

# Chapter 10

## Assessment and provision of supportive writing technology

**10.1 Supportive Writing Technology Quick Assessment Guide**

**10.2 Keyboard Quick Assessment Guide**

**10.3 Barriers to learning**

**10.4 Initial investigation**

**10.5 Assessment with the writer**

**10.6 Supportive Writing Technology Assessment Checklist**

**10.7 Evaluation**

**10.8 Management of supportive writing technology**

---

## 10 ASSESSMENT AND PROVISION OF SUPPORTIVE WRITING TECHNOLOGY

---

Earlier chapters described several different types of technology, which may benefit pupils with writing difficulties. It can be difficult to match the most appropriate tool(s) and technique(s) to a pupil's needs, as the case examples given previously have illustrated. This section attempts to summarise assessment techniques for supportive writing. General principles of assessment are also described in CALL's *Special Access Technology* (Nisbet & Poon, 1998), and in NCET's *Access Technology* (Day, 1995).

## 10.1 Supportive Writing Technology Quick Assessment Guide

### Supportive Writing Technology Quick Assessment Guide

Observation	Investigate
<i>The writer has slow or untidy writing, or gets tired handwriting...</i>	structured exercise programme teaching cursive handwriting pencil grips and paper position seating and table height word processor – laptop or desktop
<i>The writer types slowly, or quickly gets tired keyboarding...</i>	lighting high-contrast key stickers programs to teach letter and keyboard familiarity touch-typing programs keyboard adjustments and alternatives (see 10.3) word prediction speech recognition
<i>The writer is at secondary school, and/or needs a word processor for all his or her writing...</i>	portable word processor or laptop computer
<i>The writer spells most words (more than 75%) correctly...</i>	teaching spelling with a structured programme spellchecker, either hand-held or with word processor automatic spelling correction/abbreviation expansion topical word banks
<i>The writer cannot tell if words are correctly spelled, or not...</i>	word processor spellchecker – not (just) a Franklin device talking word processor / speech output
<i>The writer cannot copy words reliably...</i>	word processor spellchecker – not a Franklin device
<i>The writer has difficulty spelling many words...</i>	teaching spelling with a structured programme word predictor spellchecker talking word processor / speech output
<i>The writer has difficulty spelling most words...</i>	teaching spelling with a structured programme word / symbol banks word predictor with small lexicon and small word list spellchecker talking word processor / speech output
<i>The writer has difficulty spelling many or most words and has reasonable oral and word recognition skills...</i>	teaching spelling with a structured programme speech recognition spellchecker
<i>The writer has difficulty identifying the word required from a list on screen...</i>	talking word predictor, word bank, spellchecker speech recognition
<i>The writer cannot tell if the word typed by the speech recognition program is the one they want...</i>	speech recognition with speech feedback
<i>The writer has difficulty getting started with writing tasks...</i>	scaffolding writing frames story and sentence starters, lists of key words picture sequences (all the above using either paper and pencil, or on word processor screens) software to help the writer get going, eg. <i>Writer's Toolkit</i> , <i>StoryBook Weaver</i>
<i>The writer uses the wrong word by mistake...</i>	talking word processor / speech output
<i>Sentences are poorly structured or have poor grammar...</i>	talking word processor / speech output

## 10.2 Keyboard Quick Assessment Guide, from Special Access Technology (Nisbet & Poon, 1998)

### Keyboard Quick Assessment Guide

Observation	Access tool
<i>The user can hit keys on the keyboard but...</i>	<i>Investigate...</i>
...often hits the wrong key	seating and positioning vision keyguard increasing input acceptance time expanded / overlay keyboard with big keys
...gets letters repeated by mistake	turn off key repeat, or increase repeat time and delay
...tremors or hits the key several times	increase post-acceptance delay
...can't hold two keys down at once	'Sticky' keys
...has difficulty knowing when a key has been pressed	'Key beeps'
...suffers pain when typing	seating and positioning wrist rests Dvorak/ergonomic layout ergonomic keyboard voice recognition
...can't reach across the whole keyboard	'word prediction' software to reduce keystrokes seating and positioning arm supports small laptop-size keyboard miniature keyboard
...cannot see the keys clearly	seating and positioning lighting high-contrast key stickers expanded keyboard 'chording' or Braille keyboard on-screen keyboard voice recognition
...types very slowly	practice, using appropriate software to teach keyboard familiarity 'word prediction' or 'abbreviation expansion' software
...is not literate	overlay keyboard on-screen keyboard using a VOCA as a keyboard
<i>The user... cannot use fingers, hands or feet to operate the keyboard...</i>	<i>Investigate...</i>
	seating and positioning vision hand/finger/wrist splint hand-held pointer head or chin pointer voice recognition expanded or overlay keyboard operated by knuckle or fist on-screen keyboard access by pointing device or switches Morse Code

## 10.3 Barriers to learning

The first assessment task is to identify the 'barriers to learning' (Hawkridge & Vincent, 1992), which fall into three categories.

- a) Individual needs and abilities of the user which might include:
  - age, cognitive level and overall literacy skills;
  - word recognition skills;
  - handwriting quality and speed;
  - spelling skills & the particular nature of any difficulty;
  - vocabulary and language;
  - planning and organisational abilities;
  - visual / perceptual abilities.
- b) Environment or conditions in which learning takes place:
  - teaching and learning support staff resources;
  - staff skills and training opportunities;
  - technological resources currently available to the writer;
  - technological resources which could be made available to the writer.
- c) The nature of the learning task:
  - the curriculum Level/Stage;
  - the task (early literacy activities, creative writing, reports etc.);
  - location – in one class in primary, in several classes in secondary school, on field trips, in examination situations.

Standardised assessment tests to investigate these barriers and how supportive writing tools may help do not exist, so this chapter describes the approach to assessment procedure used by CALL Centre staff. It consists of three steps:

- initial investigation, to collect and consider background information;
- assessment with the writer;
- evaluation of recommended equipment.

This procedure reflects the nature of the CALL service which covers all of Scotland from Stranraer in the south west to the Shetland Isles – with the equivalent of 2 staff – and so it is not feasible to make several visits, or spend a lot of time in one particular school. Assessment methods for locally-based services may adopt different approaches.

## 10.4 Initial investigation

The aim of the pre-assessment investigation is to determine the skills and difficulties of the writer, the expectations of the writer, parents and school, and to draw up a 'short-list' of hardware and software that you will investigate during the assessment with the writer.

### Collect background information

Some fundamental information about the learner, the task and the environment is needed to make basic decisions about the type of technology which should be considered. Most of this information can be gathered by talking to the learner's teacher, classroom assistant, parents and educational psychologist and from looking at previous reports and samples of school work. In the case of writers with a physical handwriting or coordination difficulty it is also useful to speak to the occupational or physiotherapist, if there is one. In CALL, we gather basic information by asking the referrer (usually, the Head Teacher of the school, or educational psychologist) to consult with colleagues and complete a simple referral form. The referral form summarises:

- the nature of the difficulty;
- how it effects the learner's access to the curriculum;
- the impact of other techniques and technologies which have been tried;
- how the staff and parents hope technology will help.

The process of gathering and recording this information helps to ensure that all those involved who should be consulted, are consulted. The third point reminds referrers that there are many 'low-tech' supportive writing techniques which can be considered, such as teaching motor skills and cursive handwriting, or structured approaches to spelling (e.g. ACE Spelling Dictionary). The final point is particularly important and ideally should contain some fairly specific aims which will help judge the effect of the introduction of the technology.

Considering this background information helps to determine a general specification for the technology. For example, the aims for emergent writers and pupils with general learning difficulties and limited spelling skills might include increasing the quantity of independently produced work, or improving sight vocabulary for a particular group of words. These writers are more likely to benefit from the use of word banks or word predictors with small lexicons rather than laptop computers or speech recognition. The aims for older pupils tackling a Standard Grade or GCSE syllabus, say, might be to introduce technology which can be used to generate a greater volume of work. Other basic questions to consider are:

- Is the writer likely to need a laptop computer or would access to a desktop system be appropriate? Or both?
- What other sorts of computers and software are already in use in the school – if the school uses Macs, avoid suggesting software which only runs on Windows PC's, if possible.
- Does the writer have a known visual impairment which precludes a laptop with a small screen?
- Are there any known physical difficulties which might influence the choice of keyboard or mouse?

## Consider previous reports

Many learners who benefit from technology to support writing will have been assessed by an educational psychologist; ophthalmologist, and/or occupational therapist and reports from these specialists may give pertinent information about physical, visual and overall cognitive skills, as well as age-equivalent scores for reading and spelling.

## Examine samples of work

Request some representative samples of work from the school:

- text handwritten by the writer;
- text written independently on a computer;
- text dictated by the writer and scribed by a helper.

Ask the teacher to note on the samples the approximate length of time taken by the writer to produce each piece; whether it was a first draft or final copy; whether a spellchecker was used to help correct any errors, the amount and type of help given; and so on.

From the samples you will be able to see any differences – in terms of legibility, spelling, vocabulary, language and ideas – between text that has been handwritten, typed and dictated. For example, if the typed text is significantly better than the handwritten text, and is acceptable in terms of spelling and language, then the writer may simply need a low cost portable computer. The assessment task is then to decide on the particular laptop.

List the mis-spelled words and run them through the spellcheckers on the laptops or word processors that you think are likely to be appropriate for the writer (e.g. don't bother with programs like *Microsoft Word* if the writer is aged six). Compare the performance of the spellcheckers and note the most likely contender(s). Also consider the percentage of errors which were handled by the checkers – if the checker could only offer the correct word for 50% of the errors (a common finding, in our experience), then extra support in the form of a word predictor or speech recognition may be needed.

Look at the type of spelling errors: are they 'real word errors' which are not picked up by a spellchecker, but could be identified with talking word processor or speech output program? Are the first one or two letters of the words usually correct, in which case a word predictor is worth investigating?

Examine the sentence structure and punctuation. If the sentences are poorly structured, add speech output to the list of technologies to be evaluated.

Compare the length, vocabulary and language used in the handwritten, typed and dictated texts – if the dictated text is significantly better, the writer may need support from a word predictor or speech recognition system. For example, often the vocabulary used in the dictated text is more sophisticated than the handwritten or typed text because the writer is wary of attempting words which he or she knows they cannot spell. In these cases, consider topical word lists and banks, word prediction, and speech recognition.

## 10.5 Assessment with the writer

Assessment takes place in the writer's school and involves discussing and trying out different types of technology with the writer and staff.

The aims of the assessment are:

- to further investigate specific skills, difficulties and queries which have been identified prior to assessment;
- to try some techniques and technologies;
- to make recommendations about which systems (if any) are appropriate for trial. It is often not possible to give definitive 'answers' within a short assessment, so usually several solutions are suggested for longer evaluation in school and/or home. It is then up to the writer, the school and the parents to decide whether the technology does meet the needs and aims outlined during the initial information-gathering stage.

Throughout the assessment it is important to ask the learner about his or her opinion – what is easy or difficult, which programs and computers they like or don't like. It is common for learners in secondary school, for example, to have a strong preference for technology which is small, or black, or easy to carry, and reject devices which are perceived as "uncool".

To carry out a technology assessment, we suggest that you will need the items listed in Figure 10.1:

Although many programs are listed here, trying out a large number of programs during assessment is not recommended because it is often confusing and demotivating for yourself, the pupil and the staff. Try to narrow down the possibilities

### Figure 10.1: Suggested resources for assessment

- a selection of portable computers (e.g. *AlphaSmart*, *DreamWriter(s)*, *eMate*, palmtops etc.);
- high-contrast keyboard stickers;
- Franklin (Elementary) *SpellMaster*;
- a desktop or laptop computer running RiscOS, MacOS or Windows, with:
  - a word processor with good control over fonts, text colour and background colour (e.g. *Write:Outloud*, *TextEase*, *Clicker/Inclusive Writer*, *Word*);
  - a few word processors and spellcheckers (e.g. whatever is used in the school/authority already, plus any others which performed well in the pre-assessment spellchecker test);
  - word bank program (e.g. *TextEase/Pages*, *Clicker*, *Inclusive Writer*, *Point*);
  - talking word processor and/or speech output utility (e.g. *TextEase/Pages*, *Write:Outloud*, *Clicker*, *Inclusive Writer*, *textHELPI*, *Penfriend*);
  - word predictor (e.g. *Penfriend*, *Co:Writer*, *textHELPI*);
  - continuous and discrete speech recognition programs, plus headset (eg. *DragonDictate*, *ViaVoice*);
  - tools to structure and organise work (e.g. *Writer's Toolkit*, *Inspiration*, word processors and word banks with prepared story starters and writing frames)
  - any other software that you think is worth evaluating;
  - the ability to use them all

to a few good packages that are known and supported in the school or authority - one or two word processors, word predictors, and word bank programs – and get to know them well.

In many cases, it will not be possible to identify just one supportive writing tool which meets all requirements and so it will be necessary to use several tools or to make a judgment about which feature is most important. Sometimes different tools will be used for different tasks and in different contexts: a portable word processor for routine classroom work and a speech recognition systems for longer pieces of work, for example.

In the case study in Figure 10.2, the writer decided that speed was more important than initial accuracy. It also illustrates the importance of including the pupil in the assessment process.

### Figure 10.2: Case study – writing speed versus spelling accuracy

John seemed an ideal candidate for the use of a predictive system when he was introduced to it at the end of Primary 6. He quickly picked up the skills needed to use *Penfriend* on the Acorn . He had a significant problem with spelling correctly. However when he saw the word on the list of predictions he could identify it accurately. Just as important, he was not tempted to identify the wrong word if the target word was not suggested by *Penfriend*.

A visit to John a month later revealed that he had given up using the predictive system.

*“Didn’t you find the list of suggestions helpful?”*

*“Yes, but it slowed me down. I use the spellchecker in the Ovation now”*

*Ovation*, the DTP package in use in the school at that time, has a standard spellchecker that helped with just under half of the spelling errors he made. Even although the predictor helped his spelling accuracy more, he chose to use a faster, less accurate technique.

The case study in Figure 10.3 further illustrates how sometimes competing factors must be taken into account. Although the *Tandy WP-2* spellchecker was less effective than the *TextReader* system, the most important goal was to provide Gordon with a writing tool that he could carry around and use in all his classes.

## Assessing handwriting and keyboarding

Using a few sentences from a suitable textbook, ask the learner to copy, take dictation, and write from memory, by hand. Do the same again with a portable computer. Observe the speed and quality of writing, and the accuracy of spelling and content. It is useful to compare the results of this brief test with other pupils in the same class, and with suggested norms for the age of the writer.

For learners tackling the Scottish 5-14 Curriculum or the National Curriculum in England and Wales, the results from national tests give a good idea of the nature of any difficulty.

In a study to establish baseline handwriting speeds for examinations, Dutton (1990) investigated the performance of learners from S1 to S5, for a 30 minute writing task. Dutton reported that learners in S1 wrote between 11 (mean for male pupils) and 14.3 (mean for female) words per minute, rising to 17 to 18 words per minute in S5, with a mean of 15.7 words per minute overall. He suggests that ‘a writing speed of less than 12 words a minute would be considered abnormally slow’ for pupils in S4. The critical rate for younger writers, in S1 for example, will be slower – perhaps around 8 or 9 words per minute.

**Figure 10.3: Case study – ready access versus support features**

Gordon had a difficulty with both spelling and handwriting. He had been using various approaches using computers since primary 5.

When it became available, he used the *Textreader* word processor from Jon Duddington. He found the spelling suggestions and speech feedback very helpful.

However because he made such a great deal of use of the class computer he was supplied with a Tandy WP-2 which did not meet his needs so well but allowed him to do most of his writing by word processing.

He still used the class computer and *Textreader* on occasions. However when the local education authority's standard wordprocessor for primary schools - *Pages*, was installed on the class computer and pupils were taught its DTP facilities, he wanted to use it too. However the spellchecker is very rudimentary and proved not at all useful to him.

Gordon took his Tandy WP-2 to High School. This is what he found:

*"My bag is sometimes quite heavy and it's an extra thing I have to carry around in it. I have to print out in the learning Support room. I have one LS period a week and I have to get it all printed out in that period. Most of the members of staff know my problem and will wait for the work to be printed out. There is one teacher who thinks I'm just lazy. There are quite a few worksheets to complete. It's hard to use to Tandy to do these. I have to cut a strip off the printout and stick it on the worksheet.*

With regard to other pupils:

*"It wasn't as bad I thought it would be. There is one girl pestering me as to why I have to use it. One boy thought I must be a bit odd if I needed to use one of those."*

If the writer's handwriting is at or below this rate, or if it is immature and untidy consider whether improvements to the writing position, or teaching cursive handwriting (Ott, 1998) would be helpful. Structured exercise programmes for dyspraxic writers can have significantly improve handwriting speed, quality and effort (Portwood, 1999). If these 'low tech' approaches have already been tried, compare the quality, speed and effort needed for handwriting and keyboarding – if keyboarding is clearly faster or easier, a word processor is necessary. If the writer's keyboarding speed is slow, he or she may benefit from a program to teach keyboard familiarity. Or if keyboarding is slow primarily because of because of physical difficulties, keyboard alternatives (see the *Keyboard Quick Assessment Guide* on p.92) may be necessary. Slow keyboarding because of poor word-finding or spelling implies looking at word prediction or voice recognition.

**Assessing laptops**

In many cases you will be considering a low cost laptop computer and if so, it is worth checking if the writer has preferences about:

- text size, style and colour, and background colour;
- screen size and number of lines of text that can be displayed on screen
- keyboard size, colour and font – e.g. are lower case or high-contrast stickers better?
- physical size and weight – can the writer carry it, get it from bag to desk, and switch it on;
- appearance – does the writer have a strong preference for the cool black palmtop compared to the boring beige laptop?

Consideration of these factors, with issues such as quality of spellchecker, ease of use and transfer to desktop for editing and printing, plus cost, are usually sufficient to make a decision about the most appropriate laptop.

### Assessing spellcheckers

Ask the writer to read back the sentences he or she wrote earlier, and pick out any mis-spelled words. If correctly-spelled words are picked out as being wrong, or mis-spelled words are not picked out, the writer will need a word processor-based rather than Franklin spellchecker. If you are considering a Franklin, ask the writer to use it to check and correct a few words; verify that he or she can successfully copy the words to and from the Franklin and the workbook.

Choose the most likely spellcheckers (from the test results taken from the writer's work samples prior to the assessment). Ask the writer to type a few more sentences, or type some of the mis-spelled words in short sentences yourself, and ask the writer to use the checkers to correct them. Investigate:

- whether the writer can identify the correct word in the list(s);
- if speech output helps with identification;
- if changing the font size or colour (where possible) helps identification;
- if a spellchecker which highlights errors as they are typed is helpful;
- if he or she has any personal preferences about the spellcheckers.

### Assessing techniques and tools for organising

Many pupils with specific learning difficulties have problems planning and organising their work. While any word processor is better than paper and pencil when editing and altering the structure of text, it is also worth considering whether additional support is necessary. If the writer has difficulties in this area, it is likely to be mentioned by staff and to be apparent during the assessment. Again, the best way to investigate whether particular programs or techniques are helpful is to demonstrate and discuss them with the writer and staff. For example:

- ask the writer to read a short piece of text and answer some questions using a writing frame prepared on a word processor, or word bank program;
- 'walk' the writer through the process of starting a piece using *Writer's Toolkit*;
- work through a short planning exercise using *Inspiration*.

### Assessing word banks

If the writer is at a very early stage of literacy or has very poor or limited reading ability, then the more sophisticated word bank programs such as *Clicker 3*, *Inclusive Writer* and *Writing with Symbols 2000* are most suitable.

Slightly more advanced writers may find that word banks can help them get started with writing and compose better sentences. Ask the writer a few simple questions (about a short piece of text, or a hobby, for example). If he or she has difficulty composing a reply, make up a simple word bank with suitable vocabulary and sentence starters, if necessary, and see if it helps.

Look at the samples of writing sent by the school; is there an obvious difficulty with longer or more complex words? If so, topic-specific, or alphabetically-organised word banks are worth evaluating.

### Assessing word predictors

Consider word predictors if the writer is a slow typist, or has significant difficulty with spelling. The best way to assess whether a word predictor is helpful is to try it. Choose a suitable lexicon for the writer's age and ability (see p. 72). Ask the learner to type a sentence about an interest or hobby – for example, football, motorbikes, fashion or music. Discuss the sentence first, and add any new words with which the learner is likely to have difficulty (e.g. *Stenhousemuir, Kawasaki, Galtier, Jamiroquai*) to the predictor lexicon before the sentences are attempted. Check:

- that the word predictor offers the correct word as the writer types the first few letters;
- that the writer can identify the word from the list;
- whether speech output helps with identification;
- if it helps to reduce or increase the number of words in the word list;
- whether the writer has a preference about the word list font and size, plus text and background colour;
- that the writer gets into a smooth rhythm of typing, looking at the predictor list and looking at the text;
- what the writer thinks of using the predictor – is it any easier than typing without; does he or she feel more confident about tackling more difficult words; does it help with spelling generally.

### Assessing speech output

Look for instances of real word errors (e.g. 'how' instead of 'who', 'her' instead of 'hear') and missing punctuation in the samples of the writer's work. If this looks like being a problem area, type a few lines from the sample into the computer yourself, or better, load in unedited text files which the writer has created previously. Then show the writer how to use the speech facilities and see if the speech output helps to:

- spot and correct the real world errors;
- improve sentence structure and missing punctuation.

Select a few sentences and use the computer to read them out. Adjust the speech settings (voice, pitch, speed) and ask the writer if it makes reading any quicker or easier.

Ask the writer to type a couple of sentences with *speak as you type* (words and sentences) switched on – does it help confirm that the correct word has been typed and that the sentence makes sense, or is it distracting?

### Assessing speech recognition

It is not usually possible to train a speech recognition program sufficiently in a short assessment session to tell whether it is likely to work in the long run, so assessment

can only provide an indication of whether a program is appropriate. Refer to Chapter 9 which deals with speech recognition in more detail. The main questions to ask are:

- does the writer have reasonable oral and general literacy skills;
- does the writer have reasonably consistent speech;
- can the writer compose well-structured sentences before speaking them (in which case continuous speech is a possibility);
- does the writer has difficulty thinking of the next word, stumble over words, speak incorrect words or words in the wrong order – if so, *DragonDictate* is more likely to be suitable;

Having decided on the most likely suitable system, demonstrate and then suggest that the writer tries it out. Set up the microphone and ask the writer to speak a short sentence. Correct any errors yourself using the Word History in Dragon Dictate (turn off the choice list after every word) and the standard technique in ViaVoice. Ask the writer to repeat the sentence three or four times, correcting the errors each time, until it is correctly recognised. Consider:

- the accuracy of the system (although this test is not a completely reliable indication of potential accuracy, it is usually enough to tell whether speech recognition is worth pursuing);
- the writer's speech delivery – is it controlled and consistent;
- whether the writer can identify the mis-recognitions (with and without speech feedback);
- how the writer would correct mis-recognitions;
- the writer's response to the program – is he or she keen to use it?

## 10.6 Supportive Writing Technology Assessment Checklist

The checklist in Figure 10.4 is **not** an assessment protocol – do not start at the beginning and work your way through to the end. Before you use it, you should have already decided which tools you are going to investigate by using the Quick Assessment Guide in section 10.1, or by looking at the ‘Who might use it’ summaries at the end of the previous chapters. The checklist is an aide memoire for the assessment, and for recording observations about the different tools to support writing that are used during the assessment.

### Figure 10.4: Supportive Writing Technology Assessment Checklist

**Pre-assessment information** (from parents, school, educational psychology service, ophthalmologist, occupational therapist etc)

Age

Nature of difficulty –*details of physical, communication and educational abilities and difficulties, plus any visual or hearing impairment.*

Access to curriculum – *say how these difficulties affect work in class.*

Techniques and technologies previously tried (and what happened)

How it is hoped technology will help

#### From test reports:

Reading age

Spelling age

Other relevant information (e.g. nature of spelling difficulty, visual/perceptual problems, motor coordination etc.)

#### From samples of work:

Score simply with very poor, poor, satisfactory, good

	Legibility	Length	Spelling	Vocabulary	Ideas	Ease of use
Handwritten						
Typed						
Dictated						

Spellchecker comparison:

	Checker A	Checker B	Checker C	Checker D
spelling errors				
error 1, e.g. <i>becos</i>				
error 2, e.g. <i>shule</i>				
error 3, ...				

Key: ✓ Correct spelling was offered by spellchecker  
 X Correct spelling was not offered  
 – Word was accepted as being correctly spelled

**Assessment observations**

– tick issues or tools of interest, and record observations and comments

**Handwriting & keyboarding**

- Seating & positioning
- Handwriting technique
- Writing implement
- Keyboard familiarisation/practice
- Keyboard adaptations / alternatives
- Touch typing tutor/programme
- Writer's opinion on handwriting vs. keyboarding
- Staff opinion on handwriting vs. keyboarding

**Word processing**

- Main features
- Text font and size,
- Text colour and background colour
- Word processor used in school
- Writer's opinion on word processor
- Staff opinion on word processor

**Tools to organise writing**

- Story starters
- Writing frames
- Word banks – see below
- Outliner
- Graphical outliner
- Writer's opinion on tools
- Staff opinion on tools

**Laptops**

- |  | Laptop A | Laptop B | Laptop C | Laptop D |
|--|----------|----------|----------|----------|
| <input type="checkbox"/> Text size, font, colours    |          |          |          |          |
| <input type="checkbox"/> Screen size                 |          |          |          |          |
| <input type="checkbox"/> Keyboard size & colour      |          |          |          |          |
| <input type="checkbox"/> Special access features     |          |          |          |          |
| <input type="checkbox"/> Size and weight             |          |          |          |          |
| <input type="checkbox"/> Appearance                  |          |          |          |          |
| <input type="checkbox"/> Spellchecker                |          |          |          |          |
| <input type="checkbox"/> Ease of use                 |          |          |          |          |
| <input type="checkbox"/> Transfer to desktop         |          |          |          |          |
| <input type="checkbox"/> Printing                    |          |          |          |          |
| <input type="checkbox"/> Software built in           |          |          |          |          |
| <input type="checkbox"/> Additional software needed  |          |          |          |          |
| <input type="checkbox"/> Cost                        |          |          |          |          |
| <input type="checkbox"/> Writer's opinion on laptops |          |          |          |          |
| <input type="checkbox"/> Staff opinion on laptops    |          |          |          |          |

**Speech output**

- Does speech output help to spot and correct real word errors?
- Does speech output help with missing punctuation?
- Does speech output help improve sentence structure?
- Is speech output helpful for proof reading?
- Is *speak as you type* helpful?
- Writer's opinion on speech output
- Staff opinion on speech output

**Spellcheckers**

- Effectiveness of checkers to suggest correct spelling (see chart made earlier)
- Can the writer identify mis-spelled words in the text reliably (if so, a Franklin may help, if not a word processor spellchecker is needed)?
- Can the writer reliably copy from paper to Franklin and back again?
- Can the writer spot the correct word in the the list, with/without speech?
- Do contextual examples help to identify the correct word?
- Is *check as you type* useful, and if so, which highlighting method is best?
- Writer's opinion on spellcheckers
- Staff opinion on spellcheckers

**Automatic spelling correction / abbreviation expansion**

- Does the writer make consistent mis-spellings?
- Can the writer remember short abbreviations for longer words?

**Word predictors**

- Does the word predictor offer the correct words as the writer types?
- Can the writer identify the word in the list with/without speech?
- Can the writer swap attention between text, word list and keyboard (or on-screen keyboard)
- Lexicon type/size
- What vocabulary needs added to the lexicon?
- No. of words in list
- Word list font, size, colours
- Does an on-screen keyboard help?
- Effect of word prediction on writing speed
- Effect of word prediction on spelling accuracy
- Writer's opinion on word prediction
- Staff opinion on word prediction

**Word banks**

- ...for prompting?
- ...for structuring?
- ...with topical words
- ...with lists of difficult words
- ...alphabetically organised general vocabulary
- ...with pictures/symbols
- Size & layout of grid
- No. of cells
- Cell and text colour
- Text font & size
- Grid organisation
- Writer's opinion on word banks
- Staff opinion on word banks

**Speech recognition**

- Clarity of writer's speech
- Can the writer compose & speak meaningful sentences (-> continuous?)
- Does the writer need to focus on one word at a time (-> discrete?)
- Can the writer identify mis-recognitions (with/without speech feedback)?
- Can the writer accurately correct mis-recognitions (with/without speech feedback; spell checking; word prediction)
- Accuracy of trialled system(s)
- Writer's opinion on speech recognition
- Staff opinion on speech recognition

## 10.7 Evaluation

Assessment for supportive writing technology is not an exact science, and so it is unlikely that the assessment process will identify 'the solution'. It is much more likely that several tools, software programs, and teaching schemes will be identified as being potentially helpful. Therefore, it is usually necessary to evaluate the equipment and software in the classroom, to determine which systems are beneficial.

If possible, equipment should be loaned to the school or individual for the trial period: it may be possible to borrow equipment from the local SSENTSG contact (see Chapter 18 ) or the CALL Centre Loan Bank of Equipment. With software, licence restrictions usually prevent the loan of programs for evaluation (unless loaned already installed on a computer) but many suppliers can provide software to schools on 'sale or return', or have free demonstration copies of their programs.

The evaluation should be time limited: two or three months (i.e. one school term) is usually sufficient. It is helpful if the school and writer can keep a log of use of the equipment, and complete an evaluation form at the end of the trial.

A sample evaluation sheet is given in Figure 10.5. The system(s) that are being trialled are listed along the top. 'Handwriting' is included for comparison. The aspects of writing which the technology is intended to support are listed at the side, together

**Figure 10.5: Supportive Writing Technology Evaluation (sample)**

<b>SYSTEM</b> (add/replace systems as required)	Handwriting	Laptop A	Laptop B	Word prediction	Speech recognition
<b>OUTCOMES</b> (e.g.)					
Writing speed					
Writing quality/legibility					
Spelling					
Quantity					
Effort					
Vocabulary					
Grammar					
Ideas					
Motivation to write					
<b>FEATURES</b> (e.g.)					
Ease of use					
Portability					
Screen					
Keyboard					
Transfer to desktop					
Printing					
'Cool' factor					
<b>RATINGS</b>					
Writer's rating					
Friends' rating					
Parent's rating					
Staff rating					

with features of the systems that are being compared, and ratings from the writer and those around the writer. The outcomes given are examples – they will be changed to reflect the specific aims for the intervention as specified by the referrer in the pre-assessment investigation (see section 10.4).

The form should be completed by writer, staff and parents together, using a scale of 1 to 5, where 1 is very poor and 5 is excellent.

## 10.8 Management of supportive writing technology

Choosing suitable tools is the first part of the process of introducing supportive writing technology: training of staff and pupils and management of the equipment in school are also vital.

### Training users

For pupils to benefit fully from using supportive technology it is important for them to use it in subjects where it can be of most benefit, i.e. not just in learning support. This means that they must become proficient, independent users of the technology as teachers do not have the time to help pupils who are unsure of what they are doing. Time and resources must be prioritised for this. Ideally, pupils will move from primary school to secondary with all of the skills they need. Good keyboard skills would be particularly useful and the earlier the pupils are assessed and trained in using the technology the better.

In the short term this means that learning support departments in primary or secondary must find the time and resources for training pupils who will benefit from supportive writing technology. As every learning support teacher knows, it is extremely difficult to achieve goals if there is not enough time, equipment, money and staff. Where time is limited it may be necessary to free up time for teaching the use of supportive technology by withdrawing support during class or by stopping basic skills teaching.

If there is a group of pupils requiring teaching in the same type of skills, training as a group can save time. For teaching keyboard skills to a group of pupils, it may be cheaper and more convenient to use a stock of portable computers such as *DreamWriters* or *AlphaSmarts*, than desktop computers (unless the school has a computer lab). In some schools pupils have access to computers during breaks with supervision from classroom assistants or older pupils. Some pupils may have a computer at home which they can use to improve their keyboard skills.

### Training staff

Clearly, if teachers are to train their pupils, they themselves must feel confident in using the technology. Training for class, learning support teachers or classroom assistants in using technology is a priority. The local education authority will usually offer a programme of in-service courses in information technology and commonly used software packages. The local SSENTSG member (if there is one) may also be able to deliver in-service training on particular topics. In Scotland, SCET have a range of courses on the use of technology for pupils with special educational needs; while CALL run courses on a wide range of specialist topics including supportive writing technology. CALL can also provide in-service courses to authorities or schools. Refer to Chapter 18 *Resources* at the back of the book for more information.

## Management

Where supportive writing involves the use of a desk top system, factors to take into account are:

- access to the equipment
- time-tabling its use
- procedures for backing up and protecting work, lexicons, settings and voice files.

When the system is a personal portable computer, there is a need to consider:

- a regime for charging the batteries;
- making sure work is safe from loss by saving to disc or transfer to a desktop computer;
- access to a printer.

With word bank or predictive software, issues include:

- time for staff to create new banks and lexicons, and edit and remove unwanted words from lexicons, to match the current learning tasks.

In Primary schools there is a lot to be said for giving responsibility for management of portable computers to the pupils, including recharging the batteries where necessary. Experience suggests that the chances of success are raised where pupils are encouraged to take this responsibility. During the transfer to from primary to secondary school, pupils may need to rely upon adult help because the rigidity of the secondary timetable means that charging batteries, transfer of work to desktop for editing, and printing may be more difficult to arrange. Staff must be aware of the pupil's need to use the system for writing and willing to accept work handed in after class, if time is not available for printing out during the class.

The case study in Figure 10.6 illustrates the importance of developing a regime and procedure for making supportive writing technology fit the learning context. In some situations it may be more effective to book machines out for each school day rather than for just one period. There are also alternatives to using disc drives attached to the portables: work can be transferred to a desktop computer and then saved on the computer's hard disc, or copied to floppy disc.

**Figure 10.6: Case study – managing portables**

One High School uses Tandy WP -2 and 3 (no longer available), some Amstrad Notepad 100s and has just acquired a set of DreamWriter 100's.

The Tandys were generally more successful because they had a disc drive and pupils could attach the WP -2 to the drive and save their work onto a disc. This meant that pupils were able to carry the work around on a disc which both guaranteed security in the event of a machine failure, and also meant that the Tandys were no longer dedicated machines for individuals but rather a resource that a pupil could use when required. Pupils could keep work on disc and continue it on another WP-2 if necessary. The disc drives solved the problem of the lack of robustness in the some of the Tandys: occasionally a device "froze up " and needed a total reset, meaning the loss of a pupil's writing.

The Tandys were held in the school library and could be booked out by pupils who need them. The recharging of the portables was handled by the library staff. The portables could only be booked out for a single period at a time: pupils were not able to carry a portable around school all day. As a result there was wider use of portable technology, it became more commonplace, and the regular users appeared less 'different'.

The High school decided to buy a set of DreamWriter 200's with built-in disc drives and to use them in the same way as the existing stock of Tandys. Another advantage of the DreamWriters is that a *Ro/A-Lab* can be purchased to store and charge the machines. The Ro/A-Lab can also be locked which provides added security.