments 5-14, http://www.aifl-na.net/

# Free texts on the internet

There are now many web sites offering free electronic books (eBooks), texts (eTexts) and audio files. Most of these eBooks and eTexts are older literary works that are out of copyright, so they may be freely downloaded and used for and by children with additional support needs.

**Project Gutenberg** (www.gutenberg.org) is the oldest source of free electronic texts on the Internet and now has over 20,000 books available in plain text, HTML and audio formats. Classic works by authors such as Dickens, Shakespeare and Burns are all available from project Gutenberg.  Plain text, HTML and audio are better than nothing but these resources will often require some modification before they are accessible by a pupil with additional support needs.  For example, in order to produce a large print copy for a pupil with a visual impairment, it will be necessary to convert the plain text file into a suitable word processor format, change the size of the text, add chapter headings, and then print out the result. Similarly, if a pupil wished to use the source electronic file it is important to add structure (such as chapter and section headings) so that the pupil can find information and navigate around the book.

The **University of Virginia eText library (**http://etext.lib.virginia.edu/ebooks/) has around 2,100 books in HTML (web), Microsoft Reader and Palm Reader formats. Like Project Gutenberg, these materials are all out of copyright.  The books in HTML will require adaptation in order to be made accessible although the Microsoft Reader versions may be suitable for some pupils with visual, reading and physical difficulties (see sections 6, 9 and 10).

**Google Book Search** (www.google.co.uk/books) offers another tool for searching for texts in a variety of formats – HTML, plain text and PDF - on the internet.
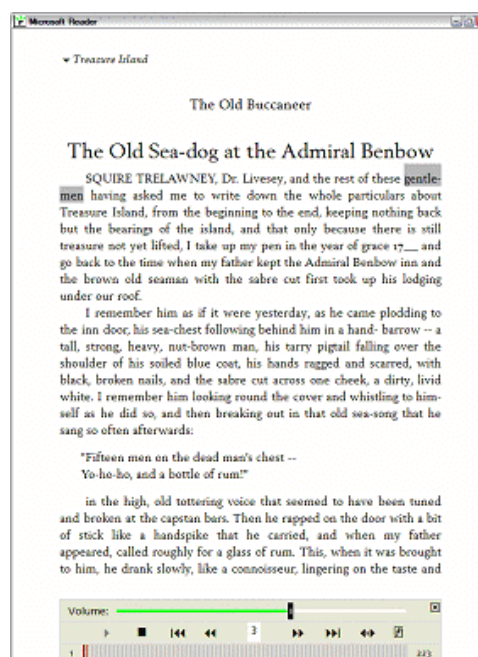


Figure 7.3:  Treasure Island, downloaded free from the University of Virginia eBook library

## Sample survey of available materials

Having explored the availability of different types of accessible resources from a range of sources, we conducted a survey of the availability of accessible formats for a small number of reading books and textbooks. We used Revealweb, the database of Scottish resources that is currently in development at the Scottish Sensory Centre, the list of books that have been created by the Edinburgh and Lothians VI service, publishers catalogues, and the internet. The resources listed on SSC and by Edinburgh & Lothians are not available yet, but we included them in the search to investigate the existence of material, in the expectation that the SSC database will enable them to become available. There will be many more resources that have been created both legally and illegally in existence in individual schools and homes but it was beyond the scope of this project to find such materials. In addition, copyright or other legal restrictions currently prevents access to most of these resources.

We chose to search for materials that were identified by staff who completed the project questionnaires. In many cases staff did not specify particular textbooks (e.g. "Course material in first and second year History, Geography, Science") and so only a relatively small number of identifiable materials were listed.

Table 7.4 summarises the results. A tick indicates that a book from that series was found in that particular format (not all the books in the Oxford Reading Tree are necessarily available in Braille, for example.)

The majority of the resources identified as required are available in Braille and the next most common type of adapted material are large print. No resources are available in symbol format (although some of these books would not be appropriate given the complexity of the language and subject matter).

This is a very small sample but it suggests that reading books are more likely to be available in some accessible formats and that textbooks are less common. The only accessible copies of textbooks that were found were in Braille and Large Print.

Only one book (as opposed to assessment and examination papers) was available in a digital format. However, we did not approach the publishers in this survey and we do know that some materials are available in PDF.

Accessible formats for children with visual impairments (i.e. Braille, Large Print, Daisy audio) are therefore easier to find, and cheaper, than formats for other groups.

| Resource | Printed Formats | | | | | | Audio Formats | | | | Digital multimedia formats | | | | | | | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Different font | Large print | Coloured paper | Simplified language | Braille / Moon | With symbols | Tape | Audio CD | Daisy audio | MP3 | Plain Text, RTF | HTML | Word | PDF | eBook/ e-format | Clicker | Daisy text | |
| Charlie & The Chocolate Factory | | √ | √ | | √ | | √ | √ | √ | | | | | | | | | |
| Stormbreaker | | √ | √ | | √ | | √ | √ | √ | | | | | | | | | |
| Oxford Reading Tree | | √ | | | √ | | | | | | | | | | | √ | | |
| Ginn 360 Reading books | | √ | | | √ | | | | | | | | | | | | | |
| Scottish Heinemann Maths textbooks | | √ | | | √ | | | | | | | | | | | | | 2 CDs of additional activities |
| Scottish Heinemann Maths workbooks | | | | | √ | | | | | | | | | | | | | |
| TJ Maths | | | | | | | | | | | | | | | | | | |
| Maths in Action | | | | | √ | | | | | | | | | | | | | |
| Nelson's Skills | | √ | | | √ | | | | | | | | | | | | | |
| Spotlight on Science | | | | | | | | | | | | | | | | | | CD for teacher resources |
| To kill a mockingbird | | √ | √ | | √ | | √ | | √ | √ | | | | | | | | |
| Macbeth | | √ | | | √ | | √ | √ | √ | √ | √ | √ | | | √ | | | |
| 5-14 assessments | √ | √ | √ | | | | | | | | | | √ | √ | | | | |
| NABs | √ | √ | √ | | √ | | | | | | | | √ | √ | | | | |
| SQA examination question papers & past papers | √ | √ | √ | | √ | | | | | | | | | √ | | | | |
| Various novels and reference materials | | √ | | | √ | | √ | √ | √ | √ | | √ | | | √ | | | |

Table 7.4: Availability of resources in accessible formats

Table 7.5 gives further details of the type of formats and sources of a subset, comprising reading books, novels, and textbooks of the materials in Table 7.4.

Again, we see that availability of Braille and Large Print textbooks appears reasonably good, whereas other alternative formats are non-existent. The novels are available in various audio formats as well as in Braille or Large Print.

The two Scottish services would appear to be good sources of material but they do not appear on Revealweb. If all the local authority transcription services in Scotland provided their catalogue lists to Revealweb or the SSC database, and were willing to share the digital intermediate files (historically, and understandably, some services with large catalogues have not been willing to share the products of considerable investment by the local authority with other areas), this would have a significant impact on availability of Braille and Large Print materials in Scotland.

| Charlie & The Chocolate Factory, by Roald Dahl 20 sources found (12 on Revealweb, remainder by internet search) | | | |
|---|---|---|---|
| **Sources** | **Format(s)** | **Users** | **Cost** |
| Calibre | Audio cassette (VI only) | VI only | Free loan |
| NLB | Braille Grade 2 | VI only | Free loan |
| Nottinghamshire Inclusion Support Service | LP: 24pt Arial bold | VI | Charge covers cost of print |
| RNIB Talking Book Service (Digital) | DAISY 2.02 Full audio structured by Chapter | RNIB members (VI) | Free loan, Annual Membership £70 |
| Amazon.co.uk | Audio cassette | Anyone | £9.99 |
| Amazon.co.uk | Audio CD | Anyone | £7.99 |
| www.audible.co.uk | Audio MP3 | Anyone | £8.99 |
| Stormbreaker, by Anthony Horowitz 12 sources, 6 on Revealweb, remainder internet search | | | |
| Calibre | Audio cassette | VI only | Free loan to VI, group & school membership £50 |
| National Library for the Blind | Braille Grade 2 Print 24pt Arial black on cream | VI only | Free loan to members |
| NBCS CustomEyesBooks | Print various sizes | Certified VI & member of NBCS | Ind: cover price Schools: 6p a page, min cover price |
| RNIB Talking Book Service (Digital) | DAISY 2.02 Full audio structured by Chapter | RNIB members (VI) | Free loan, Annual Membership £70 |
| Amazon | Audio CD | Anyone | £12.75 |
| www.audible.co.uk | Audio MP3 | Anyone | £13.99 |
| Oxford Reading Tree 218 items found on Revealweb, 2 sources on internet, 1 LA service | | | |
| Example on Revealweb: Nottinghamshire Inclusion Support Service | 19 Large Print books from ORT series,  24 – 36pt | VI | Charge covers cost – print copy only |

| Example on Revealweb: National Library for the Blind | 39 ORT books in Braille | VI | For loan |
|---|---|---|---|
| Edinburgh and Lothians VI service: various books and worksheets | 104 Large Print copies (various sizes) | VI | Free to pupils served by service |
| http://www.cricksoft.com/uk | Computer talking books | Anyone | £50 single user set |
| http://www2.sherston.com | Computer talking books | Anyone | £50 single user set |
| **Scottish Heinemann Maths**<br>**1 source on Revealweb, 2 on the Scottish Sensory Centre database, also on Edinburgh & Lothians VI catalogue**<br>**53,900 listings on the internet, but we could not find any accessible copies of the actual textbooks** | | | |
| SPMG Stage 4 & 5 HMP Wakefield | Braille | VI | 11p per page |
| SPMG Stage 4 & 5 progress Tests Braille Centre, Uddingston Grammar School | Braille | VI | Free to pupils served by service |
| Heinemann Higher Maths – Braille Centre, Uddingston Grammar School | Braille | VI | Free to pupils served by service |
| SPMG, various stages Edinburgh & Lothians VI service | 19 text and workbooks Large print | VI | Free to pupils served by service |
| Heinemann Maths 4 & 5 textbook and workbooks Edinburgh & Lothians VI service | Large print | VI | Free to pupils served by service |
| Heinemann Maths 4, 5, 6 & 7 textbook and workbooks Edinburgh & Lothians VI service | Braille | VI | Free to pupils served by service |
| http://www.myprimary.co.uk (Harcourt) | CD with additional activities – not digital versions of the books - touch screen and mouse access but not switch | anyone | £50 per stage |
| http://www.easiteach.co.uk/visitors/info/maths/activities.htm | CD of IWB activities related to SHM, – touch screen and mouse but not switch | anyone | £56 single user |
| **Nelson Skills**<br>**3 sources found on Revealweb, also in Uddingston and Edinburgh** | | | |
| Nelson Books 3 and 4 HMP Wakefield, HMP Kingston | Braille | VI | 11p per page |
| Nelson English, Spelling, Grammar, Fiction etc books Edinburgh & Lothians VI service | 14 books in Large Print | VI | Free to pupils served by service |
| Nelson English, Spelling, Grammar books Edinburgh & Lothians VI service | 4 books Braile | VI | Free to pupils served by service |
| **Spotlight Science – no accessible resources found – only a CD with teacher's resources** | | | |
| http://www.spotlightscience.co.uk/scot_index.htm | CD with teacher resources | anyone | ? |

Table 7.5: Availability details of sample books

# RNIB Scotland National Transcription Consortium

A case ('If I can't read it I can't learn it"; RNIB Scotland 2005) to set up a national transcription consortium to produce accessible materials for blind and partially sighted children was first presented to the Deputy Minister for Education at the Cross Party Group on Visual Impairment in 2005. The proposal itself (RNIB Scotland, 2006) was provided to the Books for All project team in November 2006 by RNIB Scotland.

The proposal argues that provision of accessible learning resources for pupils with sight loss in Scotland is inadequate and suggests establishing a National Consortium, centrally funded, to produce materials in Braille, large print, audio and digital formats.

To some extent, the proposed consortium already exists on a UK basis: as we saw earlier in this section, Revealweb is the catalogue of materials, and suppliers listed on Revealweb such as H.M. Prisons and RNIB itself already offer transcription services across the UK. The various RNIB Transcription Centres across the UK cooperate in this way: requests for transcription are pooled and coordinated between the RNIB Centres.

Local authority transcription services in Scotland already have a large bank of resources, none of which is listed on Revealweb: one relatively simple measure to improve availability of materials for blind and partially sighted pupils would be for these services to use Revealweb to share catalogues and resources. This would quickly show any gaps in provision and would allow services to coordinate production. Also, as we have seen, Revealweb is not the only mechanism that exists for sharing materials: the Braille Centre at Uddingston Grammar School and the Edinburgh and Lothians Services have provided listings of Braille materials to the Scottish Sensory Centre and these catalogues will be made available from the SSC web site. If other Scottish Centres participated, this would create a simple and cost-efficient mechanism for sharing information about resources already produced, or in the process of production, by others in Scotland.

While many local authorities do not have dedicated transcription services as such, almost all employ specialist teachers of the visually impaired and/or hearing impaired, and those staff could have access to materials created by their colleagues in other local authorities via Revealweb. One objection to this is that local authorities with transcription services would be subsidising those who do not invest in such services. There are two possible solutions to this problem: first, providers offering materials on Revealweb may make a charge "which does not exceed the cost of making and supplying it"; and secondly, local authorities are at liberty to negotiate service agreements with, for example the RNIB transcription service in Glasgow, to source materials.

Provision of accessible learning resources in Scotland and the UK is already inequitable: blind and partially sighted people benefit from copyright exemption; a national database of accessible materials; access to transcription services from voluntary agencies such as RNIB and HM Prisons; and statutory support services funded by local authorities. These benefits and services are not provided for other print-disabled people. Therefore a new, different approach is needed to address the needs of all print-disabled pupils.

RNIB and other organisations who represent people with a visual impairment are to be credited for the changes made to copyright legislation and for investment and development of services to support blind and partially sighted pupils: the Copyright and Visual Impairment Act permits accessible materials to be created and distributed; Revealweb lists over 100,000 accessible titles primarily in Braille, Large Print and audio; and extensive testing of DAISY has taken place. Organisations who represent other groups of print-disabled people have much to learn from RNIB, in order to achieve similar levels of provision.

The RNIB Scotland proposal notes that "it should be the right of each and every blind and visually impaired child in Scotland to access curriculum materials at the same time as their sighted peers in their preferred format" (RNIB Scotland 2005, p. 3). While we support the aims of the RNIB proposal, the Books for All project has demonstrated that these rights should also apply to other pupils with a print disability in Scotland.

The phrase 'If I can't read it I can't learn it' applies as much if not more to pupils who cannot physically hold a book or turn pages themselves, pupils with reading difficulties, pupils with language and communication difficulties, deaf pupils, and pupils with learning difficulties.

In terms of numbers, Sections 3 and 4 have shown that there are significantly more pupils with these difficulties than there are with visual impairments, and yet it is clear that availability of learning materials in suitable accessible formats for these pupils is very poor.

There is therefore an urgent need to provide accessible learning resources for all print-disabled pupils, not just those who are visually impaired. The following section explores this unmet need in more detail.

## SECTION 8    UNMET SUPPORT NEEDS

## Objective 8:    To provide approximate figures of likely unmet need, both identified and unidentified.

**Outcomes:    An approximation for the numbers of pupils with literacy support needs who might benefit from alternative accessible formats but for whom such formats are not available.**

### Summary

1) Consideration of unmet literacy support needs should cover:
   • pupils for whom copyright exemption applies and whose print support needs are being addressed and in most cases met;
   • pupils for whom copyright exemption applies and whose print support needs are not being addressed or met;
   • pupils who are not exempt, and whose print support needs are not being addressed or met;
   • pupils who are not exempt, and whose print support needs are being met.

2) Most pupils in Scotland can access standard written materials and do not require alternative formats. These pupils are not copyright exempt.

3) Between 500 and 875 pupils with visual impairment as a main difficulty in learning may benefit from alternative formats and their needs are currently addressed, but not fully met, by VI transcription services and specialists. These pupils are copyright exempt.

4) Up to ten times as many, or 5,000 pupils, may benefit when we include those who have moderate, severe or profound learning difficulties and significant additional impairments or disorders. The formats produced currently are not appropriate for most of this larger group who are also exempt from copyright.

5) Most pupils for whom a support plan is in place (around 85% of this group or 30,000 pupils) are not exempt from copyright legislation: for example those with moderate learning difficulties or many with specific learning difficulties including dyslexia. Alternative formats requested frequently in questionnaires were the use of simplified language and text, use of symbols to aid understanding and a range of access methods.

6) More effective and efficient methods could be used to support pupils to improve literacy and reduce the use of human readers and scribes by up to 50% (Nisbet *et al*, 2006) and thus increase independence.

7) Other pupils with literacy support needs may also benefit from increased availability of, and wider access to, accessible formats.

# Background to Section 8

In order to explore areas of unmet literacy support need in terms of pupils, curriculum and approaches, Section 8 draws on work from previous sections while anticipating some of the findings of subsequent sections. We refer to:

- Numbers of pupils with and without support plans who may benefit from materials in alternative formats (outlined in Section 3).
- Indications of support needs (described in Section 4).
- Curriculum materials that need to be adapted (detailed in Section 5).
- Availability of alternative formats, across schools, sectors, staff training, specialist services and managed services (Sections 6 and 7).
- Information on whether a support need can be met or has the potential to be met by existing techniques, using one accessible format to address the support needs of all or at least many users (discussed in Section 10).
- The effect of current copyright legislation, in particular copyright exemption, and whether it has an effect on the potential for support needs to be met (developed more fully in Section 12).

Rather than repeating findings from each of these sections we highlight key areas in terms of print support needs and how far they can be considered met. We explore in more detail which sort of print support needs are addressed and the extent to which they are met. We begin with a definition of 'unmet needs'. We then go on to consider what exactly we mean by unmet support needs.

## Defining unmet support needs

Rather than the term 'unmet needs' we use the term 'unmet support needs'. Not only is the latter term more in keeping with the spirit of the emerging Scottish legislative framework but it also follows the letter of the ASL (Scotland) Act 2004 and associated code of practice.

Drawing on the findings reported in previous Sections, we have grouped pupils into four categories in terms of the magnitude of unmet support needs. Group 1 comprise those with relatively few unmet support needs; the unmet support needs of Group 2 are larger; while Groups 3 and Group 4 have the greatest unmet support needs.

Group 1:    Pupils who are not exempt from copyright, whose print support needs are being addressed.

Group 2:    Pupils for whom copyright exemption applies and whose print support needs are being addressed.

Group 3:    Pupils for whom copyright exemption applies and whose print support needs are not generally being addressed.

Group 4:    Pupils who are not exempt from copyright, whose print support needs are not generally being addressed.

The extent to which the literacy support needs of pupils are met is a continuum, and should be considered in relative rather than absolute terms. The pupils in the first and second groups, whose print support needs are generally addressed, have their support needs met more effectively than those in the third and fourth groups whose needs are not addressed. But the support needs of the first two

groups could be met more effectively (there is always room for improvement); similarly we cannot assert that pupils in groups three and four do not have some needs addressed and met. With these provisos, we believe that this categorisation provides a useful approach to considering unmet support needs.

# 1    Not exempt from copyright; print support needs are being addressed; few unmet support needs

By far the biggest group of pupils whose print support needs are addressed and in most cases met are of course those who do not have a support plan. They don't require one because they do follow a standard curriculum and can demonstrate their knowledge and understanding without additional support. This majority of school pupils in Scotland can generally access written learning resources and are not covered by copyright exemption. This is not to say that the literacy support needs of all pupils are always fully addressed and always met.

Also, we note here that pupils who do not necessarily require alternative formats may still wish to use them and may benefit from using them. With a population growing up and accustomed to using iPods and MP3 players and having access to a range of technologies, some may wish to use such approaches. This group is not the subject of this report. But in terms of capacity building it is important to recognise that some pupils will benefit by being able to access alternative formats as an element of choice.

# 2    Copyright exemption applies; print support needs are being addressed; some unmet support needs

## Numbers and support needs

The primary group who have copyright dispensation, some form of support plan in place and whose print support needs are being addressed are those whose main difficulty with learning is visual impairment.

Note that while the literacy support needs of this group are addressed through the services outlined below and in Section 7, research (RNIB 2005; 2006) suggests that there are gaps in provision and that these pupils do not have their needs met as effectively as those in group 1. But compared to pupils in groups 3 and 4, the support needs of these pupils are being addressed and met far more effectively.

The Scottish Executive Statistical Bulletin indicates around 500 pupils with visual impairment as the main difficulty with learning, while RNIB Scotland suggest there are 875[28] pupils who require materials in alternative formats and there are around 1,100[29] pupils with a visual impairment in total. As we note in Section 3 and below, it is likely that the 500 pupils reported in the statistical bulletin have visual impairment as main, and only, impairment, while the other 600 (of the 1,100) are likely to have physical or learning difficulties as main impairment, and visual impairment as an additional difficulty.

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[28] RNIB 2006, p.11 quotes transcription services serving 210 pupils as 24% of the total number, which gives 875.
[29]  e.g. Visual Impairment Scotland, Review of Eyecare Services Final Report, 2006.

Pupils in group 2 are those with a visual impairment who can use Braille, large print and audio materials: they will usually have a visual impairment without additional difficulties and they number between 500 and 875. The other pupils with visual and additional impairments are less likely to be able to use materials in these formats and they fall into group 3 with pupils whose needs are not generally being addressed.

As seen in Section 4, Table 4.4 and Table 4.5, for group 2, support needs exist in reading, seeing, understanding text as well as in recording work.

## Curriculum materials needed and accessible formats

The full range of materials is needed covering all ages, stages and subject areas in both primary and secondary sectors.

As shown in, for example, Figure 4.1 the formats produced to meet these support needs include large print of various sizes and enhancements, Braille, audio and text-to-speech.

## Services local and national

There are many national and local providers of alternative accessible books and most use Revealweb ([www.Revealweb.org.uk](www.Revealweb.org.uk)) to catalogue and share resources. Revealweb is described in more detail in Section 7 but in brief, the vast majority of the 146 providers, supplying over 100,000 titles, offer materials in Braille, Large Print and audio for visually impaired people.

Most local authorities in Scotland support a visual impairment service with teachers and often ancillary staff to produce and disseminate materials, while some authorities buy in this service through partnership agreements. While there are few advantages to low incidence disabilities, skilled and specialised staff do an excellent job in Scotland to support pupils. A Scottish teacher website set up by the support / special interest group provides a means of sharing information and resources.

## Copyright exemption

To some extent progress in production and dissemination of materials for group 2 has been due to availability of copyright exemption as discussed in more detail in Section 12. Here we consider its application in terms of the support needs which it is designed to address, and in particular how far it meets these requirements.

The Copyright (Visually Impaired Persons) Act 2002 (VIP Act) provides a facility for copies to be made of printed works or provided in alternative formats suitable to individual requirements. The Act applies to people who fall within a definition of 'visually impaired' which in fact includes people with a physical impairment and who cannot hold books or turn pages, and people with a physical difficulty focussing or tracking with their eyes. As part of a strategic approach to providing for the literacy needs of visually impaired people, the VIP Act has transformed access to literacy for some. The Act was one element of an integrated approach to meet literacy requirements as shown in this statement by Stephen King of RNIB:

"In tackling access issues it was vital to take an integrated approach which simultaneously combines researching user needs; finding technical solutions; working on industry standards; and pushing for legislation.

"A technical solution on its own doesn't work, it's just a pilot. A standard on its own doesn't work: it needs legislation. And a regulatory framework on its own doesn't work, there needs to be a technical solution. So we need to take an integrated approach." [King, 2000]

Having established that, in relative terms, pupils with visual impairment as the main difficulty in learning are relatively well served in terms of support in literacy to access the curriculum and to demonstrate their knowledge and understanding, it is important to note that needs are by no means fully met.

# 3 Copyright exemption applies; print support needs are not addressed; significant unmet support needs

Although the VIP Act is described as an Act that supports people who are visually impaired, it applies not just to people who are visually impaired but also to many with significant physical impairments. People who cannot hold books or turn pages are also covered and we discuss these separately in relation to pupil education.

## Pupils with a visual impairment and additional difficulties

### Numbers and support needs

Of the 1,100 pupils (aged 5-18 years) with significant visual impairment in Scotland, half are estimated to have additional, often multiple, impairments. Many of this 50% of visually impaired pupils are unable to physically turn pages or hold books. They are likely also to have difficulty with reading, understanding, seeing and recording work.

### Curriculum materials needed and accessible formats

Deciding on which curriculum materials need to be made accessible for this group is not straightforward. A relatively small number will require the curriculum materials, textbooks, novels, worksheets etc. used to follow a standard curriculum. Because of cerebral visual impairment, however, most will require materials to be made in different accessible formats.

Many of this group will benefit from switch-accessible digital formats. None of these are made available by current VI transcription services. Such services are designed principally to meet the needs of pupils who are visually impaired without additional impairments.

In the same way, those that could obtain benefit from materials in symbol forms are also poorly served in terms of staff knowledge, availability of curricular materials and in appropriate accessible formats.

### Services local and national

As mentioned, none of the local authority services that support visually impaired pupils produce materials in text formats for those who cannot hold books or turn pages. For example, one visual impairment service covering four authorities has

two full time employees who are fully engaged in producing materials for 30 out of 200+ pupils on its caseload. Some of 170+ pupils could benefit from audio formats produced, but many will have difficulty physically operating audio players.

**Copyright exemption**

To a large extent copyright exemption might as well not exist for pupils who have both visual impairment and significant physical impairment. Despite qualifying on two (and sometimes all three, i.e. not being able to turn their eyes or head, not seeing and not being able to hold a book or turn pages) criteria for exemption, materials are generally not available in a format that can be used by these pupils.

# Pupils with physical impairment

### Numbers and support needs

At a minimum there are 2.5 times as many pupils with significant physical impairment as main difficulty in learning and a support plan in place than there are pupils with significant visual impairment (see Table 4.2). Most of these pupils will have difficulty in either holding books and/or turning pages. In terms of numbers this group of pupils is far larger than the number of pupils with significant visual impairment alone. Neither the framework for service delivery, nor the system to notify that materials are available, nor the commercial, local authority, voluntary or other infrastructure to produce materials is effective for pupils with significant physical impairment and no visual impairment.

The ratio grows to 10 times as many when we include those with moderate, severe or profound learning difficulties and significant additional impairments or disorders.[30] This equates to around 5,000 pupils across Scotland. These pupils have copyright exemption and may benefit from materials provided in alternative formats.

### Curriculum materials needed and formats available

None of the main formats currently produced to address the needs of those with significant visual impairment provides access for those pupils who cannot turn pages to access text. Clearly providing materials in Braille cannot help those who can't turn pages but nor do audio hardware solutions such as DAISY Digital Talking Book players as these are not provided with switch access. If you can't press the buttons to operate the device you cannot access the materials. Appropriate switch access methods are required.

### Services local and national

National agencies that provide services principally to those with significant physical impairment are unaware that the VIP Act covers the pupils (as well as other service users) with whom they work. There are no local authority or national providers of materials specifically for this group of pupils.

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[30] Pupils with significant physical or motor impairments (3.75%), plus pupils with moderate, severe or profound learning difficulties and significant additional impairments or disorders (5.28% + 3.16% + 1.58% = 10.02%). Total 13.77% of those with a reported main impairment and a support plan in place. This figure is 9.5 times as many as those with significant visual impairment (13.77% compared to 1.45%)

## 4    Not exempt from copyright; print support needs are not addressed; significant unmet support needs

This is by far the largest group. There are essentially two sub-groups which we will discuss separately: those with a main impairment with a support plan in place; those without a support plan but who do have literacy support needs.

## Pupils with a support plan in place

### Numbers and support needs

Here we discuss those with a reported main impairment and for whom some form of support plan is in place, either in the form of a Record of Needs (now defunct but the category for which most official statistics have been collected), or an IEP (which continues into the new framework introduced through the ASL (Scotland) Act).

With up to 5,000 covered by exemption (see (3) above), the group who are not exempt comprises a maximum of 85% of those with a reported main impairment and support plan in place i.e. around 30,000 pupils. However this figure is not helpful for planning purposes and requires further analysis of what is meant by support for literacy.

In terms of support needs noted in Table 4.5 there is huge variation in what would be the main area of literacy support required. For example, those with specific learning difficulty including dyslexia as their main area of difficulty are likely to require most support in, not surprisingly, reading, understanding and recording work. In contrast, those with severe or profound learning difficulties will likely wish to follow a highly differentiated curriculum in order to address literacy support needs in reading, understanding, and recording work.

### Curriculum materials needed and formats available

Again there is huge variation. Those with specific learning difficulties will to a large extent aim to follow a standard curriculum. Alternative formats are not readily available. There is no systematised approach, development of materials is *ad hoc*, produced in marginal (often non-existent) time. There are no economies of scale, either at a local or national level, the scope of ICT as a production and dissemination tool is often reined in by managed networks designed to restrict access rather than to enhance service delivery.

### Services local and national

As mentioned root and branch development is required. Judging by responses to our questionnaires there is strong motivation to 'do something'.

## Pupils without a support plan in place

### Numbers and support needs

From various sources it is clear that by far the greatest number of pupils with literacy support needs do not have a support plan. The situation perhaps becomes most apparent on entry to S1. In terms of support needs the biggest difficulties appear to be in understanding the text and recording work. Reading may be in line with a younger child (Level B is roughly appropriate to a child age 9

years). The pupil is then functionally literate (depending on definition) but not able to address the demands of a secondary school curriculum.

**Curriculum materials needed and formats available**

There is a huge time implication and a lack of qualified staff to produce materials in suitable formats. As noted in questionnaire responses the lack of availability of learning materials in accessible formats has a large adverse effect on pupils' ability to access the curriculum. For instance in one school one member of staff has 2 hours per week allocated for creation of differentiated materials and resources in alternative formats. The majority of the work is done voluntarily at home, representing approximately an additional 5 hours per week.

**Services local and national**

Following CPD training most subject teachers can produce appropriate worksheet materials in acceptable format to meet the needs of this group of pupils. There is a huge backlog of resources that require to be adapted and produced. The support resources which are currently available from LT Scotland do not always comply with requirements on accessibility. The teachers producing this work have not had appropriate training on making accessible resources. The end result is the production of resources which are not always accessible.

# Meeting print support needs more effectively

As we noted at the start of this section, print support needs for all four groups of pupils could be met more effectively; there is, or should always be, room for improvement. It is though worth considering two examples of areas in which support needs could be met more effectively.

## Pupils with a visual impairment

Current transcription facilities do not meet demand in full for those with a visual impairment. The 2002 VIP Act provides a legislative framework but there remains a shortfall in meeting the demands for books, worksheets etc. to pupils who need them. Despite a number of commercial, local authority, voluntary and other services set up to deliver materials and service level agreements in place, there is often a time lag in supplying materials in the right format and of the right quality.

As we have seen though, this population is, compared to other print-disabled pupils, relatively well served. Any developments in service to address the needs of this one group must recognise that: most others covered by copyright exemption do not have their needs met; most with a support plan in place but not covered by copyright exemption do not have their needs met; and that by far the greatest number - those without either a support plan or copyright exemption - do not have their needs met.

VI transcription services only produce materials for a sub-set of visually impaired pupils who can read Braille, large print and understand audio. A substantial number of pupils with visual impairment have additional impairments and these pupils are more likely to benefit from other formats, such as switch-accessible digital resources, or materials with pictures and symbols.

## Pupils with other impairments

### Evidence from SQA - reading

Just because a pupil is supported to access the curriculum and/or can demonstrate his or her knowledge and understanding by one approach does not mean that this is the only or indeed the best method of doing so. It is possible that a different approach might be more effective, or offer better value or indeed offer some combination of both in terms of cost effectiveness and efficiency. There are at least two sources of evidence to support this conclusion, one drawing on evidence from SQA and another which is based on evidence from one secondary school who took part in a recent project on alternative arrangements for assessments.

As noted in Table 6.6, SQA report that, after extra time, the second most common method of support pupils use in exams is that of a human reader. This occurred in 16,815 instances in the 2006 diet of examinations; over seven times as many readers were used as the number of adapted papers provided. There are many advantages with using a reader, particularly in the pressured examination situation, but there are also issues concerning independence. An obvious question to ask, with regard to unmet support need, is how many pupils could instead use some form of accessible adapted paper or other technique independently, rather than a human reader?

A recent project undertaken by SQA to develop and trial digital question papers is of interest. In one school 48% of the pupils who had reading difficulties used a digital paper with text-reading software, while the other 52% used a human reader.

### Evidence from SQA – writing

A similar finding was obtained with regard to writing. After extra time and a reader, the next most popular method was to use a scribe, used by pupils on 15,059 occasions in the SQA 2006 diet. If we discount the use of extra time, use of scribes constitutes 67% of the methods of writing support requested to SQA. If we further consider the percentage of requests where a pupil writes independently (i.e. using ICT, signing and a tape recorder), compared with receiving assistance from a member of staff (i.e. scribe, referral of the paper to the principal assessor, transcription) then we find that the pupil works independently of a member of staff in only 14% of instances.

Because the method of support used in examinations should correspond with the support used in class, we suggest that these statistics reflect unmet support need: if the statistics reflect classroom practice, then human support may be being used too readily and there is a need to consider other more independent methods.

Again, results of the digital papers project indicate the potential for materials to be delivered and answered using ICT. Eight schools took part in the project and the percentage of pupils using independent writing support methods (ICT, digital papers, tape recorder) varied from 17% to 85% of the pupils who required alternative assessments arrangements, with an average of 57%.

BOOKS FOR ALL

**SECTION 9    EXAMPLES OF BEST PRACTICE**

**Objective 9:    To ascertain examples of best practice used in Scottish schools and cite selected examples from other countries**

**Outcomes:    Examples of best practice in provision of different types and formats of accessible materials (e.g. reading books, textbooks, test and examination papers, worksheets).**

## Background to Section 9

In this section we provide examples of good practice in provision of accessible learning materials. The examples cover:

- a range of additional support needs (reading text, seeing text, understanding text, handling books, and writing/recording);

- different dimensions of support (for individuals, schools, groups of schools, and national agencies);

- different approaches and types of accessible formats.

We are grateful to our colleagues in schools and services who provided information and in some cases, the text, for these case examples.

## Supporting Reading

As we mentioned in Section 3 there are many approaches to remediating difficulties pupils have with reading. These include intensive approaches such as paired reading and various forms of synthetic phonics. Many pupils do benefit from such intensive highly structured methods. These are not the subject of this investigation and we would point the reader to excellent reviews of the clear and sustained improvements shown with these methods, such as described in Mackay (2006). We focus here on compensatory approaches.

### Secondary school 1

| Educational context | Secondary school |
|---|---|
| Support need | Reading |
| Learning resource | Reading books, worksheets |
| Accessible formats | Audio and summarised, differentiated material |

Table 9.1:  Supporting reading with audio recordings

One secondary school supports ten pupils in S1 known to have specific learning difficulty. The school finds that these pupils benefit greatly from materials in alternative audio and printed formats. Originally the Support for Learning teacher produced audio versions of books and material at home by recording onto audio cassette tape. More recently the material has been recorded using a Coomber CD recorder. The teacher is now exploring recording using a computer, with the aim of making MP3 files for children to access using a CD player, MP3 player, or iPod.

The teacher has found that an additional twenty-eight pupils who have not been identified as having dyslexia and do not have a support plan also benefit from using audio and summarised text versions of material printed in an accessible font, e.g. in the form of summary sheets or summary worksheets.

These pupils are working at Level B or C (expectation of working at Level D or above at that age). Some children are found to have difficulties with English and other subjects simply because they have a limited vocabulary. For them audio format has been found to be helpful. Many pupils themselves often turn to materials in alternatives formats as supportive study aids, such as the BBC's Bitesize website.

Why is this finding important? Within Scottish education, national plans require pupils to spend time on personal reading. For a pupil with a reading difficulty he (they are mostly male) is expected to sit and read a book for forty minutes at a time. Many absolutely hate doing this, so what is to be done?

Staff find audio versions of the text to be extremely practical and beneficial: the media are cheap to copy; players are small, inexpensive and easy to use; and children listening while following the text at the same time can access the material at the same speed as the rest of the class.

Support for Learning staff at the secondary school noted that differentiated worksheets, from which pupils could pick and choose to work at their level, could be of great benefit. Where a teacher is developing course work these differentiated worksheets are now considered at the same time.

The school has reported a 'funnel effect' where many younger children benefit from audio support as well as those who remain at Level B/C. The benefits of audio support are far less marked as pupils progress into Higher and Advanced Higher study. Audio format does not suit all pupils. In particular those with auditory processing difficulties find aural information much more difficult and prefer visual support materials.

Much of the accessible material that is produced by this Support for Learning department was originally created by subject teachers, so copyright is not an issue. However, in order to create audio versions of other, commercial materials such as textbooks or reading books, the staff must in most cases write to the publisher to request permission. This imposes a large administrative load and can cause delays in production of the material. A minority of pupils are covered by the Copyright (Visually Impaired Persons) Act 2002 (see section 12). For them permission is not required.

One teacher has 2 hours per week allocated for production of material: clearly this is insufficient to produce sufficient audio and differentiated material for the 38 pupils in S1, and similar albeit slightly smaller numbers in S2 and beyond.

## Secondary school 2

| Educational context | Secondary school |
|---|---|
| Support need | Reading text, writing and recording |
| Learning resource | Text books, worksheets |
| Accessible formats | Word, TextHelp Read and Write Gold & WordTalk |

Table 9.2: Scanning textbooks and accessing using Microsoft Word

### Pupil A

TextHelp Read and Write Gold[31] is being piloted for one pupil with severe dyslexic difficulties in S3. The pupil has significant reading difficulties but can understand material when it is read to him by the Read and Write program, using synthetic speech. Text books are scanned into Microsoft Word, teachers make additional class notes and worksheets available for him and he also uses the program to read and access material from the internet. He takes the Read and Write laptop into classes where he can use it to write if necessary. This is the first year of using this program so its use is in the very early stages. Currently the pupil's preferred use for the program is revision. He has WordTalk (the free text reader for Word, available from the CALL Centre[32]) installed on his laptop at home and uses a pendrive to take home relevant revision material. He has revised independently for all S3 assessments in History, Modern Studies and Physics and has done very well. He completes assessments using a reader and scribe.

His own comments are

"It is easier to revise because it's a lot quicker than having to read it. I can't understand some of the words [when I read] and then the sentence doesn't make sense."

"It is a lot easier to recall the things you've learned. You don't have to sound it out. You can go to certain points on (the revision material – textbooks and teachers' notes) and it'll read out the facts on the page."

This particular pupil does not like the use of predictive text available on Read and Write Gold and therefore prefers to type his work fully. He uses WordTalk or Read and Write to read his work as he types to check for errors. He also is learning to use the thesaurus in Read and Write Gold.

### Pupil B

An S1 pupil, again with severe dyslexic difficulties, is also now being introduced to Read and Write Gold. He is practising using the predictive text facility as it suits him. Ideally he would also use the reading facility for revision, but currently the time is not available to gather and scan S1 materials. The collection of electronic formats for courses throughout the school curriculum will be part of the Support for Learning Development plan for some time to come.

Eventually all subject materials in electronic format will be available in the shared network area for any other pupils who require them, using WordTalk, which is also

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[31] TextHelp Read and Write Gold, http://www.texthelp.com/
[32] WordTalk, www.wordtalk.org.uk

on the school network. There is a problem with macros needing to be enabled for its use and therefore this is limited to approximately 20 identified pupils.

# Supporting Seeing

## Edinburgh and Lothians VTSS

| Educational context | Visual Impairment service serving three local authorities |
|---|---|
| Support need | Seeing text |
| Learning resource | Reading books, text books, worksheets, assessments |
| Accessible formats | Braille, large print, raised diagrams, audio books |

Table 9.3:  Edinburgh and Lothians VTSS

There are thirteen VI or Sensory Support teams in Scottish local authorities who provide a transcription service for blind or partially-sighted pupils. The service based in Edinburgh and serving City of Edinburgh and the Lothians is highlighted here as an example of good practice. The service supports 230 visually impaired pupils of whom 3 are Braille users and around 30 use large print.

The Edinburgh team produce a very wide range of materials, mainly in Braille or large print. The service produces approximately 100 items per year and to date, has created a catalogue of 440 large print books and 173 Braille books. The transcription service has two full-time production technicians and three teachers. The teachers mainly support pupils in schools, but they do also contribute to the transcription service.

Each book is tailored to the individual needs of a pupil and the subject matter. For example, the same book may be adapted and printed in several font sizes; while the same pupil may use one format for a reading book, and a different format for a science textbook.



Figure 9.1:  A selection of large print and Braille reading and textbooks, worksheets and assessments
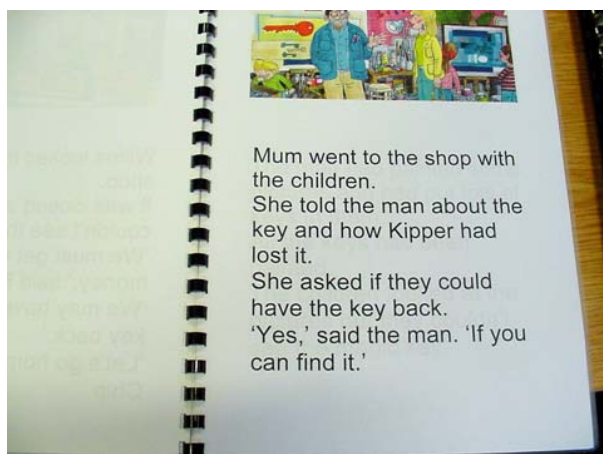
Figure 9.2:  Oxford Reading Tree book in large print
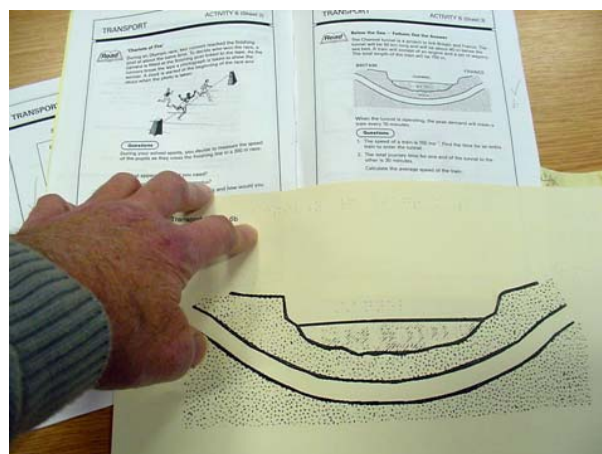


Figure 9.3:  Textbook in Braille with raised diagram

# Supporting Understanding

## Supporting Deaf Children – Fife's Sensory Support Service

| | |
|---|---|
| Educational context | Individual pupil in Mainstream Primary |
| Support need | Understanding text |
| Learning resource | Jolly Phonics teaching resources, home-school communication |
| Accessible formats | Multimedia resources with BSL video |

Table 9.4: Fife Sensory Support Service

Brian Shannan of Fife Sensory Service has been creating a range of innovative multimedia resources to support children with a hearing impairment.

The philosophy underpinning the support package is that 'Deafness in itself is not a learning disability. Learning difficulties arise when deaf children cannot access communication' (Yoshinaga-Itano, 1998). Brian has not only to provide access but also a consistent language policy that meets the needs of the individual pupils. He opted for a sign bilingual approach that uses both the sign language of the Deaf community and the written/spoken language of the hearing community. The objectives are to :

- enable the pupils to be linguistically competent;

- provide access to the wide curriculum of the school;

- facilitate good literacy skills;

- provide the pupils with a positive sense of their own identity.
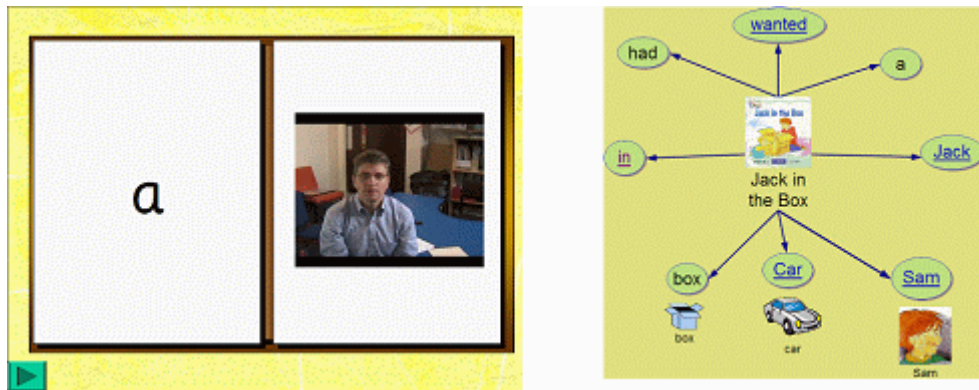
Figure 9.4: Illustration of Jolly Phonics with BSL video clips (left) and mind map (right)

For example, in St. Margaret's RC Primary School the children in the class are learning to read and write using the popular Jolly Phonics materials[33]. Jolly Phonics teaches letter and word sounds, which is obviously challenging for a hearing impaired child and so Brian has created a multimedia resource which combines Jolly Phonics illustrations with video clips of the appropriate BSL finger spelling/sign.

Although phonics develops letter recognition, essentially English is taught as a second language. The team developed mind maps that incorporate visual clues, the written word and a video sign. This has helped pupils to make excellent progress with reading and writing.

The pupil's parents are Deaf and Brian, working with the school staff and parents, has devised a home-school video diary and letter system. Every day, anything that needs to be communicated between school and parents is signed and recorded on video, and then saved to a USB memory stick. The pupil takes the memory stick home for parents to view the video and reply using the same technique. This is an excellent example of meeting obligations under the Education (Disability Strategies and Pupils' Educational Records) (Scotland) Act 2002 - Planning to Improve Access to Education for Pupils with Disabilities.



Figure 9.5: Screen shot from the BSL video home-school diary

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[33] Jolly Phonics, http://www.jollylearning.co.uk/

## Symbolised Oxford Reading Tree books - Croftcroighn School, Glasgow

| Educational context | Primary Special School |
|---|---|
| Support need | Understanding text |
| Learning resource | Oxford Reading Tree books and materials |
| Accessible formats | Oxford Reading Tree books and materials with symbols |

Table 9.5: Symbolised ORT books at Croftcroighn School, Glasgow

Croftcroighn caters for children from 2-12 years of age with severe and complex learning difficulties, including cognitive, sensory, communication and physical impairments. The school use the Oxford Reading Tree[34] scheme but the materials are not suitable for some of the pupils in school who are struggling with literacy. The stories and characters are appropriate and engaging but the pupils have difficulties with learning the words, and so Aileen McIntyre, I.C.T. Teacher, has created books and teaching resources based on the books, but with the addition of pictures and symbols.
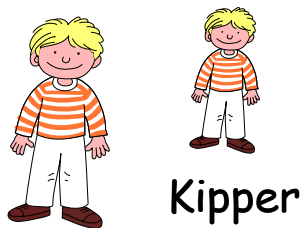


Figure 9.6:  Picture and picture/word cards
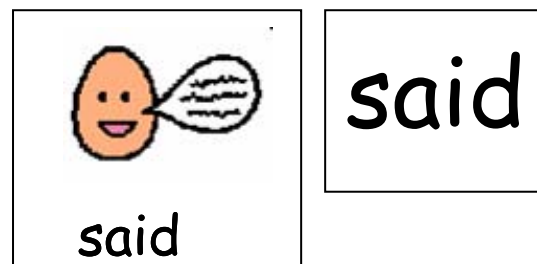


Figure 9.7:  Symbol/word and word cards

Pupils first use flashcards with picture/words in Stage 1 to match to the picture of the characters. It is hoped that at least some children will make the transition to unsupported words. Then children learn to match the plain word to the corresponding picture/word. Picture/symbol materials are also used by non-verbal, non-text users to answer questions and demonstrate understanding of the stories (Figure 9.8).

Staff have found that by using these strategies some children have gone on to read the books very successfully but there are still many who do not make the transition to reading a book: they still need the cue of the picture or symbol.

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[34] http://www.oup.com/oxed/primary/literacy/ort/

Figure 9.8: Activity board and communication sheet for non-verbal children

As an experiment, Aileen printed out a book from an ORT Talking Book CD, created and printed a picture/symbol 'translation' (Figure 9.9) then laminated and bound the two together to create a symbolised reading book. These books were so successful that they have been made available to the whole school and there are now packs with appropriate Communication Sheets and word banks with words and symbols appropriate to each ORT book. The first books were produced using BoardMaker and PCS[35] symbols. Aileen has now changed to use the British Widgit Rebus Symbols[36], mainly because they include appropriate symbols for actions. Aileen's production process involves:

- creating and printing the symbol sentences for the book;

- taking an ORT book apart;

- laminating the symbols with each page of the book;

- binding the result to create a book;

- creating matching sets of word, word/symbol and symbol cards; and communication and activity sheets.

Pupils with learning difficulties get huge satisfaction and motivation from reading the symbolised books. The children take the books home to read with and to their parents, and this has been extremely well received by parents. Staff report that teaching using the symbolised books and materials has improved childrens' basic literacy skills (word and sentence recognition and comprehension).

One teacher said: "I have been using Aileen's symbolised Oxford Reading Tree books since I came to Croftcroighn School over 3 years ago. They have allowed the children in my class to progress through the reading scheme and achieve great success in reading."

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[35] Mayer-Johnson PCS Symbols, http://www.mayer-johnson.com
[36] Widgit Software, http://www.widgit.com/

Figure 9.9:  Symbolised Oxford Reading Tree reading book and workbook

Staff have also made sets of Clicker grids for the books, so that pupils can consolidate and demonstrate their understanding of the stories.
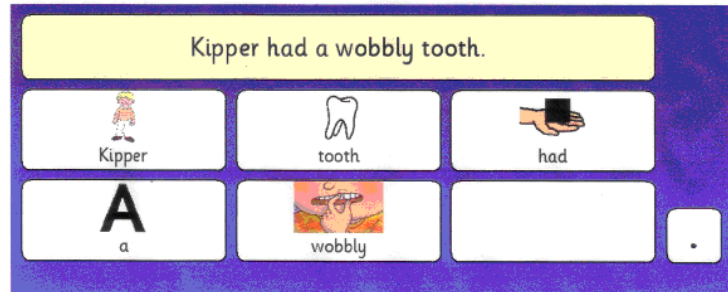


Figure 9.10:  Clicker grid for writing about a book

Following the success of these books in Croftcroighn, Aileen approached Glasgow City Council, Oxford University Press, and Widgit Software to explore publication and distribution of the books. Glasgow Council has waived any rights which they may have had, a licensing agreement has been made with Widgit, and OUP are currently considering a licensing proposal. Initially, she intends to print and publish the symbolised books on a small scale herself.

## Priory Woods School, Middlesbrough

Priory Woods is an all age community special school in east Middlesbrough for pupils with severe learning difficulties and those with profound and multiple needs. The school is listed as 'Outstanding' on the Chief Inspector's Ofsted list, and the school's web site, created by Ian Bean, won a BETT award for ICT and Inclusion in 2002. The web site (http://www.priorywoods.middlesbrough.sch.uk/)

has a huge range of resources and activities including, for example, interactive story books made using PowerPoint.

## CALL Centre Symbol Story Packs

| Educational context | Primary / early years |
|---|---|
| Support need | Reading and understanding text, communicating, writing and recording |
| Learning resource | Reading books |
| Accessible formats | Symbol resources; digital 'talking books' |

Table .9.6: CALL Centre Story Packs

Story / Symbol Packs are sets of materials to help staff and parents read and interact about picture story books with young children. The materials consist of:

- A paper symbol chart, called *Choose a Story*, allowing the child to select their preferred story book.

- The six story books.

- Six colour paper symbol topic charts or 'story boards', one for each book.

- BIGmack Tops - for sticking on to the top of a BIGmack communication aid - for each story there is a page of 2 sets of 3 pictures.

- A written guide on ways to use the materials with children.

The symbol materials help children understand the books, and enable non-speaking children or pupils with language or learning difficulties to participate in interactive storytelling. The books are bought by the CALL Centre from the publishers, symbol packs created, and then sold direct to schools and other customers.

A recent addition to the Story Packs (see below) has been digital versions in formats such as Clicker, PowerPoint and swf (Flash). Children can press a switch, use the keyboard, mouse or trackball, a touchscreen, or other access device to turn the pages on screen and read and listen to the text being spoken out. These resources are made under a CLA 'VIP' licence which permits them to be provided to pupils with physical or visual impairments.

# Supporting holding books & turning the page

### 'Helen'

| Educational context | Individual pupil in Mainstream Primary |
|---|---|
| Support need | Holding books / turning the pages |
| Learning resource | Reading books |
| Accessible formats | Microsoft Word, Reader, Acrobat PDF |

Table 9.7: Helen – accessing digital reading books

Helen is a young girl who attends a mainstream primary school. Helen is in Primary 7 and has arthogryphosis, which is a physical disability: she cannot walk

and so drives an electric wheelchair. She has some difficulty with writing and holding and manipulating objects. Provided someone places a pencil between her fingers Helen can write; she can also use the rubber end of a pencil to type on a computer keyboard; and she can operate the trackpad on a laptop computer with the knuckles of her fingers. However, one thing that she cannot do is hold and turn the pages of books and this means that she is frustrated because she cannot read books from the library or use text books or work sheets in the class. Helen does not have any difficulties with reading but her teacher was concerned that her literacy development would be restricted because she does not have sufficient opportunities to read.

Helen was referred to the CALL Centre via a Partnership Agreement between CALL and the local authority. The request from Helen's class teacher was very simple: can we get reading books from the school library onto the school computer so that Helen can 'turn the pages' electronically?  Helen said she would like to read titles by Roald Dahl and Jacqueline Wilson. A search on *Revealweb* returned copies of *The Suitcase Kid* by Jacqueline Wilson available for loan or sale in Braille, giant print, various large font sizes, and also Digital Talking Book format, but digital versions were not listed.

CALL has a CLA 'VIP' licence[37] which permits adaptation of accessible books for pupils who are visually impaired, unable to physically handle books, or have certain visual-perceptual difficulties. The paperback was scanned into the computer using FineReader Pro[38](a standard package costing around £70), and digital versions were created in Microsoft Word, Microsoft Reader and Adobe PDF formats. These formats were chosen (in preference to Daisy, for example) because:

- these formats provide viewing, navigation, search and study tools that Helen requires;

- Microsoft Word was already on the school computers and Helen's laptop, and Microsoft Reader and Adobe Reader are both free, whereas additional software at a cost would be needed to read a Daisy book;

- Word and PDF are more inclusive: Helen, staff and other pupils are already familiar with these formats and programs;

- Word and PDF formats are interactive and so digital worksheets and assessments can be created;

- many materials, such as textbooks from publishers, 5-14 assessments, commercial worksheets etc are available in Word or PDF;

- the scanning and OCR software can generate Word and PDF files directly.

Helen and her staff evaluated the books in the three formats and chose the Microsoft Reader format as the most accessible and suitable. For worksheets, she will use Microsoft Word since this program allows her to type in answers.

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[37] CLA  VIP Licensing Scheme: Guidelines for Licensees, http://www.cla.co.uk/licensing/vip.html
[38] ABBYY FineReader Pro 8, http://buy.abbyy.com
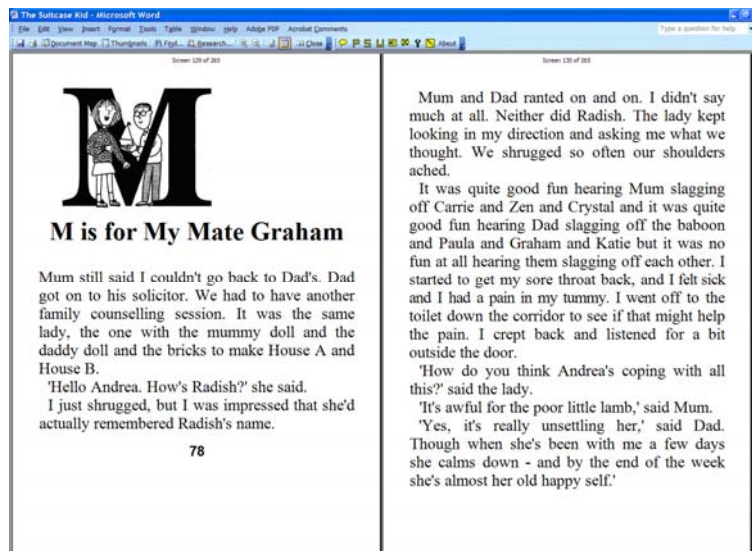
Figure 9.11: Book scanned and viewed using Microsoft Word Reading Layout
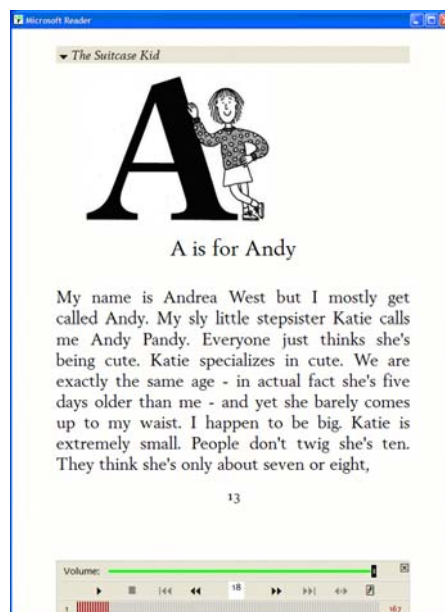


Figure 9.12:  Microsoft Reader version

CALL does not have capacity to create all the books, worksheets and other materials that Helen requires and so we wished to develop this capability in her school. By using industry-standard software costs are minimized and we hope that staff and Helen will be able to develop transferable skills. Nevertheless, staff will struggle to create accessible versions of all the reading books, textbooks and worksheets that Helen will require given that it is estimated that she will need at least:

- 4 Maths books;
- 16 English Books;
- 10 Topic books;
- several dozen worksheets;
- together with reading books from the library.

Helen and her class wrote to Jacqueline Wilson, Children's Laureate and author of *The Suitcase Kid*, to raise the issue of accessible digital books for pupils like Helen and were excited to receive a postcard saying that the matter would be taken up with her publishers.

Helen was asked if she would like to have an input to the Books for All project and she wrote:

> *My name is Helen and I have the condition Arthogryphosis. This is a term describing the multiple joint contractures at birth. It makes it difficult for me to access books and turn the pages.*
> *I need someone with me to collect the book, help me pick it up if I drop it and sometimes help me to turn the pages. It makes me feel that I am always relying on other people. Also I am not getting as much reading as I should be because I can't turn the pages as fast as my classmates. It takes me longer to read a book which means I sometimes lose interest in the story.*
> *Recently I have been able to access books through Microsoft Reader. I like this because I only have to click a button to turn the pages.*
> *My classmates and I all think that you could help me, and other children like me, by publishing books in a digital form. This should be possible seeing as publishers already do Braille and large print books for the visually impaired.*
> *This would really help me because I would be able to access the books on my own without relying on anyone else. It would help me to read faster and help me to keep up with the rest of my classmates. I wouldn't be so likely to lose interest in the book as I do normally.*
> *If you could at least consider my request I would very much appreciate it.*
> *Your sincerely,*
> *'Helen'*

## 'Megan'

| Educational context | Individual pupil in Mainstream Secondary |
|---|---|
| Support need | Handling books and writing/recording |
| Learning resource | Reading books, textbooks, worksheets |
| Accessible format | Kurzweil 3000, audio books on CD |

Table 9.8: Megan – accessing digital textbooks

Megan is now in S2 of her local mainstream, secondary school. Megan has cerebral palsy which effects her mobility and fine motor skills. Megan has a powered wheelchair with a 'riser' seat which means that she can elevate herself up to higher desks and workbenches; it also means that Megan can speak to her peers at almost eye level, rather than conversing with their chests.

When Megan was in primary 7, staff at the secondary school started planning for her transition to secondary; access to learning materials and to a satisfactory method of recording were obviously key issues. Megan has difficulty holding and handling books, and handwriting, so she was provided with a PC laptop computer. Support for Learning staff used Kurzweil 3000[39], a specialist scanning, reading and study program for students with reading difficulties to scan in a range of books so that Megan would be able to access them independently:

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[39] Kurzweil 3000, http://www.sightandsound.co.uk/, http://www.kurzweiledu.com/

*"Megan is going from strength to strength. I have scanned all of her French book in colour - this is very handy for her as a lot of the exercises involve colour. I have scanned chapters of Maths for her too. I have scanned all of the S1 Social Subjects booklets for her. I have scanned all of the English workbooks into the laptop too. She is reading "Little Women" from the Library CD and thinks it is great as she does not have to hold the page open and turn pages."*

The staff chose to use Kurzweil 3000 because:

- it was already available in the school;

- the digital pages that are generated by the program look very similar to the original paper version – a factor which is particularly important when scanning textbooks with a large number of graphics and a complicated layout (most scanning and OCR programs that produce HTML, PDF or Microsoft Word files do not produce a faithful layout);

- it is particularly quick and easy to use.

The main disadvantage of Kurzweil is cost – the Professional version for scanning books is £725, while the Learn Station version which Megan uses to view the digital books on her laptop is £185.
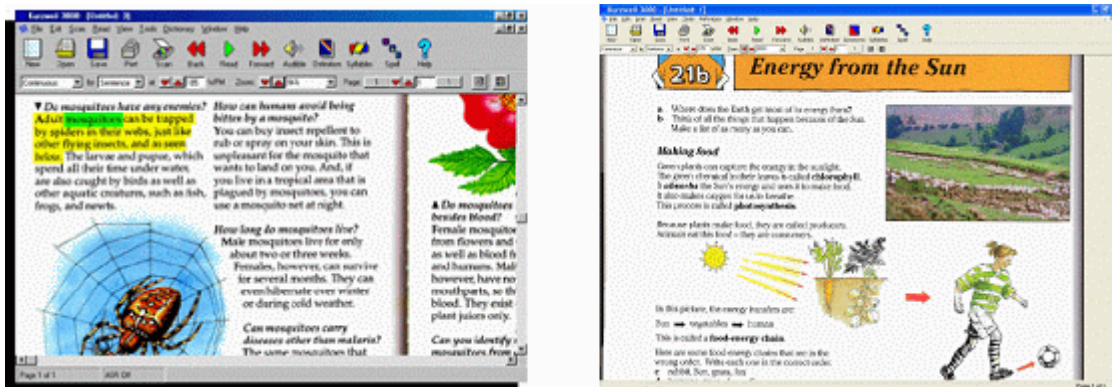


Figure 9.13:  Textbooks scanned with Kurzweil 3000

## Switch accessible resources

Switch-accessible versions of the books are a new development of the CALL Story Packs. Children who have difficulty holding the books or turning the pages can use a mouse, touch screen or a switch, to 'turn the page' and read and listen to the books themselves. The accessible versions are made and distributed with permission of the publishers.



Figure 9.14: 'Dirty Bertie' in switch-accessible digital format

# Supporting writing and recording

## 'John'

| Educational context | Individual pupil in Mainstream Primary |
|---|---|
| Support need | Handling books and writing/recording |
| Learning resource | Reading books, textbooks, worksheets |
| Accessible format | Microsoft Word |

Table 9.9: John – physical access to worksheets

John is in Primary 7 of a mainstream school. John has Cerebral Palsy and is an expert wheelchair driver: he is well known for thundering around his school causing all and sundry to get out of his way. John has some difficulties with his speech but it is intelligible and no-one has difficulty understanding what he says.

However, John cannot write or turn pages in a book by himself and when he is recording his work in school he either dictates to his assistant who writes down what he has to say or he types on a computer keyboard with his chin pointer (a device he wears on his head, with a stick projecting from under his chin). John is doing very well in school and he is in the top set of children for Maths and English.

Like Helen described above, John can't turn the pages of his textbooks or worksheets himself, so either an assistant or another pupil holds the book and turns the pages for him or in some instances his assistant scans the book into the computer and then John can press the 'page up' and 'page down' key to turn the pages. Of course John also needs to write as well as read and so when he is answering questions in worksheets, his assistant scans the worksheet in to the computer, draws in 'answer boxes' on top using Microsoft Word, and then John types his answers in himself. Scanning books into the computer and then adapting them in this way is very time-consuming and the assistant does not have time to convert all the materials that John needs.
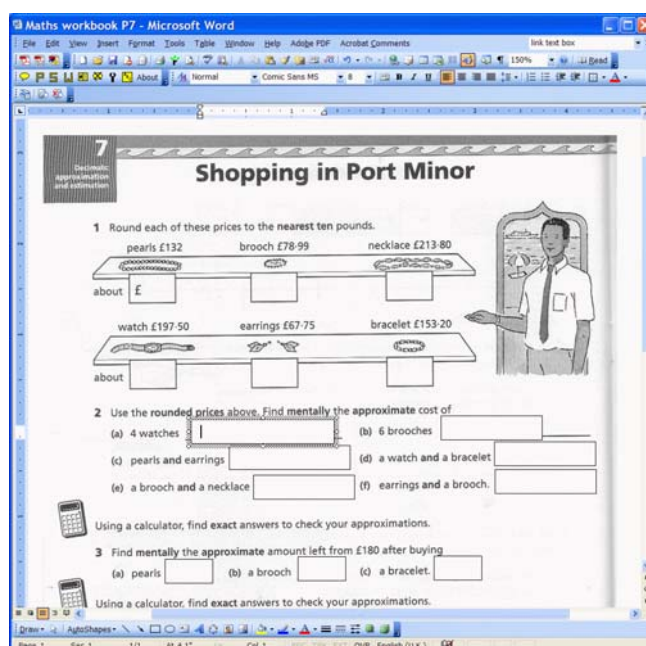


Figure 9.15:  Worksheet scanned into Word and made interactive.

## Local authority implementation of *WordTalk*

| Educational context | Local authority |
|---|---|
| Support need | Reading and seeing books; writing/recording |
| Learning resource | Reading books, textbooks, worksheets, assessments |
| Accessible format | Microsoft Word |

Table 9.10: WordTalk – access to digital books for pupils with reading difficulties

WordTalk is a program which helps children with visual, reading, writing or spelling difficulties. It can read out any text from a Microsoft Word document on a PC, and also has a talking spellchecker and thesaurus. WordTalk was developed by Rod Macaulay of TASSCC in Aberdeen, and in 2005 the Scottish Executive Education Department funded the CALL Centre and Rod to create a version of the software for distribution free of charge to Scottish education. In September 2005 WordTalk was distributed to all secondary schools in Scotland, and to local authority ICT and Support for Learning teams. It can also be downloaded free of charge from the CALL Centre web site (http://www.wordtalk.org.uk).

In February 2007 Rod was given a Microsoft Innovative Teacher Award in recognition of his work on WordTalk.

There are many programs which can read out text and that provide support with spelling; the advantages of WordTalk compared to these other tools are that it:

- is free (compared with, for example, *TextHelp Read and Write*, which costs £795 for a secondary school licence – although Read and Write and other similar programs have higher quality voices than WordTalk, can read web pages and PDFs, and have additional tools);

- relatively easy to install on networks;

- is simple to use.
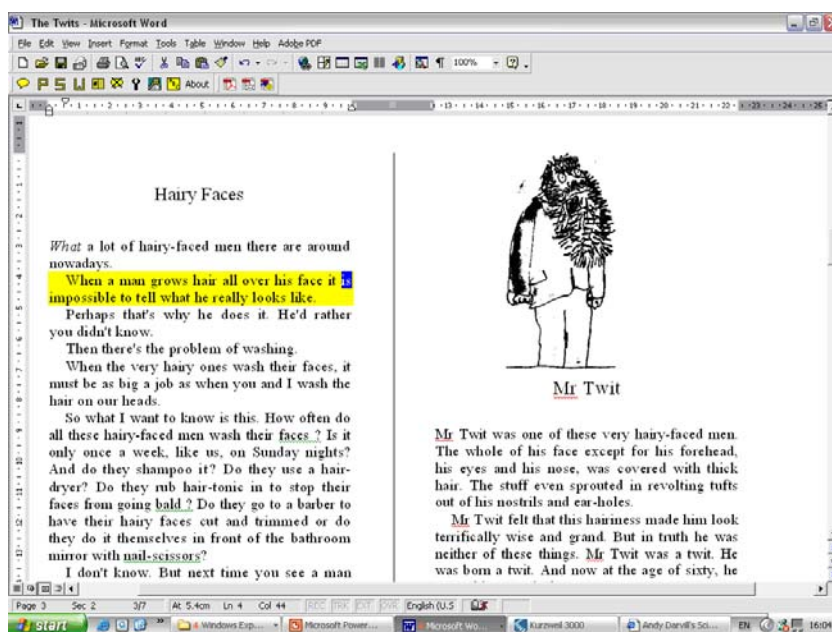


Figure 9.16: Reading book scanned into Word and read using WordTalk

Janet Mackie, ICT Support Coordinator (ASN) in Fife Council, worked with Fife ICT support teams to make WordTalk available on all the computers in the authority's schools. The distribution has been backed up by staff development. Janet gathered some comments from staff and these are given below:

- "It was a relief to me to see that class teachers related to it much better than other programs. It is a natural extension of Word for them. They didn't really have anything new to learn."

- "I'm using it successfully with my primary class, and my dyslexic grand-daughter has found it useful in her Higher Studies."

- "WordTalk is installed on almost all the computers in school. . .  A system was in place for Gavin. An adult would sit with him at the start of a writing lesson and briefly jot down his plan. Then he would take that piece of paper to a computer with WordTalk on it and use Word to create his piece of writing. Gavin passed his Level D Writing in June with the aid of the computer. This is a great achievement for Gavin."

- "As he was working, he taught me another way of using WordTalk which I had not considered. He realised that his spelling is quite bizarre and that even the WordTalk spellchecker could not help him e.g. 'feyure' for 'fear'. . . . so he gets the program to speak the word individually . .  he realised it sounded nothing like 'fear', so he took off the 'e' and 'y' making 'feur'. This sounded like 'fear' in WordTalk and this was the second choice on the spellchecker."

Implementation across the authority (compared with, for example, only offering the software to a small number of identified children with additional support needs) has meant that the tool is being used by a wide range of staff and pupils. It has also meant that issues regarding installation and access on the council's networked computers (which sometimes prevent or restrict software for pupils with disabilities being installed) were addressed systematically. Widespread availability of the software aids inclusion: staff and pupils can choose to use WordTalk because it is always there, rather than having to apply to have it installed on an individual basis for an individual pupil.

## SQA Digital Question Papers

| Educational context | Scottish National Agency |
|---|---|
| Support need | Reading text, seeing text, holding/handling book, writing/recording |
| Learning resource | SQA examination Question Papers |
| Accessible formats | Acrobat PDF, speech-enabled |

Table 9.11:     SQA Digital Question Papers


Following development and evaluation over the past few years, a small number of pupils (31) with additional support needs used digital question papers to sit 105 SQA externally assessed examinations in May 2006. This is the first time that digital question papers have been used in formal external assessments by any national examining body.

Feedback from the students who used the papers revealed that they were enthusiastic about the digital question papers, with 28 out of 31 stating that they

would use them again (3 were not sure) and all the students felt that SQA should provide digital question papers as another option beside other types of adapted question papers. Pupils found typing into the digital papers faster, easier and in some cases less painful than handwriting; more private than using a human reader; and less stressful.

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Comments from students:

It's easier and less stressful than having to write it yourself.

Papers are simpler to use. You do not have to fiddle about with different papers. By switching windows, you can see both the question and the text at the same time.

Digital paper is easier to use. It is easier to type answers in rather than write them in.

It saves time. It is simpler to use. You don't have to fiddle with lots of paper. You can see the text and the questions at the same time.

It makes it easier for many pupils to do their papers this way.

Because it is much easier to use than a reader

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Table 9.12: Comments from Students about the SQA Digital Question Papers

Interviews were conducted with staff involved in the pilot: staff felt that most students were more confident, independent, motivated and skilled when using digital papers than with traditional papers and accommodations. All stated that SQA should provide digital adapted question papers in future. Centre staff found the digital question papers to be reliable (average of 4.75 out of 5 for reliability). Some schools had difficulty finding and organising sufficient numbers of accessible computers, and this may be a barrier to increased use of digital question papers in future.

Overall, staff felt that the demands on resources were lower when using digital question papers compared to traditional assessment arrangements such as human reader and scribe (average of 2.88 compared to 4 (on a scale of 1 to 5) in terms of staffing; 2.25 compared to 3.5 in terms of accommodation; 2.25 compared to 3.5 in terms of invigilation).

SQA analysis revealed no measurable difference between the estimated and actual results obtained by the candidates using digital question papers, although the small numbers of candidates involved made analysis difficult. Digital question papers did not appear to have an impact upon results achieved compared to other types of assessment arrangement.

The digital question papers were produced in Acrobat PDF because of relatively low production costs for SQA, good accessibility, functionality and reliability, and low cost for schools. SQA already produce question papers in PDF, and so there was no need to re-design the papers. (Had the papers been produced in Microsoft Word, or Daisy format, for example, they would have needed to be re-designed at considerable time and cost.) Answer boxes were added to the question and answer papers so that pupils could type their answers on-screen, and TextHelp Systems' *PDFAloud Publishing Toolkit*[40] was used to add text-to-speech facilities for students with reading or visual difficulties. The PDF papers are reasonably accessible for the majority of candidates: they can be magnified; colours altered; accessed using the keyboard instead of the mouse; and the PDFaloud text-reading software is helpful for candidates with reading and visual difficulties. Cost

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[40] http://www.texthelp.com/

to schools are relatively low: to use a digital question paper the candidate must have access to a computer with Acrobat Standard (at around £25 per licence) and the (free) PDFaloud text reading software installed.

Adapted digital question papers in Acrobat PDF therefore appear to offer considerable benefits. The question papers produced by SQA were reliable, relatively inexpensive to produce and staff estimate that demands on accommodation, staff and invigilation were lower than traditional support methods. More importantly, the students who used them in May 2006 found them effective; students using digital question papers are far more independent than those using other types of support such as scribe and reader; and results obtained using digital papers are in line with results achieved using other methods.

The full evaluation report will be available on the CALL Centre web site at: http://www.callcentrescotland.org/digitalexams.

SQA has approved the introduction of digital question papers for pupils with additional support needs in 2007, and expects to make them widely available across Scotland in 2008.

# SECTION 10   ACCESSIBILITY AND COMPATIBILITY OF FORMATS

## Objective 10:   To compare accessibility and compatibility of Accessible Formats

**Outcome:**   **Understanding of the accessibility of different alternative formats for different groups of pupils with additional support needs.**

**Summary**

1) No single printed, audio or digital computer format is accessible for all pupils with additional support needs.

2) Required Printed formats include: resources printed in various font sizes and styles; on coloured paper; in Braille; Moon; and with symbol support.

3) Required Audio formats include: cassette, CD, MP3 and Daisy audio.

4) Required Digital computer formats include: Plain Text ('accessible', but not very usable); 'tagged' PDF documents (applicable, accessible and usable by many pupils with additional support needs but 'untagged' PDFs may not be usable by blind pupils with screen readers, for example); Daisy text books (more accessible for visually impaired pupils); electronic book formats like Daisy or MS Reader (not interactive and so not suitable for accessible worksheets, tests or examinations).

5) Accessibility, usability, applicability and availability are not synonymous. A resource may be technically 'accessible' but not usable by a particular pupil. Accessible materials are of no benefit unless they and the means to access them are also made available.

6) The use of a particular digital computer format does not necessarily result in a document that is accessible.

7) By educating publishers, authors and educators to use 'Incidental Obligatory Accessibility' (IOA)[41] or 'Accessibility Without Trying' (AWOT), source learning materials will be more accessible and will be easier to convert to specific accessible formats.

8) Tools and processes exist to create and convert resources in different digital formats.

9) Efficient production and distribution would be enhanced by establishing file repositories (in local authorities and also nationally) to store digital versions of materials. At the present time the most suitable format is one which can be reliably created and edited using Microsoft Word, since most accessible digital formats can be generated from Word.

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[41] Incidental Obligatory Accessibility, http://callcentre.education.ed.ac.uk/digitalcurriculum/downloads/session12/index_files/textmostly/slide14.html

## Background to Section 10

In this section of the report we consider the accessibility of different alternative formats for pupils with different types of additional support need. We look at the accessibility of:

- printed formats (text, tactile and symbolised);

- audio formats (tape, CD, digital files);

- digital computer formats (such as PDF, Daisy, HTML);

for pupils with difficulties with regard to:

- reading;

- seeing;

- understanding;

- holding the book and turning pages;

- writing and recording.

Sections 5 to 9 have shown that different groups of pupils require curriculum resources and information in different mediums and formats. Guidance issued by SEED to local authorities and other responsible bodies recommends:

"In considering barriers to full participation in the curriculum and short, medium and long-term priorities, responsible bodies must consider pupils with different types of disabilities. They should look in turn at the needs of pupils with: communication difficulties, specific learning difficulties (e.g. dyslexia and developmental co-ordination disorders, including dyspraxia), other learning difficulties, specific language impairment, autistic spectrum disorders, hearing impairments, visual impairments and physical disabilities/motor impairments." and that "Information may need to be provided in alternative forms, such as: providing information orally (for example, to ensure that a pupil has understood information provided on posters or in their timetable), in Braille, in large print, in audio formats, through ICT, through sign language (either on video or by using appropriately qualified teachers or auxiliary staff) or through a recognized symbol system (such as Makaton)."

(Scottish Executive 2002, para 50).

There are numerous other examples of policy documents that recognize the range of accessible formats that is required.

A report commissioned by the Scottish Executive Social Exclusion Unit notes that "there is no 'one size fits all' formula for effective provision of information for disadvantaged groups, and that different approaches can benefit different people" (Rosengard *et al*, 2007), while the Draft Strategy for Scotland's Languages recommends that "Scottish public bodies should seek to provide access to high quality translation, interpretation and communication support (tics) services in order to ensure fair and accessible services for everyone. Language should not act as a barrier to awareness of, or access to, services and opportunities by considering the needs of the target audience and ensuring that information and publicity material is available in a range of languages and formats." (Scottish Executive 2007).

# Accessibility of printed, audio and computer formats

Table 10.1 offers an overall analysis of the accessibility of different formats for different groups of pupils with additional support needs. The accessibility scores include weighting for applicability, so Braille, for example, has a low score for most groups of children apart from those with significant visual impairment. The total scores reflect the overall applicability and accessibility for all children with literacy support needs.

The scores given are subjective, based on the judgment of the authors. We could not find reliable research which analyses the accessibility of these different formats. This is partly because different users have widely varying requirements, and partly because accessible formats do not guarantee accessible resources. A well-designed and structured digital document in most formats will be reasonably accessible for most users, whereas poorly composed resources are likely to be less accessible for everybody, regardless of the format. For example, a digital file which has structure (i.e. a table of contents with hyperlinks to chapters and sub-sections) is much more accessible for users with physical or visual impairments, but it is also more accessible for most readers because the user can skim the contents of the book and easily navigate between sections.

The digital formats are all rated on the basis that we are dealing with a standard text document, and consequently, are not very accessible for students with learning difficulties who do not use text or who have difficulty manipulating digital documents. Had we scored Word, PDF, HTML and Daisy books on the basis that they had symbols then scores would be higher. Clicker resources have the highest score because they offer a wide range of text, pictures and symbols and they are accessible to keyboard, mouse/pointing device and switch users.

Table 10.1    Accessibility of alternative formats (1=very poor; 5=satisfactory, 10=very good; Word and PDF scores are for structured/tagged files)

| Main Impairment | Printed Formats | | | | | | Audio Formats | | | | Digital multimedia formats | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Different font | Large print | Coloured paper | Simplified language | Braille / Moon | With symbols | Tape | Audio CD | Daisy audio | MP3 | Plain Text, RTF | HTML | Word* | PDF* | eBook | Clicker | Daisy text |
| Significant hearing impairment | 5 | 5 | 5 | 9 | 1 | 7 | 1 | 1 | 1 | 1 | 4 | 5 | 7 | 7 | 7 | 7 | 7 |
| Significant visual impairment | 5 | 9 | 7 | 8 | 9 | 3 | 5 | 6 | 9 | 7 | 2 | 5 | 7 | 7 | 3 | 5 | 9 |
| Significant physical or motor impairments | 1 | 1 | 1 | 2 | 1 | 4 | 4 | 3 | 3 | 3 | 5 | 5 | 6 | 6 | 6 | 8 | 6 |
| Significant language and speech disorder | 5 | 5 | 5 | 7 | 1 | 7 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 7 | 4 |
| Autistic spectrum disorder | 6 | 6 | 6 | 7 | 1 | 8 | 4 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 6 | 5 |
| Social, emotional and behavioural difficulties | 5 | 5 | 5 | 5 | 1 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 |
| Learning difficulties: | | | | | | | | | | | | | | | | | |
| Moderate | 6 | 6 | 5 | 7 | 1 | 7 | 5 | 6 | 6 | 6 | 5 | 5 | 6 | 6 | 6 | 7 | 6 |
| Severe | 4 | 4 | 3 | 6 | 1 | 8 | 4 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 7 | 4 |
| Profound | 1 | 1 | 1 | 2 | 1 | 9 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 7 | 1 |
| Specific language and/ or maths (incl dyslexia) | 7 | 6 | 7 | 7 | 1 | 5 | 5 | 7 | 5 | 7 | 5 | 6 | 8 | 7 | 6 | 7 | 6 |
| Complex or multiple impairments: | | | | | | | | | | | | | | | | | |
| Dual sensory impairment | 1 | 1 | 1 | 2 | 5 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 |
| Moderate learning diffs & significant additional impairments /disorders | 3 | 3 | 3 | 5 | 1 | 5 | 4 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 7 | 5 |
| Severe learning diffs & significant additional impairments / disorders | 2 | 2 | 2 | 4 | 1 | 6 | 3 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 7 | 3 |
| Profound learning diffs & significant additional impairments / disorders | 1 | 1 | 1 | 3 | 1 | 7 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 3 | 1 |
| Total | 52 | 55 | 52 | 74 | 26 | 85 | 49 | 56 | 57 | 57 | 46 | 55 | 63 | 62 | 57 | 86 | 63 |

# Printed Formats

Learning resources can be made accessible in different printed formats, from alternative 'alphabets' designed for touch rather than sight (Braille and Moon), to simple adaptations to existing print such as enlarging by photocopying. It is not possible, nor would it be helpful, to explore all formats in detail in this section and other sections of the report also describe the formats; here, we will consider accessibility of printed formats.

## Printed text formats

### Accessibility for pupils with difficulty reading

The appearance of the text can have a huge impact on readability. Books and worksheets that are printed in relatively small serif fonts such as Times New Roman can be hard for pupils with reading difficulties to read. Altering font, size, letter and line spacing, the quantity of text, and text and background colours can all improve readability, reading rate and understanding.

Many pupils with visual-perceptual difficulties find some fonts much more difficult to read than others[42] [43]. In general, most researchers and authoritative sources recommend the use of san-serif fonts because the serif can alter the appearance of the basic letter shape and therefore make the letter more difficult to recognise and read. The size of the font is very important and generally a minimum of 12 point is recommended.  The length of the ascenders and descenders is another significant factor – when these are longer the word shape is more defined and easier to recognise. Some teachers and pupils prefer fonts that are similar to handwriting, such as Sassoon or Comic Sans, although others find these fonts over-bold or 'childish'.

There are fonts designed specifically for pupils with dyslexia, such as Read Regular[44] and Lexia Readable[45] which in addition to the features noted above, also have letter shapes designed to minimise letter reversals (e.g. confusion between 'b' and 'd') and combinations (e.g. misreading 'rn' and 'm'). Read Regular and Sassoon must be purchased; Lexia is free for individual use while publishers are charged a small fee.

Of the free, readily available fonts, the following are recommended: Arial (PC), Comic Sans, Geneva (Mac), Helvetica or Arial (Mac), Myriad Pro, Tahoma, and Trebuchet. Verdana was designed to be read easily at any size, also online.

Left-aligned, non-justified text, with a line spacing of 1.5 or 2 lines; avoiding large paragraphs or blocks of text, and the use of non-bleached white paper (such as pale yellow, beige or blue) are recommended. Diagrams and illustrations are useful (provided they are not overly 'busy') to aid comprehension and break up the text.

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[42] Dyslexia Style Guide, BDA, http://www.bdadyslexia.org.uk/extra352.html
[43] Typefaces for Dyslexics, http://www.dyslexic.com/fonts
[44] Read Regular font, http://www.readregular.com
[45] Lexia Readable, http://www.k-type.com

**Accessibility for pupils with difficulty seeing**

An important concern for pupils with a visual impairment only (i.e. who do not have other impairments), is the size of the font though other factors do come in as well. RNIB recommend 12 or 14, and many pupils who require large print will need 18 point or larger. Highly stylised typefaces should be avoided, but most standard fonts are acceptable. It is helpful to use line spacing of 1.5 to 2 and left-aligned, non-justified text is also recommended.[46] A high contrast between text and paper is desirable – black on white, or black on yellow – on matt or uncoated (non-glossy) paper. A simple layout with all text and navigational aids such as headings aligned to the left aids access. The use or otherwise of illustrations also varies – in some cases illustrations are removed and replaced by text.

There are therefore some similarities and some differences between printed formats designed for children with visual and reading difficulties, which are summarised in Table 10.2.

| Feature | Visual Impairment | Visual dyslexia/visual stress |
|---|---|---|
| Size of print | 14 point minimum, up to 36 point | At least 12 point |
| Line spacing | 1.5 to 2 | 1.5 to 2 |
| Font | Sans serif preferred | Specific sans serif fonts with particular characteristics |
| Colour | High contrast black on white/black on yellow; but individual preference | Off white - range of colours required - pastel paper is popular |
| Graphics | Large graphics, remove graphics or produce raised diagrams, or text descriptions | Standard size graphics |
| Layout | May need simplified layout, print on A4 pages | May need simplified layout, print on A4 pages |
| Content | May required simplified language | May required simplified language |

Table 10.2: Comparison between printed formats for pupils with visual impairment and visual dyslexia

Consequently, printed materials produced for children with a visual impairment will not necessarily suit those with other print disabilities, and vice-versa. In fact, the main similarity between printed materials for print-disabled children is the variability and the need for materials to meet the individual needs of the pupil. Just as different children with a visual impairment require different sizes of font (e.g. one pupil may be able to read 14 point, while another may need 36 point), so one pupil with visual perceptual difficulties may prefer 14 point Comic Sans on pale yellow paper, while another may use 12 point Lexia on green paper.

Large print and adapted print materials must therefore be created for the individual child and to suit the material in question.

**Accessibility for pupils with difficulty understanding**

The main accessibility issue for pupils with difficulty understanding is the complexity of language and readability of the text itself. Simplified text materials are accessible to a very wide range and a very large number of pupils with mild

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[46] RNIB clear print guidelines,
http://www.rnib.org.uk/xpedio/groups/public/documents/publicwebsite/public_printdesign.hcsp

and moderate learning difficulties, hearing impairment, visual impairment as well as specific learning difficulties. Materials with complex vocabulary are not accessible.

### Accessibility for pupils with difficulty holding the book

Pupils with physical difficulties may have significant difficulties holding a book or turning the pages: printed materials are therefore by definition inaccessible to these pupils. These pupils can only access printed books with help from another person, or by using a mechanical page-turner at a cost of between £2000 and £3400[47].

### Accessibility for pupils with difficulty writing and recording

Printed text formats for pupils with difficulty writing and recording can be by definition challenging: pupils with physical, dyspraxic or visual difficulties may have problems hand-writing; other pupils have difficulties with spelling, grammar and punctuation; children with more complex learning difficulties may not be text users at all.

## Tactile formats (Braille and Moon)

### Accessibility for visually impaired pupils

Braille and Moon are tactile codes to represent letters, numbers and other characters, used by blind and visually impaired people. There are two types of Braille: Braille 1 is simpler and each letter of the alphabet and number is represented by a combination of six dots that can be felt; Braille 2 uses 'contractions' to represent common letter patterns such as 'ing', 'and' or 'able'. Braille 2 has the advantage of using up to 25% less paper than grade 1 Braille. Braille can be used for signage, on watches and clocks, on maps and diagrams and on appliances and games and toys, as well as for reading and writing. The Moon alphabet is made up of 14 raised characters used at various angles, each with a clear bold outline. For many elderly blind people especially, Moon is easier to learn than the more complex Braille system, although some people gain confidence from learning Moon to move onto Braille.

In terms of accessibility, Braille and Moon are accessible to pupils with severe visual impairment, with good motor control and relatively good language and literacy skills: they are therefore not accessible or applicable to the majority of visually impaired pupils, who have additional difficulties.

### Accessibility of tactile formats (Braille and Moon) for pupils with other difficulties (reading, understanding, holding the book)

Braille and Moon are not designed for, and therefore not generally appropriate or accessible to pupils with other additional support needs.

## Printed Symbol Formats

Pictures and symbols have been used for communication and to write and record for thousands of years, but it is only relatively recently that learning materials with symbol 'systems' have been used on a large scale in education. Over the past

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[47] Page Turners, QED, http://www.qedonline.co.uk

decade or so the use of symbols has in some respects revolutionised access to the curriculum for many children with additional support needs. In most special schools and units, and many mainstream schools, symbols are used routinely to clarify and add meaning to text. Symbol systems are used by education, speech and language therapy, social work and health professionals in a range of settings and contexts (Wilson, 2003). The primary cause of this explosion has been the availability of computers and printers and development of software that enables high-quality symbol-supported resources to be created quickly and relatively cheaply.

"Symbols can help support:

- communication - making a symbol communication book can help people make choices.

- independence and participation - symbols aid understanding which can increase involvement, choice and confidence.

- literacy and learning - symbol software encourage users to "write" by selecting symbols from a predetermined set in a grid.

- creativity and self expression - writing letters and stories and expressing your own opinions.

- access to information - all of us need accessible information and this should be presented in such a way that the reader can understand and use."

from *An Introduction to Symbols*[48]

There are many different symbol sets but the most popular symbols in use in Scottish education are the Picture Communication Symbols from Mayer-Johnson shown in Figure 10.1, and the Widgit Rebus symbols from Widgit Software, seen in Figure 10.2.



Figure 10.1: PCS Symbols



Figure 10.2: Widgit Rebus Symbols

Learning resources with symbols are accessible to a very broad range of learners, particularly when combined with text, because the process of creating a symbol

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[48] An Introduction to Symbols
http://www.widgit.com/symbols/about_symbols/intro_2_symbols/index.htm

resource will usually involve simplifying the text, which can immediately make it more accessible to many more pupils. Symbol-supported learning resources are used by pupils:

- with speech and language difficulties;

- with autistic spectrum disorder;

- with learning difficulties;

- with hearing impairment;

- with severe and complex difficulties.

**Accessibility for pupils with difficulty reading**

Good readers do not usually need symbolised materials but the addition of symbols can clarify the meaning of text for some children with reading difficulties.

**Accessibility for pupils with difficulty seeing**

Symbols can be printed in almost any size and the most common symbols sets are available in both colour and black and white. Some consider that the latter may provide greater contrast for children with visual impairment.[49] The majority of printed symbols are not particularly accessible for blind pupils since they are a visual medium. A significant percentage of visually impaired pupils have additional learning difficulties and so symbolised materials are an important resource for these children.

**Accessibility for pupils with difficulty understanding**

The main group of children who benefit from symbols are those who have difficulty understanding text. Pupils with mild and moderate learning difficulties; speech and language impairment; severe and complex difficulties; and those on the autistic spectrum can all access symbolised materials.

**Accessibility for pupils with difficulty holding the book**

Children who have difficulty handling printed materials will also have reduced access to printed symbol materials, and would need digital versions accessible via computer.

**Accessibility for pupils with difficulty writing/recording**

Pupils who have significant writing and recording difficulties can use symbols as an alternative to text. Examples would be a child demonstrating understanding by identifying symbols in response to spoken questions or constructing 'sentences' with symbols (see Section 9). Children can access symbols physically (picking them up or pointing to them); or by eye-pointing, for example. The use of symbols for writing/recording requires the appropriate symbols to be printed and available - pupils do not draw the symbols themselves. Children can also write with symbols on computer, selecting the symbols via mouse, touch screen or switch.

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[49] Debate continues over preference for colour versus black and white, (see Aitken, A, Millar, S.V., Nisbet, P.D. Applying the new medical model: intervening in the environment of children who are multiply disabled. British Journal of Visual Impairment, 19:2, ISSN 0264 6196. 2001.)

# Audio formats

Audio compared to written text has advantages and disadvantages: some pupils find audio enhances learning; but clearly some concepts and ideas are better suited in many cases to visual representations.

## Cassette Tape

Audio tapes have been used for many years to enable access to curriculum materials for students with additional support needs.  Audio cassettes are relatively inexpensive to copy and distribute, while portable players to access tapes are extremely cheap.

### Accessibility

Tape players are accessible for many pupils with visual impairment, reading and learning difficulties. Simple adaptations to tape players[50], or the use of Environmental Control Systems[51] allow students with physical difficulties to access taped materials. Despite the development of audio CDs and digital audio files, cassette tapes are still extremely popular due to their simplicity and accessibility. The main disadvantages of cassette tapes are size; fragility and particularly difficulties with navigation – the user cannot easily find particular sections on the tape. Tape recorders provide an accessible medium for many children with writing and recording difficulties because it is cheap and easy for them to record with speech. However, cassette tapes and recorders are becoming less common with the advent of audio CD and particularly, of iPods and MP3 players.

## Audio CD

Audio CDs have many of the advantages of cassette tape, but are more durable and navigation is quicker and easier. Audio CDs can be played on car music systems, computers and cheap personal CD players.

### Accessibility

The accessibility of audio CDs depends on the type of player used. Many visually impaired pupils and children with reading and learning difficulties can access personal audio CD players easily. It is slightly more difficult to modify a personal CD player for a switch user, compared to a tape recorder, but switch-accessible CD players are available for around £100[52]. Free keyboard, mouse or switch-controlled software to play CDs on computer is available from Inclusive Technology[53]. Audio CDs are not a particularly accessible format for children with writing and recording difficulties because few CD players have recording capability.

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[50] Using a switch to control devices, http://ace-north.org.uk/pages/resources/infosheets.asp
[51] Life Skills & Environmental Controls, http://www.qedonline.co.uk/catalog/index.php?cPath=86&osCsid=f6801b9a93b8454031c0e82c2c1da861
[52] Switch-Adapted CD Player, http://www.liberator.co.uk/liberator/InclusionDevices.asp
[53] Inclusive CD Player, http://www.inclusive.co.uk/downloads/downloads.shtml

## Daisy Digital Talking Books

Daisy is the new Digital Talking Book format that has been adopted by RNIB and many other organisations supporting people with visual impairment. The main advantages of Daisy, compared with a standard audio CD, are that:

- it is an international, published standard;

- the file sizes are smaller (so longer recordings can be stored on a single CD – although this is because files are compressed using MP3, for example, not because of the Daisy format itself);

- Daisy CDs have structure and navigation that enables a blind user to move easily around and find chapters, sections and even individual words.[54]

A Daisy talking book consists of a set of audio files (often but not necessarily in MP3 format) together with 'index' files which can be spoken out by the player so that a user can navigate around the book. Daisy talking books can be accessed either on personal portable Daisy players, or with specialist software on computer. The portable Daisy players are essentially modified versions of standard MP3 CD players.

### Accessibility

The Daisy audio format is designed for and particularly accessible to pupils with visual impairment. The built-in structure and access tools allow a pupil to navigate around the book and search and find information quickly. Daisy audio books are less accessible for children with other print disabilities. This is not because of the characteristics of the format itself, but more as a result of lack of access to Daisy hardware and books.

The main disadvantages of Daisy audio books for pupils who are not visually impaired, are that the Daisy audio players are not readily available and are very expensive (the cheapest player from RNIB is £195, compared to around £20 for a CD MP3 player from a local electrical retailer). Visually impaired pupils can join the RNIB Talking Book service and for £70 per year (usually paid for by the local authority) receive a free Daisy player with free access to the Talking Book library which has over 9,500 Daisy titles, but this service is not available to children who are not visually impaired[55]. Although Daisy Talking Books are available at low cost for pupils with visual impairment, they are not easily available to pupils with other print disabilities.

For pupils who are not visually impaired, Daisy Talking Books are less accessible than standard audio CDs or downloadable audio files; the players are more expensive; the books are not available; and most children with sight do not need the Daisy navigation features because they can see the player buttons or screen on a standard CD or MP3 player.

Daisy players based on modified MP3 players can be used for recording purposes by children who have writing or recording difficulties - the recording is saved as an

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[54] Daisy technology explained,
http://www.rnib.org.uk/xpedio/groups/public/documents/publicwebsite/public_daisy.hcsp
[55] RNIB Talking Book Service,
http://www.rnib.org.uk/xpedio/groups/public/documents/PublicWebsite/public_talkingbooks.hcsp#P70_4636

MP3 file.  Daisy players which are based on modified personal CD players cannot be used for recording.

## Digital audio files (MP3)

The development of MP3 players such as the Apple iPod has led to an explosion in the availability of downloadable music, 'podcasting' (radio or other broadcasts delivered via the internet for listening to on an MP3 player) and also downloadable audio books. A popular supplier of downloadable audio books in the UK is Audible.com (http://www.audible.com), with over 11,000 titles available, and other sites in the UK are the Apple iTunes store (http://www.iTunes.co.uk), Naxos Audiobooks (http://www.naxosaudiobooks.com), and Audioville (http://www.audioville.co.uk/). As well as commercial audiobooks, there are a huge number of free audiobooks, radio programmes and other audio files that can be downloaded from the internet and played on computer, listened to on iPods, MP3 players and mobile phones, and burned to CD and played on portable CD players.

Schools are increasingly using iPods and other MP3 players for classroom activities[56], and to distribute learning materials. Staff and pupils use free software such as Audacity[57] to create their own audio recordings and programmes, which can then be made available on the internet and downloaded by pupils. Making voice recordings takes time, so a new faster alternative is to use computer software to generate an audio recording of a document with a synthesised voice. This approach is not suited to some materials such as novels, for example, because the artificial voices lack feeling and intonation, but it is a suitable technique for creating shorter more factual recordings. Software to create such audio files is available commercially and the new version of the free WordTalk software, funded by SEED and which will be available in 2007[58], will have this capability.

### Accessibility

Accessibility depends in part on availability and the huge quantity of audio material in MP3 is a major factor in making such resources accessible, together with the number of devices which can play the audio files: computer; portable MP3 players; mobile phones; handheld PDAs etc . The accessibility of the players themselves varies greatly from model to model, but devices like the ubiquitous iPod are accessible to the majority of pupils with additional support needs. There is no doubt that the navigation features of Daisy mean that Daisy audio books are more accessible for many visually impaired users than ordinary MP3, but nevertheless, iPods, standard MP3 players, mobile phones and PDAs are usable by people with visual impairment[59] and devices for visually impaired pupils such as the BookCourier[60] can play both MP3 and Daisy audio books. For people with learning difficulties or physical difficulties, RNIB's Milestone 311[61] player is simple to use with large buttons. Options for switch users to control MP3 players are

[56] Podcasting, http://www.ltscotland.org.uk/ictineducation/ictadvice/Podcasting/introduction.asp
[57] Audacity Sound Recorder/editor, http://audacity.sourceforge.net/
[58] WordTalk free text reader for Microsoft Word, http://www.wordtalk.org.uk/
[59] Blackpool TrEACL project, http://www.aclearn.net/display.cfm?resID=11983
[60] BookCourier, http://www.accessableworld.com/bookcourier/
[61] Milestone 311, http://onlineshop.rnib.org.uk/

limited but there is an adapter available for controlling an iPod with a single switch[62].



Figure 10.3     Switch-controlled iPod

MP3 players and iPods are reasonably accessible for pupils who have writing and recording difficulties: many cheap MP3 players have a voice recording capability and microphones are available for iPods.

# Digital text / multimedia formats

There are many formats suitable for distributing digital curriculum materials, such as Microsoft Word, Adobe PDF, Microsoft or MobiPocket Reader, HTML (web pages) and DAISY.  In this section we will describe the main accessibility characteristics of different formats. We have chosen a sub-set of formats – there are many more that can be used to create accessible materials – for example, Microsoft PowerPoint and Opus Illuminatus are both commonly used to create 'talking books' on computer[63].

## Plain text and RTF

### Plain text

Plain text is the most basic type of digital format. Plain text is exactly that: a text file with line breaks and carriage returns but no formatting, structure (headings etc), tables or graphics. In some respects plain text is extremely accessible, since virtually all word processors on a huge range of computers and devices can open a text file, and because virtually all assistive software packages (e.g. text and screen readers) can access plain text. However, accessibility is not the same as usability, and the lack of structure and other information makes plain text hard to use: a blind user of a screen reader program, for example, faced with plain text, has little option than to begin at the beginning of the file and work through it. While the screen reader will read the text without any difficulty, it will take a long time: if the document had structure with chapter headings that could be read first, then the reader could listen to the outline of the document and then decide which sections to read first.

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[62] SwitchPod switch-accessible iPod, http://www.tecsol.com.au/SwitchPod.htm
[63] Creating switch accessible multimedia,
http://atschool.eduweb.co.uk/meldreth/textandinfo/Powerp/Media1.html

**RTF (Rich Text Format)**

RTF offers formatting and allows graphics to be saved, but there is little facility for structure or navigation or features such as tables. RTF files can be opened by almost any word processor. Like plain text, RTF is very accessible but is not particularly usable.

There are many documents that are stored and made available in plain text, RTF and other basic formats, but in the main they should be viewed as source texts or intermediate files, which are of little use in their 'native' form. To be accessible and useful, they usually have to be converted or adapted into a more useful format which offers structure and navigation and a means of dealing with features such as pictures and tables.

## HTML

HTML is the original underlying format of the web and as we know it can be used to display pages with considerable complexity, with different fonts, sizes and colours; columns and tables; graphics, sound and video clips; and hyperlinks. HTML documents can be opened and read using a large variety of browsers such as Internet Explorer, Firefox or Safari, as well as most word processors used in schools such as Microsoft Word, Textease and AppleWorks. HTML documents can be created using almost any word processor and with many free and commercially available editors.
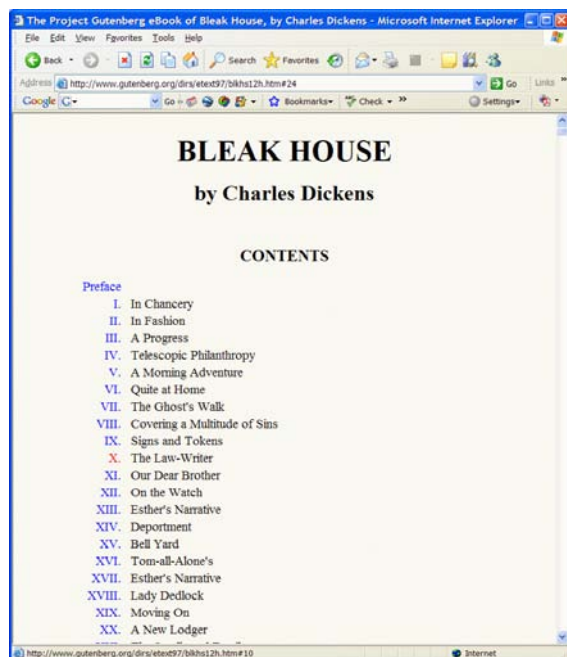


Figure 10.4: Bleak House, By Charles Dickens, available free in HTML from Project Gutenberg. The document is structured with a table of contents as hyperlinks so the user can jump to any chapter with a single click or switch press.

### Accessibility

The flexibility of HTML means that some pages can be very accessible, while others can be extremely inaccessible, depending on the designer or author. A well-structured HTML document is both accessible and usable; a poorly designed HTML page can be impossible to access for someone who is using assistive technology (or anyone else). The W3C consortium has published guidelines for making accessible web and HTML pages[64]. An HTML document which follows W3C guidelines should be structured; illustrations will have text descriptions; and tables can be marked up to make sense to screen readers. As a format, HTML seems to be regarded as more accessible than Word or PDF[65] but we believe that this comparison is based on several assumptions about accessibility where the focus is on online documents to be accessed by a person with visual impairment. If we take a wider view, we believe that Word and PDF have some advantages over HTML. For example, although it is possible to save

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[64] W3C World Wide Web Consortium, http://www.w3.org/
[65] How accessible are Microsoft Word documents? http://www.washington.edu/accessit/articles?266

and distribute an HTML document on CD say, rather than online (e.g. Daisy text books are composed of HTML pages) and open it using either browser or word processors, different applications process the file in different ways and the result is not always accurate (e.g. illustrations may not be shown). Bookshare, the US web site that distributes accessible books for print-disabled people, no longer accepts books in HTML format: "HTML and DAISY offer markup, but because they can be created in so many different ways, users are served best when we generate these files for Bookshare.org subscribers using internal tools."[66] Bookshare does accept files in RTF and Word formats.

Computers used by students with additional support needs are not always connected to the internet in Scottish schools. For example, at least one local authority in Scotland will not allow laptops to connect wirelessly to the school internet, which restricts access for the pupil who relies on the laptop to obtain digital resources, while many Support for Learning departments use standalone computers because ICT services restrict access to control panels or refuse to install specialist assistive software (despite the fact that this is likely to be illegal under Disability Equality legislation). Therefore, there is a need for digital books to be distributed as distinct files on CD or memory stick as well as online, and Word or PDF are more convenient formats.

There is also a distinction to be made between the file format and the application used to read the book. Most browsers have relatively basic features and tools whereas applications designed to handle digital books and resources such as Microsoft Word, Microsoft Reader, Adobe Reader or Daisy book readers have extra facilities to support reading (e.g. text to speech), study (e.g. highlighting, bookmarks, voice and text comments) and writing (e.g. spellcheckers). A basic HTML format document may well be accessible but browsers may lack the additional features and tools that make the resource usable.

## Microsoft Word (DOC)

There are probably more worksheets and documents in Microsoft Word format in Scottish schools than in any other electronic format. 5-14 and NAB assessments are available in Microsoft Word format. The Microsoft Word software is widely available, ideal for creating interactive worksheets, and documents are reasonably accessible using assistive technology (e.g. CALL Centre's recent SEED-funded project to distribute *WordTalk* freely to schools offers free text-to-speech to help pupils with reading difficulties access Word documents). Creating and opening documents and materials in Word generally costs nothing because it is installed already on most computers in Scottish education. Word documents can also be opened by a wide variety of other free programs such as OpenOffice and StarOffice[67] (freely available to Scottish Education under a licence negotiated by SEED with Sun Microsystems). Versions of Microsoft Word are available on Windows PCs and Macs.

### Accessibility

Microsoft Word as a format is reasonably accessible, but a problem is that many documents written using Word are not.

[66] Bookshare, http://www.bookshare.org/web/Welcome.html
[67] StarOffice, http://www.sun.com/software/star/staroffice/ & http://www.ltscotland.org.uk/edresources/softwareschemes/index.asp

On the positive side, Microsoft Word documents can be adjusted to suit children with difficulty reading or seeing: the text can be magnified and re-flowed (i.e. the words 'reflowed' to fit the size of the window); font style and size altered; line and character spacing increased; text and background colours adjusted; and the Word Reading Layout provides a simple and accessible view for reading books and materials.
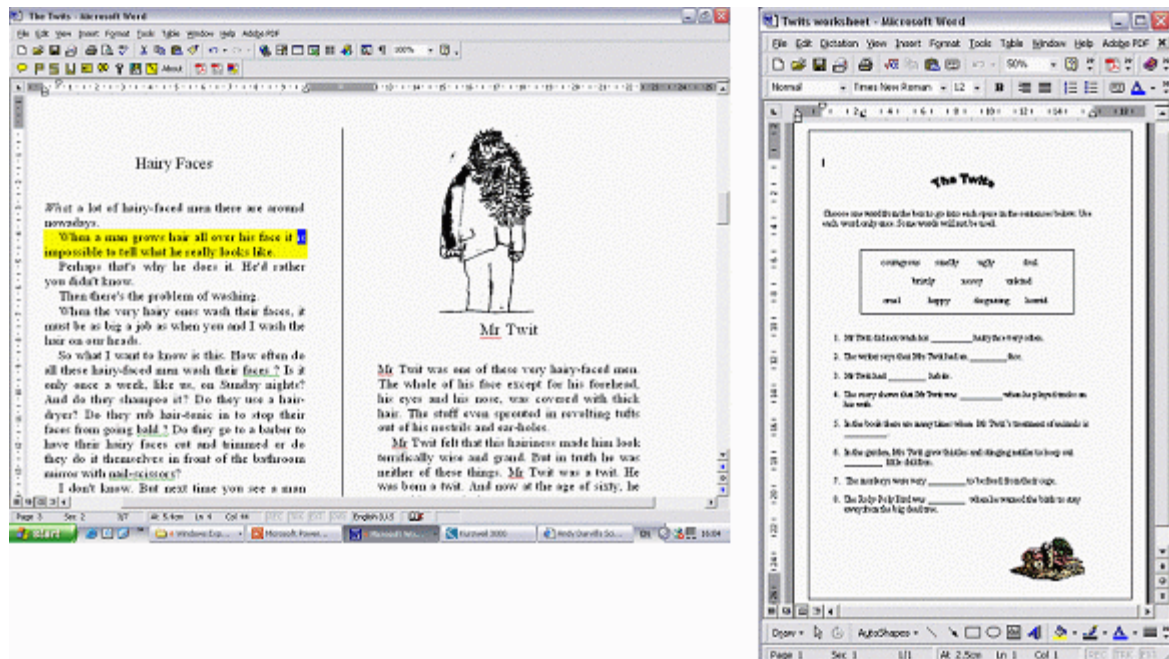


Figure 10.5:  Reading book with worksheet scanned into Word and read out using free WordTalk software

Pupils with reading or visual difficulties can use additional software, such as WordTalk, to read out the text from the screen.  Microsoft Word has tools which are helpful for study such as electronic highlighting, bookmarking and commenting.  Most screen readers and screen magnification programs used by pupils with visual impairment can access Microsoft Word documents. Microsoft Word is a very effective format for children who have writing and recording difficulties because, since it is a word processor, text can be inserted easily and Word has a whole range of tools to support writing, such as spellchecker, thesaurus, AutoCorrect, and the equation editor[68]. Lastly, alternative access tools such as word predictors and speech recognition programs work well with Microsoft Word.

The main disadvantage with Microsoft Word format as a means of distributing electronic documents is that that there is wide variation in the content, design and layout of documents. It is possible to create a document in Microsoft Word which is extremely accessible to a very wide range of children with additional support needs, but it is equally possible to create a document which is very inaccessible. The terms Incidental Obligatory Accessibility (IOA)[69] or Accessibility Without

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[68] Supporting Literacy Using Microsoft Word, http://callcentre.education.ed.ac.uk/About_CALL/Publications_CAA/Quick_Guides_CAB/quick_guides_cab.html
[69] Incidental Obligatory Accessibility, http://callcentre.education.ed.ac.uk/digitalcurriculum/downloads/session12/index_files/textmostly/slide14.html

Trying (AWOT) have been suggested to describe using facilities built into Microsoft Word (and other tools such as Adobe Acrobat or web design software) to create accessible documents.  A simple example of Incidental Obligatory Accessibility is to use Word styles to create structure for a document rather than just changing the format of the text.  By using Word styles for chapter and section headings, pupils with difficulties reading, seeing, understanding or physically accessing the document can use the Word 'Document Map' to easily navigate around the document; blind users with screen readers can skim the chapter heads and easily find sections; and pupils with physical difficulties can use mouse, keyboard or switch to go directly to a chapter, from the table of contents at the beginning of the document.

Word is one of the most useful and efficient tools for creating accessible documents in other formats. Word styles and headings can be used to define structure, alternative text can be added for images, and the resulting file can be saved in a variety of formats including RTF, HTML[70], PDF, Microsoft Reader, and Daisy[71]. Structured materials created using Microsoft Word can therefore be converted into almost any other format. A disadvantage with Word compared to PDF, for example, is that files do not contain sufficient information for use in commercial printing.

## Adobe PDF

Globally, there are probably more PDF documents in existence than in any other digital format. Governments, organisations and publishers use PDF as their preferred format for distributing documents. For example, 5-14 assessments, NABs and SQA examination question papers are all produced in PDF. Publishers like PDF because they can quickly and cheaply produce a digital file for printers to use to create a reliable hard copy, from virtually any source program, whether it is a desktop publishing package, a word processor, or a spreadsheet. This means that publishers will often be willing and able to provide a PDF book for use by a pupil with additional support needs.

Where publishers cannot provide PDFs, books can be scanned and scanned PDF files of textbooks are generally more accurate than Word or HTML files.

PDF is good for distributing textbooks, novels, reports, and documents can be made interactive through the addition of 'form fields' (as in the case of the CALL Centre / SQA digital question papers project). PDFs can be read on a large number of different machines, including Windows, Macs, Unix and also pocket PC/PDA devices, using free Acrobat Reader software.

Creating a PDF document is relatively low cost: StarOffice, available free to Scottish Education, can export PDF documents; while the full Adobe Acrobat Professional 7 will cost a Scottish school £19.80 for a licence and £19 for the software CD, from Learning and Teaching Scotland.

Most schools in Scotland use Microsoft Word or equivalent to produce course materials, workbooks and worksheets and creating PDFs from Word is simple and low cost. An added advantage is that the PDFs generated in this way are 'tagged'

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[70] Create Structured Documents in Microsoft Word, http://www.webaim.org/techniques/word/
[71]  Boston University Office of Disability Services DAISY Production Training Module http://people.bu.edu/access/Introduction.htm

and therefore reasonably accessible provided basic accessibility procedures are followed when creating the material.

Book sellers such as WH Smith have started selling 'eBooks' in PDF (http://ebooks.whsmith.co.uk) and there are many classic texts (e.g. by Robert Louis Stevenson, Dickens etc) available as free Adobe eBooks on the internet (http://www.adobe.com/epaper/ebooks/ebookslib.html).

**Accessibility**

PDF documents can be accessible for pupils with additional support needs but, like web sites or Word documents, some PDF documents are more accessible than others for some users. There are two main classes of PDF documents: those which are 'untagged', where little or no effort has been made to ensure accessibility, and those which are 'tagged'. Tagged PDFs are structured (the headings for sections, for example, can be seen in the 'Bookmarks' tab and listened to using a screen reader); the 'reading order' of the text is defined so that a text or screen reader reads it in the correct order; graphic elements have text descriptions; the text language is defined so that the correct characters are used.

Popular opinion divides PDFs into those which are accessible (tagged) and those which are not (untagged) but in fact this is misleading. The term 'accessible' when used to discuss digital documents too often means 'accessible to blind or visually impaired users'. Untagged PDFs may not be accessible to some pupils who are visually impaired and use screen readers but they may be entirely accessible for children with physical or reading difficulties, for example. Equally, PDFs (or documents in other formats) which are accessible for blind pupils using screen readers may or may not be accessible to pupils with severe physical disabilities who use switches.

The new SQA digital question papers are a good example of this in practice. The digital question papers are untagged, but they have still proven to be accessible to the majority of students who require them (Nisbet *et al*, 2006). Pupils with physical writing and recording difficulties can navigate around the papers and type answers on screen, while those with reading difficulties can use PDFaloud text to speech software. The question papers may or may not be accessible for blind pupils who use screen readers, but if they are not, SQA extract the text and edit it to create a digital paper in another format (HTML, Word, RTF or Daisy) that could be accessed using the screen reader. (This process is used already by SQA to create the text files used for Braille papers.) Creating different accessible formats to meet the needs of different users is entirely reasonable: the untagged PDFs meet the needs of the majority of pupils and other methods are used for the small number of pupils who require different formats. One might argue that SQA should ensure that *all* the papers should be produced in *one* digital format that is accessible to *every* pupil, but that would be unnecessarily expensive (SQA would have to change their entire desktop publishing software and procedures, and retrain staff) and arguably, impossible as no single digital format meets the needs of every pupil. There are parallels here with production of printed papers: the majority of pupils can use standard print; some pupils need papers on coloured paper, others require different font sizes, others need Braille. The untagged, speech-enabled PDF question papers are accessible and usable by the majority of candidates with additional support needs and given that SQA know exactly which papers are required by which pupils, in good time, alternative formats that require more time and expense can be created if necessary.

Pupils with reading, seeing or physical difficulties can open any PDF (tagged or untagged) with the free Acrobat Reader program and:

- magnify and reflow the document;

- view one page at a time, or two pages side by side;

- move around and access the document using the mouse, keyboard, or keyboard equivalent;

- change background and foreground colours;

- view the document structure and move quickly around the document using the 'bookmarks' pane;

- automatically open the document at the last page read;

- have the document read using Adobe's built-in Read Outloud tool;

- read the document using a text reader such as PDFaloud.

Visually impaired users may or may not be able to read an untagged PDF with screen readers such as Jaws and HAL, but they are more likely to be successful with a tagged PDF where the reading order is specified correctly, and the document has structure.

PDFs can be very accessible for pupils with writing or recording difficulties: if the PDF has been set up for the purpose, pupils can add highlighting, bookmarks and comments, type in answers to questions, and record voice comments using the free Acrobat Reader.

The main accessibility issue with PDF is the variability in content and design of individual documents - this is the same issue that was identified with HTML, Microsoft Word or Daisy text. Just as it is possible to produce a website which conforms to accessibility guidelines, but is completely unusable, so it is possible to produce a PDF document which adopts accessibility tools but which cannot be accessed properly[72]. Blind users of screen readers, quite rightly, sometimes complain about inaccessible PDF documents. This is because PDF has been around for many years and so documents produced a long time ago may not have any accessibility features; or the PDF author has not built accessibility in to the document; or in some cases, it is because the document was designed for printing and viewing and it is impossible to present it sensibly in an audio form. But this does not mean that PDF as a format is not accessible: authors and publishers should be educated and made aware of the processes involved to create more accessible PDFs.

Another potential difficulty is Digital Rights Management (DRM): it is possible for authors or commercial eBook publishers to add excessive security and DRM which prevents the user from reading the PDF with assistive technology even though this is permitted by copyright law[73]. This may not be a problem with copyright-free material or resources specifically produced for pupils with additional support needs, but it is when dealing with commercial products where the publisher wishes to restrict copying and distribution of the book.

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[72] PDF Accessibility, http://www.webaim.org/techniques/acrobat/

[73] Gowers Review of Intellectual Property, http://www.hm-treasury.gov.uk/independent_reviews/gowers_review_intellectual_property/gowersreview_index.cfm

Adobe and other sources provide detailed guidance on creating accessible PDFs[74] [75].
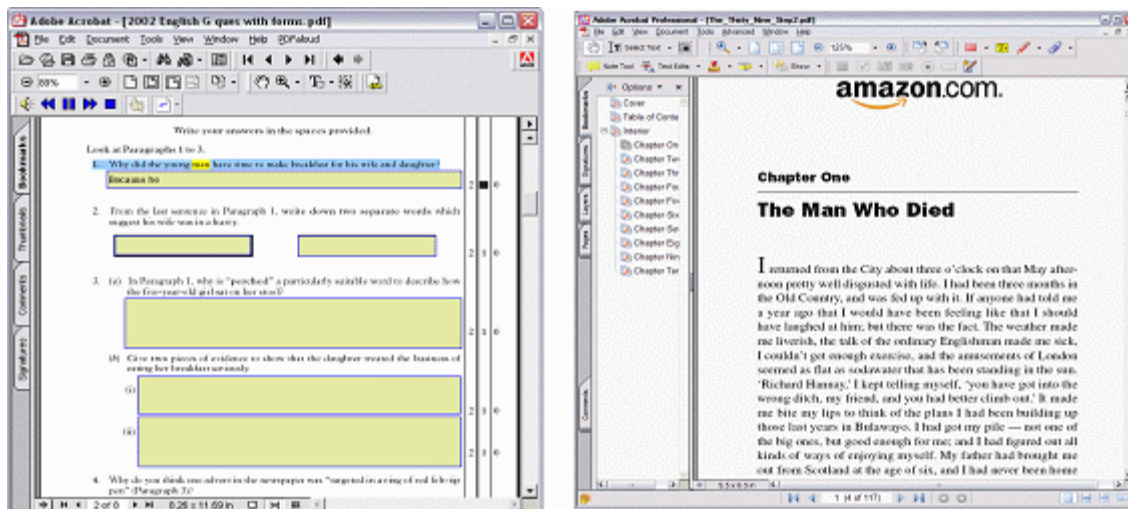


Figure 10.6: PDF documents of SQA English exam paper with form fields (left) and sample page from chapter showing chapter Bookmarks (right).

## Microsoft Reader / Palm / MobiPocket Reader (.LIT)

These formats are specifically designed for distribution of electronic books, or eBooks, and a page on the electronic version looks very much like a printed page.
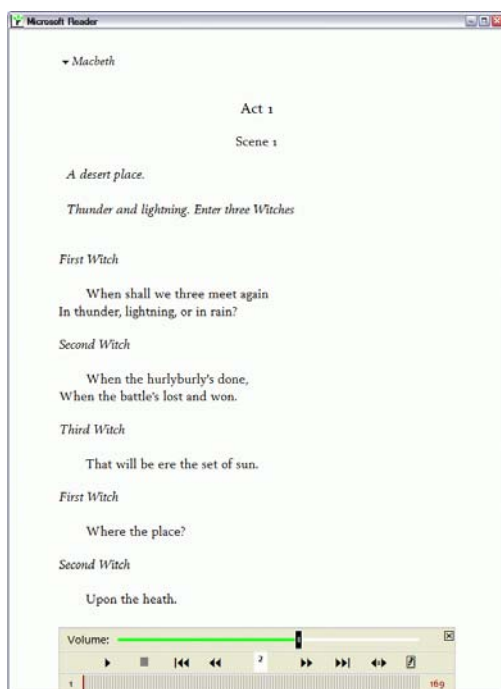


Figure 10.7: MacBeth, in Microsoft Reader format (free from the internet).

Microsoft Reader runs on Windows and Pocket (handheld) PCs; MobiPocket and Palm Reader are for Windows, Macintosh, Pocket PC and Palm PDA's. The Windows version of Microsoft Reader has basic text-to-speech built in. Publishers such as Penguin (http://www.penguin.co.uk/static/cs/uk/0/epenguin/) now produce and sell eBooks in these formats and also in Adobe PDF. Creating an eBook can cost little or nothing (e.g. an author can save a book in Microsoft Reader format directly from Word 2002/3). The Reader software to read an eBook in these formats is free of charge.

### Accessibility

Microsoft Reader books are fairly accessible for some pupils with reading difficulties: there is an optional free text-reader for Microsoft Reader which highlights the text as it is read, and the type size can be altered, although

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[74] The Adobe Acrobat 8 family and accessibility, http://www.adobe.com/enterprise/accessibility/acrobat.html
[75] Creating Accessible PDFs with Adobe Acrobat 6 and Microsoft Word 2000, http://www.jimbyrne.co.uk/

unlike Microsoft Word, it is not possible change the font or colours. Another difficulty is that the free text-to-speech facility will not work if the author or publisher has copy-protected the book, and almost all commercial titles are copy protected.

There are many unprotected and accessible free books that can be downloaded in Microsoft reader format from sites such as the University of Virginia e-book library (http://etext.lib.virginia.edu/ebooks/). The maximum font size in a Microsoft Reader book is relatively small and so most books are not particularly accessible for pupils who have a visual impairment.  Microsoft Reader books are a reasonable option for children with physical difficulty handling paper materials because they can be navigated and accessed using mouse, keyboard or keyboard equivalent (for example, a switch user can press switches to move backwards and forwards through the book).

In terms of access for children who have writing and recording difficulties, Microsoft Reader books are less accessible than documents in interactive formats such as Microsoft Word or Adobe PDF.  While a pupil can add text and voice comments, drawings and bookmarks in MS Reader, both Word and Acrobat are much better formats for creating interactive worksheets or assessments. Microsoft Reader is an electronic book format, like Daisy, and as such it is designed for viewing material rather than interacting and typing answers to questions.

## Clicker 4/5

Clicker is an extremely popular British program and 15 licences for Clicker 4 were provided free to each primary school in Scotland, through the Scottish Schools Digital Network (SSDN), in 2004. The latest version 5 is claimed to be installed on over half a million school computers. Crick software, the publishers, distribute a large number of books and resources that can be read with Clicker (http://www.cricksoft.com/uk/). For example, electronic versions of Oxford Reading Tree books are available in Clicker format.  Schools use Clicker to create their own electronic books and resources and there are hundreds of free grids and resources that can be downloaded from the Learning Grids web site at (http://www.learninggrids.com/uk). There are over 65,000 registered users of Learning Grids.com and so it is a massive and rich source of material. However, the grids that are offered are copyright-free: there are no grids with free Oxford Reading Tree books, for example, because that would break copyright law. A new development – Community Learning Grids – allows schools, groups of schools, local authorities or other agencies to set up protected areas where copyrighted material can be made available to a closed user group under licence.

As well as offering a good format for creating accessible talking books, Clicker's huge advantage over many other formats is that it was originally designed for creating interactive digital resources for pupils with additional support needs: having read a book, the pupil then tackles activities on screen. Creating Clicker books is free (for primary schools that have the software already) or relatively low cost (Clicker 5 is £84 and additional licences are £14 from Learning and Teaching Scotland). Clicker 5 also has the option of using real digitised human speech as well as synthetic speech in talking books, although the Clicker *Sayso* synthetic speech is extremely smooth and intelligible. Clicker 5 books, like Daisy books, can have human digitised speech where words are highlighted as they are spoken.

Figure 10.8:  Postman Pat talking book made in Clicker 4, accessible by mouse or switch



Figure 10.9:  Find Out and Write About Clicker resource

**Accessibility**

Clicker grids and resources can be very accessible to pupils with reading, understanding and physical difficulties. Clicker has built-in text to speech tools for reading pages; symbols can be incorporated for non-readers; and Clicker is one of the few programs designed for and accessible to switch users. Clicker resources may be accessible for pupils with some vision, but many are not designed for and therefore may not be accessible to blind children.

Clicker resources are almost always interactive, so that they are very accessible for pupils with writing and recording difficulties. Pupils can write by clicking on or using a switch to select letters, whole words, phrases and sentences, and Clicker grids can also incorporate word prediction from the Penfriend word prediction program. Clicker is available for both Windows and Mac computers.

Figure 10.10:  Clicker 5 Oxford Reading Tree digital talking book and writing activity

## DAISY and NISO Z39.86

The DAISY format (Digital Accessible Information System) is specifically designed for visually impaired and blind people. Its strength is that it provides a specification for structuring material so that the user can read and/or listen, navigate and find information quickly using audio cues. Daisy books can be accessed using portable DAISY audio players, as well as displayed and read using computers. It is a developing worldwide standard, which has been adopted in many countries and by many publishers. It is also suitable for giving some students with reading difficulties and physical difficulties access to text. There are 6 different types of Daisy digital talking book (DTB):[76]

- "Full audio with Title element only: no navigable structure.

- Full audio with Navigation Center (NCC or NCX) only: book with structure.

- Full audio with Navigation Center and partial text: with structure as well as some additional text, e.g., index, glossary, etc. The audio and existing text components are synchronized.

- Full audio and full text: A DTB with structure and complete text and audio. The audio and full text are synchronized. This type of production may be used to generate braille.

- Full text and some audio: This is a DTB with structure, complete text, and limited audio.

- Text and no audio: This is a DTB containing a Navigation Center and marked up/structured electronic text only and no audio is present."

The existence of different types of Daisy books can be confusing for users because it is not always clear what type is available. The RNIB Talking Book service, for example, supplies type 2 audio books only, which are not accessible to a computer user who wants the text. There are also two DAISY standards in use – Daisy 2.02 and Daisy 3.0 – and the specification is still under development, so that not all Daisy readers can open a given Daisy book. (This problem is not confined to Daisy books of course – all digital file formats are constantly being upgraded.)

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[76] http://www.daisy.org/about_us/dtbooks.asp

The most popular programs for creating DAISY books in the UK are Dolphin Publisher and EasyProducer, both from Dolphin Computer Access[77]. Publisher can be used to create Daisy books with a human recorded voice and costs £2,450 (£695 for education/charities). EasyProducer (£348) is designed to make Daisy books from Word documents, but this time with synthetic speech rather than human speech. Dolphin have another product in development – EasyConverter – which is designed specifically for producing accessible alternative formats. EasyConverter will be able to scan paper documents and access digital PDF, HTML, NISO and Word files and produce Structured Word, Large Print (in various sizes), Braille, Daisy audio and MP3 audio. It appears to be a very suitable product for schools, local authority services and others to use for creating accessible resources in multiple formats. It is important to note that this product stores the 'intermediate' files (files to be converted into the various print, audio and digital formats) in Microsoft Word format and uses Microsoft Word for editing the files. This supports the recommendations made in this and other sections of Books for All that Microsoft Word is the most suitable format and tool for storing and editing files for creating accessible resources.

Daisy text books can be read using a number of different programs. EasyReader, also from Dolphin (£30), is one of the most popular but other programs can also read Daisy books. DAISY readers for Macintosh or Palm/Pocket PCs are not readily available.

**NIMAS**

In the US, the DAISY 3 standard has led to development of a proposed standard for the production and electronic distribution of digital versions of textbooks and other instructional materials so they can be more easily converted to accessible formats, including Braille and text-to-speech. The National Instructional Materials Accessibility Standard[78] (NIMAS) seeks to provide a standard specification for the creation of accessible digital materials. The basic concept is very attractive: a common standard for publishers to use to create digital versions of textbooks, which can then be converted into different accessible formats such as Braille, Large Print, audio and digital formats such as XHTML and Daisy.

NIMAS is a work in progress and NIMAS files require specialist skills and tools to create. A NIMAS 1.1 'file set' is designed as a 'pre-production' standard "for use by publishers, authorised entities, and others to produce accessible versions of printed instructional materials. They are not intended to be used as-is and should not be considered finished products."[79] Creating a NIMAS file set requires expertise in writing XML documents, and a suitable XML editor. Likewise, converting an NIMAS file set into a format suitable for the end user (e.g. Braille, MP3, Word (DOC)) requires skill and/or specialist software. Very few programs yet exist for converting NIMAS file sets into anything useful (although EasyConverter, which is scheduled for release in 2007 may offer one practical solution).

NIMAS and Daisy are evolving standards and there are different versions and tools currently available; in our opinion, the NIMAS / DAISY format is not yet sufficiently developed or specified, and tools are not yet available, for it to be used

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[77] http://www.dolphinuk.co.uk
[78] http://nimas.cast.org/
[79] Creating NIMAS files, http://nimas.cast.org/about/resources/creating_nimas.html

on a wide scale by staff in local authorities and schools. At the present time it is a niche format, well-suited to Digital Audio Book production by RNIB for example, but not as suitable for widespread use in comparison to other more established formats and tools. The NIMAS and Daisy formats and tools are designed around the needs of the visually impaired and we believe that the standard itself, and the production and reading tools require further development before they might be suitable for other print-disabled groups.



Figure 10.11:  DAISY books read with EasyReader

## Accessibility

Daisy books are designed for visually impaired users with good language and understanding and are very accessible for this group, provided the correct type is obtained and the reader software can open it. The audio books are accessible for pupils with reading, understanding and physical difficulties, although for most of these pupils the Daisy format does not offer much more than a standard MP3 audio book that can be played on much cheaper and more readily available hardware.

Daisy is a published standard but accessibility of Daisy books varies depending on the player and on the software reader used. For example, a Daisy audio book can be played back on a PC using EasyReader software, but TextHelp's Read and Write Gold program, which has a Daisy reader, cannot play type 2 Daisy audio books. Read and Write Gold can read back Daisy computer books using synthetic speech, but cannot play back any recorded human voice.

Like other digital formats, Daisy books on computer vary in terms of accessibility depending on the actual file and the software used to display and read the book. In theory, the Daisy standard should help to ensure that books are correctly designed and structured, but in practice this does not seem to be happening. The US Bookshare site, for example, which offers 30,000 accessible Daisy and BRF (Braille) files, no longer accepts books donated in Daisy format because they can be unsatisfactory and difficult to rework – RTF, Word, Kurzweil, Ark (Open Book) and Wynn formats are required[80].

Control over the text size, spacing and colours of a Daisy book depends on the software used to read it. EasyReader can alter colours and size but the font itself

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[80] http://www.bookshare.org/web/Welcome.html

cannot be altered and so it may or may not be suitable for pupils with dyslexia who prefer particular fonts. All functions can be operated with the keyboard as well as the mouse, so the books are reasonably accessible for pupils with physical difficulties. Since XHTML files can display graphics, Daisy books should be able to display symbol-supported text although we have not seen any examples. A switch user could use switches to scroll up and down and turn pages but there are no built-in switch and scanning options.

A pupil can add text and voice notes to a Daisy book on computer but they are not designed to be interactive: the format is not as suitable as Word, PDF, Clicker or Textease for creating worksheets or examination papers where the pupil has to type in answers to questions. This is significant disadvantage compared to these other more interactive formats.

DAISY is one of several possible formats for distributing digital curriculum resources. It is designed for visually impaired and blind people. DAISY books require special players and reading software. Formats such as PDF, Word, various eBook varieties and basic MP3 are cheaper and easier to produce and accessible to a larger number of pupils, using a greater range of devices, such as Pocket PC and PDA's, both Windows and Macintosh computers, and standard MP3 audio players. DAISY has a role, because a blind pupil may find a DAISY book more accessible than a standard MP3 audio file, for example, but other formats are better suited for other groups of children with additional support needs.

A significant number of school resources, such as worksheets, tests and examination papers, need to be interactive, and therefore accessible digital versions should enable pupils to type answers quickly and easily into the resource on screen. The DAISY format does not provide this capability, whereas other formats, such as PDF and Word, do. To provide accessible digital resources for *all* children with additional support needs in Scotland, not just those with a visual impairment, requires materials in more than format, suited to the child and also to the type of resource in question.

## Kurzweil (KES)

Kurzweil 1000 and 3000 are programs designed specifically for converting paper and digital documents into formats that can be accessed by pupils with disabilities. Kurzweil 1000 is for visually impaired pupils, while Kurzweil 3000 is aimed at sighted pupils with reading difficulties. The programs are both very easy to use, particularly for scanning and converting textbooks into digital form. The main advantage of Kurzweil 3000 compared with other scanning and OCR programs is ease of use and that the scanned image appears almost exactly like the paper original. Most other scanning and OCR programs create Word, HTML or PDF files, and the software conversion process to generate these formats (especially into Word and HTML, less so with PDF) can often produce digital copies with untidy results.

The Kurzweil software to scan books is expensive (£725 for colour scanning; £500 for black and white) while the LearnStation version to read the scanned books costs £185 per computer. Kurzweil is available for Windows and Mac.

Several states in the U.S. have adopted the Kurzweil format as a standard for creating and distributing electronic resources and it is fairly popular in some parts

of Scotland (the City of Edinburgh, for example, bought scanning licences for all the secondary schools in the authority.)

The main disadvantage of Kurzweil is that a pupil requires Kurzweil software to open and read scanned KES files. Kurzweil can save scanned books in Word and other formats but all formatting and graphics are lost in the process. This means that most pupils will need copies of the Kurzweil reader software, which is relatively expensive, and that options for converting into other formats are limited. A supply system based on Kurzweil is therefore more expensive to implement, and less flexible, than, for example, a system for scanning and distribution based on Word or PDF formats.

### Accessibility

Materials in KES format are reasonably accessible for many pupils because the program has text-to-speech and useful study tools. Pupils with physical disabilities can use Kurzweil to navigate digital books but there are no switch access features built in. There are few structural features in a Kurzweil file and Kurzweil 3000 is not suitable for blind users, although Kurzweil 1000 is.

## Textease (TE)

Textease[81] is a word processing and desktop publishing program designed specifically for education. It is part of a suite of tools that includes software for painting, drawing, making movies, and working with spreadsheets, databases, concept maps and logo-like programming. Textease files can use text, pictures, sound and video. Several local authorities in Scotland have site licences for Textease and have created large banks of resources in Textease format. Free resources are also available from the Softease web site.

The Easiteach[82] interactive whiteboard resources from Research Machines are essentially Textease files. RM computers with Easiteach software are installed in many local authorities and the resources are used for whole class teaching. Pupils with additional support needs can have independent access on personal laptops or desktops to Easiteach resources .

### Accessibility

Textease files are accessible to the majority of pupils with additional support needs. Textease resources can be magnified and re-sized, colours and fonts altered and the program has a built-in text-to-speech reader. Textease resources can be very interactive and stimulating for many pupils because of the multimedia features and because of the general ease of use and support tools (word and picture banks, text-to-speech etc). However, most resources require use of a mouse so they are not suitable for many pupils with physical difficulties, and few resources can be accessed by pupils with severe visual difficulties.

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[81] Textease, http://www.softease.com/
[82] Easiteach, www.rm.com/**easiteach**
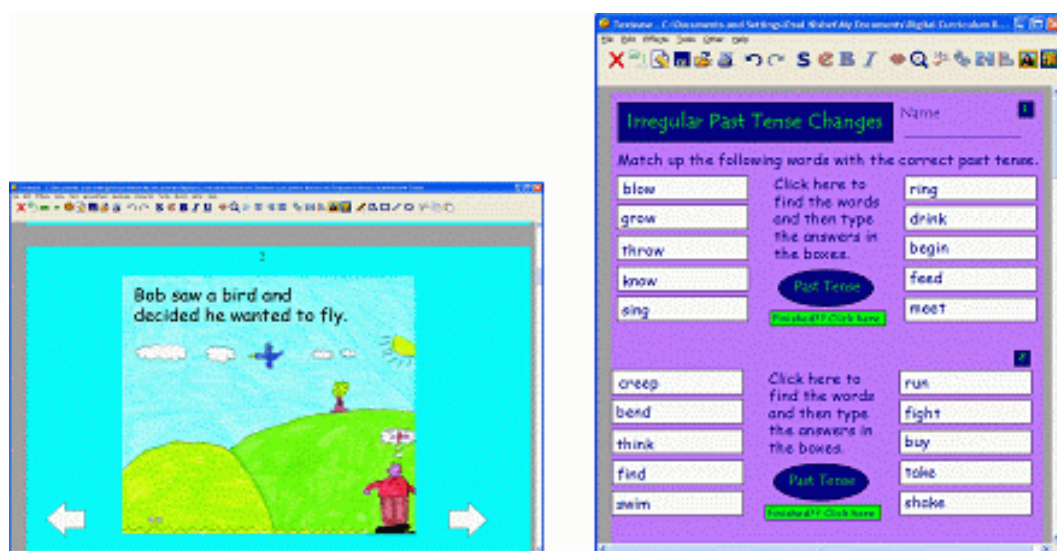
Figure 10.12: Textease Digital book made by primary pupils and an interactive English exercise

# SECTION 11    INDICATIVE COSTINGS

**Objective 11:**    **To provide comparative, indicative costings for producing materials in a range of accessible formats.**

**Outcomes:**    **Summary of production costs for creating accessible materials in different formats.**

## Summary

1) Production costs of accessible resources vary considerably depending on the type of material to be converted and on the format required.

2) Some aspects of production can be automated. Creation of many accessible formats (e.g. Braille, Symbol formats, etc) requires staff with expertise in the production of that format.

3) The most time-consuming and costly part of the process is the creation of a digital master copy that can then be used to produce printed, audio or digital multimedia versions.

4) Examples of master production costs for printed material are £4 per page for a symbolised Oxford Reading Tree book and £6.30 per A4 text page for a Braille or Large Print resource.

5) The master production cost of good quality human audio recordings may be between £10 and £30 per A4 page. The master production cost of an audio recording with synthetic speech could be a factor of ten lower.

6) More research is required into the acceptability and utility of recorded compared to synthetic audio files.

7) The cheapest digital multimedia format is the format in which the publisher can provide the material. In these situations the cost of production may be zero or very low. Most publishers can provide files in 'untagged' PDF.

8) Untagged PDF can be converted into other formats such as HTML, XML, DOC, RTF, tagged PDF and Daisy formats but the converted files usually require considerable editing and structuring to be made accessible.

9) If a source electronic document is not available, the paper version must be scanned in and converted to readable text. Scanned digital files always require proof-checking, editing and structuring before they can be used.

# Background to Section 11

Service delivery for production and provision of learning resources in accessible formats is examined in more detail in Sections 13 and 14.

The short timescale and large scope of the project did not enable us to obtain definitive costings for production of all types of learning resources (e.g. reading books, textbooks, worksheets etc) in all formats (e.g. Braille, printed formats, audio multimedia formats). Indeed, given the variability in terms of the type of material, the starting point (i.e. whether starting production with a printed copy that requires scanning and OCR, or a digital copy), the production techniques, and the end format, we doubt whether such definitive costings are at this stage possible to calculate. Instead, we have endeavoured to provide indicative costings for production of different formats.

Some costs associated with different parts of the production process have been obtained by trials undertaken by the project team; other costs indicating overall production for books are drawn from charges made by transcription services (although these may or may not reflect the production cost, given that many services are subsidised or have volunteer staff); and we have also used staffing levels and production output of one local authority service to get a picture of service-level costs.

Production of accessible learning resources involves capital and process costs. While some specialist hardware and software is expensive, the main per-unit costs are salary costs for staff to create the accessible material. Printing and distribution in most cases are lower than production costs because most accessible materials are currently produced for individual pupils. We believe that there is considerable duplication of effort by staff creating the same accessible versions of the same resources, and so there is scope to reduce production costs by sharing resources.

On the assumption that we are re-versioning an existing printed text, the production process can be broken down into three phases:

1. Production of basic 'raw' resources, by either:

    - acquisition of original source digital file and/or;
    - scanning and OCR and/or;
    - re-typing and/or;
    - making an audio recording.

2. Production of accessible versions, for example by:

    - converting into a suitable format;
    - editing the text;
    - altering design and layout;
    - adding structural and navigational tools (chapter headings, etc);
    - adding text for pictures;
    - adding fields for answers or some other form of interactivity.

3. Printing and distribution, e.g.

- printing hard copy;
- creation and distribution of CDs or memory sticks;
- uploading on school intranet or internet;
- provision of the necessary hardware for access, e.g. audio players; desktop or laptop computers.

There is overlap between each stage depending on the format and the material being produced: if a publisher can provide source electronic material in a reasonably accessible and workable form (such as tagged PDF), then Stage 1 and much of Stage 2 are quick or may not even be required at all.

If on the other hand, a publisher provides a digital version in a desktop publishing format created by say, Quark Express, the resource will have to be re-worked in order to create an accessible version. This may involve opening the file and then saving it as PDF, but the result may require editing or manually selecting, copying and pasting text and graphic elements from one program to another. In some cases it is actually quicker to scan the material into the computer and create a PDF or Word version using OCR software.

If the publisher cannot provide a suitable digital source, then the material will have to be scanned and converted into editable text using optical character recognition (OCR) software. In some cases the three stages can be accomplished in one – for example some students use Kurzweil 3000 scanning and OCR software (see below) which scans and creates accessible digital resources (that is, accessible to some pupils, not all) in one quick, seamless process. In others, such as production of Large Print books, the material has to be scanned, checked, re-desktop published, and then printed.

# Braille and Large Print transcription services

An internet survey of charges made by existing transcription services was carried out to investigate costs of provision. Braille and large print transcription requires expertise. A Braille transcriber must understand Braille, and input may also be required from a subject specialist for maths or science material, while creation of Large Print materials requires desktop publishing skills.

Virtually all existing transcription services serve pupils who are blind and partially-sighted through production of Braille and Large Print: there are very few advertised sources of printed materials in adapted fonts, or with symbols, or in digital multimedia formats for students with other impairments.

## RNIB Transcription Centres

RNIB transcription centres throughout the UK offer production of Braille, Large Print and sometimes audio materials. The charges for transcription vary depending on the material and the format required. Indicative costs for the RNIB Transcription Centre North West[83] are given below:

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[83] www.guidance-services.co.uk/new/Y&NY.doc

- Audio Cassette - £3.70 per A4 page inc. cost of cassette, £2.50 per additional copy, plus £2.50 handling charge

- Braille, Large Print, Computer disc – Master production £6.30 per A4 print page (equal to 3 Braille pages), plus £0.25 each per Braille/large print page. Copied disc £1.50. Comb binding for Braille /Large Print: £1.00 per copy, handling charge £2.50

- CD ROM - £4.10 per A4 page, £2.50 per additional copy, plus handling charge £2.50

- Digital audio – Daisy – printed material is transcribed via a computer program to CD ROM.

There is a minimum charge for transcription of £25 and prices are subject to VAT.

## H.M. Prisons

According to Revealweb there are 18 H.M. prisons in the UK offering transcription, mainly into Braille. Example charges are 11p per page (HM Prison Wakefield) for Braille and Large Print to 80p. per page for tactile diagrams. Labour costs here are clearly not a consideration with these charges.

## Kirklees Metropolitan Council Cultural and Leisure Services (formerly VIPER)

This service provides transcription of materials into Braille, Large Print and audio tape. Quoted charges[84] are for printing material direct from electronic files in Word or text sent by the customer (i.e. the customer will need to obtain or scan and edit the book):

- Braille: a double-sided sheet 30p - 40p (one A4 12-point side equates to about 2 to 2.5 sides of Braille)

- Tape: £1 a tape and £5 recording fee

- Large Print:  20p per A4 double sided sheet

## Staff costs of one VI Transcription Service

One Scottish local authority service produces approximately 100 accessible resources per year in Braille or Large Print. These may be whole books, book chapters or smaller items such as worksheets. The service employs two full-time technicians and teachers also transcribe some materials. A very rough calculation of the cost per item produced in terms of staffing might give a figure of approximately £500 to £700 per item. Staff in the service note that time and therefore costs would be reduced if they could access suitable digital files rather than having to scan them into the computer.

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[84] http://www.kirklees.gov.uk/community/libraries/whatservice/viper.shtml

## Printed Symbolised resources

Widgit Software are able to produce symbolised versions of books, electronic documents and web sites; cost depends on the material. Aileen McIntyre at Croftcroighn School in Glasgow (see Section 9 of this report) estimates that it takes around 3 hours to produce (by hand) a symbolised, bound Oxford Reading Tree book (about 30 pages, small amount of text each page). This equates to £120 at a standard £40 hourly rate (the hourly rate was taken from RNIB suggested charges – see below), or £4 per page. Production of symbolised resources, like Braille, requires expertise: knowledge of the symbols and their meaning and an understanding of the needs of the pupil and the material.

## Audio formats

There are two types of audio recordings: those made by recording a human reader, and those made by software converting text to a digital audio file using synthetic speech.

### Human audio recordings

High quality human recorded audio is expensive because it requires a professional sound booth, audio engineer and ideally, a professional voice actor. The cost of producing commercial audio books such as the Harry Potter series recorded by Stephen Fry is extremely high – thousands of pounds. High quality recordings by lesser known readers are created by transcription services. At the other end of the scale are staff in schools who create audio recordings of material direct to tape, or by recording into computer.

The production ratio for high quality recordings can vary from 4:1 to 12:1[85] (i.e. between 4 and 12 hours of work for every hour of completed audio). If we assume 430 words per A4 page, a speaking rate of 115 words per minute, and a cost of £40 per hour, then a page of audio will cost between and £10 and £30 to record.

Lower quality recordings made by staff in schools are likely to have a much lower production ratio – approaching 1:1 and so the per-page production cost may be as low as £2.50.

### Synthesised audio recordings

There are many software programs that can generate a digital audio file using synthesised speech, direct from a source text that has either been scanned in, or has been provided by a publisher. For example, Kurzweil 3000[86] (£725), TextHelp Read and Write Gold[87] (£320), TextAloud[88] (£19) and the new version of WordTalk (free) can generate audio recordings in WAV or MP3 direct from a text file. The process is automatic and reasonably quick: one product claims to produce an hour of audio in 4 minutes[89]. Similarly, Dolphin's EasyProducer

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[85] Audiobook Production and Narration, http://www.waynejune.com/audiobook_production_and_narration.htm
[86] Kurzweil 3000, http://www.sightandsound.co.uk/
[87] TextHelp Read and Write Gold, http://www.texthelp.com/page.asp
[88] TextAloud, http://www.nextup.com
[89] Text to Audio v7, http://www.dyslexiame.co.uk/Text%20to%20Audio.htm

product (£275) can create Daisy audio with synthesized speech from a Microsoft Word document.

The main disadvantage of a synthesised audio recording is the nature of the voice: listening to a synthetic voice is less pleasant than listening to a human voice. The quality of synthetic voices is improving: recent synthetic voices that are supplied with products like EasyProducer and Read and Write Gold are high quality and have a British 'accent'; and there is now a facility on the Scottish Executive web site where reports and publications can be read out in a very high quality synthetic voice with a good Scots female accent.

However, a human recording is in most cases easier to understand and a synthetic speech program may not pronounce unusual words or technical terms correctly. Nevertheless, as far as we are aware, there has been no research to investigate and compare the acceptability or comprehension of human with synthetic audio recordings. It is likely that longer, fictional material requires a human voice, while shorter factual resources may be acceptable and accessible in synthetic voice. More research into the acceptability and utility of audio is required.

The cost per page of generating synthesised audio is low, provided the document is available in a suitable format. The digital text must either be prepared as separate electronic files, for 'batch' conversion into separate MP3 audio tracks, or it must have structure or bookmarks which are used to create separate audio files (e.g. for each book chapter). The text itself must obviously be prepared in the correct order for reading, with tables and text boxes edited, and any illustrations replaced by text descriptions.

The production process for creating synthesised audio is similar to that of Braille or accessible digital text: the book must be scanned or otherwise acquired, and then edited and structured. Straightforward text documents are relatively quick and cheap to produce because little or no editing is required; textbooks with a complex layout will require more editing and structuring. English language reading books will require little or no proof-listening to check and correct pronunciation, whereas technical titles may require a lot more time and effort.

In terms of time and costs, then, a simple reading book might take one to two minutes per page to scan and edit (see below) giving a cost per page of master production of less than £1. The cost of actually generating the audio recording is a few pence per page.

## Indicative scanning and editing costs

Table 11.1 is given to illustrate the time required to scan and edit materials. The scanning times given in Table 11.1 are representative of the small-scale production that takes place in support for learning departments, and by individual staff and students, in schools across Scotland. Larger transcription services for blind and partially sighted pupils should be using automatic sheet-feeder scanners (e.g. Xerox 492) which can scan up to 33 pages per minute. Likewise, the OCR software can operate automatically on a batch of images with each page recognised and analysed in a few seconds. So for large scale production, the initial scanning and OCR process can be quick and automatic. Subsequent editing and adaptation, however, remains time-consuming.

The scanning time per page varies according to the type of book and the scanner and software used. *Charlie and the Chocolate Factory* was scanned in black and white, two pages at a time, and therefore took less time than the *Storm Castle* Oxford Reading Tree book, which was scanned in colour (which takes longer) one page at a time.

| Book | Scanning/ OCR | Time to scan | Time to edit | Output formats | Total time | Cost @ £40/hour[90] |
|---|---|---|---|---|---|---|
| Charlie And The Chocolate Factory paperback (190 pages) | FineReader Pro on flat-bed scanner | 1.5 hours (28 seconds per page) | 3 hours (56 seconds per page) | Structured MS Word, MS Reader and tagged PDF | 4.5 hours (1.4 minutes per page) | £180 £0.95 per page |
| Storm Castle, Oxford Reading Tree paperback (34 pages) | FineReader Pro on flat-bed scanner | 50 minutes (88 seconds per page) | 25 minutes (44 seconds per page) | Unstructured MS Word, untagged PDF | 1 hour 15 minutes (2.2 minutes per page) | £50; (£1.47 per page) |
| Storm Castle, Oxford Reading Tree paperback (34 pages) | Kurzweil 3000[91] | 35 minutes (1 minute per page) | 0 | Kurzweil KES | 35 minutes (1 minute per page) | £23 (£0.68 per page) |

Table 11.1      Scanning and OCR comparison

The accuracy of the OCR process depends on the quality of the original document (worksheets and handouts that have been photocopied many times will not produce good results), and the type of book (scanned files of textbooks with a complex layout and many illustrations are less accurate than novels, for example).

All scanned material requires proof-checking and correction, possible manual re-scanning, and editing and structuring in order to produce an accessible format.

For example, the editing time to create the Charlie and the Chocolate Factory book was longer than that of Storm Castle because there was more text per page, and because structure (chapter headings and page numbers) was added.

The fastest process involved using Kurzweil 3000 software, because there was no need to edit the scanned version at all. The Kurzweil KES format is specifically designed for creating digital versions of scanned books for sighted students with reading difficulties and so the resulting materials are not suitable for pupils with a significant visual impairment or switch users, for example. The other disadvantage of Kurzweil format is that the relatively expensive Kurzweil LearnStation software (£185 per licence) is needed to read KES files (compared to reading PDF files, for example, using the free Adobe Reader). Kurzweil can export files as Word documents but in the process graphics are removed.

The more complex the book in terms of layout and design, the more editing is required in order to create an accessible digital version. Figure 11.1 shows a Starting Science for Scotland book scanned using Kurzweil 3000. The digital version matches the printed copy exactly, and is being read out and highlighted by Kurzweil.

The second screen shot shows the same page scanned using FineReader OCR and saved in Microsoft Word. Some of the page elements are misplaced. The complexity of the page – with text boxes and illustrations spread across it – also

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[90] Hourly rate based on RNIB figures for producing Daisy books – see below.
[91] Kurzweil 3000, http://www.kurzweiledu.com

means that it is not suitable for pupils who require a high level or magnification. There is no structure – chapter headings and page numbers would have to be added manually, nor text descriptions of illustrations. Lastly, when the page is read out the reading order will be unpredictable and will depend on which section of text is closest to the top left hand corner of the page. A pupil who can see may not find this a problem because he or she can click on the text to have it read out, but pupils with visual impairments will have difficulty.
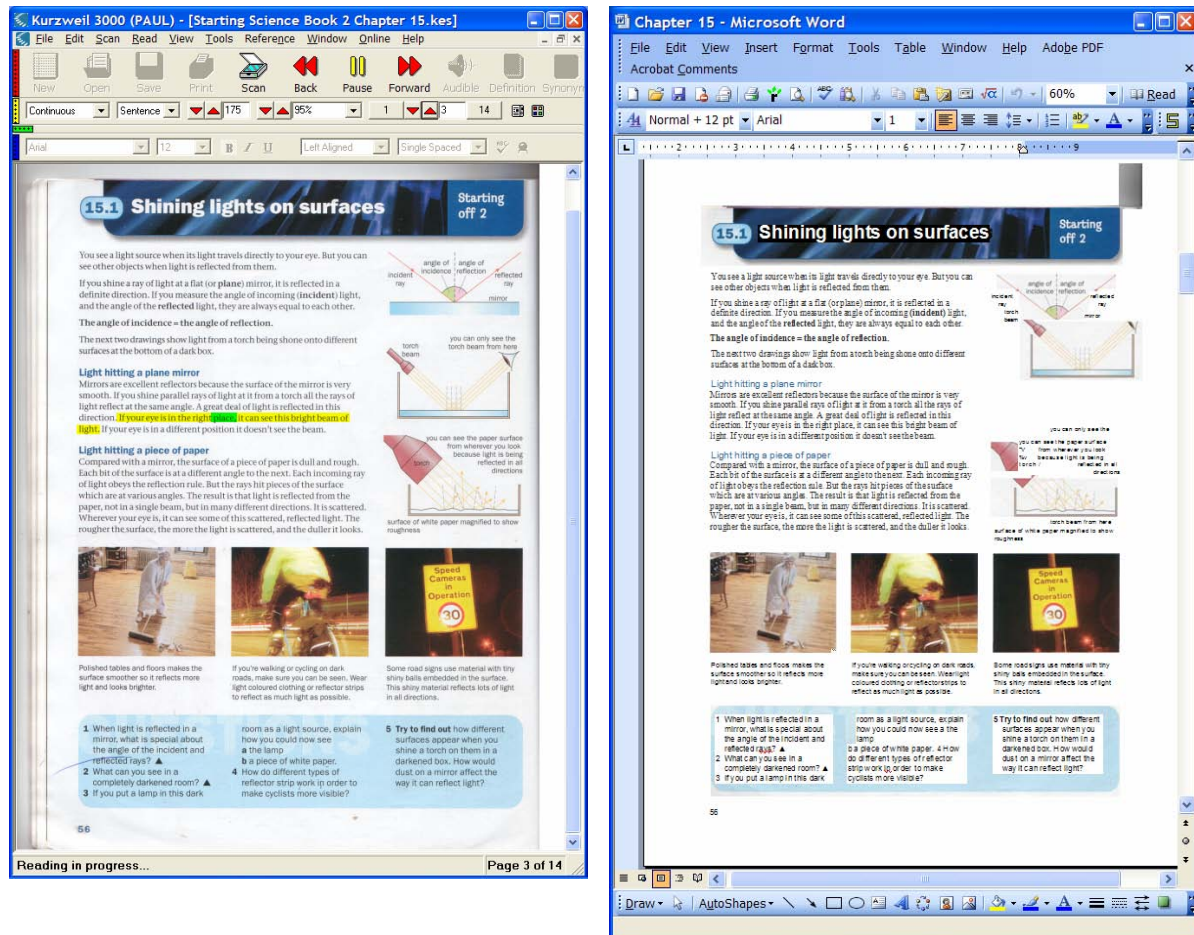


Figure 11.1: Textbook scanned using Kurzweil 3000 (left), and using FineReader and Microsoft Word (right)

Figure 11.2 shows the same page scanned using TextHelp Read and Write Gold[92] and saved as a PDF. (The scanning and OCR engine in Read and Write Gold is FineReader and so FineReader alone would produce similar results.)

This time the page layout is much closer to the original printed copy because software conversion of complex pages to PDF is more effective than conversion to Word. The PDF is 'untagged' (see section 10 of this report) making it accessible to pupils with reading or moderate physical difficulties. Because it lacks structure it would be less accessible for those with severe visual or physical impairment.

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[92] Texthelp Read and Write Gold, £320, http://www.texthelp.com
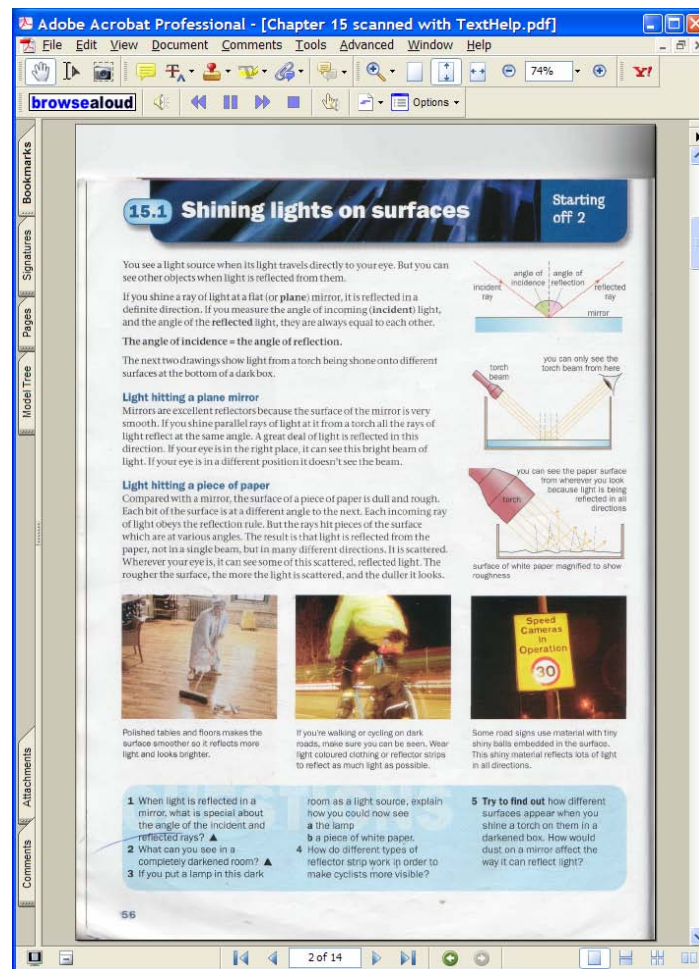
Figure 11.2: Starting Science scanned and saved as PDF

Adding bookmarks or tags to give navigation to the PDF could be done using Adobe Professional, but this would be a time-consuming task. Conversion and creation of a structured Word, PDF or Daisy version of this textbook would likewise involve considerable manual editing – text and graphic elements would have to be positioned and defined manually in order to create a completely accessible version for a blind user of a screen reader, for example.

A key question here is whether it is helpful or necessary for the digital multimedia version to look like the printed original. There are advantages for sighted pupils: the student can use both digital and hard copy together (sometimes it is easier and faster to locate information in a book than on the computer); and it may be easier to use especially in a class where the majority of pupils are using the printed version.

But for creating other types of accessible materials, such as hard copy large or adapted print, Braille, synthesised speech audio files, and structured accessible Word or Daisy books, it is not practical (and it may be impossible) to create a single digital file which both resembles the printed original, and which can be made accessible in these other formats, when we are dealing with a textbook with such a complex layout. The scanned version would require conversion and manual editing into a more tractable digital format where the structure, reading order, and location of elements were defined. In practice, the version that was

scanned into Microsoft Word would serve as a starting point for editing and then saving in, for example, DOC, Daisy or XML.

# Case example: digital examination question papers

### Acrobat PDF

In 2006 a small number of pupils with additional support needs used digital question papers in SQA examinations for the first time. The trials were undertaken by the CALL Centre and SQA and the digital question papers proved to be a great success with both staff and pupils (Nisbet *et al*, 2006). A sample question paper is shown in Figure 11.3

The digital question papers were produced in Acrobat PDF because of relatively low production costs for SQA, good functionality and reliability, and low cost to schools. SQA already produce question papers in PDF, and so there is no need to re-design the papers. The PDF papers are accessible for the majority of candidates with additional support needs: they can be magnified; colours altered; accessed using the keyboard instead of the mouse; and PDFaloud text-reading software helps candidates with reading and visual difficulties. Cost to schools are relatively low: to use a digital question paper the candidate required a computer with Acrobat Standard (at £19.80 per licence) and a free version of the PDFaloud text reading software installed .



Click on a sentence to have it read out by PDFaloud. Each word is highlighted as it is read.

'Form fields' are drawn in so that answers can be typed in on screen.
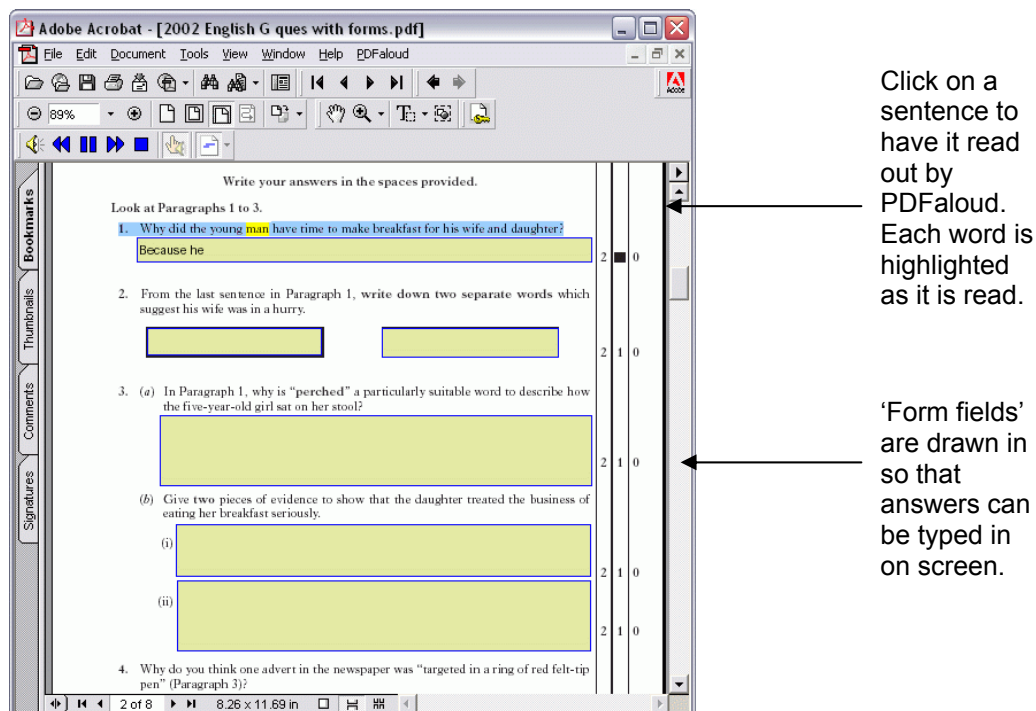
Figure 11.3:  SQA PDF digital question paper

Fifty seven digital question papers were produced for the 2006 diet and SQA staff estimate that the average length of time for production of a paper was 42 minutes, while checking and quality assurance took 105 minutes on average, giving a total of 2.5 hours. The papers varied in length between 2 and 36 pages, with an average of 15 pages.

Most of the production time was taken up by drawing and checking 'form fields' (answer boxes) for question and answer papers. Thirty two (56%) of the 57

papers created were in Question and Answer format, to which a total of 2,348 form fields were added (an average of 73 form fields per paper).

The time required to produce a paper without form fields / answer boxes is far shorter and involves:

1. opening the paper in Adobe Acrobat Professional;
2. clicking once to 'speech-enable' the paper (if a spoken version required);
3. saving the paper;
4. opening it on a test computer
5. viewing and clicking once on text to make sure it speaks.

|  | Capital Cost | Cost per paper |
|---|---|---|
| Adobe Professional 8 (SQA already have this for producing printed papers) | £135 (education price) | £0.00 |
| PDFaloud Publishing Toolkit | £3,000 | £52 (falls as no. of papers rises) |
|  | Time | Cost @ £40/hour |
| Production of question-only paper without answer boxes | 5 minutes | £3 |
| Production of question and answer paper with answer boxes | 2.5 hours | £100 |
| Average cost per speech-enabled paper without answer boxes |  | £55 |
| Average cost per speech-enabled paper with answer boxes |  | £155.00 |

Table 11.2: Production costs of PDF exam papers

Because SQA already have the paper in the digital PDF format there is little or no preparation required and costs are low. SQA produce the digital papers in-house, which has advantages in terms of security, reliability and workflow. Production cost per paper for question-only papers without form fields are very low; the cost per-paper for 'speech-enabling' the papers would decrease if a larger number of papers were produced. Costs for schools are also low (Table 11.3).

|  | Cost |
|---|---|
| Adobe Standard 7 (price from Learning and Teaching Scotland) | £19.80 per licence |
| PDFaloud / Browsealoud (if required, to read the paper using speech synthesis) | free |

Table 11.3: Costs to schools of PDF exam papers

**Daisy Examination Papers**

Indicative costs for production of examination papers in Daisy format are shown in Table 11.4 below. The costs were given by RNIB in a meeting with representatives of the English Joint Council on Qualifications.[93] The production process here involves the exam board sending a PDF of the paper to RNIB, who would then convert it into the Daisy paper. There are therefore no capital costs to the exam board.

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[93] Paper presented at meeting of JCQ Access to Assessment and Qualification Advisory group.

| | Time | Cost @ £40/hour |
|---|---|---|
| Production of 10 page question-only paper without answer boxes | 6 hours | £240 |
| Production of question and answer paper with answer boxes | Not possible / known | Not known |
| Average cost per paper without answer boxes | | £240 |
| Average cost per paper with answer boxes | | Not possible |

Table 11.4: Production costs of Daisy exam papers

The Daisy format does not allow interactive form fields or answer boxes to be added, and so no costs for this part of the process are known.

| | Cost |
|---|---|
| EasyReader | £30 per licence |

Table 11.5: Costs to schools of reading Daisy exam papers

**Cost and access comparison**

Comparing the production costs of Daisy and PDF examination papers demonstrates the cost advantages of using an industry-standard format like PDF. The average cost to produce a speech-enabled PDF paper for the SQA pilot project was £55 (approx. £3.50 per page) in comparison to a Daisy paper costing £240 (£24 per page), and the PDF cost-per-page would fall as more PDF papers were generated.

The schools who used the PDF papers needed Acrobat Standard software for pupils to write and save answers into the paper, at £19.80 per licence, but the latest Acrobat Reader 8 (free) can save answers and so the cost of software to schools is now zero. In comparison, EasyReader costs £30 per licence (although it may be possible to negotiate site licences with the suppliers).

52% of the PDF digital papers were 'question and answer' format where form fields were inserted to allow the candidate to type their answers in directly to the paper. This is an important facility which is not possible with the Daisy format.

As discussed in section 10, Daisy and PDF have different advantages and disadvantages for different groups of users. The CALL project demonstrates that PDF is an excellent accessible option for the majority of print-disabled pupils who have reading difficulties, moderate physical difficulties, and mild visual impairment. Daisy may be a better option for children with more severe visual impairments, although this has yet to be tested.

It is clear however, that production costs of materials in PDF are very low in comparison to costs for Daisy where the document effectively has to be re-designed.

In our view, speech-enabled PDF with form fields is therefore the preferred format for provision of digital assessments for most pupils on grounds of accessibility and cost. Some blind pupils who use screen readers, for example, may require other formats, such as plain text, DOC or Daisy, while other pupils with severe physical impairments who use switches may need formats such as Clicker.

# SECTION 12   COPYRIGHT LAW

## Objective 12:   To highlight key issues of copyright exemption and restriction and to suggest what options are available to address these issues.

**Outcome:**   **Summary of current UK Copyright law and exemptions, and how these apply to the production and distribution of accessible curriculum materials for pupils in Scotland and the UK**

### Summary

1)  Copyright exemption under the Copyright (Visually Impaired Persons) Act 2002 currently applies to a subset of print-disabled people: people who are visually impaired, who have difficulty holding or turning the pages of a book or who have a physical difficulty focusing or tracking.

2)  Copyright exemption allows accessible versions of books to be created and shared without needing to obtain permission from the publisher or rightsholder. This has improved availability of accessible materials for pupils with visual impairments who are copyright exempt.

3)  The needs of those who have difficulty holding or turning the pages of a book are not well served by existing service providers or procedures, even though they are covered by copyright exemption.

4)  Other print-disabled groups of pupils could benefit from copyright exemption: pupils who are Deaf or hearing impaired; pupils with specific learning difficulties; those with language or communication impairments, autistic spectrum disorder or the majority of the 34,680 pupils in Scotland who had some form of support plan in place in September 2005.

5)  Copyright exemption appears to be at odds with all other aspects of Disability Discrimination including the Education (Disability Strategies & Pupils' Educational Records) (Scotland) Act 2002, Additional Support for Learning (Scotland) Act 2004, and the Disability Discrimination Act 2005. The Disability Working Group of the Scottish Executive, in mentioning access to print, has drawn attention to the fact that this remains a reserved matter to the UK Parliament.

6)  There is a strong argument for broadening the groups of pupils that are currently copyright exempt. Since copyright is a reserved matter, this would require legislation at Westminster.

7)  An alternative approach to dealing with copyright for those pupils who are not copyright exempt is to negotiate amendments to licences held by schools and local authorities with the Copyright Licensing Agency.

# Disability Equality Duty and Copyright legislation

The Disability Equality Duty is a duty on public bodies to promote disability equality that came into force in December 2006. There are two duties: a general one and a specific one.

## General duty

The general duty applies to all public bodies and covers:

- The need to promote equality of opportunity between disabled persons and other persons.
- The need to eliminate discrimination that is unlawful under the DDA.
- The need to eliminate harassment of disabled persons that is related to their disabilities.
- The need to promote positive attitudes towards disabled persons.
- The need to encourage participation by disabled persons in public life.
- The need to take steps to take account of disabled persons' disabilities, even where that involves treating disabled persons more favourably than other persons.

## Specific duty

The specific duty applies to certain public bodies (e.g. local authorities, health boards, police authorities, Scottish Ministers, Scottish Arts Council, Scottish Qualifications Authority, SSSC, Audit Scotland, Accounts Commission) and requires them to:

- Produce a disability equality scheme to enable bodies to plan, deliver, evaluate and report on measures to promote disability equality. Bodies must involve disabled people in developing their scheme.
- Produce an action plan to improve equality for disabled people, setting out key targets in employment and service provision, for example.

When applied to education, disability discrimination legislation requires local authorities to "ensure that any information that is important to enable pupils to learn or to be able to participate in school activities can be provided in an alternative form if the pupil may have difficulty reading information provided in standard written form" (Scottish Executive 2002 para. 64).

As discussed in the earlier sections of this report, many children with additional support needs have difficulty reading information provided in standard written form, for many reasons. To meet the obligations of the Disability Equality Duty and provide material in an alternative form, the school or local authority must either be able to purchase or otherwise obtain the learning resources in the particular format required, or, if the resource does not exist in that format, create the alternative format resource 'in house'.

However, such adaptation is illegal under Copyright legislation, for the majority of children who require alternative formats, unless permission is obtained from the publisher or rightsholder.

The Copyright, Designs and Patents Act 1988[94] restricts copying or adaptation of published works to the owner of the copyright and to licence holders. Most local authorities in Scotland have a 'photocopy' licence with the Copyright Licensing Agency which permits 5% of a work to be copied, but this is clearly insufficient for children with additional support needs who require to read 100% of a textbook.

# Copyright (Visually Impaired Persons) Act 2002

## Copyright Licensing Agency Photocopy Licence

The CLA Photocopy licence for schools in Scotland[95] contains a section drawn from the Copyright (Visually Impaired Persons) Act 2002[96], which states that a local authority in Scotland (the Licensee) can make accessible copies for a student (the Authorised Person) who is 'visually impaired'. (Note also that there are some publications that the CLA licence does not cover – the CLA web site http://www.cla.co.uk has a list of exempted works.)

The definition of a "visually impaired person", in accordance with s.31F (9) of the Copyright, Designs and Patents Act 1988 is a pupil:

>   (a) who is blind;

>   (b) who has an impairment of visual function which cannot be improved, by the use of corrective lenses, to a level that would normally be acceptable for reading without a special level or kind of light;

>   (c) who is unable, through physical disability, to hold or manipulate a book; or

>   (d) who is unable, through physical disability, to focus or move his eyes to the extent that would normally be acceptable for reading.

An employee of the local authority can therefore legally make and supply an accessible copy of any book or other publication that is covered by the CLA licence, for any pupil who meets the definition above in the local authority without having to ask permission from, or notify, the publisher. If the pupil does not meet the definition, permission must be obtained from the publisher to adapt the book.

Staff, pupils or parents are legally obliged to check whether an accessible copy exists, and if so, buy or obtain it, if possible, before making their own accessible copy.

The definition (d) above is likely to apply to pupils with 'visual dyslexia': for example, those who perceive the text to flicker or move, who have difficulty scanning accurately along the text and moving from line to line, and as a result, who experience headaches and eyestrain when reading for any length of time, because these visual problems are due to difficulties in focussing or tracking.

However, this dispensation does not apply to the majority of pupils who have difficulty with standard written text as a result of:

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[94] Copyright, Designs and Patents Act 1988,
http://www.opsi.gov.uk/acts/acts1988/Ukpga_19880048_en_1.htm
[95] CLA Licence applying to Schools of Scottish Councils
http://www.cla.co.uk/support/schools/index.html
[96] Copyright and Visually Impaired Persons Act 2002,
http://www.opsi.gov.uk/acts/acts2002/20020033.htm

- learning difficulties (specific or general);

- hearing impairment;

- speech and language difficulties;

- autistic spectrum disorder, for example.

A number of authors have noted that as a result of the restrictions on which disabled people are exempt, copyright exemption law appears itself to discriminate against most groups of disabled pupils.

## The 2002 Copyright Act in practice

Earlier sections of this report have noted that:

- staff in schools spend considerable time and effort writing to publishers and rights holders to request permission to adapt books and learning materials;

- adapted materials cannot be shared (for example, given to another school for use by a pupil with a print-disability, who is not covered by the 2002 VIP Act) without obtaining permission again from the rights holder;

- services and agencies (such as local authority visual impairment or sensory services) who have already produced adapted materials cannot legally provide materials to pupils who could benefit from them and who are not covered by the 2002 VIP Act – it is legal for a Sensory Service to create materials for a visually impaired pupil, but illegal to give those same materials to a child with a hearing impairment, for example;

- there is widespread confusion in schools and local authorities regarding what can be adapted and for whom; for example most staff in schools are not aware that they can share adapted resources for pupils who are covered by the VIP 2002 act;

- most pupils with additional support needs are not able to access learning resources in accessible formats.

## Copyright Licensing Agency 'VIP' licence

As discussed above, the standard CLA photocopy licence permits materials to be adapted and provided across a local authority for children covered by the 2002 VIP act, but wider dissemination (i.e. outwith the local authority) is not permitted under that licence. CLA has another licence available to 'Approved Bodies' (educational establishments or not-for-profit bodies) which "is specifically designed for those not-for-profit bodies who make accessible editions for circulation outside their organisation."[97] This free CLA 'VIP' licence[98] permits an agency to create an accessible version of a resource and to distribute the copy to pupils covered by the 2002 act. The licence allows the organisation to "make a charge for the supply of the copy no greater than the cost of production". The Approved Body is obliged to check to establish if a suitable accessible version is commercially available and if so, is not permitted to create another one. The VIP licence requires the Approved Body to 'notify' the publisher or rightsholder that an

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[97] CLA  VIP Licensing Scheme: Guidelines For Licensees,
www.**cla**.co.uk/**licensing**/**CLA**%20VI%20guidelines.doc
[98] CLA VIP Licence, www.**cla**.co.uk/**licensing**/FINAL**VIP**-Licence-29-10-03.pdf

accessible copy has been created, and this is achieved by reporting the copy on Revealweb (www.Revealweb.org.uk).

Revealweb is an online database of accessible books and resources. By registering an accessible copy on the web site, other Approved Bodies and individuals covered by the 2002 VIP act can then locate resources. Revealweb lists over 100,000 titles in alternative formats available from 146 sources in the UK. The majority of the titles are in formats for blind and partially sighted people and most of the Approved Bodies will only supply to people who are visually impaired (see Section 7). Revealweb is supported and managed by The Royal National Institute of the Blind (RNIB) and National Library for the Blind (NLB), and is funded by The Department of Culture, Media and Sport (DCMS); Resource, the council of museums, libraries and archives; The British Library Co-operation and Partnership Programme; The Lloyds TSB Foundation; The Ellerman Foundation; RNIB and the NLB.

# What might be done to address restrictions

This short section is intended as a lead-in to Sections 13 and 14 of the Books for All report. It describes briefly some practical steps that could be taken to address limitations imposed by copyright exemption introduced under the 2002 Copyright VIP act.

## Raise awareness of existing copyright exemption

It would be helpful to raise awareness of copyright exemption and the fact that it applies not just to pupils who have difficulty seeing print. Throughout the period in which we have carried out the Books for All project we have, with one exception, noted a complete lack of awareness about who the current copyright exemption legislation applies to and who is not exempt. For example:

- Major voluntary organisations that work with people who cannot hold books or turn pages are unaware that copyright exemption applies to them.

- Staff at all levels of local authorities – from senior management to classroom assistants – if they are aware of the act, believe it applies only to visually impaired pupils.

- All local authority transcription services and producers of materials in alternative formats should be encouraged to take out a free CLA VIP licence. Local authorities and school-based VI transcription services mostly do not hold a CLA VIP licence. This means that the materials they produce can be used only by pupils in their local authority. Pupils in other authorities cannot benefit.

- Many VI services are unaware of the need to, and do not check Revealweb for the availability of materials before they produce them.

- Those VI services that do produce materials generally do not notify Revealweb, therefore if another service were to check for availability they would not be found. While this is not breaking the law, and it could be argued the materials would be of limited value outside Scottish education so not worth posting information about them on a UK site, it does mean that the same materials can be produced several times over: an inefficient use of resources.

## Extend copyright exemption

The single most important step that could be taken to improve accessibility to print materials for those who are not visually impaired is to extend copyright exemption to the wider group of print disabled people. By extending exemption copyright legislation would reflect other disability legislation in the UK.

Such a step would come under disability discrimination legislation, which is a policy matter reserved to the UK Westminster Parliament; neither the Scottish Executive nor local authorities can progress on their own. Nonetheless the Scottish Executive could raise this matter within Westminster.

## Produce accessible resources more efficiently

One of the most time-consuming parts of the process of creating accessible books is that of scanning the material into the computer. Some publishers (e.g. Harcourt, OUP, Leckie and Leckie) are able and willing to provide digital versions of the material (usually in PDF) where files exist. However, traditionally, printers rather than publishers keep PDF files of materials and sometimes it can be difficult or costly to obtain these files.

A number of steps are currently being taken by the Museums, Libraries and Archives (MLA) Council (see Section 13) and RNIB to encourage publishers and others to create a repository of digital source files which could then be accessed in appropriate formats. Any service development in Scotland should have regard to the future potential of these new arrangements and in particular they should not be limited only to people who are visually impaired.

## Negotiate licences with publishers through CLA

Although the Copyright (Visually Impaired Persons) Act 2002 restricts the creation and distribution of accessible learning resources, the limitations can be addressed by responsible bodies by requesting permission from publishers and rightsholders to adapt materials for pupils who cannot use standard texts and who are not covered by the 2002 exemption.

Typically, permission is requested and granted for adaptation of a book for an individual pupil, leading to duplication of effort for both education staff and publishers: staff all over the country request permission to adapt the same books for different pupils. A more efficient approach would be for local authorities to negotiate licences with publishers, or preferably for COSLA or another body representing education in Scotland to negotiate a licence with CLA that would enable local authorities to meet their obligations under the Disability Equality duties.

The relevant sections of the CLA licences could then apply to all persons with a print disability, not just those covered by the copyright VIP act. The current definition and a possible new wording drawn from a report from the Scottish Executive Disability Working Group are given below.

Currently, the CLA licences allow adaptation of materials for a pupil:

- "who is blind;

- who has an impairment of visual function which cannot be improved, by the use of corrective lenses, to a level that would normally be acceptable for reading without a special level or kind of light;

- who is unable, through physical disability, to hold or manipulate a book; or

- who is unable, through physical disability, to focus or move his eyes to the extent that would normally be acceptable for reading."[99]

A more equitable licence would allow adaptation of materials for pupils who

"cannot obtain access to information in a print format because they:

- are blind or vision impaired;

- have physical disabilities which limit their ability to hold or manipulate information in a printed form;

- have perceptual or other disabilities which limit their ability to follow a line of print or which affect their concentration;

- cannot comprehend information in a print format due to insufficient literacy or language skills."[100]

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[99] Section s.31F (9) of the Copyright, Designs and Patents Act 1988 as amended by the Copyright (Visually Impaired Persons) Act 2002.
[100] Witcher, S. (2006) Report of the Disability Working Group. Scottish Executive. ISBN: 0-7559-5141-7. Available from http://www.scotland.gov.uk/Publications/2006/10/16092613/0

# SECTION 13  MODELS OF PROVISION

**Objective 13: To design and evaluate potential models of service provision for providing accessible curriculum materials especially local v. national forms of delivery, or some combination thereof.**

**Outcome:** **Analysis of potential models for service delivery and in particular, options for local versus national forms of delivery. Models are evaluated against criteria developed as a result of Sections 1 to 12.**

## Summary

1) Two models (Models A and B) of service provision are considered in terms of meeting criteria of: inclusion and equity; the range of alternative formats that the model would produce; addressing the issues of copyright for pupils who are currently not exempt; supporting local authorities to fulfil legal duties; feasibility and scalability.

2) The recommended model of provision (Model A) addresses the needs of all pupils with print disabilities in Scotland. It will reduce duplication of effort, improve access to the curriculum, increase pupils' independence and we believe that implementation of the model is feasible and affordable.

3) The recommended model is also designed to extend and fit into anticipated developments in other parts of the UK as and when these occur, with the ultimate aim of establishing UK-wide provision for all people (i.e. adults as well as children) with any identifiable print disability (i.e. not just the visually impaired). This UK-wide provision is referred to as Model B.

# Criteria for comparison and evaluation of models

The following criteria for comparing potential models of service provision were devised, based on the findings reported in Sections 1 to 12.

## Inclusion and equity

The service model should address the literacy support needs of as many print-disabled pupils as possible in an equitable manner.

## Range of Alternative Formats

In order to achieve inclusion, the service model should enable provision of a range of learning materials (reading books, textbooks, worksheets, assessment materials, test and examination papers) in a range of alternative formats to meet the access needs of all pupils with print disabilities.

## Support to local authorities to fulfil legal duties

Local authorities are responsible for education of pupils within the authority, and to fulfill duties under Disability Equality and Additional Support for Learning legislation. The model should support local authorities in carrying out these duties.

## Copyright

Copyright law currently permits books and other paper-based learning materials to be adapted for use by some groups of print-disabled children, but not others. The model should include measures to deal with copyright issues to ensure that all print-disabled children have equal access to accessible materials in an appropriate format.

## Feasibility and efficiency

Implementation of a service model should be feasible, practical and cost effective and should be achievable within a reasonable time scale.

## Scalability

Implementation of a model of provision should allow for future development and expansion. While the main target groups are those pupils with an identifiable disability (i.e. learning difficulty, physical disability, visual impairment, hearing impairment) consideration should also be given to the potential use of materials in alternative formats by the wider school population.

# Models of service provision

There are many potential models of service provision for providing accessible curriculum materials and after research and analysis, we have identified two to describe and consider in this report. The two models are:

Model A: A model for Scottish national provision serving the needs of all print-disabled pupils in Scotland. Given the timescales and challenges of implementing UK-wide provision of accessible learning materials (Model B), and the urgent need for action to support pupils in Scotland, we recommend that the Scottish Executive, in partnership with local authorities, relevant agencies such as the National Library of Scotland, Learning and Teaching Scotland and the CALL Centre, and voluntary organisations such as RNIB Scotland, Dyslexia Scotland and Capability Scotland, explores implementation of this Model.

Model B: A model of UK national provision serving the needs of all print-disabled citizens (adults and children). This is an aspirational model which will require a number of legislative and policy developments at a UK level. It is described here to outline the overall situation across the UK, and because it is important to consider how initiatives to provide accessible resources within Scottish education fit within the wider UK perspective. Note that even if Model B were to be implemented, Model A would still be required in order to support local authorities in fulfilling duties under legislation.

The scope of this Books for All report concerns the literacy support needs of pupils in Scotland, and we believe that Model A is achievable in the short term to meet the support needs of pupils with print disabilities in Scotland.

# Scottish Accessible Learning Resources Network (Model A)

The Model described in this section will be designed according to the criteria we set out above.

## Inclusion

The model of service provision of accessible learning materials addresses the needs of all print-disabled pupils in Scotland. Provision should not be restricted to any one single disability group (e.g. pupils who are visually impaired), or to only those groups who are currently covered by copyright exemption (e.g. those with visual or physical impairment). Model A concentrates on supporting pupils who have a disability and are therefore covered by Disability Equality legislation, but has potential to be extended to other children with additional support needs, such as those with English as an Additional Language or children who are temporarily hospitalised. Figure 13.1 illustrates the main groups of disabled pupils who are supported by this model of provision.

We estimate that a minimum of 4% of the Scottish school population would benefit from materials in accessible alternative formats – those pupils who have been identified with additional support needs as a result of specific learning difficulties, physical, visual or hearing impairment, and/or speech and language and learning difficulties. The number of pupils who will benefit is likely to be larger given that 7% of candidates who sat SQA examinations required support to read question papers and/or write and record answers, and on feedback and responses from schools which suggest that 12 to 14% may potentially benefit (see Books for All section 3).

| | | | |
|---|---|---|---|
| Physical impairment | Specific Learning Difficulties inc Dyslexia | Visual impairment | Hearing impairment Deafblind |
| Autistic Spectrum Disorder | Mild & moderate learning difficulties | Speech and/or language impairment | Severe & complex learning difficulties |
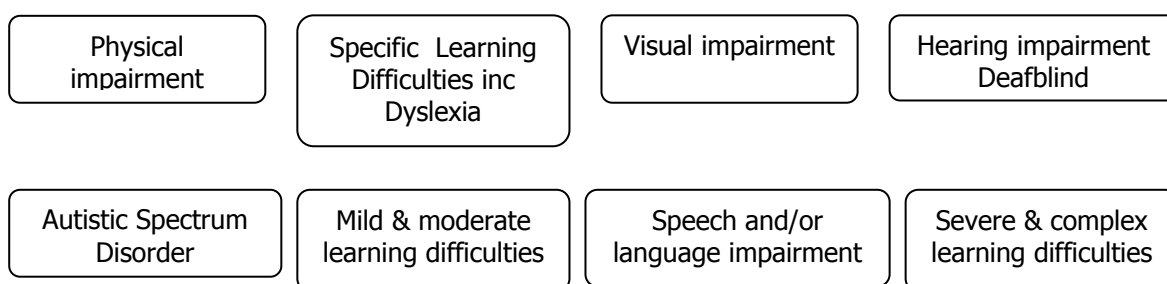
Figure 13.1: Pupils to be supported by the model

## Range of alternative formats

The model of provision aims to ensure that all necessary accessible formats are equally available to any child who has difficulty with the standard written form. These formats include:

**Printed materials:**

- Adapted print (e.g. on coloured paper, in a different font, different spacing etc);
- Large print (in a range of sizes);
- Simplified text;
- Symbolised print;
- Braille.

**Audio formats:**

- Cassette & CD;
- MP3;
- Daisy Talking Book.

**Digital or electronic text and multimedia formats (eText), e.g.:**

- MS Word (DOC);
- PDF;
- RTF;
- HTML;
- Kurzweil (KES);
- Daisy;
- MS PowerPoint (PPT);
- Clicker (CLK);
- Textease (TE).

Figure 13.2 inserts examples of accessible formats required within Model A.

| **Physical impairment** eText, audio | **Specific Learning Difficulties** Adapted print, eText, audio | **Visual impairment** Adapted / large print, Braille, eText, audio | **Hearing impairment** Deafblind Adapted print, eText, signed video |
|---|---|---|---|
| **Autistic Spectrum Disorder** Adapted print, symbolised print, eText, | **Mild & moderate learning difficulties** Adapted print, symbolised print, eText, audio | **Speech and/or language impairment** Adapted print, symbolised print, eText, audio | **Severe & complex learning difficulties** Adapted print, symbolised print, eText, audio |

Figure 13.2:  Pupil groups and required formats

For convenience in Figure 13.2, we have grouped all audio formats together as 'audio' and all digital or multimedia materials as 'eText', but it is important to note that different pupils require different types of materials within these format options. For example, most pupils can access audio materials in MP3 format but some pupils with significant visual impairment may require resources in Daisy Digital Talking Book format; pupils with more severe and complex difficulties might require eText in the form of symbolised digital resources, accessible through switch or touch-screen; while dyslexic pupils might use digital text with support from text-reading software.

## Support to local authorities to fulfil legal duties

Education authorities have a duty to provide education for all pupils including those with disabilities and additional support needs. The duty does not lie with the Scottish Executive, with voluntary organisations or with other agencies.

Therefore the primary source of accessible learning materials should be through local authority services and structures. In Sections 1 to 12 we noted that many children require materials adapted to their particular needs and that in many cases this can only be done with local expertise and knowledge. This principle does not require individual schools to always work through local authority services – if a school can obtain materials directly from a commercial, local authority or voluntary provider for example, then the school should be able to do so – but it does recognise the central role and responsibility borne by the local authority.

Many educational resources such as workbooks and worksheets are generated by individual teachers in schools and the creation of accessible versions of these materials is the responsibility also of the local authority. In most cases the rights to such products – both paper and alternative format – belong to the local authority.

We noted earlier that availability of accessible materials for certain pupils with a visual impairment (those who use Braille and large print) is relatively good in comparison to availability of accessible learning materials for pupils with other types of print disabilities.

Model A should therefore stimulate the development of local authority services on an equitable basis: if a local authority provides Braille copies for a blind child, so too should it provide accessible digital books, for example, to children who are physically unable to handle paper materials. Where a local authority has developed a Visual Impairment Transcription Service or arranged contracts with external suppliers to produce Braille, large print and audio books for blind and partially sighted children, so it should consider how adapted print, print with symbols, audio and digital materials can be produced and distributed throughout the local authority for dyslexic, hearing impaired and physically disabled children and those with learning disabilities.

There are also a number of national government and voluntary organisations that support local authorities and Model A must take account of these agencies and their current and potential roles. In order to ensure equity and inclusion for all groups of print-disabled children, the model of provision must involve agencies representing and supporting children with different disabilities. Model A is therefore not designed around the needs of pupils with one type of impairment.

Figure 13.3 illustrates how a local authority (or other responsible body) relates to pupils whose print-disabilities arise from impairments, and also adds government, voluntary organisations and publishers to Model A of service delivery.

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┌─────────────────────┐   ┌─────────────────────┐   ┌─────────────────────┐
│    Voluntary        │   │ Scottish Executive  │   │  Publishers and     │
│ organisations and   │◄─►│   and national      │◄─►│    publishers'      │
│    providers        │   │  funded agencies    │   │   associations      │
│ e.g. RNIB, Dyslexia │   │ e.g. LTS, HMIe, SQA,│   │   e.g. CLA, PLS     │
│ Scotland, Capability│   │   National Library  │   │                     │
│ Scotland, RNID, SSA,│   │  of Scotland, CALL, │   │                     │
│       etc           │   │      SSC, etc       │   │                     │
└─────────────────────┘   └─────────────────────┘   └─────────────────────┘

              ┌────────────────────────────┐
              │  Local Authority Accessible│
              │  Learning Resources Services│
              └────────────────────────────┘
```

| Physical impairment | Specific Learning Difficulties | Visual impairment | Hearing impairment |
|---|---|---|---|
| eText, audio | Adapted print, eText, audio | Adapted / large print, Braille, eText, audio | Deafblind Adapted print, eText, signed video |

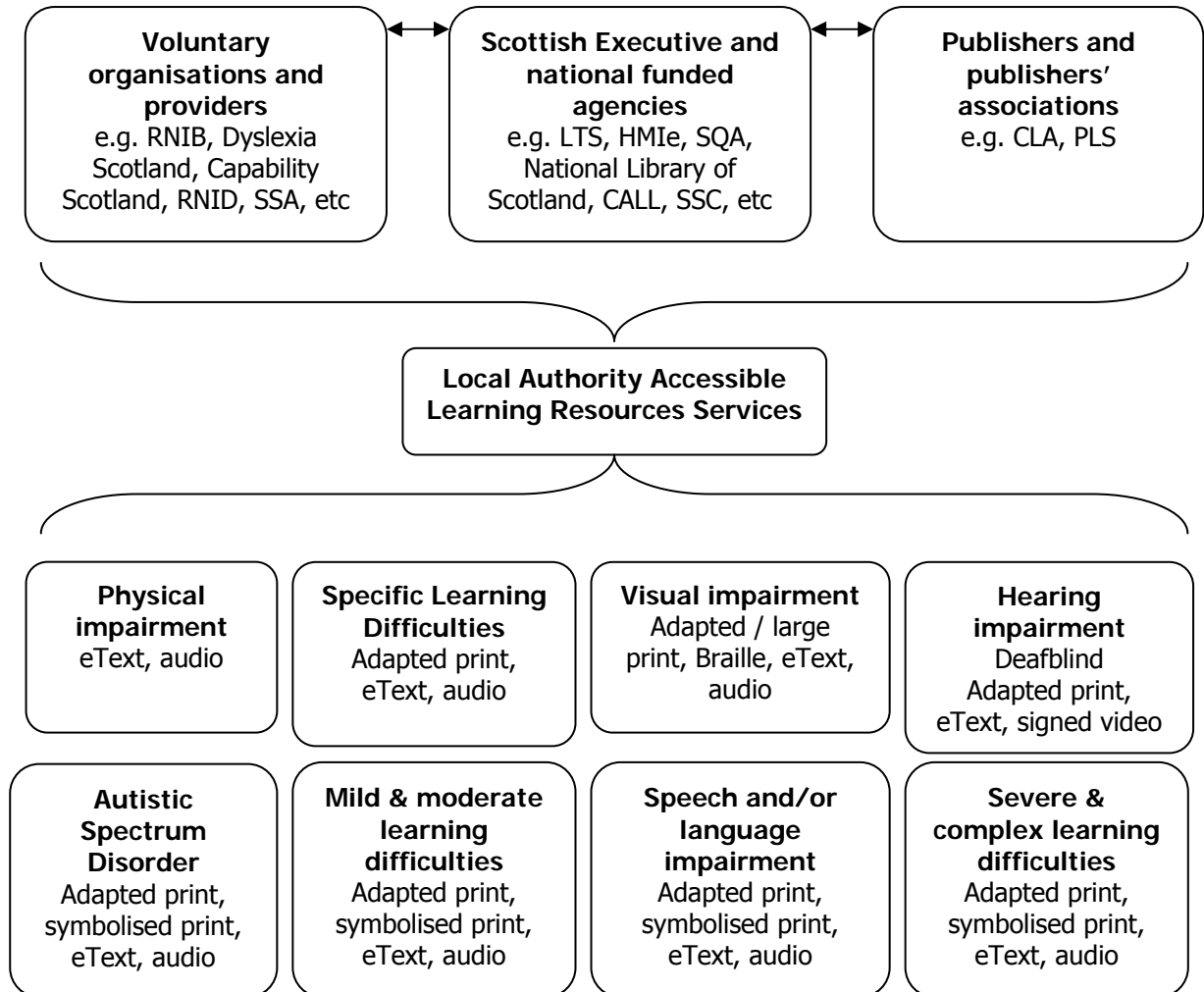| Autistic Spectrum Disorder | Mild & moderate learning difficulties | Speech and/or language impairment | Severe & complex learning difficulties |
|---|---|---|---|
| Adapted print, symbolised print, eText, audio | Adapted print, symbolised print, eText, audio | Adapted print, symbolised print, eText, audio | Adapted print, symbolised print, eText, audio |

Figure 13.3:  National and local authority provision

## Copyright

### Raise awareness of existing copyright exemption

It is necessary to raise awareness of the copyright exemption established in the 2002 Copyright (Visually Impaired Persons) Act[101] and the fact that it applies not just to pupils who have difficulty seeing print. Throughout the period in which we have carried out the Books for All project we have, with one exception, noted a complete lack of awareness about who the current copyright exemption legislation applies to and who is not exempt. For example:

- Major voluntary organisations that work with people who cannot physically hold books or turn pages are unaware that copyright exemption applies to them.
- Staff at all levels of local authorities – from senior management to classroom assistants – if they are aware of the Copyright VIP 2002 Act, believe it applies only to visually impaired pupils.
- Currently, local authority transcription services only serve pupils with a visual impairment and work under the Copyright VIP Act to make accessible copies available to pupils within their own local authority. There is little sharing of materials between authorities.
- Many VI services are unaware of the need to, and do not check Revealweb[102] for the availability of materials before they produce them.
- There is in fact a provision for authorities to share resources made for pupils who fall within the Copyright and VIP Act definition: the (free) Copyright Licensing Agency 'VIP' licence (CLA 2003) is designed for this purpose. Local authority transcription services in Scotland should therefore be encouraged to take out a CLA VIP licence so that materials produced can be used by pupils and services in other local authorities.

Note that providers listed on Revealweb can only legally provide materials to people who are copyright-exempt and the majority of the materials listed are Braille, Large Print and audio for people with a visual impairment, so that even if local authority services made better use of Revealweb, it would not benefit the majority of pupils with a print disability in Scotland.

### Provision for groups not covered by copyright exemption

Copyright exemption regarding the creation of accessible materials currently applies to a sub-set of print-disabled groups. Since copyright law is a reserved matter Model A must aim for materials to be provided for non-exempt groups by negotiating licences with the publishers and/or the Copyright Licensing Agency. The model includes licensing at both national, local authority and possibly school levels.

For some publications, the most efficient and cost-effective approach may be for a licence to be negotiated on a national basis: for example, in respect of titles that are used by a majority of schools in Scotland. Such negotiation might be

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[101] Essentially, this gives freedom to create and provide accessible copies for anyone who is visually impaired, physically unable to use books, or has a physically difficulty tracking or focussing their eyes. See Books for All section 12.
[102] www.Revealweb.org.uk; the online database of over 100,000 accessible titles, mainly in Braille, Large print and audio; see Books for All Section 7.

undertaken by COSLA or another agency that can represent all local authorities and other responsible bodies.

Similarly, for other titles which may be used by only one or two local authorities, the local authority may wish to obtain permission or negotiate a licence to create accessible materials for pupils who "have difficulty reading information provided in standard written form" but who are not covered by the Copyright VIP 2002 act, by:

- seeking permission from rightsholders to create and provide materials across the authority (thereby avoiding the current duplication of effort whereby staff in schools seek permission and then adapt the same books);
- negotiating a licence with CLA to adapt the materials.

Such provision is likely to be regarded as 'reasonable' under Disability Equality legislation: "Similarly, they could consider implementing a strategy to make curriculum resources, that are currently paper-based (such as textbooks or worksheets), available in common electronic forms to assist pupils with visual or learning difficulties." (Scottish Executive 2002, para. 41).

It is also necessary for schools to approach publishers independently in order to request permission to adapt specific titles because in most cases the purchase of books and resources is devolved to individual schools and/or departments in schools.

Given that schools source books and learning materials on an individual basis, and yet local authorities have a responsibility for developing accessibility strategies and for improving the delivery of information, then action will be required both at local authority level, and in schools, to coordinate the production, distribution and sharing of accessible resources.

Comments made to the Books for All project team from staff and publishers suggest that educational publishers such as Harcourt Education (Heinemann, Ginn, Rigby, Payne-Gallway), Oxford University Press and Leckie and Leckie are in principle happy to give permission for publications to be adapted for pupils with print disabilities. At present, permission is requested and granted for adaptation of a book for an individual pupil, which does, as noted previously, lead to huge duplication of effort for both education staff and publishers: staff all over the country write to request permission to adapt the same books for different pupils. A more efficient approach, as we have outlined, would be for local authorities to negotiate licences with publishers, or preferably for COSLA or another body representing education in Scotland to negotiate a licence with CLA that would enable local authorities to meet the obligations under the Disability Equality duties.

**Reconciling Disability Equality and Copyright legislation**

Disability Equality legislation requires responsible bodies to provide resources in alternative formats, while Copyright law restricts such provision to a small proportion of children who require accessible texts. This anomaly can only be addressed by changes to legislation at a UK level, or by amendments to licensing. The Right to Read Campaign is calling for action on a UK basis to ensure that all print-disabled people "have the Right to Read the same book, at the same time, at

the same price".[103] In our view, unless copyright exemption is extended to all print-disabled groups, any progress made by the Campaign will further increase the gap in provision between the visually impaired and other print-disabled children (including, as we have seen, those who are exempt but whose needs are not being met). The Right to Read Alliance is also lobbying for the law to be extended "to all people who have difficulties reading normal printed text who are covered by the Disability Discrimination Act 1995"[104] which would bring copyright law in the UK into line with other countries. In the U.S., for example, the 1996 Chafee Amendment states that:

"it is not an infringement of copyright for an authorized entity to reproduce or to distribute copies or phonorecords of a previously published, nondramatic literary work if such copies or phonorecords are reproduced or distributed in specialized formats exclusively for use by blind or other persons with disabilities" [US Public Law 104-197 Chafee Amendment to chapter 1 of title 17, section 21].

This amendment applies to people who have learning disabilities as well as those with visual, perceptual or physical difficulties.

It is possible that the CLA might extend the scope of the existing licences to cover groups who are covered by the DDA, but who are not currently exempt under the Copyright VIP Act. This would appear to be a reasonable interim solution to the current inequitable situation whereby a school or local authority can adapt materials for one pupil who has reading difficulties because of a visual problem, but not for another who cannot read because of phonological or language difficulties.

## Feasibility and efficiency

### Reduce duplication

As we have reported there is considerable duplication of effort between schools and between local authorities with regard to the creation of accessible learning materials. In part this is due to the restrictions imposed by copyright law which allows materials to be distributed easily to some print-disabled children but not all. It is also due to lack of awareness: teachers and service providers are simply not aware of what can and cannot be legally created and shared. Lastly, it is due to a lack of suitable mechanisms for cataloguing and sharing materials between schools within local authorities, and between local authorities and services. Model A addresses all of these issues. Measures to address copyright restrictions have been outlined above.

### Awareness and expertise

The model is based upon local authorities, as responsible bodies, coordinating the provision of accessible learning resources to pupils within the authority. The lack of provision revealed in this project suggests that local authorities are not taking adequate action in this regard and we therefore recommend that support is given to authorities to encourage and assist the establishment of effective provision.

We believe that most local authorities already have the required components for such a service, but that they could benefit from tailored advice or consultancy,

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[103] Right to Read Campaign, http://www.rnib.org.uk/xpedio/groups/public/documents/publicwebsite/public_r2rdeclaration.hcsp
[104] Right to Read Campaign, http://www.dyslexia.org.uk/r2r.php

plus training and CPD, to make best use and deliver best value. Model A therefore includes a development role for a unit, to be funded nationally, to deliver such support.

**Cataloguing and sharing resources**

Provision of accessible materials is already made for some pupils with visual impairments in most local authorities but as we have noted earlier, resources are not shared between services: none of the Scottish transcription services are listed on Revealweb, for example.

Duplication could be reduced by sharing resources nationally as well as within local authorities. There are several possible options for cataloguing and sharing accessible learning resources:

- retain the status quo – local authorities could share information and resources as and when they see fit;
- use Revealweb;
- create a dedicated system, which we are calling a Scottish Accessible Learning Resources Network.

We recommend the third option. The status quo is rejected because it will not improve availability of accessible books; and we have doubts whether local authority services will take out CLA VIP licences in order to notify and share materials and resources (across the UK) via Revealweb. Even if they did it would not benefit the majority of print-disabled pupils who are not exempt from copyright law because Revealweb can only be used to catalogue and share materials for those people who are copyright exempt.

The Scottish Accessible Learning Resources Network would be responsible for:

- stimulating development and operation of local authority accessible resources services;
- negotiating copyright on specific titles for (Scottish) national use;
- liaising with relevant government, voluntary and commercial agencies;
- operating a cataloguing and resource-sharing mechanism (which includes a national file repository).

Sections 7 to 11 have shown that considerable efficiencies and improvements in provision are possible by establishing file repositories of source digital versions of curriculum resources, and a national repository is suggested in Model B. Model A assumes that local authorities will establish their own repositories (e.g. for materials which are created originally within the local authority or for materials that are heavily used by the authority) and that there should be a mechanism for sharing files between local authorities. This could take the form of a Revealweb-style database and/or a file repository. It is our view that the Network should establish a file repository to collate and produce digital versions of commonly used Scottish curriculum resources in order to stimulate and support the development of services in local authorities, and improve efficiency of production. We believe that the agency running the file repository should be centrally funded and independent of any single disability group in order to ensure that all print disabled pupils are supported equally. The formats provided by the repository should be PDF (as provided by publishers) and Microsoft Word (as the core format which can be used to generate other accessible formats).

The Scottish Accessible Learning Resources Network bank would link to any developments that might take place on a UK basis; for example as described later in this section discussing Model B.

**Feasibility**

We believe that the implementation of this model is feasible and cost-effective.

Local authorities will have to broaden their scope to include the production of accessible resources for children who have a wider range of print disabilities than visual impairment. We believe that this can be achieved by better organisation of existing efforts to create accessible learning resources to reduce duplication of production. In many local authorities, much work has already been done: services will already have electronic versions of many books which were created in order to generate large print and Braille formats, for example. Books for All has identified many schools where accessible materials have been created and could, with due negotiation over licensing, be shared across and outwith the authority.

Resources are required to establish the Scottish Accessible Learning Resources Network but again we believe that the major components of this already exist. The Network is not a national transcription service, but a mechanism for coordinating the activities of national agencies and local authority providers.

## Scalability

Implementation of Model A can be tackled in stages, but it is vital that any staged development is progressed in terms of construction of the overall model (as opposed to the development of a single vertically integrated service for one user group). The establishment of mechanisms for negotiating copyright, creating resources, cataloging and sharing will be extendable to the wider school population if necessary.

## Scottish Accessible Learning Resources Network

The Scottish Accessible Learning Resources Network would be a body independent of any single disability group and would undertake the following roles:

- liaison with SEED, COSLA and publishers' associations and CLA over national licensing for production of accessible resources;
- provision of advice and consultancy to local authorities;
- staff development for local authority staff involved in production of accessible resources;
- mechanisms for electronic file storage of materials and cataloguing and sharing resources.

Figure 13.4 illustrates agencies involved in the Scottish national provision of accessible learning resources.

Figure 13.5 focuses on how a local authority might provide services to different groups of pupils with disabilities (with service provision organised by disability group), while Figure 13.6 illustrates provision according to the type of support required. These two models are offered to demonstrate that authorities have the responsibility and the right to develop models to suit their own circumstances.

**Figure 13.4: Scottish Accessible Learning Resources Network**

**Figure 13.5: Local Authority provision by pupil group**



| | |
|---|---|
| **Pupils:** physically impaired<br>**Formats:** eText, audio, switch-accessible<br>**Copyright:** exempt | **Pupils:** visually impaired<br>**Formats:** eText, Braille, large print, audio<br>**Copyright:** exempt |

Pupils: Autistic Spectrum Disorder
Formats: Adapted print, symbolised print, eText, audio
Copyright: not exempt

Pupils: hearing impaired & deafblind
Formats: eText, adapted print, signed video schools
Copyright: not exempt

Local Authority Coordination (Library services?)
- File storage
- Cataloguing
- Distribution
- Security, record keeping and audit
- Liaison with SEED, SALRON, other local authorities
- Liaison with CLA & publishers

Pupils: Mild/moderate learning difficulties
Formats: eText, symbolised, audio, switch-accessible
Copyright: not exempt

Pupils: Severe & complex
Formats: Adapted print, symbolised print, eText, audio, switch-accessible
Copyright: some exempt, some not

Pupils: specific learning difficulties / dyslexic
Formats: eText, adapted print, audio
Copyright: some exempt, some not

Pupils: Speech and/or language impairment
Formats: Adapted print, symbolised print, eText, audio
Copyright: not exempt

Provision may be extended to additional support for learning groups such as:

Pupils: English as Additional Language
Formats: various
Copyright: not exempt

Pupils: Travellers
Formats: various
Copyright: not exempt

Pupils: Temporarily hospitalised
Formats: various
Copyright: not exempt

**Figure 13.6: Local Authority provision by nature of support need**

Local Authority Coordination
(Library services?)
- File storage
- Cataloguing
- Distribution
- Security, record keeping and audit
- Liaison with SEED, SALRL, other local authorities
- Liaison with CLA & publishers

Printed materials:
- Adapted print (e.g. on coloured paper, in a different font, different spacing etc)
- Large print (in a range of sizes)
- Simplified text
- Symbolised print
- Braille

Audio formats:
- Cassette & CD
- MP3
- Daisy Talking Book

Digital or electronic text and multimedia formats, e.g.:
- MS Word (DOC)
- PDF
- RTF
- Kurzweil (KES)
- Daisy
- MS PowerPoint (PPT)
- Clicker (CLK)
- Textease (TE)

# UK Provision of Accessible Books for Print-Disabled People (Model B)

Most books published in the UK are published on a UK-wide basis: publishers are required to lodge a copy of every newly published book with the British Library; copyright exemptions for visually impaired people and those who have difficulty holding books and turning pages apply across the UK; Disability Equality duties apply in all parts of the UK; and key relevant agencies operate across the UK.

Therefore, initiatives to create and distribute books in accessible formats (including Model A above) must be considered in relation to a UK perspective.

One possible model for UK-wide creation and distribution of accessible books has been proposed and described in some detail in a report commissioned and published by the Museums, Libraries and Archives Council in 2005 (MLA, 2005).

We endorse this model, subject to one crucial and significant amendment: the model proposed in the MLA report focuses only on the needs of people who are visually impaired, and as we have demonstrated throughout this report, the scope of such a service must be broadened to include all people with print disabilities.

The MLA report recommends exploring mechanisms for sourcing and storing digital files, and RNIB and the Publishers Licensing Society (PLS) are currently investigating how published material could be made available in digital form, for conversion into large print, Braille, and audio products[105]. This is a small-scale exploratory project – to date 120 files have been provided by 7 publishers – but results should be helpful to inform progress towards effective UK provision of materials in accessible format. However, like the MLA report, the project is limited in scope and is concerned only with the production of materials for blind and partially sighted people.

(As part of the Books for All project we also contacted a small number of publishers in order to explore the range of digital formats available and received 718 samples of textbooks and worksheets in different electronic formats from Harcourt and Oxford University Press. Clearly publishers are willing to explore collaboration.)

In this section we describe the MLA UK-wide model, and how it could be expanded to include other groups in addition to the visually impaired population.

The MLA report outlines five roles (**not** organisations) required for provision of books in alternative formats:

- Publisher;
- Repository;
- Service provider;
- Public library;
- User.

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[105] PLS Visually Impaired Persons project, http://www.pls.org.uk/ngen_public/article.asp?aid=337

## Publisher

Publishers would submit an electronic PDF file to a central UK repository for every book published (on the same basis as they submit a paper copy to the British Library at present). Publishers would be encouraged but not required to also submit files in other formats such as XML, where possible.

## Repository

The repository provides a secure, trusted environment for receiving, storing, disseminating and auditing distribution of digital files. Service providers (see below) would draw files from the repository and convert them to suitable accessible formats. The MLA report suggests that the repository may also convert PDF files from publishers into other formats (e.g. XML and/or the developing US NIMAS standard [106]) and the report notes a number of tools, methods and commercial services for converting PDF to other file formats. The PLS/RNIB project mentioned above is currently exploring some of these methods. The repository may also act as a clearing house for materials in accessible formats in order to reduce duplication of effort but the majority of file conversion will be undertaken by service providers. The repository will have a role in validating and auditing service providers.

The MLA report suggests RNIB, MLA or the British Library would be suitable organisations to operate the repository. We recommend that the British Library is the natural agency to undertake this role. It is important that the agency providing the repository service is not linked to one single user population, in order to ensure equity. For example, the MLA report suggests that the repository might process files into Daisy formats, but this would not be equitable unless the repository also processed files into other formats required by other user groups. The repository should therefore be independent of organisations representing specific user groups.

## Service provider

The service providers are specialist organisations who convert the digital files into suitable accessible formats. Such service providers are likely to be voluntary organisations, local authority or school services. Service providers would be validated by the repository agency.

The MLA report lists provision of audiobooks: large print, Braille and eBooks, but this list must be extended to include other formats and providers for other print-disabled groups. The report notes that the service providers will need to have expertise in 'understanding very closely the needs of their particular audience, and how to manipulate file formats and produce output that meets their needs economically'. A range of service providers is therefore envisaged, serving different user groups and needs.

The MLA report concentrates upon meeting the needs of people with visual impairment, but as we have seen, this should be extended at least to other groups who are covered by the Copyright (Visually Impaired Persons) Act 2002.

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[106] National Instructional Materials Accessibility Standard (NIMAS), http://nimas.cast.org/

However, at present, there are very few providers that exist to serve the needs of print-disabled people who are not visually impaired (see Sections 7 and 8). Revealweb lists 146 providers of accessible materials and the majority produce Braille, Large Print and audio for blind and partially sighted people. There is therefore a need to stimulate the development of equivalent services, on a UK basis, for other groups. For example, agencies supporting people who have a physical difficulty handling books, such as the ACE Centres in England, the CALL Centre in Scotland, local authority services and individual schools, and voluntary organisations such as Scope, Capability Scotland and MND, MS and Spinal Injury associations might source digital files from the repository for conversion into suitable digital formats. Organisations working with people with specific reading difficulties or dyslexia (i.e. those who can be defined as 'unable, through physical disability, to focus or move his eyes to the extent that would normally be acceptable for reading'[107]) would be able to retrieve digital files and convert them to suitable audio, adapted print and digital formats.

However, such provision will not meet the needs of all people who have difficulty with print and who would benefit from books and information in alternative formats because copyright currently prevents provision of these accessible materials to, for example, the hearing impaired or those with reading difficulties as a result of phonological or language processing difficulties. If the groups covered by copyright exemption could be extended, or permission obtained in some other way, then organisations and services supporting Deaf and hearing impaired people might use the files in the repository to create multimedia resources with signed video; those working with people with a range of different learning difficulties would use the digital text and illustrations to create symbolised materials; and agencies working with all reading-impaired or dyslexic people (not just those with 'visual dyslexia') could obtain, adapt and supply accessible books to this user group.

Implementation of this Extended MLA model should therefore aim to address the issue of copyright through changes in legislation and/or licensing.

This model allows for a multiplicity of providers to suit the varying needs of users. Providers may be national agencies, but can also be specialist services in local authorities, colleges and universities. In Sections 3 and 4 we noted that pupils often have very specific needs which are best met by local services.

Providers would be encouraged to offer copies of materials back to the repository for distribution to other providers. Providers would be obliged to restrict access to materials to those users who require them as a result of disability, and would maintain records to that effect.

## Public Libraries

The MLA report suggest that public libraries would provide the main route for end users to access accessible books and while this is suitable for the general public, it is likely that educational establishments such as schools, colleges and universities will require other routes.

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[107]   Copyright and Visually Impaired Persons Act 2002, http://www.opsi.gov.uk/acts/acts2002/20020033.htm

## Users

The MLA report addresses the needs of blind or partially sighted people: as we have said, this coverage must be extended at least to those with copyright exemption, and in time, to other print-disabled groups.

The Extended MLA Model B is given in Figure 13.7.

**Publishers** produce PDF files

**Service providers**
a) scan and OCR paper materials
b) convert into accessible formats
c) provide to users
d) provide copies to repository

**UK Digital File Repository**

a) Accepts and stores 'raw' files from publishers
b) Accepts and stores converted accessible files from service providers
c) Validates and audits service providers
d) Liaises with publishers
e) May scan / convert files (to be discussed)
f) Core file formats PDF, XML
g) Additional file formats, e.g.
   • DOC
   • NIMAS
   • Daisy
   • KES
   • Text and images
   • MP3

VI transcription services e.g. RNIB

Local authority VI transcription services

Physical disability / deaf / learning disability / dyslexic service providers

Education authority libraries & SEN support services

School, college, university libraries and disability services

Public libraries

**Users:**
**All** print-disabled people, not just the visually impaired

**Formats:**
**Print**
Large print
Adapted print
Symbolised
Braille
**Audio**
MP3
Daisy audio
**Digital / multimedia**
PDF
DOC
KES
Daisy
RTF
Clicker
Flash

Figure 13.7:   Extended MLA UK Model of provision
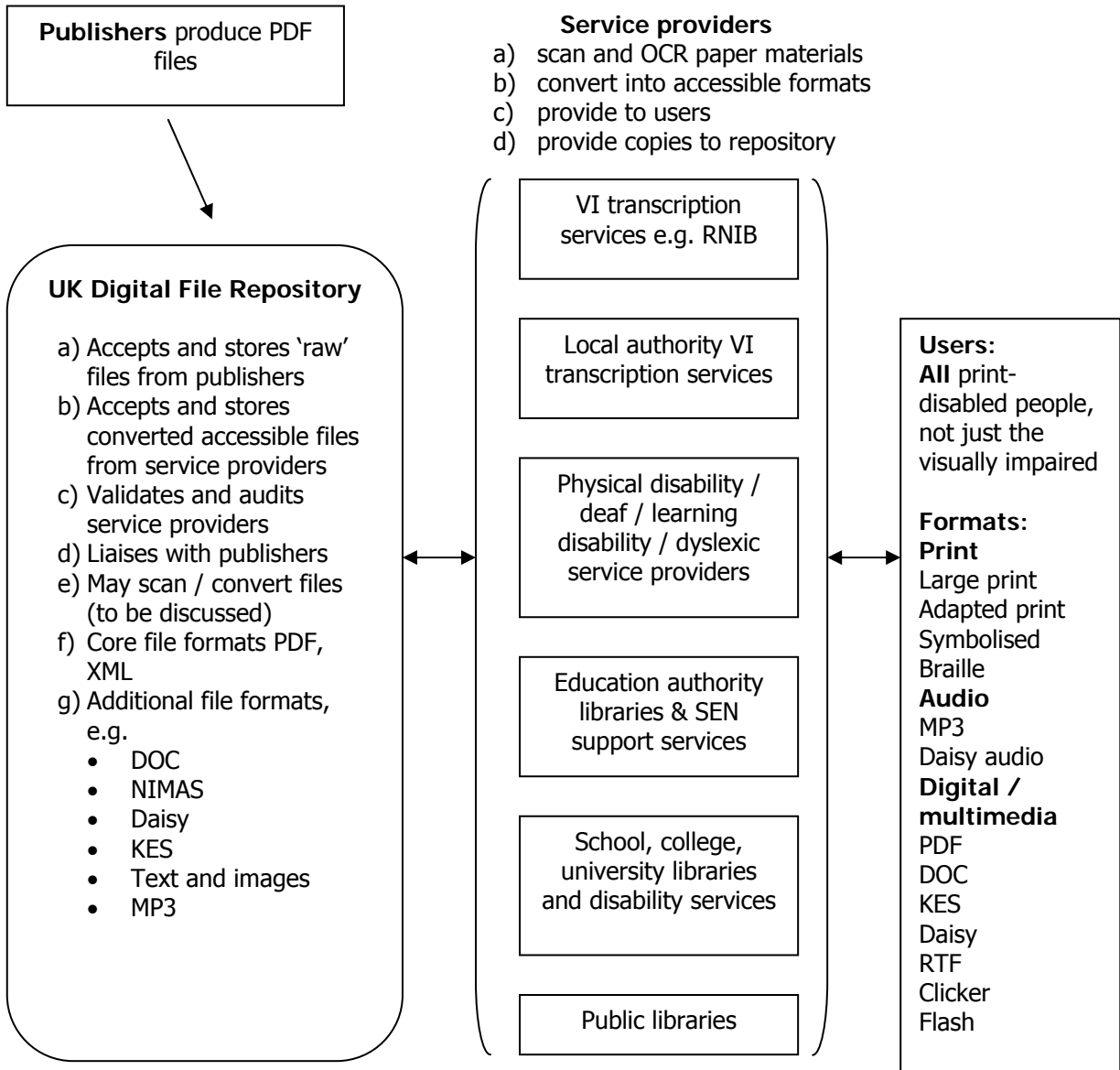
## Consideration of Extended MLA Model B against criteria

### Inclusion

Provision based upon the Extended MLA model, amended for all user groups currently covered by copyright exemption, would address the needs of a proportion of pupils in Scotland who have difficulty accessing standard written books as a result of an identifiable disability. Addressing the needs of all pupils

will require changes in legislation and/or licensing and development of service providers to publish accessible materials for print-disabled groups who are currently poorly served.

The Extended MLA model is designed to produce accessible versions of published materials. A significant number of materials used in schools are actually produced within education authorities and schools and so this model would not address the need for accessible versions of such materials: developments in local authority services (via Model A) would be required in order to satisfy the need.

**Alternative Formats**

This extended model would produce a good range of accessible materials in a wide range of formats (provided services to create the full range of formats were developed).

**Support to local authorities to fulfil legal duties**

The model would support local authorities by providing access to digital source texts, but would not address the need for awareness-raising, staff development or provision of materials created within the local authority itself. The MLA model would only support local authorities to meet legal duties for a sub-set of print disabled pupils; the Extended MLA model addresses a wider group, but without changes in copyright legislation local authorities would not be supported to address responsibilities to all pupils.

**Copyright**

The MLA model operates within existing copyright law, which as we have noted is inequitable. Our Extended MLA model will require changes in copyright legislation at a UK level, as copyright is a reserved matter, or extension of CLA licences.

**Feasibility and efficiency**

Implementation of this model is feasible but will require changes in copyright legislation and/or licensing, and considerable discussion, coordinated action and planning across a wide range of national and local government departments, voluntary agencies, publishers and publishers associations, the Copyright Licensing Agency, and bodies such as the Museums, Libraries and Archives Council. Implementation of such a model is likely to take some considerable time and there are many risks associated with such a model.

**Scalability**

Model B could be implemented and scaled up in stages. The first stage would be the establishment of the independent UK repository, and the validation of approved service providers to produce materials for users who are currently covered by copyright exemption (i.e. those with specific visual impairments, physical disabilities and visual/perceptual difficulties). There are already many service providers supporting people with visual impairment and so there would be a need to stimulate the development of corresponding services for other groups.

## SECTION 14  IMPLEMENTING THE NETWORK

## Objective 14: To forecast implications of systems of production for staffing needs, including where staff reductions, increases and specialisation may be required.

## Outcome:

**Summary**

1) To signal the need for a step change in use of alternative accessible formats a conference should be held at which an announcement is made of a Scottish Accessible Learning Resources Network.

2) Awareness-raising should focus on the potential for both schools and authorities to improve access to the curriculum through learning resources in alternative formats; to clarify copyright law and copyright exemption with regard to the adaptation of materials; and to put forward plans for the Network.

3) A phased roll-out should take place with the Network performing both an operational role with authorities and schools as well as a more strategic role with key partners.

## Implementing a Scottish Accessible Learning Resources Network

## Introduction

In Section 13 we showed that Model A, based on a Scottish Accessible Learning Resources Network, is best placed to meet the criteria for a service that can provide accessible learning materials, ensuring:

- Inclusion and equity;
- Provision of a range of Alternative Formats;
- Support to local authorities to fulfil legal duties;
- Copyright extension;
- Feasibility and efficiency;
- Scalability.

In this final section we describe in a little more detail what would be expected of Model A and a Scottish Accessible Learning Resources Network. Some of the steps involved in delivering accessible curriculum materials will be relatively straightforward to introduce. Others will be more complex to deliver on, either because they:

- depend on specialist skills that are not yet widely available, or
- require structures that have yet to be put in place, or
- require an integrated approach that crosses traditional subject and curriculum boundaries, or
- depend on all three of the above to be addressed.

A number of actions need to be taken and processes established to ensure successful implementation. In this final section we first outline these actions and processes. We then consider how this may be done in a phased, managed way that can make best use of limited resources.

## Establish Scottish Accessible Learning Resources Network team

### The need for a network and coordinating function

We recommend that a new service is set up to help provide a coordinating function. New impetus is needed to raise awareness, improve on the unevenness of staff skills, develop tools and resources and promote equity with print disabled pupils. Unless specific attention is given to this emerging area change will not happen.

One measure of the need for a new impetus and coordination is that in the four years since copyright exemption was extended, only one group of pupils has benefited – pupils receiving services from teachers of visually impaired pupils – even though 'the visually impaired' was defined under copyright exemption legislation to include more pupils than those with a visual impairment.

A second measure of the need to signal a clear commitment to change is that staff at all levels who are aware of accessible books – and there are few – equate accessible formats with sight impairment. Nor is this a problem confined to Scotland; globally, accessible formats are generally considered only as applicable to visually impaired people.

# Role of the Scottish Accessible Learning Resources Network

In this section we outline the roles such a network would perform in relation to schools and education authorities and what additional specific tasks it should undertake.

## Proposed Aim:

The aim of the new Scottish Accessible Learning Resources Network should be to assist education authorities to fulfil their duties to meet pupils' support needs by providing print materials in accessible formats.

## Proposed Objectives:

In order to address this aim, the Network should:

1.  Undertake an operational role to support local authorities to carry out their duties under relevant legislation.
2.  Perform a strategic role by developing materials and staff development resources and liaise with central government, local authorities and other key agencies.

## 1. Operational role

At several points we have reported on the need to raise awareness of the potential for improvements to be made in giving pupils wider access to the curriculum. Awareness-raising is necessary at all levels of staffing – from senior officers to classroom assistants. Action is therefore needed across several areas of service delivery so that change may be effected.

Raising awareness in schools and local authorities is essential but it will not be sufficient, therefore, following an outline of what actions need to be taken to raise awareness we discuss other steps that will help ensure that the resources needed are in place to respond to heightened awareness: raising awareness without the tools in place to do something about it is a wasteful exercise.

### Raise awareness

Once set up the first actions of the Scottish Accessible Learning Resources Network should be to raise awareness amongst schools, local authorities and others. Throughout the Books for All project, we were aware of a huge gap in awareness that will need to be bridged in order that pupils can benefit from receiving materials in accessible formats. While pockets of good practice exist in Scotland, the lack of awareness and understanding exists at all levels of staff including:

- Accessibility officers both within education and corporate services within the local authority, who are involved in developing strategies to improve access to the physical environment, the curriculum and information and communication;
- Head teachers, class teachers, support for learning staff and classroom assistants;
- IT and other support services.

Each of these groups will benefit from increasing their knowledge and acquiring new skills in the area of print accessibility.

Custom and practice dictates not only how services address questions of alternative formats, but also in knowing what questions to ask. We are convinced that progress cannot take place unless significant effort is put into raising awareness.

Awareness raising should address the lack of understanding about accessible formats that exists at all levels and what is currently possible under existing legislation. Effort will be needed in order simply to get to the point where there is wider understanding of the gaps in practice that exist in this area, and what actions can be taken to address these gaps. Two key operational targets for awareness raising are schools and local authorities.

**Awareness raising: schools**

Awareness raising with schools should focus on:

- Opportunities afforded by devolved budgets to source materials in alternative formats.
- What steps they could take to respond to the anticipatory duties of Disabilities Strategies legislation to improve pupils' access to the curriculum e.g. when completing school development plans.
- How staff might more readily make available in accessible forms those materials and resources they themselves have produced.
- What systems need to be in place to promote sharing of such materials within the school.
- Arrangements for obtaining out-of-copyright materials.
- Understanding among school senior management of obligations under existing legislation on copyright exemption and of the duty to promote equality for disabled pupils.
- Staff skills needed to respond to requests for appropriate alternative formats.
- How to set up efficient procedures for producing, storing and distributing materials.
- Arrangements for record keeping on accessible copies made and of pupils receiving them.
- Arrangements for liaising with local authority staff in order to acquire materials in more specialised formats.

**Awareness raising: education authorities**

As the "responsible body" under disability discrimination legislation, and having duties under the Education (Scotland) Act 1980, the Education (Additional Support for Learning) (Scotland) Act 2004 and Disability Strategies legislation, the priority for education authorities should be to add value to the proposed actions

described above for implementation at school level. As the corporate public body, local authorities have complementary duties to their education authorities through, for example, their disability equality duties to promote equity.

For developments at school and classroom level to take place, implementation will need to be driven by education authorities who will also have a continuing role to play in adding value to arrangements that will take place within schools. Education authorities can improve arrangements in schools by taking action to:

- Raise awareness with schools, support for learning staff, peripatetic service providers and other relevant agents of change.
- In consultation with relevant agencies, both internal to the authority and external, identify in-service training needs to be devised and undertaken by schools.
- Make available, either singly or in association with other authorities or national or voluntary bodies, resources and network arrangements that support schools to produce accessible materials.
- Put in place an appropriate infrastructure to ensure that production and delivery of materials in alternative formats can be implemented and maintained in a cost effective manner.
- As part of that infrastructure, put in place or liaise with others to ensure that accessible formats are available to pupils that currently are exempt from copyright.
- Seek to negotiate licensing arrangements to create accessible versions for pupils who are **not** currently exempt from copyright.
- Ensure that managed computer networks in schools can support provision of alternative formats to be made available to individual pupils.[108]
- Set up either through the authority intranet, or by other means, an appropriate facility for storing and accessing materials in intermediate electronic format (e.g. structured / tagged MS Word (DOC)/HTML/PDF); and mechanisms for distributing to schools while ensuring secure arrangements for digital rights and that these are managed within the law.

At the time of writing the most likely education authority agents of change who are in a position to promote and introduce such changes are Quality Improvement Officers, working in close collaboration with senior management responsible for pupils with additional support needs.

**Awareness raising: conference to launch Scottish accessible learning resource network**

There is a concern that, unless a clear commitment is made to introduce change and specific identifiable actions are taken that signal to authorities and schools that change is needed in this area, the status quo will remain. If so, availability of accessible materials will continue to be restricted to the few pupils who are assumed, wrongly, to be the only ones who can benefit from copyright exemption. We therefore recommend holding a conference to which selected local authority representatives and other agencies are invited, to launch the Scottish Accessible Learning Resources Network.

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[108] The local authority now has a general and specific duty to ensure the promotion of equity with disabled people. This includes, for example, setting out terms in contractual arrangements with suppliers of managed network services.

**Adding value: producing accessible materials**

The Scottish Accessible Learning Resources Network should work with education authorities on all of the above so that they can:

- Identify and make available in accessible formats those materials that are out of copyright.
- Apply Best Value criteria to extend arrangements for making materials available in accessible formats to those pupils for whom copyright exemption exists but for whom no arrangements are in place.
- Support local authorities to take steps to extend provision for pupils who "have difficulty reading information provided in standard written form" but who are not covered by the 2002 copyright act, through for example Disability Equality legislation.
- Identify what formats are required by individual pupils and set up work flows that can meet these requirements.
- Have available the appropriate tools for schools and / or authorities to produce materials in accessible formats, and staff skills to use them in the two different settings.
- Coordinate production of accessible resources.
- Put in place mechanisms for staff to a) check for availability of existing accessible versions and b) share accessible copies with other schools within the local authority, and beyond.
- Develop procedures for staff to obtain materials in specialised formats, and if necessary, implement services and tools at authority level.

## 2. Strategic role

Above we have discussed in outline form how the Scottish Accessible Learning Resources Network would support schools and education authorities to make materials available in accessible formats. In addition to that operational role a number of steps should be taken in parallel to help lay the foundations of a coherent integrated approach to delivering learning materials in accessible formats. We use the term 'strategic role' for reference but see the operational and strategic functions as intertwined: both need to be in place.

The Scottish Accessible Learning Resources Network should in liaison with others:

- Devise and produce a 'toolkit' on accessible formats.
- Establish competences needed to produce materials in the alternative formats required and at the quality required.
- Devise a training program and produce exemplar materials both printed and web based.
- Submit training-program for accreditation and validation by SQA under SCQF.
- Offer technical skills training to authority and school personnel.
- Establish mechanisms for identifying in advance new curriculum materials required in accessible formats.
- Develop mechanisms for sharing resources.
- With relevant agencies, examine opportunities to extend copyright exemption.

- Liaise with providers of materials in alternative formats, including local authorities; voluntary organisations; Scottish Executive; national funded agencies; and publishers' associations.
- Liaise with local authorities on capacity building options to facilitate the wider groups of pupils who can benefit from increased availability of alternative formats.
- Liaise with Convention of Scottish Local Authorities (COSLA) and CLA on licensing arrangements.
- Liaise with relevant Scottish Executive departments and relevant government agencies on improving access to print for the wider group of people who have some form of print disability.

# Implementing Model A: a phased approach

While some of the actions required to implement Model A described above are relatively straightforward, putting in place a coherent framework of effective service delivery will represent a complex undertaking involving collaborative partnership arrangements. We propose therefore that development is undertaken in phases. This will allow both broad developments to take place across authorities as well as more in-depth work through partnership arrangements with a smaller number of authorities.

## Phase 1

### Establish Scottish Accessible Learning Resources Network

- Based on the above operational and strategic functions agree remit of network with Scottish Executive and other potential partners.
- Establish Project Working Group plus Steering Committee or Advisory Group.
- Agree team members and work plan.
- Hold first meeting, agree content of conference and launch.

### Scottish Accessible Learning Resources Network Conference

Hold a conference inviting selected local authority representatives and other agencies to attend to raise awareness of:

- Scottish Accessible Learning Resources Network.
- Duties under Disabilities Strategies and other legislation and how alternative formats can help to meet the literacy support needs of pupils with ASN.
- What is possible within existing copyright exemption legislation.
- Which pupils are exempt under existing legislation; what this means for the pupils and for services they provide.
- Action planning requirements.
- Revealweb and duties.
- Partnership arrangements with local authorities.

**Outcome of conference:**

- Foundation for awareness raising.
- Brief guide to accessible formats.

- Clarity amongst delegates on who to contact for additional information and for specialist guidance.
- Up to three pilot authorities identified.

**Begin to establish arrangements for exempt pupils for whom materials are not available**

- Discuss with partner authorities what provision can be made for making available electronic intermediate source material.

**Begin to explore extension of copyright exemption**

- Meet with Scottish Executive to discuss approach to Westminster through the Office for Disability Issues regarding extending copyright exemption to print disabled people.
- Attend meetings with publishers, publishers associations and the Copyright Licensing Agency to explore possible licensing schemes for providing accessible learning resources for print-disabled pupils who are not copyright exempt.

**Design draft structure of file repository for learning resources**

- Establish criteria for design of file repository.
- Design outline structure for file repository system identifying inputs, processes and outputs.
- Consult on outline structure with CLA, SEED, LTS, CALL, local authorities, COSLA and relevant bodies such as RNIB, RNID, Dyslexia Scotland, Capability Scotland.

**Accessible Learning Resources Toolkit**

- Begin development of Accessible Learning Resources 'toolkit' incorporating guidance and staff development resources.
- Consult with authorities on requirements.


## Phase 2

**Establish Accessible Learning Resources Networks in three local authorities**

- Collaborate with each partner pilot authority on mechanisms for: identifying pupils who would benefit from alternative formats; how information on required formats will be managed; what formats are required; existing resources generating materials; potential for (and restrictions on) sharing.
- Identify broad range of end users, ensuring inclusiveness and equity.
- Identify sample staff who will produce materials.
- Begin to identify staff competences required.
- Structure materials.
- Produce intermediate source files.
- Explore dissemination channels.

**Awareness raising: schools and authorities**

- Agree with the three pilot authorities appropriate awareness raising mechanisms for each authority, reflecting priority themes set out above for awareness raising in schools and in authorities.
- Explore arrangements to heighten understanding among school senior management of obligations under existing legislation on copyright exemption and of the duty to promote equality for disabled pupils.
- Identify staff skills needed to respond to requests for appropriate alternative formats.
- Agree efficient procedures for producing, storing and distributing materials.
- Introduce arrangements for record keeping on accessible copies made and of pupils receiving them.
- Agree arrangements for liaising with local authority staff in order to acquire materials in more specialised formats.
- Agree content for awareness raising, how it will be delivered to schools and other agents in each authority. (What needs to be said, who says it, when it is done and what is in place to respond to follow up questions.)

**Liaison with CLA**

- Continue to explore extension of copyright exemption
- Establish CLA licence to enable accessible materials to be made for print-disabled pupils who are not copyright-exempt.

**Accessible Learning Resources Toolkit**

- Complete Accessible Learning Resources Toolkit.
- Establish criteria for evaluation of toolkit.
- Pilot delivery in the three local authorities.
- Evaluate use of toolkit.

**Pilot file repository system**

- Complete file repository system structure.
- Establish procedures and mechanisms for sharing materials between local authorities.
- Each local authority network pilots collating, creating and providing access to bank of accessible resources.

**Continue strategic role**

- Offer technical skills training to authority and school personnel.
- Establish staff competences to produce materials in alternative formats.
- Devise a training program and produce exemplar materials both printed and web based.
- Submit training-program for accreditation and validation by SQA under SCQF.
- Establish mechanisms for identifying in advance new curriculum materials required in accessible formats.
- Develop mechanisms for sharing resources.
- With relevant agencies, examine opportunities to extend copyright exemption.

- Liaise with providers of materials in alternative formats, including local authorities; voluntary organisations; Scottish Executive; national funded agencies; and publishers' associations.

## Phase 3

### Scaling up

- Continue roll-out of Accessible Learning Resources Networks in three local authorities.
- Continue process of cataloguing and sharing materials between local authorities.

### Awareness raising

- Continue raising awareness with schools, support for learning staff, peripatetic service providers and other relevant agents of change.
- In consultation with relevant agencies, both internal to the authority and external, identify in-service training needs to be devised and undertaken by schools.
- Devise a training program.
- Submit training-program for accreditation and validation by SQA under SCQF.
- Agree network arrangements to support schools to produce accessible materials.
- Ensure that managed computer networks in schools can support provision of alternative formats to be made available to individual pupils.[109]
- Set up either through the authority intranet, or by other means, an appropriate facility for storing and accessing materials in intermediate electronic format (e.g. structured / tagged MS Word (DOC)/HTML/PDF); and mechanisms for distributing to schools while ensuring secure arrangements for digital rights and that these are managed within the law.

### Evaluation of pilot

- Conduct evaluation of impact of Accessible Learning Resources Networks on learning and teaching, for possible wider implementation.
- Begin discussion with other Scottish local authorities, identifying best fit with one or more of the three pilot authorities.

## Phase 4

- Continue process of cataloguing and sharing materials between local authorities.
- Establish mechanisms to identify in advance new curriculum materials required in accessible formats.
- Continue roll out of network.

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[109] The local authority now has a general and specific duty to ensure the promotion of equity with disabled people. This includes for example setting out terms in contractual arrangements with suppliers of managed network services.

- Liaise with local authorities on capacity building options to facilitate the wider groups of pupils who can benefit from increased availability of alternative formats.
- Liaise with Convention of Scottish Local Authorities (COSLA) and CLA on licensing arrangements.
- Liaise with relevant Scottish Executive departments and relevant government agencies on improving access to print for the wider group of people who have some form of print disability.

## Concluding comments

Scottish education could become an international leader in enabling the availability of accessible formats to all pupils with a print disability. The policy framework that has developed in Scotland over the last 8 years has introduced new opportunities for these developments to take place.

Without a sustained effort to make it happen changes to practice will remain isolated and fragmented, where progress will occur in a piecemeal fashion. We have presented in outline form what steps would be needed to increase the availability of accessible learning materials in accessible formats.

We suggest that the Scottish Executive give further consideration to the phased outline of work presented in section 14.

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## APPENDIX 1   Books Required for Primary & Secondary Schooling (Sorensen, in RNIB 2005)

| Primary 1 | |
|---|---|
| 9 Maths books | 9 |
| 7 Topic books | 7 |
| 5 Reading books each with 15 associated smaller books | 80 |
| **Primary 2** | |
| 9 Maths books | 9 |
| 8 English books | 8 |
| 21 Topic books | 21 |
| **Primary 3** | |
| 3 Maths books | 3 |
| 19 English books | 19 |
| 11 Topic books | 11 |
| 1 dictionary | 1 |
| **Primary 4** | |
| 4 Maths books | 4 |
| PCM 46 booklets | 46 |
| PCM 96 booklets | 96 |
| 1 Nelson Spelling | 1 |
| 1 Topic books | 1 |
| 1 dictionary | 1 |
| **Primary 5** | |
| 3 Maths books | 3 |
| 12 English books | 12 |
| 50 – 60 grammar worksheets | 60 |
| 1 Nelson Spelling | 1 |
| 1 Password | 1 |
| 15 Topic books | 15 |
| **Primary 6** | |
| 4 Maths books | 4 |
| 15 English books | 15 |
| 1 Nelson Spelling | 1 |
| 9 Topic books | 9 |
| 1 dictionary | 1 |
| **Primary 7** | |
| 4 Maths books | 4 |
| 16 English Books | 16 |
| 1 Topic books | 1 |
| 1 dictionary | 1 |
| **Total Books required for seven years of primary schooling** | **461** |

| Books required for six years of secondary schooling | |
|---|---|
| Advanced Higher English | 28 |
| Advanced Higher French | 18 |
| Advanced Higher German | 68 |
| Higher Maths | 17 |
| Higher History | 94 |
| Higher RMPS | 88 |
| Standard Grade Biology | 21 |
| Standard Grade Music | 11 |
| S1/2 Science | 17 |
| S1/2 R.E. | 4 |
| S1/2 Geography | 13 |
| S1/2 Modern Studies | 25 |
| S1/2 Home Economics | 4 |
| S1 – 6 PSD | 41 |
| **Total** Books required for six years of secondary schooling | **449** |

Although it appears that almost 500 separate texts are prepared for primary sector Sorenson has noted that 60 worksheets compare to 3 English books. Other similar comparisons have been made to arrive at a figure of around 375 texts needed to complete seven years of primary schooling.

# APPENDIX 2   Short form questionnaire

## QUESTIONNAIRE ON ACCESSING TEXT MATERIALS

Please complete this questionnaire and give it to CALL Centre, or return it to: The CALL Centre, The University of Edinburgh, Paterson's Land, Holyrood Road, Edinburgh EH8 8AQ. Tel. 0131 651 6235. Fax 0131 651 6234.

**1. Who are you?**

Learning Support Teacher  ☐     Class / Subject  ☐       Parent  ☐

Child Young Person  ☐         Other  ☐

**2. How many pupils / people who have difficulty with reading or with manipulating books and learning resources do you work with?**

0 ☐     1-5 ☐          5-10 ☐          10-20 ☐          more than 20  ☐

**3. What support do you provide to give access to books and learning resources? (tick all that apply)**

Human Reader ☐   Adapt into different colour/ font/ size ☐        Audio tape/CD/ MP3 ☐

Electronic / digital / computer version ☐          Other (what?)  ☐

**4. In which of these alternative formats would it be most useful to be able to get material for the people you work with?**

Adapt into different colour/ font/ size ☐          Audio tape/CD/ MP3 ☐

Electronic / digital / computer version ☐          Other (what?)  ☐

**5. Can you give an estimate of the numbers of materials that a pupil might require in the above formats over an average year?**

Textbooks ____          Fiction / Reading books ____     Teacher produced worksheets ____

Commercial Worksheets ____     Assessments (eg NABs) ____     Exams ____     Other ____

**6. Are there any specific textbooks or resources that are needed in an accessible format?**


**7. Are there any specific formats you need (e.g. particular digital formats like PDF / Word / Daisy)?**


**8. Do you have any other comments about making print materials more accessible for people who have reading difficulties?**


Would you be willing for the CALL Centre to contact you at some time in the future to discuss your

answers in more detail?                    Yes ☐  No ☐


Name                                    School (if applicable)

Address

Tel.                                    Email

## APPENDIX 3   Long form questionnaire

## Books for All Questionnaire on Accessing Text Materials

## BRIBE!

Staff who send back completed questionnaires will be entered into a raffle. The prizes will be accessible digital books from publishers such as Crick Software (Clicker format); Don Johnston's Start to Finish series; RNIB (Daisy audio format).

The CALL Centre has been funded by the Scottish Executive Education Department to investigate the need for textbooks, worksheets, assessments, and other learning materials in accessible forms.

We want to find out:

- The number of students with additional support needs who have difficulty reading and accessing age-appropriate learning materials.
- How schools currently support print-disabled students to access books and other written resources.
- The number of students who might benefit from using learning materials in alternative, accessible formats.
- The number and type of accessible learning resources required.

You can fill in the questionnaire on your own behalf, or on behalf of your department school or unit (e.g. if you work in Support for Learning dept. or specialist local authority service), and either for all the students you support, or just those in one group/class or year (e.g. students in S1, say).

Please copy and give the questionnaire to anyone you think might be interested.

Please complete this Questionnaire and return it either by email or in the enclosed Freepost envelope by Friday 26th November to:

The CALL Centre,

University of Edinburgh,

Paterson's Land, Holyrood Road,

Edinburgh EH8 8AQ

Tel. 0131 651 6235. Fax 0131 651 6234.

Paul.Nisbet@ed.ac.uk

## 1. About you

| I am a… | Tick |
|---|---|
| Class teacher | |
| Support for learning or specialist teacher | |
| Principal Teacher (e.g. SfL) / Team leader / Unit head | |
| Head teacher | |
| Education manager / officer | |
| Parent | |
| Child / young person | |
| Other (please specify) _____ | |

| I work in… | Tick |
|---|---|
| Mainstream Primary | |
| Mainstream Secondary | |
| Special school / unit (primary) | |
| Special school / unit (secondary) | |
| Peripatetic service (primary) | |
| Peripatetic service (secondary) | |
| Other (please specify) _____ | |

| I am completing this questionnaire on behalf of… | Tick |
|---|---|
| Myself | |
| My dept / unit / school / local authority (please circle which, and how many colleagues work there) | |

| I am completing this questionnaire with regard to…. | Tick | Class / school / local authority roll * |
|---|---|---|
| A pupil or group of pupils | | |
| A class | | |
| A year group (please specify which, e.g. S3) | | |
| A school | | |
| An education authority | | |
| Other (please specify) _____ | | |

(* The total number of all pupils in your class / year group / school - not just those with additional support needs)

Name of your local authority: ………………………………………….

**2.** **Think of the children or young people you/your dept/unit work with. In comparison to <u>most other pupils of about the same age</u>, how many have difficulty with any of the following? (Tick all that apply)**

| Pupils' difficulties | Tick | How many pupils? | For your comments |
|---|---|---|---|
| Reading text | | | |
| Seeing text | | | |
| Understanding text | | | |
| Holding / turning pages of a book or document | | | |
| Recording work e.g. handwriting, spelling | | | |
| Other (please specify) | | | |

**3.** **Now think of the support the same pupils actually get to help them access written learning resources. What support or formats do you or others provide? Please write in the <u>approximate numbers of pupils</u> that you work with who are helped by each method/format. Use as many boxes as is appropriate for each area of difficulty and support.**

| Support given with: | Reading text | Seeing text | Understanding text | Holding book / turning pages | Recording work e.g. handwriting | Other (please specify) |
|---|---|---|---|---|---|---|
| Human support | | | | | | |
| Reader | | | | | | |
| Scribe | | | | | | |
| Signing | | | | | | |
| Printed formats | | | | | | |
| Different font | | | | | | |
| Large print | | | | | | |
| Coloured paper | | | | | | |
| Simplified language | | | | | | |
| With symbol support | | | | | | |
| Braille | | | | | | |
| Coloured lenses/ film | | | | | | |
| Magnifier/ low vision aid | | | | | | |

APPENDIX 3

| Support given with: | Reading text | Seeing text | Understanding text | Holding book / turning pages | Recording work e.g. handwriting | Other (please specify) |
|---|---|---|---|---|---|---|
| **Audio formats** | | | | | | |
| Tape | | | | | | |
| Audio CD | | | | | | |
| MP3/digital audio file | | | | | | |
| **Computer formats** | | | | | | |
| Digital resources on computer | | | | | | |
| Scanned into computer | | | | | | |
| Read by computer (text to speech) | | | | | | |
| Word processor or other writing software | | | | | | |
| **Other (please specify)** | | | | | | |

**Please describe how you/your dept/unit make, or where you obtain accessible books and learning resources (e.g. particular hardware or software tools, commercial publishers, voluntary sector providers)**

**4. Are you/your dept/unit able to obtain or create sufficient copies of books and other learning materials in accessible formats?**

Yes ☐          No ☐

**If you answered 'no' to this question:**

Why - what are the reasons for difficulties in obtaining or creating materials?

☐

Does this lack of learning materials in accessible formats have an adverse effect on your pupils' ability to access to the curriculum?

No effect ☐          Some effect ☐          Large effect ☐

Would you need fewer staff to read/scribe for your pupils if you could obtain accessible learning materials at an affordable cost?

Yes ☐          No ☐

**5. How much of your/your dept's/unit's time is spent creating accessible books and learning resources?**

Less than 10% ☐
10% to 24% ☐
25% to 49% ☐
50% to 74% ☐
More than 75% ☐

**6. How many accessible books, worksheets, assessments, audio files etc do you/your dept/unit make each year (on average)?**

No of accessible items per year ☐          Formats you produce (large print, audio, computer files etc) ☐

**7. Imagine an ideal world! Consider the methods of support and the formats that you think the pupils <u>might</u> benefit from. Please write in the <u>approximate numbers of pupils that might be helped</u> by each method/format. Use as many boxes as is appropriate for each area of difficulty.**

| Support given with: | Reading text | Seeing text | Understanding text | Holding book / turning pages | Recording work e.g. handwriting | Other (please specify) |
|---|---|---|---|---|---|---|
| **Human support** | | | | | | |
| Reader | | | | | | |
| Scribe | | | | | | |
| Signing | | | | | | |
| **Printed formats** | | | | | | |
| Different font | | | | | | |
| Large print | | | | | | |
| Coloured paper | | | | | | |
| Simplified language | | | | | | |
| With symbol support | | | | | | |
| Braille | | | | | | |
| Coloured lenses/ film | | | | | | |
| Magnifier/ LVA | | | | | | |
| **Audio formats** | | | | | | |
| Tape | | | | | | |
| Audio CD | | | | | | |
| MP3/digital audio file | | | | | | |
| **Computer formats** | | | | | | |
| Digital resources on computer | | | | | | |
| Scanned into computer | | | | | | |
| Read by computer (text to speech) | | | | | | |
| Word processor or other writing software | | | | | | |
| **Other (please specify)** | | | | | | |

8.  **In this ideal world, how many books and other learning resources in accessible formats are needed by your pupils? Please use the table below to estimate the approximate number of <u>different learning materials</u> that <u>one</u> of your pupils might require over <u>one</u> school year in accessible formats. If you wish, copy this page and complete it for more than one pupil/year group. If you can't give numbers, tick the resources and formats you need.**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Pupil difficulty /difficulties (e.g. reading, seeing, writing etc):** | | | | | | | | | |
| **Pupil year group:** | | | | | | | | | |
| **Number of resources required in one year:** | **Text books** | **Reading books** | **Commercial worksheets** | **Teacher produced worksheets** | **Exam papers / prelims** | **Assessments: 5-14** | **Assessments: NABs** | **Exam papers and prelims** | **Other (please specify)** |
| Different font | | | | | | | | | |
| Large print | | | | | | | | | |
| Coloured paper | | | | | | | | | |
| Simplified language | | | | | | | | | |
| With symbols | | | | | | | | | |
| Braille | | | | | | | | | |
| Tape | | | | | | | | | |
| CD | | | | | | | | | |
| MP3 file | | | | | | | | | |
| Digital resources on computer | | | | | | | | | |
| Text read by computer | | | | | | | | | |
| Other (please specify) | | | | | | | | | |

**9.** **Are there any specific textbooks or resources that you would want in an accessible format? Please say which format(s) you need.**

**10.** **How do you think print materials can be made more accessible for people who have reading or writing difficulties?**

Would you be willing for the CALL Centre to contact you to discuss your answers in more detail?

Yes ☐          No ☐

| | |
|---|---|
| Name (if you would welcome contact): | |
| School (if applicable): | |
| Address: | |
| Tel: | |
| Email: | |

# APPENDIX 4   Producing multiple formats

It should be clear from the main report that there is no one format that is accessible to all pupils, and that materials are required in several formats depending on the support need of the pupil and the subject matter.

Some stages involved in producing multiple formats are quite straightforward albeit time-consuming. A brief outline is given below.

## Digital source file available

### Portable Document Format (PDF)

In most cases the process of producing accessible formats begins by obtaining an original source document from the publisher, usually in PDF. Some publishers cannot supply PDF and only have the material in a desktop publishing format such as Quark Xpress. For many pupils, PDF is a satisfactory accessible digital format.

### Conversion for PDF

Where PDF is not appropriate Acrobat Professional can convert PDFs into other formats such as MS Word, HTML and XML. Adobe also offer a free online facility for converting PDFs into HTML 3.2 or text. Such automatic conversion of complex, untagged PDFs is unlikely to produce satisfactory results, and documents usually require manual editing.

Commercial firms offer services to convert PDF or other digital formats to XML, HTML or MS Word and we understand that RNIB are currently working with publishers in the UK to investigate if and how a production process for converting PDF or other source files from publishers to accessible formats could be developed.

Even though it is possible to convert digital formats in this way, it is expensive, and so costs would be greatly reduced if publishers were able to provide source texts in a format suitable for conversion.

## Digital source file not available

### Scanning and Optical Character Recognition (OCR)

If the digital source file is not available, the book can be scanned in to the computer using optical character recognition software, although this is time-consuming and may also introduce scanning errors. Wherever possible efforts should be made to obtain the electronic source.

There are several programs that are commonly used to scan and convert printed material to digital form, and the most popular are Kurzweil 1000/3000 and Abbyy FineReader Pro. The Kurzweil products are designed specifically for scanning resources for children who have difficulty accessing books; they are quick and easy to use and produce digital books that look very similar to the printed copy. Many local authorities, schools and Universities in the UK use Kurzweil software. The main disadvantage of Kurzweil is that the scanning software is relatively expensive (£725), and the scanned files are read using Kurzweil software which is again relatively expensive (£185 per licence). Several states in the US have

adopted Kurzweil (KES) format as a standard for creating accessible digital resources.

Abbyy FineReader Pro (£72) appears the most popular package for providers to use to scan materials in order to create accessible digital resources in more common formats such as PDF, Word or HTML. Pages scanned with FineReader in these formats will usually require further processing, editing and structuring in order to make them accessible.

The Books for All project team experimented with a number of different techniques for scanning and creating different accessible formats, and the procedure that gave most flexibility involved:

1. Scanning with FineReader and saving the book or chapter as a single PDF image file (i.e. not recognised). The PDF image file can then be opened by most other scanning and OCR programs, such as Kurzweil 3000, or converted using FineReader itself.
2. Using FineReader to recognise the text, edit it, and save it as Word and PDF.
3. Editing and adapting using Word, followed by saving in a variety of formats (see below).

**Editing and structuring to create accessible formats**

In most cases, scanned files are saved as PDFs or Microsoft Word documents. Scanned books saved directly in PDF will not be structured or 'tagged' and may not be accessible. Once opened in MS Word however, a provider can edit the document and add structure and accessibility features. The resulting file can then be saved in formats such as Word, HTML, Microsoft Reader, RTF, or, with additional software, tagged PDF and Daisy formats:

- Adobe Acrobat Professional (£38.80 for CD and licence for Scottish schools from LT Scotland) can be used to create tagged PDF files from Word.
- EasyProducer (Dolphin, £348 ) can create Daisy books from Word files; while the new Dolphin EasyConverter, due later in 2007, will be able to scan books (using a version of FineReader built in to the software) or open PDF, HTML Word and NISO files and create Structured Word, Large Print (in various sizes), Braille, Daisy audio and MP3 audio.

Note that interactive documents such as worksheets or assessments may be better accessed as Word documents anyway.

A significant population would benefit from materials in symbol format. Text from the Microsoft Word document can be copied and pasted into a program such as Communicate:In Print which can automatically add symbols to create a document for non-readers.

Creating switch-accessible Clicker versions follows a similar process whereby text and graphics can be cut and pasted into Clicker pages or grids.

Books in Word can be saved as audio MP3 (recorded using synthetic voices) using low-cost or free software. Or, since EasyProducer and EasyConverter software can create both MP3 and Daisy audio files from a Word document, a pupil who is visually impaired could access material saved in Daisy audio format with an expensive Daisy player while a pupil with dyslexia could listen to the same MP3 file on an iPod.

The common software application in this process is Microsoft Word – it is used to receive scanned files, for editing and structuring and with additional software and for saving the materials in MP3, PDF, Daisy, HTML and Microsoft Reader. By copying and pasting from Word into other applications, resources can be created in symbol and switch-accessible formats.

The best file format for creating 'intermediate' files from which the widest range of other accessible formats can be produced is therefore 'structured' Microsoft Word DOC format.

By using the tools described, a book would then be available to:

- the small number of pupils with severe visual impairment, in Daisy audio on a Daisy player, or text using EasyReader or other Daisy reader software;
- the much larger number of pupils with reading difficulties, who could access the book via PDF or Microsoft Word with, for example, the free WordTalk text reader;
- pupils with learning difficulties who need symbols (both in printed form and also on-screen);
- pupils with physical impairments using keyboard, mouse or switches.

BOOKS FOR ALL