Summary of Research

An Annotated Review of Current Research Supporting the Use of Kurzweil 3000

Kurzweil
EDUCATIONAL SYSTEMS®

Table of Contents

Introduction

No Child Left Behind (NCLB), signed into law in January 2002, is considered one of the most significant federal education policy initiatives in a generation. Its purpose is to ensure that every student becomes proficient in reading and mathematics by 2013-2014. An important aspect of this legislation is to encourage schools to adopt programs, strategies and materials that have been researched using rigorous scientific methodology and have proven to be effective.

Fortunately, the fruits of over 30 years of research on reading, most of it sponsored by the federal government, are now available. While much of the research focuses on the mechanics of reading, the picture that has emerged makes a strong case for the use of assistive technology tools such as Kurzweil 3000, or other accommodations, to provide access to content while students are receiving explicit instruction in decoding, spelling, and writing. In fact, without this type of accommodation, it becomes almost impossible for struggling readers to catch up academically.

This report provides research validation for the use of assistive technology like Kurzweil 3000 as an important accommodation for struggling students.

The main research findings are summarized below and are followed by a detailed review of the research presented in two parts.

- **Part I** cites research studies that support the use of tools such as Kurzweil 3000 in the classroom.
- **Part II** cites research studies that show how specific features of Kurzweil 3000 support important aspects of the reading and learning process.

Synopsis

- Brain research, using sophisticated imaging technology, has shown that struggling readers actually use different parts of the brain when reading. As a result, their brains are less efficient in learning the mechanics of reading. These differences are not related to intelligence. Many struggling readers are highly intelligent and have strong cognitive abilities. However, because they are unable to master decoding as it's traditionally taught, they gradually become locked out of much of what is happening in the classroom.
- Research has shown that accurate and automatic decoding frees the competent reader to focus on content. Because reading is difficult, struggling readers spend most of their energy trying to decode words with little left to ponder their meaning. Over time, their limited exposure to meaningful print impacts the development of vocabulary and background knowledge essential for comprehending more advanced subject matter.
- The middle school curriculum assumes that students can read and write efficiently. However, since struggling readers have not yet mastered decoding, spelling, or writing, they are unable to read grade-level materials or express their thoughts in writing independently. As a result, they fall further and further behind in their class work.
- Intensive remediation over time can help these students become better readers, however, unless their vocabulary development, background knowledge, and mastery of subject matter keep pace with their peers, they will continue their downward spiral.

Tools like Kurzweil 3000 can make a significant difference in supporting the development of decoding and fluency skills as well as providing meaningful access to curriculum materials. In addition, Kurzweil 3000 helps struggling readers actively engage in the reading process, participate more fully in class and keep up with their assignments. Many schools also use Kurzweil 3000 as an accommodation for test taking, so students can be evaluated on what they know and not how well they can read and write.

A comprehensive overview of the government-sponsored research cited in this document can be found in:

Author	Title	Source
National Reading Panel	*Teaching Children to Read: An Evidenced-based Assessment of the Scientific Research Literature and its Implications* (NIH Publication No. 00-4769). Washington, DC: U.S. Government Printing Office.	National Institute of Child Health and Human Development, National Institutes of Health, 2000 for Reading Instruction

Part I

Why Kurzweil 3000 provides essential support to students who are reading significantly below grade level

Some educators are concerned that text readers such as Kurzweil 3000 might become a crutch that prevents struggling students from learning how to read and write on their own. Research findings have shown quite the reverse. Assistive technology like Kurzweil 3000, for example, not only allows struggling students to read more advanced grade-level material; it also helps improve word recognition and decoding. As students using the program become more active readers, they are developing the skills that support independent reading without the assistive technology. The research cited below clearly demonstrates why providing access to grade-level curriculum content via accommodation is critical to struggling readers' academic success. I. Learning differences reflect differences in how the brain processes information

I. Learning differences reflect differences in how the brain processes information

Author	Title	Source	Summary
S. Shaywitz	*Overcoming Dyslexia*	Knopf, New York, 2003	Real differences in the way good readers and struggling readers process information make it difficult for struggling readers to master decoding, spelling, and writing as they are traditionally taught. These students learn best with instructional methods that simultaneously activate different parts of the brain.

II. Poor reading skills affect all academic areas

Author	Title	Source	Summary
S. Chall V.A. Jacobs L.E. Baldwin	*The Reading Crisis: Why Poor Children Fall Behind*	Harvard University Press, MA, 1990	Although many struggling readers are of average, or even above average intelligence, poor reading skills isolate them from their peers as well as impact their vocabulary development and exposure to relevant background knowledge. Repeated failures naturally impacts motivation and self esteem.
T.S. Kaniuka	*Reading Achievement, Attitude Toward Reading, and Reading Self-Esteem of Historically Low Achieving Students*	*Journal of Instructional Psychology* 37.2 (2010): 184-88. Academic Search Complete. Web. 14 Mar. 2011.	Difficulty with reading skills across areas affects struggling readers self-esteem and achievement levels. This is true more predominantly for students that have other factors affecting their learning, namely poverty.
S. E. Stothard C. Hulme	*A comparison of phonological skills in children with reading comprehension difficulties and children with decoding difficulties.*	*Journal of Child Psychology and Psychiatry*, 36(3), 399-408, 2006	Weak phonological processing skills affects decoding and reading comprehension.

III. The ability to decode every word is essential to comprehension

Author	Title	Source	Summary
J. K. Torgesen R. F. Hudson	*Reading fluency: Critical issues for struggling readers. In S. J. Samuels & A. E. Farstrup (Eds.), What research has to say about fluency instruction (pp. 130- 158).Newark, DE*	International Reading Association, 2006	Skills required for accuracy of decoding include: alphabetic principles, the ability to blend sounds, the ability to use cues to identify words in text, and a large sight-word vocabulary of high-frequency words. Decoding is an essential skill leading to automaticity.
M.J. Adams	*Beginning to Read: Thinking about Print*	MIT Press, MA, 1990	In order to benefit from reading independently, students should be able to decode text with 95% accuracy. For students reading well below grade level, this precludes access to most of their text materials.

IV. Comprehension, the ultimate goal of reading, is equally dependent on vocabulary development and background information as on accurate decoding

Author	Title	Source	Summary
J. McQuillan	*The effects of print access and print exposure on English vocabulary acquisition of language minority students*	*Reading*, 6(1), 2006	Students who lack in print exposure have increased long-term difficulty with vocabulary acquisition and comprehension.
E.D. Hirsch	*Reading Comprehension Requires Knowledge of Words and the World*	*American Educator*, Spring 2003	Exposure to interesting print plays a critical role in vocabulary acquisition and the development of background knowledge. Both are essential to fully comprehending what is read.
T.G. White M.F. Graves W.H. Slater	*Growth of Reading Vocabulary in Decoding and Word Meaning in Diverse Elementary Schools*	*Journal of Educational Psychology*, 82, 281-290, 1990	The vocabulary gap between good and poor readers widens significantly over time. In first grade, the gap was about 1500 words. By 4th grade, the gap had increased to over 5,000 words.

V. The right accommodations allow students to demonstrate what they know and not how well they can read.

Author	Title	Source	Summary
J. M. Fletcher D. J. Francis A. Boudousquie K. Copeland V. Young S. Kalinowski S. Vaughn	*Effects of accommodations on high-stakes testing for students with reading disabilities.*	*Exceptional Children*, 72(2), 136–150, 2006	Selection of appropriate accommodations support students ability to be successful as readers during testing situations.

Author	Title	Source	Summary
N. Strangman B. Dalton	*Using technology to support struggling readers: A review of the research*	*Handbook of special education technology research and practice*, 549-569, 2005	Digital technologies have the ability to support reading skills deficits, through compensatory means or remedial skill instruction. Each of these digital technologies must take into account the importance of student engagement and universal design for learning perspectives.
L.G. Fielding P.D. Pearson	*Reading Comprehension: What Works*	*Educational Leadership*, 62-68, 1994	Reading materials should be selected based on speaking and listening ability to allow students to function at their cognitive rather than their reading levels. This may mean providing accommodations to make these materials accessible.
M. Gehrmann J. Marci Kinas	*Assistive Technology for Students with Mild Disabilities*	ERIC Clearinghouse, 2002	Technology can help struggling readers overcome barriers that prevent them for doing their best work. These include: 1) overcoming the mechanics of spelling, grammar and punctuation, 2) organizing, editing, and revising their work, and 3) staying motivated.

In Conclusion

- For students to benefit from independent reading, they must be able to decode 95% of the text they read with speed and accuracy. This precludes most struggling readers from actively reading gradelevel texts.
- Struggling readers will not develop the vocabulary and background knowledge necessary for subject matter mastery unless they have timely access to grade-level materials.
- Along with remediation in decoding, spelling and writing, accommodations such as Kurzweil 3000 providing access to grade-level text, offer struggling readers their best chance to succeed.

Part II

Kurzweil 3000 — The ideal classroom accommodation

While Kurzweil 3000 is a sophisticated text reader, the program also offers a rich array of features to reinforce the core reading skills research has shown to be important. These include decoding, fluency, comprehension and writing. Each of the sections below highlights a core skill, lists the Kurzweil 3000 features that reinforce the skill, and then cites relevant research that validates the importance of the skill.

I. Struggling readers require a multi-sensory approach to reading instruction

Struggling readers using computer-based remediation providing auditory, visual, and kinesthetic feedback, outperform control groups receiving regular classroom instruction. Multi-sensory support in learning targeted words as well as opportunities for consistent, meaningful practice, have been shown to help struggling students become more accurate and fluent readers.

Kurzweil 3000 features that develop accuracy and fluency include:

- The ability to read scanned text, digital files or Internet pages
- Visual tracking of words as text is read
- The ability to insert recorded or printed notes anywhere in a document
- Auditory support when typing
- The ability to highlight and hear targeted words
- The ability to divide targeted words into syllables
- The ability to playback a targeted word as often as necessary to facilitate learning

Author	Title	Source	Summary
S. Dimmitt, J. Hodapp C. Judas C. Munn C. Rachow	*Iowa text reader project impacts student achievement*	*Closing the Gap*, 24(6), 12-13, 2006	Use of the Kurzweil software provided significant impact on fluency, passage comprehension on both recall and inferential questions, and improved school behaviors.
T. Hasselbring L.I. Goin	*Literacy instruction for older struggling readers: What is the role of technology?*	*Reading & Writing Quarterly*, 20, 123–144, 2006	Text-reader software creates a more level academic playing field for students who do not decode or comprehend well enough to read grade-level text independently and can reduce the stigma and failure that many students face.
K.L. Howard	*Universal design for learning: Meeting the needs of all students*	*Learning & Leading with Technology*, 31, 26-29, 2004	Simultaneous presentation of text visually and auditorily can aid comprehension, especially among struggling students.
National Reading Panel	*Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction.* Washington, DC	National Institute of Child Health and Human Development. (available online at www.nationalreadingpanel.org/), 2000	National Reading Panel (2000) concluded that of the 16 categories of strategy instruction surveyed, seven appeared to have a firm scientific basis "for concluding that they improve comprehension in normal readers" (p. 4-42). Among these strategies are comprehension monitoring, using graphic and semantic organizers, using the structure of stories, answering questions, generating questions, and summarizing.
B.W. Wise J. Ring R.K. Olson	*Individual Differences in gains from computerassisted Remedial Reading with more emphasis on Phonological Analysis or Accurate Reading in Context*	*Journal of Experimental Child Psychology*, 77: 197-235, 2000	For children with reading disabilities, reading stories with computer speech support for difficult words can lead to substantial growth in phonological decoding, word reading, spelling, and reading comprehension that transfers to improved independent reading without computer support. All poor readers in the 2nd-5th grades benefited from accurate reading of text on the computer, and it appears that the addition of explicit computer-supported decoding instruction has additional benefits for the youngest and weakest readers.

II. Pre-Reading skills improve comprehension

Some of the ways Kurzweil 3000 supports pre-reading include allowing students:

- To use the Read feature to quickly read through a document
- To use notes to jot down questions or comments
- To highlight critical information or unfamiliar vocabulary for further review

Author	Title	Source	Summary
B.M. Taylor B.J. Frye	*Comprehension strategy instruction in the intermediate grades.*	Reading Research and Instruction, 32, 39–48, 1992	Pre reading text assists students to notice when they do understand, to identify what they do not understand, and to use appropriate "fix-up" strategies to resolve problems when they do not understand something they read.
D.P. Bryant M. Goodwin B.R. Bryant K. Higgins	*Vocabulary instruction for students with learning disabilities: A review of the research.*	Learning Disability Quarterly, 117-128, 2003	Computer assisted instruction, fluency-building vocabulary practice activities, mnemonic strategy instruction, and concept enhancement instruction were found to be positive means for immediate recall, maintenance, and generalization.

III. Vocabulary instruction improves comprehension

Kurzweil 3000 is ideal for teaching vocabulary. Students can look up unfamiliar words as they read or highlight unfamiliar words to define and study. For example, they can use:

- The online dictionary for instant definitions
- The thesaurus to generate a list of synonyms
- The syllable tool to more easily identify roots, prefixes and suffixes
- Quick access to the Internet with Kurzweil 3000 for additional background information

Author	Title	Source	Summary
J.A. Dole C. Sloan W. Trathen	*Teaching Vocabulary within the Context of Literature*	*Journal of Reading*, 38(6), 452- 460, 1995	Being able to use a variety of sources helped students learn words on a deeper level.
J. M. Harmon W.B. Hedrick K.D. Wood	*Research on vocabulary instruction in the content areas: Implications for struggling readers*	*Reading & Writing Quarterly*, 21(3), 261-280, 2005	Vocabulary instruction in the content areas should focus on concrete and specific strategies that can be generalized across disciplines.
A.K. Jitendra L.L. Edwards G. Sacks L.A. Jacobson	*What research says about vocabulary instruction for students with learning disabilities*	*Exceptional Children*, 70(3), 299-322, 2004	Keyword or mnemonic approaches, cognitive strategy instruction, direct instruction, constant time delay, activity-based methods, and computer-assisted instruction all increase vocabulary knowledge and overall comprehension of text.

Author	Title	Source	Summary
W.H. Rupley W.D. Nichols	*Vocabulary instruction for the struggling reader*	*Reading & Writing Quarterly*, 21(3), 239-260, 2005	Struggling readers often do not make gains in their reading comprehension because they have a limited reading vocabulary. Enhancing the vocabulary development and growth for children who are experiencing reading difficulties enables them to better identify key concepts in text that they read, make inferences within and between texts, and increase their abilities to comprehend.

IV. Enhanced concentration improves reading fluency

Many students with learning disabilities also have attentional issues. Studies done with college students with an attention disorder showed that the use of Kurzweil 3000 enabled them to concentrate on their reading for longer periods of time, experience less fatigue and stress, as well as significantly increase their rate of reading. Kurzweil 3000 helps students stay focused by:

- Preventing students from skipping or missing parts of words
- Transforming reading into an interactive rather than passive process
- Providing timely feedback so students need not interrupt their flow of reading

Author	Title	Source	Summary
L. Hecker L. Burns J. Elkind K. Elkind L. Katz	*Benefits of Assistive Reading Software for Students with Attention Disorders*	*Annals of Dyslexia*, Vol. 52, 2002	The use of Kurzweil 3000 allowed post-secondary students with an attention disorder to read longer, faster and with less fatigue than students not using assistive software. Because students were able to complete assignment in less time, they experienced less stress and developed a more positive attitude toward their studies.
J. Elkind	*Computer Reading Machines for Poor Readers*	*Perspectives*, International Dyslexia Association, Vol. 24, No. 2, Spring 1998	The use of Kurzweil 3000 enabled struggling readers with good oral language capabilities to improve their reading rate and comprehension as well as increase the length of time they were able to read without tiring.
J.K. Torgesen R. Hudson	*Reading fluency: critical issues for struggling readers.* In S.J. Samuels and A. Farstrup (Eds.).	*Reading fluency: The forgotten dimension of reading success.* Newark, DE: International Reading Association, 2006	Reading fluency is an essential element in the overall reading success of a student.

V. Comprehension

By providing auditory and visual access to text, Kurzweil 3000 allows struggling readers to focus on understanding the text while supporting their accurate decoding of difficult words. A number of Kurzweil 3000 features further facilitate comprehension. For example, students can:

- Take notes in the margin to restate an idea or to insert additional information
- Drag and drop text from other documents into margin notes or footnotes
- Generate questions in the form of notes which can be extracted into a separate outline
- Highlight critical information using up to four colors
- Create outlines or flash cards from highlighted text
- Instantly locate specific sections of the text
- Make multiple passes through a document to check for different things
- Open both the original document and a text document at the same time, so they can refer to the original while answering questions or summarizing

Author	Title	Source	Summary
National Reading Panel	*Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction.* Washington, DC	National Institute of Child Health and Human Development. (available online at www. national readingpanel.org/), 2000	Instruction in the use of strategies in the areas of comprehension monitoring, using graphic and semantic organizers, using the structure of stories, answering questions, generating questions, and summarizing all are research based effective practices for improving comprehension.
J.K. Torgesen	*Issues in the Assessment of Executive Function: An Information Processing Perspective*	*Frames of Reference for the Assessment of Learning Disabilities*, G. Reid Lyon (Ed), 143-162, 1994	Good readers internalize a variety of strategies to monitor their comprehension while poor readers do not. Useful strategies such as pre-reading or identifying and re-reading confusing material can be successfully taught.
G. Roberts, J.K. Torgesen Boardman N. Scammacca	*Evidence-Based Strategies for Reading Instruction of Older Students with Learning Disabilities*	*Learning Disabilities Research & Practice*, 23(2), 63-69, 2008	Older students with learning disabilities need explicit instruction followed by independent practice incorporating the strategies and technology in order to gain and meaningfully use comprehension strategies.
N.K. Duke P.D. Pearson	*Effective practices for developing reading comprehension*	*Journal of Education*, 189(1), 107, 2008	Predictions, think-alouds, and visual representations of text materials assist in comprehension skill development.
M.G. McKeown I.L. Beck R.G. Blake	*Rethinking reading comprehension instruction: A comparison of instruction for strategies and content approaches*	*Reading Research Quarterly*, 44(3), 218-253, 2009	Content based instruction with focused student attention on the text through open, meaning-based questions about the text showed effectiveness for narrative recall and expository learning.

Author	Title	Source	Summary
L.M. Morrow	*Comprehension instruction: Research-based best practices.* C. C. Block, & S. R. Parris (Eds.).	The Guilford Press, 2008	Reciprocal teaching of multiple strategies for comprehension can be facilitated through technology.

VI. Fluency

Fluency is the ability to read independently with ease and accuracy. Struggling readers often read haltingly, without attention to punctuation, and have difficulty grouping words into meaningful grammatical units. Even when they can decode individual words, they still read connected text inaccurately. Like other skills, fluency can be improved through practice. Some of the ways students can use Kurzweil 3000 to build fluency include:

- Focusing on chunks of words by breaking text into segments
- Improving focus and accuracy by increasing font size or decreasing number of words on the screen
- Training the eye to move more quickly across the page by gradually increasing reading speed
- Reinforcing the flow and cadence of the words by listening to a passage multiple times

Author	Title	Source	Summary
J.K. Torgesen C.A. Rashotte A.W. Alexander	*Principles of fluency instruction in reading: Relationships with established empirical outcomes*	York Press. In M. Wolf (Ed.), *Dyslexia, fluency, and the brain.* Timonium, MD, 2001	The proportion of words recognized as orthographic, variations in speed of processing sight words, speed to process novel words, use of context clues, and the speed of word meanings identifications all impact a student's ability to read fluently.
M.R. Kuhn S.A. Stahl	*Fluency: A review of developmental and remedial practices*	*Journal of Educational Psychology*, 95 , 3-21, 2003	By listening to good models of fluent reading, students learn how a reader's voice can help text make sense.
S.J. Samuels	*Reading fluency: Its development and assessment*	International Reading Association. In A.E. Farstrup & S. J. Samuels (Eds.), *What research has to say about reading instruction* (3rd ed., pp. 166-183). Newark, DE, 2002	The more attention readers must give to identifying words, the less attention they have left to give to comprehension.
F.B. Wood L. Flowers E. Grigorenko	*On the functional neuroanatomy of fluency or why walking is just as important to reading as talking is. In M. Wolf (Ed.), Dyslexia, fluency, and the brain*	York Press. Timonium, 2001	Fluency also involves anticipation of what will come next in the text and that speeded practice alone is not sufficient. Anticipation facilitates reaction time and is particularly important for comprehension.

Author	Title	Source	Summary
J.E. Hasbrouck G. Tindal	*Curriculum-based Oral Reading Fluency Norms for Students in Grades 2 through 5*	*Teaching Exceptional Children*, 24(3), 41-44, 1992	Listening to text orally several times before reading independently was shown to aid fluency development.

VII. Writing and proofreading

Readers struggling with decoding and spelling naturally have difficulty with written expression. Some of the ways Kurzweil 3000 can help students write more effectively include:

- Brainstorming ideas
- Highlighting important information and turning it into an outline
- Using the spelling tool, dictionary, or word prediction tool as needed
- Using the thesaurus to embellish language
- Listening to what they've written to proofread for content and spelling

Author	Title	Source	Summary
R. Gersten S. Baker	*Teaching Expressive Writing to Students with Learning Disabilities: A Meta-analysis*	*Elementary School Journal, 101(3), 251-72, 2001*	A review of the research shows that students with disabilities can be taught to write better if given proper instruction and using the right tools.
S. Graham K. Harris G. Troia	*Self-regulated Strategy Development Revisited: Teaching Writing Strategies to Struggling Writers*	*Topics in Language Disorders*, 20(4), 1-14, 2000	Students can be taught to self regulate their writing by learning strategies for planning, producing, revising and editing their written work.
B.A. Wollak D.A. Koppenhaver	*Technology supported, evidenced-based writing instruction for adolescents with significant writing disabilities*	*Assistive Technology Outcomes and Benefits*, 7(1), 1-23, 2011	Sound, technology based writing instruction should include a cognitive based model of planning, generating, and organizing combined with the translation of ideas taking into account both mechanics and language. The production, and motivation, as well as social context must be considered when instructing within the writing process.
M.C. Sitko C.J. Laine C.J. Sitko	*Writing tools, technology and strategies for struggling writers. The handbook of special education technology*	*Research & Practice*, 571-598, 2005	The Computer Assisted Writing Process (CAWP) model assists students in utilizing technology during the conceptual, logistical, and publishing phases of writing. This model can be individualized to infuse multiple means of technology use based in the student's needs.
G.R. Peterson-Karlan	*Technology to Support Writing by Students with Learning and Academic Disabilities: Recent Research Trends and Findings*	*Assistive Technology Outcomes and Benefits*, 7(1), 39-62, 2011	There is limited yet still growing evidenced based research to support technology based writing instruction in the areas of planning, transcription, editing, and revising.

Author	Title	Source	Summary
S. Graham K.R. Harris	*Students with Learning Disabilities and the Process of Writing: A Meta-Analysis of SRSD Studies*	*Handbook of Learning Disabilities*, 323, 2005	Students who were instructed in self-regulation strategies related to writing showed growth in their ability to be strategic writers.
C.A. MacArthur	*Reflections on research on writing and technology for struggling writers*	*Learning Disabilities Research and Practice*, 24, 93-103, 2009	Word processors, word prediction, spell checkers, text-to-speech, and organization tools have all been discussed as helping or having potential to help students with disabilities to engage in the many levels of cognition required to produce coherent, organized, audience-aware, and conventionally accurate compositions.
S. Graham D. Perrin	*A meta-analysis of writing instruction for adolescent students*	*Journal of Educational Psychology*, 99, 445–476, 2007	The use of word processing has a positive effect on students' writing development, and this impact is even more pronounced for struggling writers.
S. Graham K.R. Harris C. MacArthur	*Writing instruction*	Academic Press. *In* B. Wong (Ed.), *Learning about learning disabilities* (3rd ed., pp. 281–313). Orlando, FL, 2004	Factors that make word processing helpful for developing writing: Legibility of text, Potential for publishing in variety of formats, Ease of revision, Fluent production of text (while composing, note taking, etc.), Likelihood of supporting applications (for spelling, grammar, semantic mapping); Portable, easy-to-replicate electronic text (easy to share and provide feedback; hard to lose); Potential for links to electronic source material.
B. Pisha	*Rates of Development of Keyboarding Skills in Elementary School-Aged Children With and Without Identified Learning Disability*	Doctoral Thesis, Harvard University School of Education, 1999	Word processing enables students to produce assignments that are both legible and neat, and a great help to students whose handwriting cannot be read easily. Students were able to learn rapidly with the use of keyboarding tutorial.
D. Bligh	*What's the use of lectures?* San Francisco	Jossey-Bass, 2000	Not surprisingly, the preponderance of studies confirms that students recall more lecture material if they record it in their notes.

VIII. Study skills and test taking skills

Struggling readers have a great deal of difficulty both studying for and taking tests. Kurzweil 3000 can help students study more effectively for tests. It can also be used as an accommodation for test taking. Some of the benefits students derive from using Kurzweil 3000 to study or take tests include:

- Learning information more effectively through the use of strategies such as pre-reading, highlighting, taking notes, and summarizing
- Creating outlines by extracting key information to facilitate review
- Accessing the text being studied while answering sample questions on a separate document
- Answering fill-in-the-blank, multiple choice, true/false, short answer and essay questions electronically
- Practicing using different test formats
- Reading the question and answer aloud to check answers
- Providing access to supports such as dictionary and thesaurus as the testing situation allows

Author	Title	Source	Summary
S. De La Paz B. Owen K. Harris S. Graham	*Riding Elvis's Motorcycle; Using Self-regulated Strategy Development to PLAN and Write for a State Writing Exam*	*Learning Disabilities Research and Practice*, 15(2), 101-109, 2000	The mnemonics PLAN and WRITE were successfully used to help students prepare for a state exam. Students used the mnemonics to remind them of strategy steps to use before starting to write and while composing.
J.E. Wall	*Technology- Delivered Assessment: Diamonds or Rocks?*	ERIC, 2000	When used properly, technology plays an important role in assessment in providing access as well as individual adaptations.
B. Elbaum	*Effects of an Oral Testing Accommodation on the Mathematics Performance of Secondary Students With and Without Learning Disabilities*	*The Journal of Special Education*, Volume 40, Number 4, pp. 218-229, 2007	Among elementary students, the accommodation boost for elementary students is clearly of greater magnitude for students with LD than it is for students without LD. Among secondary students, the read-aloud accommodation may have helped improve performance because of fewer errors owing to failure to encode or to make careful distinctions among response choices.
L.S. Fuchs D. Fuchs S. Eaton C.L. Hamlett K. Karns	*Supplementing Teachers' Judgments of Mathematics Test Accommodations with Objective Data Sources*	*School Psychology Review*: 29, 65-86, 2000	When students were read the text surrounding math problems, their math scores were more valid indicators of their math skills.

IX. Internet access

Student can easily access the Internet with Kurzweil 3000 and use the reading and many of the study skills tools with Internet pages. Struggling readers now have the ability to:

- Access unlimited resources
- Research any topic
- Communicate with subject matter experts
- Communicate with students around the world

Author	Title	Source	Summary
A. Meyer D.H. Rose	*The future is in the margins: The role of technology and disability in educational reform.* In D.H. Rose, A. Meyer, & C. Hitchcock (Eds.)	*The universally designed classroom: Accessible curriculum and digital technologies.* Cambridge, MA: Harvard Education Press, 2005	New media, such as text-to-speech software and audio files, provide access to content in a form that may be more flexible and efficient at meeting the needs of certain diverse learners.
The Children's Partnership	*Online Content for Low-income and Underserved Americans: The Digital Divide's new Frontier/ A Strategic Audit of Activities and Opportunities*	The Children's Partnership, 2000	Much of the information on the Internet is written for audiences with an advanced literacy level. A wealth of content is therefore inaccessible to struggling readers without some type of accommodation.
F. Sosenke	*World Tours*	*Learning and Leading with Technology*, 27(5), 32-5, 2000	Teachers cited many educational benefits of the Internet including: the development of research skills, integrated learning, interactivity, handling difficult topics, multicultural learning, and collaborative problem solving.
National Center for Education Statistics, U.S. Department of Education Institute of Education Sciences	*NAEP 2004 Trends in Academic Progress*	NCES 2005–464, July 2005, Retrieved from http://nces.ed.gov/ nationsreportcard/ pdf/main2005/ 2005464.pdf	The percentage of 13-year-olds with access to computers in schools increased from 12 percent in 1978 to 57 percent in 2004. The percentage of students receiving instruction in computers at age 13 also increased, from 14 percent in 1978 to 48 percent in 2004.

In Conclusion

In his address to the 2003 International Dyslexia Conference, Reid Lyon, Director of the National Institute of Child Health and Human Development, commented with both concern and dismay that national reading scores have not improved despite the widespread adoption of phonics based reading materials. Other speakers picked up on this theme suggesting that both researchers and educators have to pay more attention to the other parts of reading: vocabulary development, reading for comprehension and information and fluency. Text to speech software such as Kurzweil 3000 has proven to be one of the most successful ways of exposing struggling readers to subject matter content at their grade level while helping them become more accurate and fluent readers. Given the high stakes set by NCLB, making assistive technology like Kurzweil 3000 available to needy students may be one of the wisest investments a school can make.

About Kurzweil Educational Systems

Kurzweil Educational Systems® is a leader in assistive technology, text-to-speech software literacy solutions, serving the needs of the nation's most challenged students, including individuals with special needs and learning difficulties, such as dyslexia, attention deficit disorder or those who are English Language Learners. Driven by the vision to serve the needs of the nation's most challenged learners, and enabling students to reach their full potential, Kurzweil Educational Systems provides complete reading, study skill, and writing support for students and adults with academic challenges and reading support for those who are blind or visually impaired. Kurzweil Educational Systems is part of the Cambium Learning Technologies group.

About Kurzweil 3000-*firefly*

Kurzweil 3000-*firefly* is a comprehensive reading, writing, study skills software solution for students who struggle to read at grade level, those who have been diagnosed with Dyslexia and students who are English language learners. Kurzweil 3000-*firefly* provides immediate, anytime, anywhere access that supports mixed computer platforms, online storage of digital content, and reduces installation worries. In addition to award winning Kurzweil 3000 software, this option also includes access to digitized text from any browser with the *firefly* web-based application and mobile access to the FREE *firefly* iPad app!