Chapter 6 – Assistive Technology for the Composition of Written Material

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Assistive Technology for the Composition of Written Material

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Introduction

Writing is a complex process that involves both the physical mechanics of handwriting and the cognitive component of organizing, creating or composing written material. This chapter focuses on tools that may assist students who struggle with writing composition.

"Composition is the plan, placement, or arrangements of the elements." (www.wikipedia.org) Composition of writing involves the ability of the student to express ideas in a way that is meaningful to others. Standards for the development of literacy suggest that good writing necessitates a linear path to the end product. A student is required to learn a concept or series of concepts, to organize that information into a linear form, and then compose the ideas in a meaningful way which creates a presentation that express ideas surrounding a specific topic.

A common concern expressed by teachers, parents, and in some cases, the students themselves is "They have good ideas but just can't get them down on paper." Understanding the writing sequence and adding supports as needed may help students. For others there may be alternate ways to share or present what they know. The following tools may assist students in overcoming or adapting to the writing obstacles they face.

Using the SETT process and Decision Making Guide

It is intended that you use this as a guide. The Decision Making Guide follows the SETT (Student, Environment, Task, and Tool) format with a subcategory of Sensory Considerations included with Student and Environment. Additional categories include:

- Narrowing the Focus to help identify a specific task in order to select appropriate assistive technologies.
- Implementation Plan to assign trials, dates, responsibilities and data collection.
- Follow-Up Plan to set a date for the team to reconvene and review the student's progress.

Again, this is intended as a guide; during the actual assessment process, each topic should be written in large print where everyone can see (i.e., on a flip chart or board). Information should then be transferred to paper for distribution, filing, and future reference. For more information about using the SETT process, please refer to Chapter 1 of this manual.

The questions posed in the guide are not intended to be all inclusive but rather to prompt the team to consider as many factors as possible in order to identify and ultimately try appropriate assistive technology tools and strategies for their students.

WATI Assistive Technology Decision Making Guide

Area of Concern: <u>Composing Written Materials</u>

PROBLEM IDENTIFICATION

<table>
<tr><th>Student's Abilities/Difficulties</th><th>Environmental Considerations</th><th>Tasks</th></tr>
<tr><td>What are the student's abilities & difficulties related to the area of concern?

• Struggles getting thoughts on paper
• Problems organizing thoughts
• Doesn't know how to get started with the writing process</td><td>What environmental considerations impact the area of concern?

• Teacher's expectations concerning tool use
• Rigor of assignments
• No one trained in operation of tools
• Limited access to tool
• Current/past AT used</td><td>What task(s) do you want the student to do?

• Generate ideas
• Organize writing
• Getting ideas on paper
• Connecting ideas
• Appropriate citations and formats
• Using correct grammar, spelling and/or punctuation</td></tr>
<tr><th colspan="2">Sensory Considerations</th><th>Narrowing the Focus</th></tr>
<tr><td colspan="2">What sensory challenges does the student have that impacts this area of concern? (i.e., visual, auditory, tactile)

Visual clutter, background noise, tactile stimulation, awareness of physical space, fluorescent lighting versus full spectrum lighting</td><td>i.e. Identify specific task(s) for solution generation
After the team has generated a list of tasks that the student needs to do, you may want to refine the list to limit the tasks that the team will focus on. The tasks that remain can become your new focus at a later date.</td></tr>
<tr><th>Solution Generation Tools & Strategies</th><th>Solution Selection Tools & Strategies</th><th>Implementation Plan</th></tr>
<tr><td rowspan="3">Brainstorming Only
No Decisions yet

Review the area continuum</td><td rowspan="3">Use a Feature Match Process to discuss and select idea(s) from Solution Generation</td><td>AT Trials/Services Needed:
• Date
• Length
• Person Responsible
• Formulate objectives/criteria to determine success of trial/AT</td></tr>
<tr><th>Follow-Up Plan</th></tr>
<tr><td>Who & When
Set specific date now.</td></tr>
</table>

Important: It is intended that you use this as a guide. Each topic should be written in large print where everyone can see them, i.e. on a flip chart or board. Information should then be transferred to paper for distribution, file, and future reference.

Student's Abilities and Difficulties

Students may struggle getting thoughts on paper, organizing thoughts, getting started with the process of writing, and/or making a mental picture of what to write about.

As a team, discuss what the student's abilities and difficulties are related to composing writing. Please complete and review Section 5 of the WATI Student Information Guide: Composing Written Material (Chapter 1, page 32).

Sensory Considerations
Some students are adversely affected by environmental stimulation that others can filter out or ignore. Some common factors that can impact a student's learning and focus include hypersensitivity or hyposensitivity to stimuli such as:

- Visual clutter
- Fluorescent lighting versus full spectrum lighting
- Classroom and background noise
- Tactile stimulation
- Awareness of physical space
- Other individual specific sensitivities

Although these factors are not directly related to writing, they impact the student's ability to focus on instruction and learning so should always be considered.

Other Considerations
Each individual student has specific skills and areas of concern. Be certain to address those as you capture the particular traits of the student in this part of the SETT process.

Environmental Concerns

As a team, discuss and write on chart paper any environmental considerations that might impact the student's writing such as auditory or visual distracters, placement in the classroom, number of different writing environments or any other environmental impacts.

An area to consider may include teacher expectations such as: rigor of the assignment, goal of the composition process, comfort level with alternative media as an expression of knowledge (i.e., *PowerPoint*, Venn Diagrams, *Inspiration* outlines, etc.), rubrics for evaluation of the project or facilitation of tool use.

What are the tools already available in the student's classroom or in the school? Are they pre-loaded and ready? Have all the student's teachers and the student themselves been trained in how to use the tool? Are the number and location of tools appropriate to allow access to the student in all environments? What supports are in place for the teacher to facilitate tool use?

Assistive Technology: past and present
What assistive technology (AT) has been employed in the past or is currently used with the student? List all assistive technologies that have been used with the student. If some have been discontinued, make note of the reasons. Sometimes effective tools are discontinued for reasons that no longer exist such as computer conflicts, lack of training, lack of interest, or other reasons. Do not discount assistive technology that was previously tried and discarded. There may have been a mismatch between the assistive technology and the student's skills at the time. Differences in skill development, maturity, a different environment or other factors may make all the difference. If the student is currently using assistive technology note the AT used, location, level of effectiveness, trained staff, and any other issues that are pertinent to the student/building. Be certain to list low and high tech AT supports.

Sensory Considerations
Some students are adversely affected by environmental stimulation which others can filter out or ignore. Some common factors which can impact a student's learning and focus include hypersensitivity or hyposensitivity to stimuli such as: visual clutter, fluorescent lighting versus full spectrum lighting, classroom and background noise, tactile stimulation, awareness of physical space or other student specific sensitivities.

Although these factors are not directly related to writing, they impact the student's ability to focus on instruction and learning and should always be considered.

Tasks
As a team, discuss and write on chart paper the reading tasks that the student needs to do.
One of the most important questions when assessing a student's need for assistive technology is: What are the tasks the student needs to do? In this instance what does the student need to write and then what does the student need to do with the information written? Some examples may include: generating ideas, organizing writing, getting ideas on paper, using appropriate grammar/spelling/punctuation, connecting ideas to make sense to the reader or using appropriate citations and formats.

Narrowing the Focus
As a team identify, by circling or other means, those few tasks the student needs to do for writing that will have the most impact.

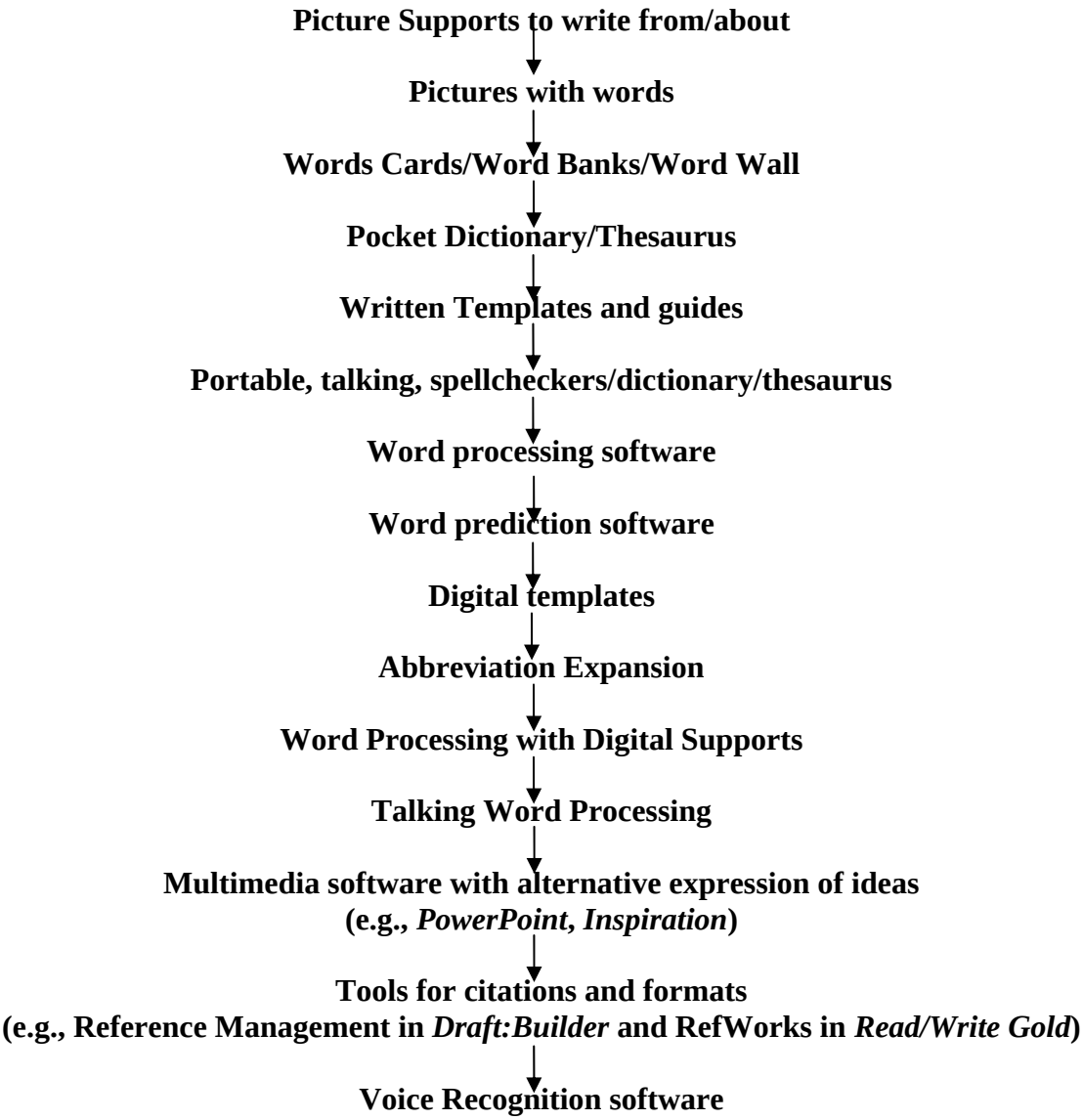
After the team has generated a list of tasks that the student needs to do, you may want to refine the list to limit the tasks that the team (including the student) will focus on. Too many tasks can overwhelm the team. Introduction of too many factors and tools may reduce your ability to determine effectiveness. Maintain your original list of tasks and review it later. Some tasks may already be effectively addressed with the new tools/strategies that you are using. The tasks that remain can become your new focus at a later date.

Solution Generation: Tools/Strategies

As a team, brainstorm and write on chart paper any assistive technologies and/or strategies you think will assist the student in successfully completing those tasks you identified.

The team brainstorms strategies and assistive technology tools that may be of benefit for the student to complete the identified tasks in the given environments. Do not critique or otherwise evaluate the suggestions at this time. List all suggested tools and strategies including those currently in use on chart paper for all to see. The tools and strategies discussed earlier follow the general continuum for writing. The continuum is generally organized from low to high assistive technology. It is not intended to be used as a step-by-step protocol for using AT tools with a student, but rather an organizational continuum of types of Assistive Technology.

A Continuum of Considerations for Assistive Technology For Composing Written Materials



Picture Supports to write from or about

Some students have difficulty determining a topic or image about which to write. Students on the autism spectrum may not be able to readily form a visual picture of what they are to be writing about. Utilizing a picture from a magazine, a digital photograph, or a textbook picture may help to provide the visual support necessary for the student to be able to complete a written activity.

Pictures with words

Some students may need pictures or photos with word labels attached. For students who seem to have difficulty finding the correct word, having the picture label may help them identify the works they are looking for. Thus the student is able to spend his/her time and energy on writing about the topic, instead wasting valuable time searching for the correct word. Specific software: *Boardmaker, Picture It, Writing with Symbols, Pix Writer.*

Word Cards/Word Banks/Word Wall

These tools are commonly used in many elementary school classrooms, and help to provide students who struggle with writing by having frequently used words displayed on the classroom walls, study carrels, dividers, or on charts. These visual tools provide examples of words the student might need to use in the given activity. These words can also be added to word prediction programs that have topic dictionaries for easy retrieval while they are writing. Writing with Pictures: using a picture-based writing program such as *PixWriter* will allow students to write even if they are unable to spell. The student can begin to put together simple picture sentences.

Pocket Dictionary/Thesaurus

If a student is able to look up words in a dictionary or thesaurus, these pocket models can be useful. Because they are portable and unobtrusive, the student is able to utilize the tool whenever needed.

Written Templates and Guides

These may include “story starters” and other sentence builders that can help students by allowing them to fill in words or phrases to make complete sentences. Various templates can be created for the main idea, supporting characters, developing plots, etc. Templates can be created of varying complexity depending upon the needs of the student. Specific software such as *Kidspiration* or *Inspiration* work very well for making templates.

Portable Talking Spell Checkers, Dictionaries and Thesaurus

Stand-alone desktop and pocket sized spell checkers are available. Some are based on exact spelling while others use phonics to help a student find the word they are trying to write. Most stand alone spell checkers have a small keyboard to enter the word the way a student thinks it's spelled. Homonyms can be particularly difficult. When words sound alike but have different meanings (there/their/they're), some spell checkers will not show the other options. Using the wrong spelling changes the meaning and can increase the frustration of the writer, having a dictionary component as part of the spell checker can help decrease that frustration. When a word is spelled phonetically, it may not be recognized with all spell checkers. The spell checker suggests words that begin with the same two or three letters typed in. Spelling that's not phonetic may not be recognized, so no suggestions for the correct word are given. Chances of success are greater if the first two or three letters are typed correctly.

Talking spell checkers and electronic dictionaries such as Franklin etc. can help a poor speller select or identify appropriate words and correct spelling errors during the process of writing and proofreading. Talking devices "read aloud" and display the selected words onscreen, so the user can see and hear the words. Match the student's needs with the features - speech, thesaurus, help with words that sound alike but are spelled differently, and capabilities of the device.

Check the keyboard of the electronic, handheld spell checker for asterisk and question mark keys. Depending on the design of the device, those two keys may be used to help you find the correct spelling. The asterisk often is used as a marker for an indefinite number of missing letters. For instance, typing in "neu*" yields a list of words beginning with those two letters and, hopefully, phonetic alternatives as well - "neutral," "new," "newt," "pneumonia." The question mark sometimes can be used in place of unknown letters. Typing in "p?t" brings a listing of all words in the spell checker's word base with that letter pattern - "pact," "pant," "past," "peat," "pelt," "plot." A stand-alone, electronic spell checker with asterisk and question mark keys and speech capability can be a helpful tool for students who struggle with spelling.

If the student is using a computer, websites like www.dictionary.com can help with definitions and homonyms and www.visuwords.com can give a visual representation to the words through color coding groups of meanings when a word has several uses. *Read and Write Gold* is one example of a software program that not only gives text to speech but also clarifies homophones.

Word Processing Software

Computers change the writing process by making it easier to access, develop, record and edit ideas, and to publish and share with others. Different computer supports are useful during different phases of the writing process. Students may need to change the size, color or shape of the font they write with. The background color can be formatted if needed and pictures added to cue up what they are writing about. These can be converted back to the "print standard" of an assignment—a student may prefer to type in 24 point font but the assignment needs to be converted back to 12 point font before it is turned in.

Word processing software (i.e., Microsoft *Word*, *Open Office*, *Claris Works, Word Perfect*) lets you see typed text on a computer screen before printing on paper. In this way, you can easily remove or add words, move sentences or paragraphs around, and correct spelling errors without having to rewrite the paper.

Grammar checkers, often included in word processing programs, check for errors in grammar, punctuation, capitalization, and word usage. Possible errors are shown on the computer screen and cue the student to check their writing, giving them a chance to correct problems before printing a document. Grammar check may be a part of the word processing program or purchased separately. Digital text also allows for easy formatting—it's easy to underline, boldface, change spacing between lines, center text or add visual elements.

The writing and editing process can be a laborious time-consuming task. Errors are easily corrected and information can be reorganized and edited before printing the final product. Other tool "add-ons" such as word prediction programs and/or abbreviation expansion, which are described below, can work along with word processing software for added support.

Word Prediction Software

Word prediction programs reduce the time, effort and frustration for individuals with spelling difficulties to produce written work by providing an on-screen list of possible words to use in a piece of writing. The student types a letter or two and the program provides a list of words (based on word frequency and context) beginning with that letter(s). If one of the choices is a word the student wishes to use, they select it. If not, the student enters another letter that produces a new set of choices.

Word Prediction software (i.e., *Co:Writer, WordQ, Read and Write Gold, Premier, and SOLO*) also include features such as spell checking as you type, multiple word prediction, text to speech, grammatical rules, phonetic spelling and hotkeys for frequently used words. Text-to-speech can provide auditory feedback to students to assist them in word choices and selection to monitor the structure and meaning of their work.

Digital Templates

Digital templates are interactive prompted writing guides that assist writers through the correct writing sequence. Some software (*SOLO*) uses prompt statements that guide students through each step of the writing process, from creating an introductory paragraph to completing the conclusion statement. Many allow you to modify any of the templates or create your own templates for any subject or assignment.

Abbreviation Expansion

Abbreviation Expansion software can be used to create abbreviated forms for frequently used words or phrases for slower writers and poor spellers. For example, if a student consistently misspells "conscious" they could type "c-o-n" and space bar in its place and the word "conscious" will automatically appear on the screen. This feature is often included in word prediction programs such as *Co:Writer* as well as word processing programs like MS *Word*.

Word Processing with digital supports

Students can be provided with access features to support their digital writing. Digital highlighters can be used to extract text from source documents, decreasing the copying time this would normally take. Digitally based graphic organizers can be used to group chunks of information that will be needed and to organize the circular thinking patterns students may have on a topic into an outline with a push of a button. This outline can then be exported to a word processing document or PowerPoint with the “organizational” elements intact. Some students benefit from hearing the words they are writing, text readers or read back elements can help them catch poor word choices or the correct spelling/wrong word used. Programs mentioned before such as word prediction and abbreviation/expansion help get the right words on paper, and built in tools such as the thesaurus, word count and grammar check can provide valuable editing feedback. Some new writing tools are emerging at the time of this writing that can assess not only writing conventions like punctuation and capitalization, but these tools can provide more in-depth feedback such as sentence length, sentences leading to a cohesive paragraph, or sentences that lead to a key point, all helping a student to evaluate their writing before it is turned in.

Talking Word Processing

This software is used to provide verbal feedback to a student while they write. The verbal feedback can be provided at a letter, word, sentence, or paragraph level. The entire document could also be read back. Some students are better able to hear mistakes than read for mistakes. Some examples of software that do this are *Write Out Loud, WordQ, Read and Write Gold, Premier*, etc. (See Chapter 7 – Assistive Technology for Reading for additional resources.)

Multimedia Software for Alternative Expression of Ideas

Improving access to digital media is changing the type of assignments students can use to express their understanding of content. Early multimedia such as *PowerPoint* or *HyperStudio* allowed a student to add pictures, videos, movement and sound to their projects. SMART® Notebook software is an example of a new generation of multimedia software. Alternative formats of expression may help some students get their "ideas out".

PowerPoint, a program that is available in almost every school allows a student to add graphics, movement, charts and graphs, video, and voice to a project. Text to speech software can be used to read the text in the PowerPoint. Internet access allows a student to find the right pictures and videos to express an idea. Sound and video editing software such as *GarageBand* or *Audacity* are also available to edit media materials a student may want to use. Through picture editing and the slideshow feature, projects like *Claymation* and cartoons can be made. Personal publishing software, such as *Comic Book Creator*, allows students to use visuals to help make their point. Choosing the features that match a student's motivation and/or abilities will help them create a project that can truly share what they know.

Graphic organizers like *Inspiration, C-map* or *Spark-Space* can help a student visually and kinesthetically organize the bits of information gathered for a project prior to beginning the writing process. This information can then be organized into a coordinated whole.

Video and pod casting software can help a student express visually and verbally what they are struggling to get down on paper. Through the editing process they can organize those thoughts into a cohesive whole.

Some of the new online tools such as *Google Docs* or protected group spaces such as those found in *Moodle* can help students work together on writing projects. The group members are at their own workstation and see a group document at the same time. This may work well as an instructional strategy but can also be used by the students to create a better group document.

Tools for Citation Formats

Citations are important for students to use, helping them recognize the authors and creators whose ideas, words and media contributed to the current project. Websites, documents and other citable works are easy to loose in the rush of internet searching. Website tracking software and reference managers such as the ones built into *Draft:Builder* or *Read/Write Gold's RefWorks* can help a student format not only written work but the varying media a student may draw upon for their projects.

Voice Recognition (VR) Software

Voice recognition software is improving as fast as the new versions are released. Training time has been significantly decreased, ease of use increased, and student accuracy significantly improved. In addition to stand-alone VR software, VR is also built into other software such as *Office XP, Vista OS, WordQ, SpeakQ, Read and Write Gold and Premier.*

For all of the positives VR software may still fall short of getting the student's thoughts and ideas down on paper. VR can not organize thoughts or improve sentence delivery on its own. A student's jumbled thoughts or poor speech patterns will show up on the computer screen. Good training with voice recognition is important. Students need to master navigating the software and controlling the writing process by voice. They will still need to edit, catch the program's misunderstood but correctly spelled words, and check their work. VR software can be used with an organizational software such as *Inspiration* to help enhance the organization of writing.

Students will need time to learn and master the VR program before they are expected to use it functionally in classroom assignments. Microphones may also be an issue. Many schools report they are using a lot of them. The tender wires take a beating in the school environment. Despite these challenges (needed training, proper computer equipment, still needing an organizational tool, etc.), students may benefit greatly by using their voice to write. (For more information, see Chapter 5, Assistive Technology for Motor aspects of Writing.)

Solution Selection: Tools & Strategies

Use a Feature Match process to discuss and select those ideas, tools, and strategies that were generated during the solution brainstorming. Select those that best match the student, the environment and the reading tasks that need to be accomplished. Limit your selections to a reasonable number and prioritize them according to those that can be accomplished immediately, in a reasonable time period and those that will be considered at a later time.

Implementation Plan

After tools have been selected and prioritized, identify any trials or services that are needed including procurement of trial materials, team member(s) responsibilities, start date and length of trial, training needed and any other student/staff specific issues. Be certain to identify writing objectives and criteria of performance to determine the effectiveness of the trials.

Follow Up Plan

Before the meeting ends set a mutually agreed upon time and place to give progress on the implementation plan. Be sure to include all those people who have assigned tasks and an interest in the outcome. This will give team members a chance to revisit concerns, keep members on track and solve problems before they become a roadblock to implementation.

Web Resources

Dictionary.com
An online dictionary, thesaurus, reference and translation guide
http://dictionary.com

Visuwords.com
Online graphical dictionary — Look up words to find their meanings and associations with other words and concepts. Produce diagrams reminiscent of a neural net. Learn how words associate.
http://visuwords.com

Wikipedia
A multilingual, web-based, free content encyclopedia project.
http://www.wikipedia.org

Product Resources

Audacity

http://audacity.sourceforge.net/

Claymation

Registered Trademark – Will Vinton 1978
Claymation Station
http://library.thinkquest.org/22316/home.html

C-Map

Institute for Human and Machine Cognition
http://cmap.ihmc.us

Comic Book Creator

Planetwide Media a division of Planetwide Games, Inc.
Personal publishing software
http://mycomicbookcreator.com/

Draft:Builder

Don Johnston Incorporated
26799 West Commerce Drive
Volo, IL 60073
http://donjohnston.com

GarageBand

http://www.apple.com/ilife/garageband/

Google Docs

International Business Machines Corporation
http://www.google.com

HyperStudio

http://hyperstudio.com

Inspiration

Inspiration Software, Inc.
http://www.inspiration.com

Moodle

http://moodle.org

Power Point

Microsoft Office
http://office.microsoft.com

Read/Write Gold

TextHelp Systems Inc.
http://www.texthelp.com/page.asp?pg_id=10059

Spark-Space Limited

UK Company
www.spark-space.com/education.htm