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Summary of Research

Scientifically Based Research Validating Kurzweil 3000

An Annotated Review of Research Supporting the Use of
Kurzweil 3000 in English Language Learner Classrooms



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Introduction

As a result of political changes around the world and increased awareness of economic contrasts in quality of life between countries, many nations are experiencing a dramatic influx of immigrants. English-language countries such as the United States, the United Kingdom, Australia, and Canada struggle with the issue of educating immigrants in English so that these populations can pursue the opportunities afforded them in their new country. The complexity of the issue is compounded by the fact that English language learner (ELL) students are an extremely varied group. Many have experienced traumatic situations in their country of birth and may not have had access to education at all. Others are highly literate in their own language, have been highly educated in their native country, and are more easily able to achieve successfully (Schifini, 2002; Suarez-Orozco & Suarez-Orozco, 2001; Ruiz-de-Vasco & Fix, 2000; Waggoner, 1999).

It takes time for all English language learners to gain a new language. They must learn social language, as well as more difficult academic language (Cummins, 1986). Research shows that it takes between 5 and 10 years to gain proficiency in academic language (Collier, 1992). Meanwhile, native-English speaking peers are learning content and new language, making it more difficult for ELL students to catch up. The challenge for educators in the United Kingdom, Australia, Canada, and the United States is to facilitate the language-learning process and teach content so that these students are able to access and utilize educational opportunities to become successful citizens in their new nations (Department of Education & Skills, 2004; Australian Capital Territory, 2002; Ministry of Education, 2001).

In the United States, the No Child Left Behind Act (2001) requires that students from all language, cultural, and economic backgrounds reach the same high level of academic achievement as native-English speaking students. These requirements have made the academic achievement of ELL students in U.S. public schools a focal point. According to 2003-2004 data, approximately 5,127,037 ELL students are enrolled in U.S. public schools in grades pre-K through 12 (Padolsky, 2005). This number represents a 43.9% increase over the reported 1993-1994 public school ELL enrollment. The large number of these students, as well as federal, state, and district pressure for higher test scores, means that the issue of academic attainment for this student demographic has become increasingly important.

In response to the higher levels of accountability in reading and math legislated by No Child Left Behind, in 2001 the National Institute of Child Health and Human Development published the findings of the National Reading Panel. This work provided the basis for Reading First legislation within Title I of the No Child Left Behind Act. Reading First aims to set in place a national reading policy that requires explicit and systematic instruction in phonemic awareness; phonics; vocabulary development; reading fluency, including oral reading skills; and reading comprehension strategies in K-3. Although this legislation focused on students in K-3, it indirectly affects reading instruction throughout K-12.

Recognizing that the National Reading Panel did not address the issue of non-native English speaking students, in 2002 the U.S. Department of Education announced the formation of the National Literacy Panel. The National Literacy Panel has the task of identifying, assessing, and synthesizing literacy research related to the education of English language learning minority children and youth and providing research-based recommendations to guide educational practice and inform educational policy. The panel seeks to understand the cognitive, linguistic, socio-cultural, and instructional factors inherent in the process of reading in English for non-native English speakers, and the complex interactions between these factors.

This report provides research validation for the use of technology such as Kurzweil 3000 as an important tool for ELL students learning to read and comprehend grade-level content-area work. 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 and studies that support the use of tools such as Kurzweil 3000 for all ELL students in the classroom.

Part II cites research and studies that show how specific features of Kurzweil 3000 support important aspects of the reading and learning process for all English language learners, regardless of their ability level or prior education experience.

Note that this report relies primarily on United States-based research and examples. All research referenced within the report is summarized in a table at the end of the section in which it is cited.

Author	Title	Source	Reference Description
A. Schifini	<i>Teaching Newcomers to Read in English</i>	Proceedings of the First National Conference for Educators of Newcomer Students, 2002	ELL students come from varied backgrounds. Some ELL students have had little access to education, while others have been highly educated and thus are more immediately successful academically.
C. Suarez-Orozco M.M. Suarez-Orozco	<i>Immigrant Children and the America Project</i>	Education Week, XX(27), 40-56, 2001	
J. Ruiz-de-Vasco M. Fix	<i>Overlooked and Underserved: Immigrant Students in U.S. Secondary Schools</i>	The Urban Institute, 2000	
D. Waggoner	<i>Who Are Newcomer and Linguistically Different Youths?</i>	In C. Faltis and P. Wolfe (Eds.) So Much to Say: Adolescents, Bilingualism, and ESL in the Secondary School, 13-41, 1999	
J. Cummins	<i>Language Proficiency and Academic Achievement</i>	In J. Cummins and M. Swain (Eds.), Bilingualism in Education, 138-161, 1986	To master the English language, ELL students must learn both conversational and academic English.
V.P. Collier	<i>Promoting Academic Success for ESL Students: Understanding Second Language Acquisition for School</i>	New Jersey TESOL, 1995	Academic English takes between 5 to 10 years to fully develop, much longer than acquisition of conversational English.
Department of Education and Skills	<i>Aiming High: Understanding the Educational Needs of Minority Ethnic Pupils in Mainly White Schools: A Guide to Practice</i>	Department of Education and Skills, United Kingdom, 2004	Educators in the United States, Canada, Australia, and the United Kingdom have the dual challenge of teaching English language learners both language and content in order to make these students academically successful in the long-term.
Australian Capital Territory	<i>English as a Second Language</i>	Australian Capital Territory, 2002	
Ministry of Education	<i>The Ontario Curriculum Guides Grades 1-8: English as a Second Language and English Literacy Development: A Resource Guide</i>	Ministry of Education, 2001	
D. Padolsky	<i>Frequently Asked Questions</i>	NCELA, 2005	There were more than 5 million ELL students in U.S. schools in 2003-2004.

Part I

Why Kurzweil 3000 provides essential support to all English language learners.

English language learners are an extremely diverse population. The approximately 5 million students who make up the U.S. ELL population in grades K-12 have varying levels of English language proficiency and varying cultural and language backgrounds (Fitzgerald, 1995). In addition, students have differing amounts of education in their home countries, sometimes as a result of war or natural disasters, which provides a tremendously complex

challenge to education administrators and teachers (Arreaga-Mayer & Perdomo-Rivera, 1996). While many students have prior educational experience in their home country and first language and have home support for education, many do not.

Technology helps schools meet the needs of their diverse student populations in a variety of ways. Kurzweil 3000 provides tools for learning that meet the individual academic needs of ELL students, especially in grades 6-12, through content-area learning, practice of literacy concepts, and test-taking skills. The multi-sensory approach (e.g., combining audio and visual reinforcement of text) of Kurzweil 3000 ensures accommodation for the varied learning styles among this diverse population of students. Students who have exited ELL programs and are considered proficient in English may still have difficulties with academic content; Kurzweil 3000 can provide linguistic and academic support to these students.

Author	Title	Source	Reference Description
J. Fitzgerald	<i>English-as-a-Second-Language Learners' Cognitive Reading Processes: A Review of Research in the United States</i>	Review of Educational Research, 65(2), 145-190, 1995	The U.S. population of ELL students have widely varying levels of English language proficiency and cultural and language backgrounds.
C. Arreaga-Mayer C. Perdoma-Rivera	<i>Ecobehavioral Analysis of Instruction for At-Risk Language Minority Students</i>	The Elementary School Journal, 96(3), 245-256, 1996	English language learners can have very different amounts of education in their home countries, which makes the task of educating these students more complex.

I. English language learners need programs tailored to meet their specific needs.

ELL students in grades 6-12 face a challenging task. Although they need to become proficient in English, they must continue their academic progress at the same time. In the upper grades the focus is on reading to learn, rather than learning to read, and this makes academic progress difficult for many ELL students (Ernst, 1994). Academic learning needs to be made comprehensible to English language learners throughout the continuously evolving process of interaction between language and cognition (Baker, 1996). Research shows that “language, academic, and cognitive development all go hand in hand. As our students increase their knowledge of second language across all subject areas, they need to have continuing development of thinking skills” (Ovando & Collier, 1998, p. 114). This must be done in a manner that meets with the specific needs and varied backgrounds of these students.

The Kurzweil 3000 program is content-independent, self-paced, and allows for individualized instruction of ELL students at varied literacy and English language proficiency levels. It incorporates tools for reading, writing, and listening and opportunities for speaking in a way that serves individual needs. More advanced ELL students can check their own reading and writing. The program also provides scaffolded access to higher-level material and content that students might not be able to access independently. The important dimension of practice with text at the student’s level of understanding is integral to the Kurzweil 3000 program.

Author	Title	Source	Reference Description
G. Ernst	<i>Beyond Language: The Many Dimensions of an ESL Program</i>	Anthropology & Education Quarterly, 25(3), 1994, 317-335	The shift from “learning to read” to “reading to learn” in the upper grades makes academic achievement difficult for ELL students.
C. Baker	<i>Foundations of Bilingual Education and Bilingualism</i>	Multilingual Matters, United Kingdom, 1996	Making learning comprehensible for ELL students is a constantly evolving process involving both language and cognition.
C. Ovando V.P. Collier	<i>Bilingual and ESL Classrooms: Teaching in Multicultural Contexts</i>	McGraw-Hill, New York, 1998	Thinking skills need to be taught at the same time as English language development, in every subject area. The development of language, academic skills, and cognitive development are closely tied together.

II. English language learners learn language through interaction with text.

ELL students need comprehensible text that is at or slightly beyond their language proficiency level (Fitzgerald, 1995). However, although it may appear that intermediate-level learners understand grade-level academic texts, they still require contextual support in order to completely understand academic content and use literacy skills. Researchers have found that content lessons often do not allow much time for interaction or for students to practice the presented information (Short & Echevarria, 1999). In order to promote high academic achievement, “tasks must be meaningful, have a true interactional component, and have a comprehensible purpose for the language student” (LeLoup & Ponterio, 2003, p. 4).

Kurzweil 3000 has tools that address an ELL student’s need for comprehensible input. The text is tracked visually as the student reads, and a targeted word can be played back as often as necessary to facilitate learning. Kurzweil 3000 also promotes active manipulation of text to foster use of comprehension strategies. Outlines or flash cards can be created from text that the student has highlighted. In addition, the original document and a new document can be open at the same time. This enables the student to refer to the original text while answering questions or summarizing. Kurzweil 3000 helps ELL students access and master the difficult and complex texts assigned in content-area classrooms through tools for reading, study skills, writing, editing, test preparation, and test taking.

Author	Title	Source	Reference Description
J. Fitzgerald	<i>English-as-a-Second-Language Learners’ Cognitive Reading Processes: A Review of Research in the United States</i>	Review of Educational Research, 65(2), 145-190, 1995	For text to be comprehensible to ELL students, it must be at or slightly beyond their English language proficiency level.
D. Short J. Echevarria	<i>The Sheltered Observation Protocol: A Tool for Teacher-Researcher Collaboration and Professional Development</i>	Center for Research on Education, Diversity & Excellence, 1999	Many times, content lessons do not present ELL students enough time to interact or practice their language and content learning.
J.W. LeLoup R. Ponterio	<i>Second Language Acquisition and Technology: A Review of Research</i>	CAL Digest, EDO-FL-03-11	For ELL students to achieve academically, tasks must encourage interaction between peers, be meaningful, and have an explicit purpose for learning.

III. English language learners with learning disabilities need academic experiences that support their specific needs.

English language learners with learning disabilities are especially vulnerable to academic failure because of difficulties with language processing that are exacerbated by having to learn a new language. Students viewed as poor language learners may be struggling because of a learning disability. ELL students who are identified as having learning disabilities need to be educated with their peers while engaged in a challenging curriculum that allows for progress toward their Individualized Education Plan (IEP) goals. Providing curriculum content, language learning, literacy support, and tasks that balance the involvement of each hemisphere of the brain ensures that learning failure is not perpetuated. Education research emphasizes that developmental difficulties must be taken into account for English language learners, as well as a focus on meaningful messages in academic content (Leung, 1996). Reading whole texts engages ELL students with learning disabilities more than reading text fragments (Ruiz, 1991). In addition, research states that “it is not a matter of students with learning difficulties do a class or activity over again; it is a matter of having them do it differently” (Root, 1994, p. 4).

ELL students with learning disabilities require a meaningful context for language learning and also need support for their learning difficulties. Kurzweil 3000 provides computer-based remediation support with auditory, visual, and kinesthetic feedback. This multi-sensory approach, as well as its opportunities for consistent, meaningful practice, supports the needs of English language learners with learning disabilities for specific, discrete, and general learning. Kurzweil 3000 provides whole texts, which gives more opportunities for ELL students with learning disabilities to understand the messages inherent in the academic texts while reading in a second language. In addition, the word processing capabilities of Kurzweil 3000 enable ELL students who have difficulties with the physical aspects of writing to concentrate on the academic task, allowing them to produce neat and legible assignments.

Author	Title	Source	Reference Description
B.P. Leung	<i>Quality Assessment Practices in a Diverse Society</i>	Teaching Exceptional Children, 28(3), 42-45, 1996	ELL students with learning disabilities need to have their development difficulties taken into account when educators structure and present instructional tasks. Academic content for these students must present meaningful messages that students can understand.
N.T. Ruiz	<i>Effective Instruction for Language Minority Children with Mild Disabilities</i>	ERIC Digests, E499, 1991	ELL students with learning disabilities are more motivated and engaged to read if they read whole texts as opposed to text fragments.
C. Root	<i>A Guide to Learning Disabilities for the ESL Classroom Practitioner</i>	TESL-EJ, 1(1), A-4, 1994	Oftentimes, repetition of an academic task does not enable a student with learning disabilities to succeed. The task must be attempted differently, from a different perspective.

IV. Gifted English language learners need academic experiences to enhance, develop, and accelerate their learning.

ELL students are underrepresented in gifted and talented programs, as educators struggle to understand the issues involved in their identification (Birely, 1995). Students who were excellent students in their country of birth can feel frustrated, since it is often difficult for them to be recognized as such in their new country. Often, the ELL students who are more easily identified as gifted are those who have had prior education experiences and who learn English quickly. Even so, these students struggle with the lack of culturally relevant academic background and ongoing linguistic challenges. Barriers need to be removed so that gifted ELL students can recognize their own potential (Passow, Monks, & Heller, 1993). Research shows that technology for the gifted "is often a means to reach the appropriate depth and breadth of curriculum and advanced product opportunities" (Johnson, 2000, p. 4).

Kurzweil 3000 facilitates the learning of content and provides support for learning strategies favored in schools. Kurzweil 3000 allows gifted English language learners to accelerate their learning as they work on a text, outlining concepts and major points, using their outline for written text, using the thesaurus to embellish language, and listening to what they have written to proofread for content, syntax, and spelling. As Kurzweil 3000 facilitates new linguistic and content information, gifted ELL students can integrate prior knowledge and feel equal to their native-English speaking peers as they all work on new academic content. The use of Kurzweil 3000 allows ELL students to monitor their own progress and display their academic and language learning abilities.

Author	Title	Source	Reference Description
M. Birely	<i>Identifying High Ability/High Achievement Giftedness: Serving the Needs of Gifted Children from a Multicultural Perspective</i>	In J.L. Genshaft, M. Birely, & C.L. Hollinger (Eds.), <i>Serving Gifted and Talented Students: A Resource for School Personnel</i> , 3-13, 1995	Because educators have difficulty identifying ELL students that are gifted and talented, these students are often underrepresented in gifted and talented programs.
A.H. Passow F.J. Monks A. Heller	<i>Research and Education of the Gifted in the Year 2000 and Beyond</i>	In K.A. Heller, F.J. Monks, & A.H. Passow (Eds.), <i>International Handbook of Research and Development of Giftedness and Talent</i> , 883-903, 1993	The methods for identifying gifted and talented students need to be adapted for the varied backgrounds of ELL students. Students who are talented students in their native country may not be identified similarly in their new county of residence.
D.T. Johnson	<i>Teaching Mathematics to Gifted Students in a Mixed-Ability Classroom</i>	ERIC Digest, E594, 2000	Technology promotes an ideal opportunity for gifted and talented ELL students to fully explore the curriculum.

V. Technology provides powerful learning experiences for English language learners.

Computers link ELL students to the world beyond school. They provide language, academic learning, and valuable technological competence, which is a critical skill for the future workplace. Access to the Internet provides research opportunities and a connection to culturally and linguistically relevant information. Meaningful contexts for language and new technological skills provide powerful and exciting learning for ELL students. Research shows that English language learners report positive attitudes to using computers for language learning, including lower anxiety and a high interest level (LeLoup & Ponterio, 2003; Cassidy, 1996; Kleinmann, 1987). In addition, "research suggests that the effective integration of technology can improve academic achievement, promote English and native language proficiency, augment positive self-concepts, enhance motivation, stimulate positive attitudes towards learning, and foster higher-level thinking skills" (Chisholm & Beckett, 2003, p. 257).

ELL students learn well when they believe that there is "real-world" application of what they are learning. The use of Kurzweil 3000 can provide this opportunity. Support for decoding, fluency skills, learning and test-taking strategies, and access to comprehensible and meaningful content-area texts makes Kurzweil 3000 a powerful learning tool for ELL students. The technology provided by Kurzweil 3000 facilitates writing and production of assignments in academic styles. This develops the understanding of text structure for English language learners who have not previously experienced these requirements.

Author	Title	Source	Reference Description
J.W. LeLoup R. Ponterio	<i>Second Language Acquisition and Technology: A Review of Research</i>	CAL Digest, EDO-FL-03-11, 2003	Using computers for language learning fosters higher levels of motivation, engagement, and low anxiety learning.
J.A. Casidy	<i>Computer-Assisted Language Arts Instruction for the ESL Learners</i>	The English Journal, 85(8), 55-57, 1996	
H.H. Kleinmann	<i>The Effect of Computer-Assisted Instruction on ESL Reading Achievement</i>	The Modern Language Journal, 71(3), 267-276, 1987	

Author	Title	Source	Reference Description
I.M. Chisholm C. Beckett	<i>Teacher Preparation for Equitable Access Through the Integration of TESOL Standards, Multiple Intelligences, and Technology</i>	Technology, Pedagogy and Education, 12(2), 2003	Using technology in ELL classrooms has many advantages. Technology can help to improve academic achievement, English language proficiency, motivation, and foster thinking skills development.

VI. Technology provides opportunities for collaboration between teachers who serve English language learners.

One of the underlying principles of the Goals 2000: Educate America Act (National Clearinghouse for Bilingual Education, 1995) is the importance of mainstream and bilingual/ESL teachers' collaboration. The collaborative process ensures that expertise is shared by mutual agreement for the benefit of students (Baca & Cervantes, 1998). Collaboration between mainstream and bilingual/ESL teachers provides the best learning environment for ELL students, since it helps all educators who work with English language learners to fully understand the needs of their students. When mainstream and bilingual/ESL teachers jointly review learning materials and texts and plan their instruction together, ELL students receive increased exposure to comprehensible texts, and academic and acculturation issues are diminished (Valdes, 1998; Young, 1996). Collaboration through the use of technology can improve the focus on the specific academic, cognitive, and linguistic goals of ELL special education students. Students gain significantly through teacher collaboration as teachers work together to meet their needs (Coltrane, 2002). In addition, research shows that "collaboration between mainstream and bilingual/ESL teachers in schools with programs that serve limited English proficient (LEP) students . . . can result in a shared commitment to systemic school reform leading to higher achievement" (Sakash & Rodriguez-Brown, 1995, p. 1).

Kurzweil 3000 provides a point of contact between bilingual/ESL and content-area teachers to collaborate on shared content and language learning goals. Teachers can collaborate on the appropriate choice of text to scan into Kurzweil 3000 or choose together from the many that are already available electronically. Having identified appropriate content, such as a social studies text, the text can be worked on in both the ESL and social studies classes, ensuring that each teacher understands the language, content, and learning strategies requirements of their student. Kurzweil 3000 Notes can be used to ensure that the important content aspects of the task are emphasized by the content-area teacher. The ESL teacher could also insert Notes to draw attention to important language and learning strategy aspects of the task. Another advantage of teacher collaboration is that through planning and implementation of the Kurzweil 3000 program, the instructional competencies of both mainstream and ESL/bilingual teachers can be enhanced.

Author	Title	Source	Reference Description
National Clearinghouse for Bilingual Education	<i>Forming New Partnerships for Educating All Students to High Standards</i>	NCELA, 1995	Collaboration between mainstream and ESL/bilingual teachers is a key method for encouraging the long-term academic achievement of ELL students.
L.M. Baca H.T. Cervantes	<i>The Bilingual Special Education Interface</i>	Merill Prentice-Hall, Ohio, 1998	The collaboration process helps teachers share information in a way that is helpful and beneficial to students.
G. Valdes	<i>The World Outside and Inside Schools: Language and Immigrant Children</i>	Educational Researcher, 27(6), 4-18, 1998	By planning instruction for ELL students collaboratively, ESL/bilingual and mainstream teachers can better ensure that students are reading comprehensible texts and receiving the necessary academic and cultural support.
M.W. Young	<i>English (As a Second Language) Language Arts Teachers: The Key to Mainstreamed ESL Student Success</i>	The English Journal, 85(8), 17-24, 1996	
B. Coltrane	<i>Team Teaching: Meeting the Needs of English Language Learners Through Collaboration</i>	CAL, 25(2), 2002	Teachers who work together to meet the needs of ELL students produce higher levels of academic achievement in the students they teach.

Author	Title	Source	Reference Description
K. Sakash F.L. Rodriguez- Brown	<i>Teamworks: Mainstream and Bilingual/ESL Teacher Collaboration</i>	NCELA Program Information Guide Series, 24, 1995	Collaborative teaching helps to achieve school-wide reform, thus enabling academic success in larger groups of ELL students.

Part II

How Kurzweil 3000 addresses critical aspects of literacy for ELL students.

Kurzweil 3000 technology can make a significant difference in supporting the development of literacy skills for English language learners. Kurzweil 3000 is a sophisticated suite of reading, writing, and learning tools. It provides an array of features to support the core reading skills that research has shown to be important, including decoding, fluency, comprehension, and writing. Each section below highlights a necessary skill for ELL students, cites relevant research validating the importance of that skill, and lists the Kurzweil 3000 features that reinforce that skill.

I. English language learners need to learn language and content.

ELL research findings:

In a study conducted by Thomas and Collier (1996), secondary school ELL students entering the U.S. system had the best opportunity for long-term success when their ESL instruction was content based. It is critical to English language learners' academic success that they learn academic content while developing their English language proficiency. There has been considerable research on the best ways to integrate language and academic learning for ELL students (Hernandez, 2003; Dong, 2002; Kidd, 1996; Collier, 1995; Ortiz & Wilkinson, 1991). Integrating modified language into content instruction is important and makes discipline-specific language comprehensible for English language learners. As an example, Dong (2002) suggests a glossary of key words, diagrams, and drawings that should be prepared to communicate concepts in content areas.

Kurzweil 3000 applications:

An important aspect of Kurzweil 3000 is that it allows ELL students to work on difficult, decontextualized content-area texts.

More specifically, Kurzweil 3000 supports content learning for ELL students through:

- The ability to read any scanned text, digital file, or Internet page.
- Access to text at or just beyond the ELL student's language proficiency level.
- A multi-sensory approach to text comprehension.
- Visual tracking of words as text is read.
- Auditory support when typing.
- Bilingual dictionaries and support for picture dictionaries.
- The ability to play back a targeted word as often as necessary to facilitate learning.
- The ability to take notes and to add notes to an outline.

Author	Title	Source	Reference Description
W.P. Thomas V.P. Collier	<i>Language-Minority Student Achievement and Program Effectiveness</i>	NABE News, 33-35, 1996	ELL students in secondary school have greater opportunities for success if they are taught English that is directly tied to mainstream content.
A. Hernandez	<i>Making Content Instruction Accessible for English Language Learners</i>	In G.G. Garcia (Ed.), <i>English Learners: Reaching the Highest Level of English Literacy</i> , 71-95, 2003	Various research studies have investigated the best methods for integrating language and content teaching in ELL classrooms.
Y.R. Dong	<i>Integrating Language and Content: How Three Biology Teachers Work With Non-Native English Speaking Students</i>	<i>International Journal of Bilingual Education and Bilingualism</i> , 5(1), 40-57, 2002	
R. Kidd	<i>Teaching Academic Language Functions at the Secondary Level</i>	<i>The Canadian Modern Language Review</i> , 52(2), 285-307, 1996	
V.P. Collier	<i>Promoting Academic Success for ESL Students: Understanding Second Language Acquisition for Schools</i>	New Jersey TESOL, New Jersey, 1995	
A.A. Ortiz C.Y. Wilkinson	<i>Assessment and Intervention Model for the Bilingual Exceptional Student</i>	<i>Teacher Education and Special Education</i> , 14, 35-42, 1991	
Y.R. Dong	<i>Integrating Language and Content: How Three Biology Teachers Work With Non-Native English Speaking Students</i>	<i>International Journal of Bilingual Education and Bilingualism</i> , 5(1), 40-57, 2002	Glossaries of key words, diagrams, and drawings are a few examples of the methods teachers can use to make content concepts accessible to ELL students.

II. Language is acquired by understanding messages in a low-anxiety situation.

ELL research findings:

Krashen and Terrell (1983) state that language learners need messages, or input that they understand, so that there is a match between the level of language delivered to the student and the level that the student understands. They also state that it is important that language learners not become anxious or defensive in language learning. Belief in their ability to succeed is critical to students' success (Richardson & Miles, 2003; Street, 2003, 2001; Freebody & Luke, 1990).

Social and cultural processes influence the ways that students think, their understanding and implementation of school tasks, and their approach to language learning (Cheng, 2003). They can make an academic learning environment stressful and difficult for ELL students. It is important that these students not be frustrated by language that is too difficult or to feel that they are expected to fail. The use of computers can foster such low-stress situations, becoming a catalyst for learning and communication (Owen, 1996).

Kurzweil 3000 applications:

Kurzweil 3000 supports a low-anxiety situation for understanding messages through:

- The use of text that provides messages at a student's level of understanding.
- The use of text that focuses on academic information rather than grammatical structures.
- Heightened interest because of technology use.
- The ability to work at a student's own level.
- The opportunity to work independently, in pairs, or in small groups.
- The insertion of Sticky Notes or Bubble Notes by the teacher, which helps students scaffold learning and connect with prior knowledge.
- Internet use to gather information.

Author	Title	Source	Reference Description
S. Krashen T. Terrell	<i>The Natural Approach: Language Acquisition in the Classroom</i>	Pergamon, United Kingdom, 1983	ELL students need comprehensible input, or understandable messages, so that there is a match between the level of language a student receives (in terms of input) and the level that the student understands.
R. Richardson B. Miles	<i>Equality Stories: Recognition, Respect, and Raising Achievement</i>	Trentham Books, United Kingdom, 2003	For ELL students to be able to learn most successfully, they must believe that they can succeed. They must be neither defensive nor anxious while they are learning language.
B. Street	<i>What's "New" in Literacy Studies? Critical Approaches to Literacy in Theory and Practice</i>	Current Issues in Comparative Education, 5(2), 2003	
P. Freebody A. Luke	<i>"Literacies" Programs: Debates and Demands in Cultural Context</i>	Prospect: Australian Journal of ESL, 5(3), 6-17, 1990	
L.L. Cheng	<i>How Culture Can Affect Assessment</i>	National Symposium on Learning Disabilities in English Language Learners, 2003	Learning can not be considered in a vacuum. Social and cultural processes influence the ways ELL students learn.
T. Owen	<i>Other People's Children</i>	The English Journal, 85(8), 34-39, 1996	The use of computers can foster low-stress/low-anxiety situations where language learning can be maximized.

III. English phonics can be puzzling.

ELL research findings:

Phonemic awareness and phonics are considered essential parts of reading. These letter/sound connections need to link to sounds in words that students know (Clay, 1993). ELL students who are literate in their own language may understand this aspect of reading, but English phonemes may be difficult to pronounce and distinguish or to place in a meaningful context (Bear, Templeton, Helman, & Baren, 2003). Learning phonics can be problematic for ELL students, as they may not be familiar with the graphophonic symbols within a text (Gibbons, 1991). Some students may be literate in character-based languages such as Chinese, which involve character recognition, but not in phonics (Peregoy & Boyle, 2000; Koda, 1999). Other students may find that letters in one language correspond to a different sound in another (Jones, 1996). It is also important to understand that ELL students often do not understand the meanings of all the words they can decode (Garcia & Bauer, 2004).

Kurzweil 3000 applications:

Kurzweil 3000 supports the teaching of phonics to English language learners through:

- The pronunciation of text in English.
- The ability to read text aloud numerous times.
- Syllabication, which helps identify phonemes within words.
- The ability to highlight and read words.
- Dictionaries and thesaurus to understand the meaning of a targeted word.

Author	Title	Source	Reference Description
M.M. Clay	<i>An Observational Survey of Early Literacy Achievement</i>	Heinemann, New Hampshire, 1993	To be a successful reader, students need to connect the sounds of letters to the sounds in words that they know orally.
D. Bear S. Templeton L. Helman T. Baren	<i>Orthographic Development and Learning to Read in Different Languages</i>	In G.G. Garcia (Ed.), English Learners: Reaching the Highest Level of English Literacy, 71-95, 2003	ELL students may have difficulty pronouncing English phonemes and determining their purpose in reading.
P. Gibbons	<i>Learning to Learn in a Second Language</i>	Heinemann, New Hampshire, 1991	ELL students may have difficulties learning English phonics because of lack of knowledge of graphonic symbols.
S.F. Peregoy O.F. Boyle	<i>English Learners Reading English: What We Know, What We Need to Know</i>	Theory into Practice, 39(4), 237-247, 2000	For students who are literate in character-based languages (like Chinese), awareness that certain sounds represent certain letter/combinations of letters may be completely unfamiliar.
K. Koda	<i>Development of L2 Intraword Orthographic Sensitivity and Decoding Skills</i>	The Modern Language Journal, 83(1), 148-162, 1999	
M.L. Jones	<i>Phonics in ESL Literacy Instruction: Functional or Not?</i>	Literacy Online: Proceedings of the 1996 World Conference on Literacy	Letters in one language may correspond to different letters in another language, possibly confusing ELL students.
G.E. Garcia E.B. Bauer	<i>The Selection and Use of English Text with Young English Language Learners</i>	In J. Hoffman and D. Schallert (Eds.), The Texts in Primary Classrooms, Mahwah, NJ: Lawrence Erlbaum Associates, 2004	While ELL students may be able to decode a word, they may not understand what it means.

IV. Vocabulary enrichment is a critical factor in academic learning.

ELL research findings:

To a large extent, ELL students rely on vocabulary knowledge for comprehension. Since they comprehend through understanding messages, they focus on the content of a message. Therefore the amount of English vocabulary that they know has an impact on their academic learning. Research shows that ELL students can improve their vocabulary development and reading comprehension over time if they receive an enriched program of vocabulary instruction (Ramirez, 2000).

English language learners also face the challenge of learning social English while simultaneously learning advanced academic vocabulary appropriate to their grade level (Cummins, 1984). Vocabulary learning is critical to text comprehension; without it, academic achievement may be impeded. Learning vocabulary through a variety of sources, in a multi-sensory manner, helps students learn words on a deeper level (Dole, Sloan, & Trathen, 1995).

Kurzweil 3000 applications:

Kurzweil 3000 supports vocabulary enrichment for ELL students through:

- Auditory reading of text.
- Bilingual and English dictionaries and support for picture dictionaries.
- A thesaurus that generates a list of synonyms.
- Visual tracking of words as the text is read.
- Students' ability to insert recorded or printed notes into a document to mark challenging vocabulary.
- Reinforcement of phonetic learning, as words can be divided into syllables.
- The ability to play back words as often as required.
- A multi-sensory aspect that connects with differing learning styles.

Author	Title	Source	Reference Description
J. Ramirez	<i>Bilingualism and Literacy: Problem or Opportunity? A Synthesis of Reading Research on Bilingual Students</i>	Proceedings of the Research Symposium on High Standards in Reading for Students from Diverse Language Groups, 2000	Vocabulary knowledge is an important facet of reading comprehension. When ELL students receive an enriched program of vocabulary instruction over time, their reading comprehension can improve.
J. Cummins	<i>Bilingualism and Special Education: Issues in Assessment and Pedagogy</i>	Multilingual Matters, United Kingdom, 1984	ELL students must learn academic English at the same time they learn conversational English.
J.A. Dole C. Sloan W. Trathen	<i>Teaching Vocabulary Within the Context of Literature</i>	Journal of Reading, 38(6), 452-460, 1995	Vocabulary learning is more easily and deeply developed if students learn in a multi-sensory manner, through a variety of sources.

V. Fluency is affected by a lack of proficiency in English.

ELL research findings:

Pronunciation problems experienced by ELL students affect their fluent reading in English. Although some English language learners may understand many words in English, they can not always pronounce them correctly, which adversely affects their ability to read fluently (Garcia, 2003). Rate, fluency, and accuracy are all related to comprehension (Pinnell et al., 1995). A reader who reads slowly without any variance in rate probably finds it extremely difficult to access visual and spoken cues and does not recognize and process the visual word easily (Fountas & Pinnell, 1996). Fluent readers recognize and comprehend words simultaneously, enabling them to read text accurately and quickly. Students who read with limited fluency are less likely to comprehend well (Antunez, 2002).

When a reader's fluency is more like the spoken word, it is likely that the message of the text is being attended to (Clay, 1993). ELL students become fluent in reading when they are exposed to authentic texts that they understand. However, those who have not had prior education experiences in their first language require even more extensive exposure to text so that fluency is modeled for them (Collier, 1995). Comprehension of the text is problematical for ELL students, and therefore fluency is likely to improve with increased proficiency in the English language.

Kurzweil 3000 applications:

Kurzweil 3000 supports the teaching of fluency to English language learners by:

- Modeling by reading text aloud.
- Allowing student to read a text at his or her level of language proficiency.
- Ensuring that students can practice listening to and reading text as often as required.
- Reinforcing the flow and cadence of the words by playing a passage multiple times.
- Focusing on chunks of words by breaking text into segments.
- Training the eye to move more quickly across the page by gradually increasing reading speed.
- Preventing students from skipping or missing parts of words.
- Transforming reading from a passive process into an interactive one.
- Providing timely feedback so students need not interrupt their flow of reading.

Author	Title	Source	Reference Description
G.E. Garcia	<i>The Reading Comprehension Development and Instruction of English-Language Learners</i>	In A.P. Sweet and C.E. Snow (Eds.), <i>Rethinking Reading Comprehension</i> , Guilford Press, 2003	ELL students may not be able to pronounce all of the words they understand correctly, which may then affect their ability to read fluently.
G.S. Pinnell J.J. Pikluski K.K. Wixson J.R. Campbell P.B. Gough A.S. Beatty	<i>Listening to Children Read Aloud: Data from NAEP's Integrated Reading Performance Record</i>	Educational Testing Service, 1995	How fast a student reads, how fluently a student reads, and how accurately a student reads all affect how well a student will comprehend a text.
I.C. Fountas G.S. Pinnell	<i>Guided Reading: Good First Teaching for All Children</i>	Heinemann, New Hampshire, 1996	A reader who reads very slowly may have difficulty in accessing visual and spoken cues. These readers may also not be able to process visual words easily.
B. Antunez	<i>Implementing Reading First with English Language Learners</i>	Directions in Language and Education, Spring (15), NCELA, 2002	ELL students with limited fluency in reading English texts are less likely to comprehend what they are reading.
M.M. Clay	<i>Reading Recovery: A Guidebook for Teachers in Training</i>	Heinemann, New Hampshire, 1993	The closer a reader's fluency is to the spoken word, the more likely that reader fully comprehends what is being read.
V.P. Collier	<i>Promoting Academic Success for ESL Students: Understanding Second Language Acquisition for School</i>	New Jersey TESOL, New Jersey, 1995	For ELL students who have had limited prior formal schooling, more extensive exposure to models of fluent reading is necessary.

VI. Proficient readers use strategies to promote reading comprehension.

ELL research findings:

ELL students who are literate in their first language are able to transfer reading comprehension strategies from one language to another (Cummins, 1986). With explicit instruction and practice, they will be able to transfer metacognitive and cognitive strategies learned in their first language to English (Garcia, 2003). However, these students will require practice in reading strategies in the new language. The Cognitive Academic Language Learning Approach (CALLA) was developed (Chamot & O'Malley, 1994) as a result of the need to teach learning strategies to ELL students. CALLA integrates language development, content-area instruction, and explicit instruction in learning strategies. Utilizing learning strategies provides English language learners with ways to make text accessible and comprehensible.

Reading comprehension is the goal of learning to read and the culmination of all reading skills. This can be challenging for ELL students, since novels, stories, and poems used in schools often reflect social settings, people, and values from a culturally different milieu (Kooy & Chiu, 1998), compounded with the need for vocabulary development. In line with theory behind the CALLA approach, English language learners can gain text comprehension through learning strategies such as utilizing prior knowledge about a topic, monitoring their understanding, and selecting strategies such as elaboration and inferencing to support comprehension. Teaching and engaging students in learning and practicing multiple learning strategies is extremely important for ELL students of all abilities, as these strategies may vary tremendously individually, as well as cross-culturally (Carroll & Monroe, 1993; Kettmann-Klingner & Vaughn, 1996).

Kurzweil 3000 applications:

Kurzweil 3000 supports reading comprehension strategies for English language learners through:

- The ability to highlight critical information, using up to four colors.
- The ability to generate questions in the form of notes that can be extracted into a separate outline.
- Creation of outlines or flash cards from highlighted texts.
- The ability to open both the original document and a text document at the same time, so students can refer to the original while answering questions or summarizing.
- Dictionaries to look up definitions.
- A thesaurus to generate a list of synonyms.
- Access to the Internet for additional background information.
- Use of the Read feature, which allows students to quickly read through a document.
- Students' use of Notes to jot down questions or comments.
- Teachers' insertion of notes or instructions in Sticky Notes or Voice Notes in order to remind students of critical strategies, concepts, or ideas.
- Teachers' use of Bubble Notes to insert multiple-choice, true/false or open response comprehension questions in student texts.

Author	Title	Source	Reference Description
J. Cummins	<i>Language Proficiency and Academic Achievement</i>	In J. Cummins and M. Swain (Eds.), <i>Bilingualism in Education</i> , Longman, 1986	When an ELL student is literate in his or her first language, he or she may be able to transfer reading comprehension strategies from their native language to English.
G.E. Garcia	<i>The Reading Comprehension Development and Instruction of English-Language Learners</i>	In A.P. Sweet and C.E. Snow (Eds.), <i>Rethinking Reading Comprehension</i> , Guilford Press, 2003	For reading comprehension strategies to transfer between languages, ELL students must be given explicit instruction and ample practice.
A. Chamot M. O'Malley	<i>The CALLA Handbook: Implementing the Cognitive Academic Language Learning Approach</i>	Addison-Wesley Publishing Company, Massachusetts, 1994	The Cognitive Academic Language Learning Approach (CALLA) is one method used to teach ELL students the learning strategies necessary to succeed in mainstream, content area classrooms.
M. Kooy A. Chiu	<i>Language, Literature, and Learning in the ESL Classroom: A Classroom Kaleidoscope</i>	The English Journal, 88(2), 78-84, 1998	ELL students may not have the required cultural background knowledge to fully comprehend novels, stories, and poems.

Author	Title	Source	Reference Description
P. Carroll L.B. Monroe	<i>Learning Styles and Composition</i>	The Modern Language Journal, 77(2), 148-162, 1993	Teaching ELL students different learning strategies is extremely important. ELL students may have a wide range of abilities and need to learn and practice multiple strategies.
J. Kettmann-Klinger S. Vaughn	<i>Reciprocal Teaching of Reading Comprehension Strategies for Students with Learning Disabilities Who Use English as a Second Language</i>	The Elementary School Journal, 96(3), 275-293, 1996	

VII. Good writers use various strategies.

ELL research findings:

Reading and writing comprehensible messages is a focus for ELL students. ELL students who are literate in their first language may be able to transfer strategies for writing from that language (Chan, 1988). However, they may have used different scripts, such as those used in Chinese, Greek, or Arabic. Literate and nonliterate ELL students will need to learn the grammar markers, rules, and written genres of their new culture and language (Gibbons, 1991; Reid, 1984). Leki (2003) states that writing practice can help writers develop efficient composing processes and also can help ELL students to learn that writing is a tool for gathering, examining, and relating information.

ELL students learn to write in the same way as they acquire an additional language: through understanding and making messages. The focus should be first on communicating meaningful messages in print (Krashen, 1984). ELL students need to work at the process of writing, that is, creating meaning, and then scan their text to check for correct grammatical structure. Since readers who struggle with decoding and spelling have difficulty with written expression (Carroll et al., 1996), it is evident that writing presents challenges for ELL students. Those who are literate in their own language understand the functions of print and already understand the place of correct grammar in writing. They will transfer this knowledge to their new language. Those without prior education will have a more difficult time learning literacy concepts. Part of the task for any writer is to determine how to manage information and to decide what should be included and where. This is especially difficult for the ELL student (Leki & Carson, 1994).

Kurzweil 3000 applications:

Kurzweil 3000 supports ELL strategies for writing through:

- Auditory reading of written text so students can proofread for content and spelling.
- The opportunity for advanced ELL students to check their own writing independently.
- Creation and utilization of vocabulary lists.
- The ability to highlight important information and turn it into an outline.
- Students' use of the spelling tool, the spell checker, or dictionary as needed.
- Students' use of a thesaurus to enlarge understanding and vocabulary.
- The opportunity for advanced ELL students to use homophones and confusables and content-specific vocabulary lists in word prediction.

Author	Title	Source	Reference Description
M.M. Chan	<i>Research in the Classroom: What We Already Know About Teaching ESL Writers</i>	The English Journal, 77(6), 84-85, 1988	ELL students who are able to write in their native language may be able to transfer strategies to writing in English.
P. Gibbons	<i>Learning to Learn in a Second Language</i>	Heinemann, New Hampshire, 1991	The native languages of ELL students may differ significantly from English. Grammar markers, rules, and genres will need to be explicitly taught to ELL students for them to be successful when writing in English.
J. Reid	<i>ESL Composition: The Linear Product of American Thought</i>	College Composition and Communication, 35(4), 449-452, 1984	
I. Leki	<i>Research Insights Into Second Language Writing Instruction</i>	CAL Digest, 2003	With practice, ELL students can learn that writing is an essential tool for gathering, examining, and relating information.
S. Krashen	<i>Writing: Research, Theory and Applications</i>	Laredo Publishing Company, California, 1984	ELL students learn to write in the same manner that they learn other skills in English. The primary focus should be on communicating messages that have meaning.
P.S. Carroll F. Blake R.A. Camelo S. Messer	<i>When Acceptance Isn't Enough: Helping ESL Students Become Successful Writers</i>	The English Journal, 85(8), 25-33, 1996	Writing is often difficult for ELL students because they often struggle to decode and spell in English.
I. Leki J. Carson	<i>Student's Perceptions of EAP Writing Instruction and Writing Needs Across Disciplines</i>	TESOL Quarterly, 28, 81-101, 1994	For ELL students with limited native language literacy, learning literacy concepts in English may be more difficult.

VIII. Test-taking strategies allow students to demonstrate their knowledge.

ELL research findings:

The large numbers of ELL students, as well as growing pressure for higher test scores, means that the issue of academic achievement of ELL students has become increasingly important. In the United States, the No Child Left Behind Act requires school districts to demonstrate that ELL students are making progress in learning academic content and in English language proficiency. ELL students are tested for a variety of reasons: screening and identification, placement, reclassification or exit, monitoring progress, and program accountability (O'Malley & Valdez Pierce, 1996). Students often find test taking difficult, since these tests may focus more on their English language proficiency than on their content knowledge. However, many tests measure both content knowledge and language ability, especially when they have been developed and normed with native English speakers (Ovando & Collier, 1998).

Research indicates that metacognitive strategies, or thinking about thinking, are critical to successful learning and test taking (Graham, 1997). Metacognitive strategies allow students to plan, control, and evaluate their own learning. It is important that ELL students practice the application and combination of strategies to successfully prepare for and complete a test (Kruger & Dunning, 1999). When ELL students can reflect upon their learning strategies, they are better prepared to make conscious decisions about how they can improve their studying or test-taking skills. As Kruger and Dunning (1999) state, self-assessment is necessary in order to know how to improve. Students need explicit teaching and practice in choosing the most appropriate strategy for each task, as well as repeated practice in mastering the types of questions and time nature of standardized tests.

Kurzweil 3000 applications:

Kurzweil 3000 supports test-taking strategies for ELL students through:

- Practice of pre-reading, highlighting, note taking, and summarizing for more effective learning.
- Creation of outlines or study guides by extracting key information for review purposes.
- Access to the text under review while answering sample questions on a separate document.
- Electronic practice with fill-in-the-blank, multiple choice, true/false, short answer, and essay questions.
- Auditory reading of the instructions as many times as needed.
- Auditory reading of the question and answer to check answers.
- Access to supports such as dictionary and thesaurus as the testing situation allows.
- Teachers' insertion of notes, reminders, or instructions into a document to remind ELL students of the test-taking strategy they need to practice.
- Creation of study guides and fact flash cards to review information and move it into long-term memory.

Author	Title	Source	Reference Description
J.M. O'Malley L. Valdez Pierce	<i>Authentic Assessment for English Language Learners: Practical Approaches for Teachers</i>	Addison-Wesley Publishing Company, Massachusetts, 1996	ELL students are tested for various purposes including identification, reclassification, monitoring progress, and program accountability.
C. Ovando V.P. Collier	<i>Bilingual and ESL Classrooms: Teaching in Multicultural Contexts</i>	McGraw-Hill, Massachusetts, 1998	Tests in English measure both an ELL student's content knowledge and English language proficiency, making test taking for these students even more difficult.
S. Graham	<i>Effective Language Learning</i>	Multilingual Matters, United Kingdom, 1997	Learning and mastering metacognitive strategies is essential for ELL students' success in learning and test taking.
J. Kruger D. Dunning	<i>Unskilled and Unaware of It: How Difficulties in Recognizing One's Own Incompetence Can Lead to Inflated Self-Assessment</i>	Journal of Personality and Social Psychology, 77, 1121-1134, 1999	To be able to succeed in test taking situations, ELL students need to practice and learn metacognitive strategies that will allow them to plan, control, and evaluate their own learning.

In Conclusion

Today's ELL students will need to be lifelong learners. Reading skills, effective learning strategies, content information, and access to technological tools are essential in order for English language learners to succeed.

Technology 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, programs such as Kurzweil 3000 help all English language learners to actively engage in the learning process. ELL students with little prior education or with learning difficulties can enjoy the use of a computer program that allows them to work at their own pace; academically gifted ELL students are able to work at a more accelerated pace. Most importantly, technology like Kurzweil 3000 allows ELL students to work on grade-level curriculum while developing their English language skills.

About Kurzweil Educational Systems

Kurzweil Educational Systems, Inc. founded in 1996, is the industry leader and innovator of scanning, reading and learning solutions for people with learning difficulties, and people who are blind or visually impaired. Ray Kurzweil, a co-founder of the original company, invented computer-based reading machine technology 25 years ago to provide access to printed text for the blind. With a pioneering history in developing assistive technology, the company has received worldwide recognition for enabling people with disabilities to lead more independent lives through improved reading and writing abilities.

About Kurzweil 3000

Kurzweil 3000 is reading, writing and learning software for struggling students, and is widely recognized as the most comprehensive and integrated solution for addressing language and literacy difficulties. The software uses a multi-sensory approach – presenting printed or electronic text on the computer screen with added visual and audible accessibility. The award-winning product incorporates a host of dynamic features including powerful decoding, study skills, writing and test taking tools all designed to adapt to each individual's learning style and to promote active learning.

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