
Achievement Deficits

Basic Reading Skills

Assessment Measures

The following tests provide information about basic reading skills:

Letter-Word Identification [WJ-R test 22]

This test measures the student's ability to identify letters and words. A low score on this test suggests a lack of reading vocabulary.

Word Attack [WJ-R test 31]

This test measures the student's ability to demonstrate the knowledge of phonetic analysis by decoding nonsense words. A low score on this test suggests a lack of phonics and syllabication skills.

WRAT-R Reading

This test measures the student's ability to read a list of words of increasing difficulty. A low score on this test suggests a lack of reading vocabulary.

Functional Manifestations

Basic Reading Skills

A student whose test behavior suggests specific deficits in basic reading skills may have difficulties even in classes where reading ability is not a target skill. Written instructions on tests or worksheets, assignments written on the board, the class syllabus, and word problems in classes such as math, drafting or electronics may present unexpected difficulties for this student. In addition, instructional signs on equipment in classrooms which relate to use or warn of danger may not be comprehended by this student.

In daily life, this student can expect problems with menus, billboards, street signs, warning signs, identifying product names in stores, reading maps, and finding names in phone books, as well as the more obvious reading situations involving mail, instructions with products, driving tests, and contracts.

**Software
Considerations**

Instructional Goal

Students will expand sight reading recognition vocabulary as well as practice word recognition strategies which include phonetic word attack, using context clues, and recognition of word parts (e.g. roots, prefixes, suffixes).

Instructional Considerations

Functional visual scanning skills are essential to the reading process and should be addressed early in instruction. Mastery of a given activity must be achieved without sound output before student progresses to the next level.

To improve academic performance, students can use technology to compensate for weaknesses in sight recognition and word attack skills. Such technology includes computer voice output for auditory text editing, books on tape, and “talking” hand-held spellers/dictionaries.

Any program format which engages students to read at their instructional level will stimulate use of word recognition strategies. The same software may be useful for building word identification skills as well as vocabulary.

Software Characteristics

Software should provide multiple formats for practice.

Having different formats for practice relieves tedium and facilitates generalization.

Authoring component is easy to use.

Having the opportunity to practice personally relevant words enhances/expands the value of the software.

Creating personalized reading materials is not practical unless the authoring tool is easy to use.

Software should provide multiple reading levels.

Easily identified reading levels allow an appropriate match between practice material and student’s reading level.

Sound output is desirable.

With sound output students can hear if they have successfully visually decoded a target word. The option to have a word highlighted as it is read is a useful software attribute.

**Suggested
Software**

Word Attack Plus (Davidson) - DOS/MAC

This program is useful because of the wide range of data disks available which cover various grade levels and specific content areas (roots and prefixes, SAT vocabulary).

Skills Bank II (Skills Bank Corporation) - DOS/MAC

A strength of this program is that its vocabulary building lessons are organized into word parts (including Greek and Latin roots as well as categories of prefixes and suffixes). In the DOS version, students can make print screens of word categories to use for later study and review.

WordMunchers (MECC) - DOS/MAC

This program encourages rapid decoding of vowel sounds at the single syllable word level.

Reading Comprehension

Assessment Measures

The following tests provide information about reading comprehension:

❑ *Passage Comprehension [WJ-R test 23]*

This test measures the student's ability to use context clues to determine the appropriate word in a cloze reading passage. A low score on this test suggests that a student will probably experience difficulty in reading college textbooks.

❑ *Reading Vocabulary [WJ-R test 32]*

This test measures the student's knowledge of word meanings by supplying synonyms and antonyms.

Since college reading materials assume a level of sophistication in word knowledge, a student with a low score on this test will likely experience problems in understanding lecture content and in comprehending course materials.

❑ *Degrees of Reading Power (DRP)*

This test measures the student's ability to choose the correct words, in a cloze procedure, to complete the meaning of reading passages with increasing complexity as in the Passage Comprehension test, a low score on this measure suggests that a student will experience difficulty in deriving meaning from written materials.

Weakness in any of the reading comprehension skills may adversely affect a student's school performance.

Functional Manifestations

Reading Comprehension

A student whose test behavior suggests specific deficits in reading comprehension may have difficulty in identifying main ideas, retaining sequences of events, and/or comprehending subtleties (inferences) in written material. The student may attempt classes which involve reading, but may interpret information literally, without drawing conclusions or forming opinions.

**Software
Considerations**

In daily life this student is not likely to enjoy recreational reading, and, if interested in current events, is unlikely to obtain this information from newspapers or magazines. In addition, this student may have difficulties in reading situations involving driving tests, mail, instructions with products, and contracts.

Instructional Goal

Students will improve passage comprehension by practicing strategies to enhance visualization, identification of the main idea, inferential reasoning, memory for details, and drawing conclusions. Students will use reading skills to obtain information needed to solve problems.

Students will improve vocabulary skills by studying new words and by using contextual clues to deduce meaning of unknown words.

Instructional Considerations

It should be noted that most reading comprehension software tests comprehension rather than teaching strategies. Students need to learn reading comprehension strategies before using the software to practice them.

Games and problem-solving software environments motivate students to work to understand information that they are reading. In this way, application and generalization of reading comprehension skills occurs "painlessly."

Long-term and short-term memory deficits may interfere with reading comprehension and should be addressed specifically. The instructor should also be aware that success in reading comprehension is dependent upon a student's understanding the vocabulary in the material being read.

Even when using an appropriate reading level, the use of voice output devices (e.g. hand-held electronic dictionary / speller, or computer voice output, if compatible with software package) will help students compensate for word attack weaknesses.

**Software
Considerations
(cont.)**

There are a number of full-featured programs which teach reading from the pre-literacy level through the high school level. Because such programs are costly, they are most effectively purchased by an institution for campus-wide use. Programs of this type are not included in this document.

Note:

Software characteristics and suggested software programs for reading comprehension activities are divided into three basic types:

1. reading comprehension skills only (i.e., main idea, inference, drawing conclusions);
2. vocabulary development; and
3. reading comprehension to achieve software goal (games or simulations).

**Software
Characteristics
Reading
Comprehension**

Control of reading level and passage length is desirable.

It is necessary to control passage length in order to ensure student success in decoding material. Text should be presented at or below students' reading levels for this to occur. Material of varied lengths need to be available in order to accommodate time constraints of students (e.g., a 50 minute class period), students' ability to focus and maintain attention on the reading task, and students' level of performance. Short passages must also be available for students unable to comprehend longer ones.

The ability to receive on-line hints or to review the reading passage while answering comprehension questions is desirable.

Many students' ability to mentally organize and retain the material they have read is facilitated by hints or being able to review the passage while they consider the answers to comprehension questions.

Software should employ a variety of response modes.

To make tasks more interesting as well as challenging, a variety of response modes is desirable (e.g. multiple choice responses for comprehension questions, underlining for selecting the main idea in text). Because students get bored with repetitive tasks, being forced to respond in different modes promotes different ways of processing information and formulating concepts.

Software should allow students to demonstrate comprehension without regard for spelling accuracy or an exact sequence of words.

Programs which require exact spelling and phrasing may measure areas of weakness rather than focusing on the task of reading comprehension. The option to review vocabulary prior to reading passages is desirable.

On-line dictionaries assist with acquisition of vocabulary knowledge needed to understand a reading passage. Using them provides students with practice in using reference materials as well as assisting with comprehension.

Software should include a variety of comprehension tasks (e.g. finding the main idea, reading for facts, making inferences, and drawing conclusions).

Practice in different types of reading tasks is necessary in order to help students build skills in specific areas and to help students understand the spectrum of activities which encompass reading comprehension.

Text on the screen should be easy to perceive.

An uncluttered screen format and good text resolution is necessary to facilitate reading speed, reduce eye strain, and reduce negative effects from visual perceptual interference.

**Suggested
Software
Reading
Comprehension**

Read 'N Roll (Davidson) - DOS

This program focuses on single paragraph comprehension followed by a single question involving the main idea, facts, making inferences, or sequencing. Features include vocabulary review (multiple choice in cloze procedure), paragraph review during question, text display option (text is available as black type on white background or white type on black background). A variety of grade level materials is available.

Reading Workshop (Mindscape) - DOS

Students work in an interactive format. Comprehension activities are set in the context of short stories and popular literature. A variety of comprehension activities are available, including sequencing (students put lines of the story in correct order), and identifying key words. Students also practice punctuation and identify parts of speech.

**What's the Story? (Sunburst/Wings for Learning) - DOS/
MAC**

This program provides a series of passages on motivating subjects which are age appropriate for adults. This software is especially useful because of its unique format where students begin with reading the questions and seek the answers from the text. Cloze procedure is effectively used. Students are not penalized for spelling errors.

Ace Reading Series (Mindplay) - DOS/MAC

The Ace Reporter (main idea and details), Ace Explorer (sequencing), Ace Detective (drawing conclusions), and Ace Inquirer (facts or opinions) are useful in their organization; each program focuses on one concept. Each also requires students to separate pertinent from non-essential information and has a motivating format. Reading level can be controlled, and an authoring component is available for editing existing text or writing new material.

Skills Bank II (Skills Bank Corporation) - DOS/MAC

This program is effectively organized by concept with literal, interpretive, and critical comprehension sections, as well as figurative language. Lessons are followed by quizzes and tests.

**Software
Characteristics**
Vocabulary
Development

A unique feature is explanation of both accurate and inaccurate answers. The story is available to re-read during questions, and hints are available. Students can control text and background colors from a wide array of combinations.

Screen should be uncluttered.

An uncluttered screen allows relevant information to stand out. Students with visual processing difficulties and poor scanning skills may have difficulty separating the target vocabulary word from other on-screen information if the screen is cluttered.

Authoring component should be easy to use.

An editing or authoring option in vocabulary instruction is very practical for the study of vocabulary because it allows individualization of word lists. Students may input glossary items from their text books in order to prepare for reading or taking exams. Students who input their own word lists will have the additional benefit of manipulating their word list in a way which will enhance their understanding of the words.

Content should be effectively organized.

Objectives for the development of vocabulary should be functional and clearly stated. Whether by grade-level, part of speech, "survival" vocabulary or other system, its organization should be in agreement with the instructional needs of these students.

Sound output for each vocabulary word is desirable.

With sound output for vocabulary words, students receive an additional stimulus for learning. Additionally, having an auditory model for a word may facilitate correct pronunciation of the word. (If sound is not an option provided by a program, the use of electronic dictionaries with sound output would prove to be helpful).

**Suggested
Software
Vocabulary**

Word Attack Plus (Davidson) - DOS/MAC

This program, which now includes spoken production of its vocabulary, is particularly useful in its array of formats, its organization by grade level and part of speech, and its authoring capability.

Skills Bank II (Skills Bank Corporation) - DOS/MAC

The Vocabulary Building and Word Knowledge modules of this program are effectively organized into specific lessons which are followed by quizzes and tests. A unique feature is explanation of both accurate and inaccurate answers. Students can select text and background colors from a wide array of color combinations, and they can print-screen lessons to review later.

**Software
Characteristics
Games or
simulations which
require reading
comprehension**

Software should provide a motivating environment.

It is easier for students to apply and generalize their reading comprehension strategies when they are motivated to read on. Students need to understand information from passages in order to solve problems and reach the goal of the program.

Program should provide the option to stop and save a game in progress.

Due to students' time constraints, attention spans and general fatigue factors, it is often necessary to stop a game before the goal has been attained. Students often feel more productive when they can save the activity and resume at a later time.

**Suggested
Software
Games or
simulations which
require reading
comprehension**

Lost Tribe (Lawrence Production/Davidson) - DOS/MAC

This software is especially useful because it provides a high interest format for making decisions, solving problems, estimating needs and testing hypotheses. Students need to use reading comprehension skills as well as knowledge of

mathematics, time, and human nature in order to be successful in this game/ adventure format.

Carmen San Diego Series (Broderbund) -DOS/MAC

These programs are especially useful because they require the user to read and keep track of information and use reference materials. The content focuses mainly on geography, history and culture.

Nigel's World - DOS/MAC

This program is especially useful for students with lower elementary reading level and minimal knowledge of world geography and cultures. Students build reading comprehension skills through reading assignments. They must read descriptions and hints in order to find locations and complete assignments within a time limit. Knowledge from earlier levels is necessary to complete higher levels.

Headline Harry and the Great Paper Race (Davidson) - DOS/MAC

This program is useful because it requires the user to read and keep track of information and discriminate between irrelevant and relevant information needed to win. The game addresses subjects of U.S. history, geography, and culture which may also enhance student's fund of general knowledge. This game requires some ability to hypothesize and to learn from incorrect answers.

Time Treks (Davidson) - DOS/MAC

This program requires students to use reference materials to find answers to questions. Subject matter covers a wide range of topics (science, history, civilizations, arts and more). A game board is used for selecting a variety of questions. The time factor adds pressure for reading rapidly to find answers. Students need to use this program several times before all the options available become familiar to them.

Basic Mathematics Skills

Assessment Measures

The following tests provide information about basic mathematics skills:

❑ *Calculation [WJ-R test 24]*

This test measures the student's ability to perform mathematical calculations from basic operations through calculus. If the test protocol is available, an analysis of the student's errors can provide insight into whether the student understands the concepts or is making only calculation errors. Prescriptive software must take into account the types of problems with which the student is experiencing difficulty.

❑ *Quantitative Concepts [WJ-R test 33]*

This test measures the student's knowledge of basic mathematical concepts and vocabulary. A low score on this test may impact the student's performance in classes which have a mathematical base, e.g., chemistry, anatomy and physiology, accounting, etc.

❑ *WRAT-R Arithmetic*

This test measures the student's ability to perform mathematical calculations under timed conditions. A low score on this test needs to be evaluated to determine whether the score is due to time constraints rather than lack of math knowledge.

Functional Manifestations

Basic Mathematics

A student whose test results suggest specific deficits in basic mathematical skills may also have difficulties in classes where math is not a target skill. Computing changes in measurements within hard or soft science lab assignments, understanding statistics within research articles, and handling the computing requirements within almost any mechanical, drafting or electronic courses may present unexpected difficulties for this student. In daily life this student may expect problems with making change, determining tips, managing financial accounts, estimating budgets, calculating taxes, and any measurement calculations involved in constructing, cooking or sewing.

**Software
Considerations**

Instructional Goal

Students will demonstrate knowledge of mathematical concepts, vocabulary, and calculations. Secondly, students will maximize processing speed of calculations without sacrificing accuracy.

Instructional Considerations

Work on basic mathematical skills can be tedious, so a variety of approaches is helpful. Speed of solving basic processes such as addition, subtraction, multiplication and division should be pressured to a speed considered “automatic.” If that is not feasible, then compensatory techniques such as rapid use of a calculator should be considered. Be aware of differences in instructional approaches between the classroom and the software.

Software Characteristics

Software should allow control of basic mathematical processes.

Students should be able to control numeric range (e.g. single digit, double digit, etc.) in order to provide practice in appropriate areas.

Software should provide instruction to introduce concepts prior to practicing skills.

This gives students relevant information needed to complete exercises. Avoid math software without a tutorial component.

Software should provide opportunity for drill or game format with frequent feedback.

Immediate feedback is necessary in order correct any errors before a student advances in a program. Drill allows development of automatic responses with basic mathematical functions. Games provide a motivating format for this.

Students should be able to return to missed items.

This will clarify errors and allow students to demonstrate that they now understand the correct procedure.

**Software
Considerations
(cont.)**

A customizing component is desirable.

Students or instructors can select a specific number of problems and levels of practice in order to create individualized lessons.

Software should have an optional component for monitoring speed of processing.

“Beating-the-clock” is especially motivating in a game format. If students are able to focus and maintain attention, speed, and accuracy, their automatic responses to basic math calculations may improve.

**Suggested
Software**

New Mathblaster Plus (Davidson) - DOS/MAC

This program is useful for practice in building skills in the four basic operations, fractions, decimals and percents. An arcade type game assists in building speed of “automatic” math operations. An editor allows input of student or instructor problems.

NumberMunchers (MECC) - DOS/MAC

This program encourages rapid solution of basic mathematics (addition/subtraction/multiplication/division) with easily controlled selection of math process and level of difficulty.

Skills Bank II (Skills Bank Corporation) - DOS/MAC

The mathematics section builds skills using basic math facts. More complex problems are solved with on-screen instruction from basic operations to pre-algebra. Students can print instructions for completing math problem solutions directly from the screen.

Algebra I: Homework Tutor (Missing Link Software) - MAC

This program generates an infinite number of algebra problems and allows students to insert their own homework problems. The program provides feedback at each step of the problem-solving process and will reveal either part or all of the process on request.

Mathematics Reasoning

Assessment Measures

The following test provides information about mathematics reasoning:

❑ *Applied Problems [W]-R test 25]*

This test measures the student's ability to solve word problems in mathematics. A low score on this test may indicate a lack of mathematical vocabulary or a lack of understanding of math concepts. The student will struggle with problem solving activities in some vocational programs such as nursing or drafting and in classes such as algebra or chemistry.

Functional Manifestations

Mathematical Reasoning

A student whose test results suggest specific deficits in mathematical reasoning may be able to handle the calculations involved in course work, but may not be able to determine the calculation process needed or to set up the calculation. The struggle in algebra and statistics classes may be obvious, but other courses such as biology, chemistry, physics, anatomy and physiology, and courses of study such as business, nursing, computer sciences, drafting and electronics may also present difficulties.

In daily life, this student may generally avoid situations requiring mathematical reasoning. The student may need assistance in budgeting, managing financial accounts, calculating taxes, determining efficient travel routes, verifying hours adjustments and taxes in their employment, and in modifying tasks involving construction, cooking, or sewing.

Software Considerations

Instructional Goal

Students will demonstrate the reasoning and sequencing involved in word problems and in more complex mathematical processes.

Instructional Considerations

It is extremely important that students be taught necessary mathematics vocabulary (e.g. difference, sequential, yields).

Software Considerations (cont.)

Many algebra texts now include the possibility of acquiring tutorial software correlated with the text. Software not related to a text should be evaluated in terms of its terminology, content and solution processes as related to the students' courses. There are non-computational skills underlying many mathematical processes (e.g. short-term and long term memory, sequencing). These must be addressed specifically.

Software Characteristics

Word problems should present reasoning processes in a sequential fashion and include a variety of problems.

Students benefit from following clear models. Extended practice develops automatic responses to structuring and solving problems.

Feedback should be frequent and educational.

If response is repeatedly incorrect, the process for achieving an accurate solution should be demonstrated.

Software should provide extended practice with a wide variety of problems and/or the option of repeating problems with different numbers.

Students benefit from repetition in learning to structure and solve problems. This enables them to develop a format for approaching mathematical problems.

It is desirable that software cover a wide variety of mathematical processes.

A comprehensive program allows students to progress to higher levels without having to learn how to use a new program.

Suggested Software

Skills Bank II (Skills Bank Corporation) - DOS/MAC

The Math Word Problems section of this program is helpful in developing the basic reasoning processes for solving simple word problems. Students can print instructions for completing word problem solutions directly from the screen.

Math Blaster Mystery (Davidson) - DOS/MAC

This program is especially helpful in the areas of focusing on relevant information, planning strategies, considering alternate solutions, hypothesizing and testing hypotheses, and using inductive and deductive reasoning. A variety of motivating formats are presented, selection of any level and activity may be made at any time during the use of the program. On-screen help, calculators and hints are easy to access.

Math Shop (Scholastic) - DOS

This program sets up situations in “shops” that require students to structure and solve math processes from basic math through fractions, decimals, and proportions. Students can control options of how long to work at one process (with an infinite number of problems), which process they work on, and whether to work with time pressure.

Algebra (Broderbund) - DOS/MAC

This program uses an interactive tutorial process very effectively, allowing students to learn algebraic concepts, manipulate many of these concepts on the screen, and practice a variety of problems with different numerical data.

Algeblaster Plus (Davidson) - DOS/MAC

This program is especially useful for learning elementary algebra skills. Students are guided step by step through several activities designed to teach and reinforce problem solving strategies. Translation of word problems into algebraic equations and an authoring component are available.

Geometry (Broderbund) - MAC

This program uses an interactive tutorial process which allows students to learn geometry concepts, manipulate many of these concepts on the screen, and practice a variety of problems with different numerical data.

**Suggested
Software
(cont.)**

What's My Angle? (Davidson) - DOS/MAC

This program is helpful in presenting geometry concepts, word problems, and proofs with real life applications.

Calculus (Broderbund) - DOS/MAC

This program uses an interactive tutorial process very effectively, allowing students to learn calculus concepts, manipulate many of these concepts on the screen, and practice a variety of problems with different numerical data.

Basic Writing Skills

Assessment Measures

The following tests provide information about basic writing skills:

Dictation [WJ-R test 26]

This test measures the student's ability to demonstrate knowledge of spelling, punctuation and capitalization, and usage. Problems in this area will be reflected in the student's written work.

Proofing [WJ-R test 34]

This test measures the student's ability to recognize and correct errors in spelling, punctuation and capitalization, and usage. A low score on this test suggests that a student will have problems in proofreading written work to find and correct errors.

WRAT-R Spelling

This test measures the student's ability to spell words from dictation. A low score on this test suggests that a student would benefit from using a word processing program with spell check capability.

Note:

For basic writing skills, the Functional Manifestations section and the Software Characteristics sections have been assigned to two primary aspects of writing in order to cover each area with appropriate depth. These two areas are

1. Spelling, and
2. Writing Mechanics and Proofing.

Functional Manifestations Spelling

A student whose test results suggest specific deficits in spelling may have difficulties even in classes where writing is not a target skill. Taking notes during lectures, writing down assignments accurately, and writing answers to in-class tests and quizzes within a specified time may present unexpected problems. Students with severe deficits may even have difficulty finding correct spellings in dictionaries or understanding their own writing after some time has passed.

**Functional
Manifestations
Spelling
(cont.)**

In daily life this student may not write formal or informal correspondence (letters, memos or messages), and may have difficulty taking phone messages, filling out forms, writing checks, or locating any information which is alphabetized (e.g. names in the phone book, books at libraries, information in encyclopedias).

**Software
Considerations
Spelling**

Instructional Goal

Students will learn and review new spelling words, spelling patterns, and phonics skills.

Instructional Considerations

Before students work on spelling software, it is important that they understand what spelling strategies work best for their learning styles. They also must know what spelling skills they are expected to use or develop when using spelling software.

If students will be using handwriting to take spelling tests, it is important that they use handwriting to practice spelling as well as practicing at the computer keyboard.

Correct spelling is primarily the result of applying phonics knowledge (auditory analysis, auditory memory, and sound-symbol association) as well as visual memory; and visual-motor memory. Ideally, the software should provide spelling lists for each critical element in the development of phonics skills. However, no such comprehensive program has been identified and recommended.

If students use compensatory technology, they can concentrate on critical aspects of writing (content, organization, cohesion, word choice) instead of being concerned with spelling accuracy. Compensatory technology includes on-line spelling checkers, dictionaries, thesauruses, hand-held spelling checkers, abbreviation expansion software, macros, and voice input.

Software Characteristics

Software should provide lists of words exemplifying a given rule and provide a logical hierarchy of rules.

Activities which focus on words exemplifying a single rule encourage generalization of the rule (e.g., adding suffixes to words ending in silent "e") and are more useful than drill designed for memorization of isolated spellings. Rule complexity level should reflect the reading/spelling level of words in word list (for example, -tion vs. -sion) would not be an appropriate rule for a second grade level list of spelling words.

Authoring component is easy to use.

The opportunity to practice personally relevant spelling lists enhances/expands the value of the software for students. Creating personalized lessons is not practical unless the authoring tool is easy to use.

Students should have multiple formats for practicing skills.

Having different formats (e.g. flash card, unscramble, crossword, word search, spelling bee, spell in context) for practice relieves tedium and facilitates generalization.

Software should include a range of levels and topics covered and/or provide data disks for different levels and topics.

This allows students with differing spelling levels to use the software. Students can progress through levels of greater spelling mastery without having to learn a new program.

Sound output is desirable.

Sound output confirms target words for students who are not sure they have read the word correctly. The psychological process of learning new spellings usually begins by hearing a word (either aloud or sub vocally).

Software Considerations
Spelling
(cont.)

The software program should permit students to adjust the amount of time allowed for studying new words.

Students require different amounts of processing time in different contexts. Processing time decreases with familiarity. It is difficult for students to learn new information when under pressure.

Suggested Software
Spelling

Spell It Plus (Davidson) - DOS/MAC

This software is especially useful because it provides a wide variety of spelling lists, the capacity to make flash cards and includes an activity requiring proofreading and editing in context.

Missing Links (Sunburst/Wings for Learning) - DOS

This software is useful because it requires using reading context clues and because the user can control the level of spelling difficulty by specifying the type of missing data.

Functional Manifestations
Writing Mechanics
and Proofing

A student whose test results suggest specific deficits in writing mechanics may avoid classes where writing is a target skill, but may still encounter difficulties in writing essay answers on tests, taking effective notes in lectures, writing directions to complex assignments or messages to instructors. In daily life, this student may not produce formal or informal correspondence (e.g. letters, memos or messages), or instructions as given by doctors or other professionals.

Software Considerations
Writing Mechanics
and Proofing

Instructional Goal

Students will demonstrate knowledge of the rules of capitalization, punctuation and grammar and practice strategies for monitoring and correcting errors in written work.

Instructional Considerations

Students must see the relationship between their written work and rules they are learning.

Students can improve the writing mechanics in their written assignments with the help of on-line editing aids such as grammar manuals and grammar checkers working in coordination with their word processing program.

Students should be encouraged to use more than one program to improve their writing mechanics. No one program provides enough practice material in enough different contexts to ensure mastery of a concept.

Software Characteristics

Proofing programs need to provide control over aspects of writing mechanics covered in a given activity.

Students should be dealing only with material for which they have prepared themselves.

Instruction should be clearly presented with ample examples and no jargon.

Clear presentation facilitates comprehension. Examples facilitate comprehension and generalization.

Feedback should be frequent and educational.

Students should have access to a printed record of progress including number attempted, number missed, percent correct, and list of errors. (They can use this information to assess performance and set new goals). The students should also be provided with immediate feedback as well as hints and opportunities to retake missed items as this practice creates a model for self-cueing. When students successfully re-take missed items, they can feel successful as they are learning a concept.

**Software
Considerations**
Writing Mechanics
and Proofing
(cont.)

Authoring component is easy to use.

Creating personally relevant material with which to practice a skill is always beneficial to the student. An instructor can individualize instruction by using an authoring component when one is provided. However, for both student and instructor, creating personalized lessons is not practical unless the editing tool is easy to use.

Providing numerous practice items is desirable.

Students need a great deal of practice with grammatical concepts before achieving fluidity with the concepts.

**Suggested
Software**
Writing Mechanics
and Proofing

Grammar Gremlins (Davidson) - DOS/MAC

This program is useful because it covers nine different grammar topics at grade levels 3-6.

Skills Bank II (Skills Bank Corporation) - DOS/MAC

This program is especially useful because of the wide scope of topics covered.

Grammar Examiner (Compton's New Media) - DOS

This program provides practice in proofreading in context. Using the editor to create new games and practice material is critical to ensure maximum time is spent in activities relevant to proofreading and to ensure that students are proofreading for writing concepts with which they are familiar.

Written Expression

Assessment Measures

The following tests provide information about written expression:

❑ *Writing Samples [WJ-R test 27]*

This test measures the student's ability to express ideas by producing single words, simple sentences and complex sentences. A low score on this test will be reflected in the quality of written course requirements such as tests, in-class assignments, and out-of-class papers.

❑ *Writing Fluency [WJ-R test 35]*

This test measures the student's ability to write clear sentences under timed conditions. A low score on this test suggests that a student may not have sufficient time to complete assignments.

Functional Manifestations

A student whose test results suggest specific deficits in written expression may be able to handle simple writing tasks, but may encounter difficulty when there is limited time to write, or when more complex writing is required. Organization of ideas, integration of concepts, or expressing interpretation of symbolism may present difficulties for this student, especially in timed situations such as essay tests.

In daily life this student may not enjoy writing, and therefore avoid complex writing tasks such as formal correspondence to businesses, politicians, or the media. This student may avoid employment in a setting where complex writing skills are a requirement (e.g., correspondence, memos, briefs, reports, summaries).

Software Considerations

Instructional Goal

To enhance the student's ability to facilitate and monitor expression of ideas in sentences and paragraphs. To develop the ability to monitor written language production.

**Software
Considerations
(cont.)**

Instructional Considerations

In order to practice writing skills, the student first needs to learn or know the basic components of writing (i.e. pre-writing, writing, and editing). Instruction in these areas must be clearly presented in order for the student to practice them.

Although students are often reluctant to spend time on generating and prioritizing their ideas, programs which help them brainstorm and visually organize their writing are helpful in reducing the time they spend in formulating their first drafts.

On-line editing programs (e.g. spell-checkers, grammar checkers) can be very effective in assisting students with written expression. However, as they are not considered computer-assisted instruction, their use will not be addressed here.

Software Characteristics

Software should have components to facilitate brainstorming and organization of ideas.

Students often need instruction in organizing and planning written language. Using pre-writing software activities helps to establish a solid framework for written composition.

Software should have components to check for grammatical and spelling errors.

When using a word processor or a program designed to teach writing skills, interactive spelling and grammar checkers can be effective in helping students learn to find errors in their written work. Optional tutorial information about why the identified aspect could be in error and suggestions for possible revisions allow students to learn from their mistakes. Such features enable students to identify errors they might not otherwise have noticed; students are then actively involved in the proofreading process.

The program should provide feedback to the student about the content of their written work.

Students can become aware of common errors and problems in writing (e.g. homophones, clichés etc.) when analyzing feedback.

Software should provide a word processing component with editing features.

While students are learning to produce and edit written language, it is better for them to produce a final document without having to transfer the file into a word processing program before proceeding.

Program should provide organizational skills with feedback.

Students who cannot generate ideas or independently organize them without concrete examples may benefit from putting information into outlines which can become frameworks for essays.

Software should provide supplementary exercises.

Supplementary exercises (i.e. paper pencil activities) designed to give practice in all aspects of producing written work gives students writing practice in a controlled environment. Generalization of skills is more likely when multi-modal practice occurs.

**Suggested
Software**

Success With Writing (Scholastic) - DOS/MAC

This program has four modules: Prewrite, Arrange (outline), Compose (word processor), and Evaluate/Edit. These facilitate the generation, organization and evaluation of written expression (evaluation is word analysis, word count, and readability). This product also provides supplementary exercises in an activity book.

Writer's Helper II (Conduit) - DOS/MAC

This program has a variety of pre-writing activities for brainstorming, exploring and organizing subjects. It then can be

**Suggested
Software
(cont.)**

used as a word processing program for composition. This program will also provide word analysis, word count, and evaluation of readability. It also is possible to evaluate a document file produced by a standard word processor if the file has been saved in an appropriate text file format.