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SuccessMaker®
Putting Research into Practice
K-8 Reading Course

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Abstract

SuccessMaker is a computer-based supplemental courseware solution that provides a personalized, 21st century approach toward learning to accommodate and support the wide range of needs of today's students and educators. Through the SuccessMaker K–8 Reading Course, students develop a thorough understanding of reading concepts, skills, and strategies through the presentation of an engaging and motivating, standards-based reading curriculum. This course was developed around proven pedagogical and design principles to provide effective, research-based instruction to address the diverse needs and abilities of all learners.

The sections that follow provide research summaries and citations that support the instructional practices used in the program, illustrating how we put the large body of available research into practice within the SuccessMaker reading course. Highlighted program features include reading research, 21st century learning skills, instructional design, and universal access.

Reading Research

Reading is widely recognized as a critical academic skill that is essential for success across all grade levels and educational domains. The concept of reading has been defined according to National Council of Teachers of English (2004), "complex, purposeful, social and cognitive process in which readers simultaneously use their knowledge of spoken and written language, their knowledge of the topic of the text, and their knowledge of their culture to construct meaning" (para. 1).

Research has demonstrated that there are several essential skills that children must learn in order to become successful readers (e.g., see Fooreman & Torgesen, 2001; Gambrell, Morrow, & Pressley, 2007; National Reading Panel (NRP), 2000; Snow, 2002). Specifically, children must be able to decode words quickly and accurately, read with fluency, activate vocabulary knowledge, and utilize comprehension strategies to understand the text they are reading (Vacca & Vacca, 2007). In elementary school, children in the lower grades (i.e., K-3), receive extensive instruction on emergent reading skills such as phonological awareness, word recognition, fluency and vocabulary development, where as reading instruction in the upper grades (i.e., grades 5-6) tends to focus more on comprehension development. However, once children

enter sixth-grade they are less likely to be explicitly taught advanced reading strategies. Instead, it is generally assumed that by the time students enter middle school they are able to comprehend expository and narrative texts from a wide variety of disciplines and genres with considerable skill and insight. Given the increasing complexity of content material presented in middle school and beyond, students must develop sufficient skills and competencies in decoding, fluency, vocabulary, comprehension strategies and critical thinking in order to read, understand, and learn from these challenging texts (Snow & Biancarosa, 2003). Consequently, providing effective literacy instruction is not simply an issue for the early years; it is a matter of utmost priority that must be addressed across all grade levels and curriculum subject areas.

Despite the undeniable need for research on understanding the continued literacy development that takes place during adolescence, much of the empirical evidence that has accrued thus far has focused almost exclusively on reading in the primary grades (Alvermann, 2001; Moore, Bean, Birdyshaw, & Rycik, 1999; RAND, 2002). In addition, the No Child Left Behind Act (NCLB, 2002) primarily funded programs (e.g., Reading First) that focus on reading in early childhood (i.e., K-3) (U.S. Department Of Education, 2002). Accordingly, much less is known about the development of reading competence in adolescence (National Institute of Child Health and Human Development [NICHD], 2000). To address this issue several professional organizations (e.g., International Reading Association, NCTE, NICHD, and National Reading Conference) have recently called for a shift in attention towards examining literacy teaching and learning for adolescents. In response, researchers have provided practical recommendations to help teachers implement effective strategies to improve adolescent literacy (e.g., see Deshler, Palincsar, Biancarosa, & Nair, 2007; Fisher & Frey, 2004; Moore, Alvermann, & Hinchman, 2000). In addition, to meet the diverse needs of an ever growing heterogeneous population of students, investigators and educators have turned to technology as a new medium through which students can receive individualized instruction, practice, and feedback in reading skills and comprehension (for recent reviews see MacArthur, Ferretti, Okolo, Cavalier, 2001; NICHD, 2000; Pearson, Ferdig, Blomeyer, & Moran, 2005; Reinking, 2005).

The sections that follow illustrate the connections between the research base and key elements in SuccessMaker. These sections provide research summaries and citations that support the instructional practices and design used in the program, illustrating how we put the large body of available research into practice.

Research: Technology in Reading Instruction

Over the years a substantial body of empirical evidence has been amassed supporting the use of technology as an instructional tool in primary classrooms (for reviews see Blok, Oostdam, Otter, & Overmaat, 2002; Kulik, 2003; Murphy, Penuel, Means, Korbak, & Whaley, 2001; Pearson, Ferdig, Blomeyer, & Moran, 2005; Schacter, 2001). Overall, researchers

have found that computer-assisted instruction has generally had a positive effect on a variety of student outcomes including their academic achievement and adjustment. In addition, prominent educational organizations such as the National Association for the Education of Young Children (NAEYC) have released position statements highlighting the importance of incorporating technology into reading curriculum. Thus far, technology has proven to be an effective tool through which students can receive instruction on a variety of skill and content areas, opportunities for repeated practice, and immediate feedback as to their progress (Pearson et al, 2005; Reinking, 2005; Snow, 2002).

Putting Research into Practice

As an instructional tool, SuccessMaker K-8 Reading provides educators with the means to individualize and customize the curriculum and assignments to meet students' developmental needs. SuccessMaker supplements core reading programs by providing instruction and practice in essential reading skills and strategies that have been, or are being introduced as part of students' daily classroom learning. Content material is presented using a variety of modalities (e.g., visual, auditory) to help students master basic and more advanced reading skills and concepts. Through the courseware, students are able to work at their own pace, on materials presented at their instructional level.

Research: Phonemic Awareness

Before children learn to read print, they need to be able to hear, identify, and manipulate phonemes in spoken words. This knowledge of phonemes sets the stage for children to discover the relationship between letters and sounds (i.e., phonics) that will, in turn, facilitate their ability to read print (Adams, 1990). In fact, research has shown that a child's level of phonemic awareness is predictive of their later success in learning to read (for reviews see Bus & van IJzendoorn, 1999; Ehri, Nunes, Willows, Schuster, Yaghoub-Zadeh, & Shanahan, 2001; NRP, 2000).

Most children (~80%) acquire phonemic awareness by the middle of first grade through repeated experiences with print and language at home and in the classroom (IRA, 1998). Those children who struggle with phonemic awareness benefit from more engagement and explicit, systematic instruction with language early in their schooling (NRP, 2000). Phonemic awareness can be developed through a variety of activities, including sound matching, isolation, identity, categorization, blending, segmentation, and manipulation (e.g., adding, deleting, substituting, or reversing phonemes in words (Cunningham, 2007; NRP, 2000; Vukelich et al., 2002). Findings from the National Reading Panel's meta-analysis

suggest that teaching children to manipulate phonemes in conjunction with print (e.g., letters of the alphabet) and focusing on one or two types of phoneme skills at a time, especially blending and segmenting, can contribute to their reading success (Ehri et al., 2001; NRP, 2000).

Build or Break: *Learners match the picture with the same beginning sound as the word said in the voice over (kindergarten).*

Pick and Click: *Students click on pictures whose medial sound is a short vowel sound. On the second screen, they click on the letters to spell the word (first grade).*

Syllable Sort: *Learners match pictures that have one, two, or three syllables to the corresponding characters (kindergarten).*

Putting Research into Practice

SuccessMaker builds a sound phonemic awareness foundation through focused instruction and practice aimed at improving children's understanding and awareness of spoken sounds in words. A variety of interactive and engaging activities are embedded in the course to build student's phonological and phonemic awareness. For example, students interact with words, letters, and sounds in Build or Break activities by blending phonemes into words or segmenting words into phonemes. Through the varied instruction and practice, students will be able to identify words in a set that begin with the same sound (e.g., map, mat, and maze all have a /m/ at the beginning), identify the initial and final sound in a word (e.g., the beginning sound of cat is /c/, the ending sound is /t/), blend sounds into words (e.g., what word is /v/ /a/ /n/? – van), and segment words into sounds (e.g., how many sounds in the word big? – /b/ /i/ /g/), all of which are considered essential skills for helping children understand and use the alphabetic system to read and write.

Research: Phonics

Children differ greatly in their need for phonics instruction. Some children learn to decode words on their own, often through exposure to meaningful reading and writing activities (Foorman, Francis, Fletcher, Schatschneider, & Mehta, 1998). However, others have trouble decoding words quickly and accurately (e.g., analyzing and recognizing sound-letter relationships), which slows down their ability to read in a smooth, conversational manner. Moreover, the struggle to decode words accurately can result in various reading errors (e.g., mispronunciations, word omissions, and substitutions) that, if significant, cause cognitive confusion and limit a child's ability to bring meaning and conceptual understanding to the words in the text. Research has shown that children who struggle to decode text benefit from direct, systematic phonics instruction (for reviews see Ehri et al., 2001; Foorman & Torgeson, 2001; NRP, 2000). Successful phonics programs have typically focused on synthetic (i.e., letter-sound blending) and analytic (i.e., letter-sound patterns; e.g., onset-rime) phonics.

Putting Research into Practice

SuccessMaker provides focused, systematic phonics instruction and practice using various interactive, engaging activities that address a number of skills including letter-sound associations, syllabication, consonant blending, onsets and rimes, and word analysis. For example, students are exposed to onsets and rimes in Sort activities by categorizing words based on sound patterns. Students are then able to integrate and apply learned phonics skills in context during fluency drills and decodable reading passages.

Research: Fluency

In order to read fluently, children need to be able to recognize and decode words automatically (i.e., automaticity), with little conscious effort spent on the mechanics of reading (LaBerge & Samuels, 1974).

Children who lack the ability to read fluently may experience difficulty because they read in a slow and halting manner, word-by-word, and have trouble pronouncing words quickly and accurately. These readers spend so much time and attention on trying to "say the words" that comprehension suffers, and, as a result, the reading process breaks down for them (Jenkins, Fuchs, van den Broek, Espin, & Deno, 2003; Perfetti, 1992). Such children would benefit from instruction and practice in fluency strategies (Allington, 2006). Research suggests that fluency activities should incorporate repeated and monitored oral readings (Dahl, 1979; Samuels, 1979) and model fluent reading (Dowhower, 1989) in order to demonstrate effective decoding, self-regulating, and comprehension strategies (for reviews see Kuhn & Stahl, 2000; NRP, 2000).

You Tell the Tale *(kindergarten)*

Putting Research into Practice

SuccessMaker provides fluency instruction and practice via activities that address word recognition, speed, comprehension and prosody through guided, repeated readings. Activities that focus on automaticity and accuracy practice at the word level are also included to provide additional review and practice of newly learned phonics skills and high frequency words. In SuccessMaker fluency activities, students orally read on-screen text into a microphone; student recordings are saved for later review and assessment by their teacher.

Let's Race *(third grade)*

The courseware includes the following fluency practice activities for grades K-5:

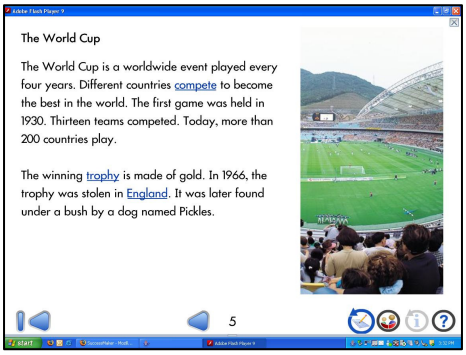
- Elapsed time fluency activities (i.e., Ready, Set, Read!) identify a student's oral reading rate.
- Retelling fluency activities (i.e., You Tell the Tale) evaluate a student's ability to extract meaning from text.
- Fluency assessment activities (i.e., Rock 'n' Read) identify how well a student reads aloud with fluency based on the number of substitutions, insertions, omissions, reversals, and repetitions that are made.
- Speed drill fluency activities (i.e., Let's Race) identify the speed and accuracy with which a student reads high frequency words or phrases.

The fluency activities promote individual accountability and choice through self-assessment and repeated readings. Students are able to review their fluency recordings and save their favorite recording to be assessed by their teacher. Text passages utilized in the fluency activities have been previously read by students and included audio support which provided a model of fluent reading.

Research: Vocabulary

Children learn words indirectly when they hear and see words in different contexts (e.g., through conversations, oral reading, and

independent reading). Direct vocabulary instruction entails teaching individual words and word learning strategies (i.e., how to use references, word parts, and context clues to determine word meanings). This instruction can increase the breadth and depth of children's vocabulary which has been linked to later emerging reading comprehension (Fisher & Blachowicz, 2005; Ouellette, 2006).



Non-fiction Reading Passage: *Students can click on hyperlinked vocabulary words for definitions and additional background information (third grade).*

Vocabulary instruction helps develop strong word skills that support the growth of children's vocabulary (for reviews see NRP, 2000; Snow, 2002) and has proven to be particularly beneficial as children are exposed to more expository texts and content-specific vocabulary with age (Armbruster, Lehr, & Osborn, 2003). Providing direct vocabulary instruction has been shown to lead to gains in word knowledge (NRP, 2000), particularly for students who are English language learners (Silverman, 2007; Umbel, Pearson, Fernandez, & Oller, 1992), students from lower socioeconomic backgrounds (Beck & McKeown, 2007), and students with learning disabilities (Bryant, Goodwin, Bryant, & Higgins, 2003; Jitendra, Edwards, Sacks, & Jacobson, 2004). Specifically, research suggests that children benefit from direct instruction of words that are essential for understanding concepts presented in the text, functionally important words, difficult words (e.g., multiple meaning words, idioms), and words they will encounter often (NRP, 2000; Stahl, 1986). Children also benefit from multiple exposures to words, including contextual exposures, to support retention and deeper understanding (Bryant et al., 2003), and from direct instruction of essential word learning strategies such as using references or context clues to determine word meaning (Cain, Oakhill, & Lemmon, 2004).

Fill in the Blank *(second grade)*

Build or Break *(fifth grade)*

Putting Research into Practice

SuccessMaker comprehensively and systematically embeds focused vocabulary instruction and practice through text passages and interactive practice activities that introduce high frequency and grade-level appropriate words as well as reinforce effective word learning strategies. Target words were selected based on their difficulty (e.g., irregular, multi-syllabic, and multiple meaning words) and criticality with regards to text passage comprehension. Students interact with vocabulary words in a variety of activity structures including matching and cloze procedures in addition to word building, replacement, and identification. Students are also indirectly exposed to key words from text passages that are hyperlinked to the glossary. The glossary provides definitions and semantic (e.g., synonyms and antonyms) or contextual (e.g., sentences, visual representations, or audio clips) examples as appropriate. In addition, the audio support provided throughout the courseware encourages indirect word learning.

Research: Text Comprehension

Proficient reading comprehension depends on the ability to decode words, read with fluency, and understand key vocabulary terms as well as employ specific comprehension strategies (Block & Pressley, 2007; NRP, 2000).

Research suggests that children who struggle with reading comprehension often have a diminished repertoire of reading strategies, lacking the requisite skills to adequately decipher the deeper meaning of text (Gersten, Fuchs, Williams, & Baker, 2001). These children have been shown to benefit from explicit instruction regarding comprehension strategies (NRP, 2000). Proven strategies for improving reading comprehension include monitoring comprehension, using graphic organizers, answering questions, generating questions, recognizing story structure and summarizing (for reviews see (Block, Gambrell, & Pressley, 2002; Gersten, Fuchs, Williams & Baker, 2001; NRP, 2000; RAND, 2002). Research suggests that these comprehension strategies can be effectively taught via direct instruction, modeling, practice, and application activities (Duke & Pearson, 2002) to ensure children are able to acquire and effectively utilize the reading skills, strategies, and resources necessary for success.

Characterized by a variety of deficits with regard to decoding, fluency and/or comprehension problems, adolescents who struggle with literacy have typically been conceptualized as students who are underachieving, unmotivated, disenchanted, or ineffective readers. In terms of skill or competence deficiencies, the struggling reader may have a diminished repertoire of reading strategies, less background knowledge, a reduced vocabulary, poor fluency, and/or difficulty comprehending the deeper meaning of the text (Alvermann, 2001; Gersten, Fuchs, Williams & Baker, 2001; McNamara & O'Reilly, in press). These students make fewer inferences and fail to monitor their comprehension (i.e., a reader's attempt to ensure a consistent, meaningful understanding), often settling for shallow levels of text analysis. In addition to these cognitive difficulties, struggling readers are often disengaged from literacy, unmotivated and have low self confidence about their reading ability (Guthrie & Davis, 2003). In contrast, research suggests that good readers are more likely to be actively engaged with text, intrinsically motivated, constantly monitor their understanding, utilize pre-reading strategies, make predictions, read selectively, determine the meaning of unfamiliar words, and integrate prior knowledge (Duke & Pearson, 2002).

In their review of effective practices for developing reading comprehension, Duke and Pearson (2002) presented a research-based instructional model of comprehension that included the following components:

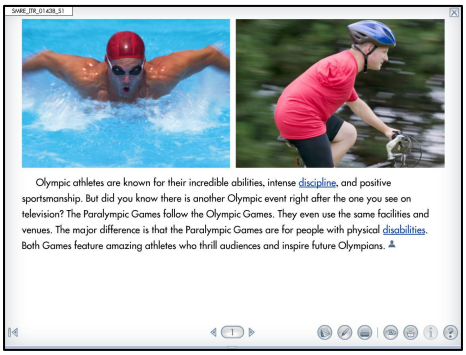
- An explicit description of the strategy and when and how it should be used.
- Teacher and/or student modeling of the strategy in action.
- Collaborative use of the strategy in action.
- Guided practice using the strategy with gradual release of responsibility.
- Independent use of the strategy (p. 208-209).

Through this model, students can receive instruction on a variety of comprehension strategies.

Read with Me: *Students click on the picture that corresponds to the sentence (kindergarten).*

Putting Research into Practice

SuccessMaker addresses reading comprehension skills and strategies by embedding focused instruction and practice throughout the courseware. Targeted skills and strategies are introduced and modeled during focused instruction to explain why the strategy helps comprehension, and when and how the strategy should be utilized during reading. Narrative and expository text passages written using the Lexile Framework® (i.e., a scale that measures student reading ability and text difficulty) are provided to enable students to apply the newly learned skills and strategies in context. Students are able to independently read the text or engage the Read-to-Me audio functionality to have the passage read aloud, offering a proficient model of fluency. Graphic organizers and other print materials are also provided to support and extend student learning.



Non-fiction Reading Passage
(seventh grade)

The program provides substantial instruction, support, and practice as students answer questions related to the main idea of passages. Story structure questioning requires students to answer who, what, when, where, why, and how questions regarding characters, setting, events, and story sequence.

Question answering—identified as a higher level skill for older elementary students—is integrated into SuccessMaker as students are posed carefully crafted questions that guide them in learning more from the text. For both typical and striving readers, summarization can be a difficult skill to master because the main idea is often inferred in text. SuccessMaker provides practice for students who need to acquire and build summarization skills. The reading program introduces and reinforces multiple strategies required for both fiction and non fiction text, SuccessMaker provides substantial practice reading nonfiction or expository texts. Approximately 60% of the text selections are nonfiction.

Instructional Design

SuccessMaker utilizes proven instructional design principles to create a unique approach to reading instruction that incorporates ongoing assessment and immediate feedback, personalized instruction and sequencing, an engaging and motivating interface, principles of universal access, and technology integration to develop and reinforce essential reading proficiency for all students.

The SuccessMaker K-8 Reading Course is organized into five curriculum strands. Content in each strand is leveled from easy to difficult and is focused on specific skill objectives tied to national and state standards. Leveled content has been carefully crafted into lessons. This overall organization enables the program to provide developmentally appropriate instruction for a student that is engaging and pedagogically sound.

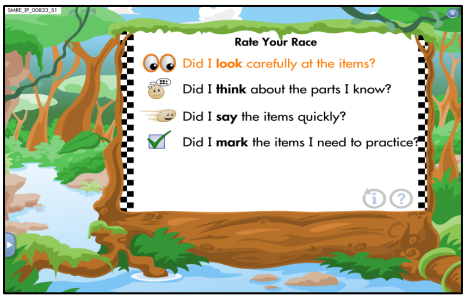
The core instructional path is based on the following structure:

Guided Practice:

- Focused Instruction: Introduces the target skill objective through a brief animation or video
- Check for Understanding (Grades 2-5): Directs student attention to the skill objective and reinforces understanding
- Text Passage: Leveled text passage and assessment items that address the skill objective
- Interactive Practice: Reinforce essential reading skills, concepts, and strategies in an interactive, engaging activity structure

Independent Practice (Grades 2-8): Students interact with texts and assessments at their independent reading level (i.e., passages that can be read with 90% comprehension).

Fluency (Grades K-5):



Let's Race: *Learners listen to a recording of their own voice and follow a guided auto-assessment (kindergarten).*

- Fluency Instruction and Practice: Build fluency skills through targeted instruction and practice activities that address word recognition, speed, and comprehension
- Interactive Vocabulary Practice: Reinforce vocabulary skills and strategies in an interactive, engaging activity structure
- Text Reader: Leveled text passage and assessment items presented at student's independent level
- Guided Reading: Improve extralinguistic skills like prosody with guided, repeated readings

Research: Feedback

Providing ongoing performance feedback can help learners identify errors, become aware of misconceptions, improve self-regulated learning, and foster overall motivation and achievement (Bangert-Drowns, Kulik, Kulik, & Morgan, 1991; Narciss & Huth, 2004).

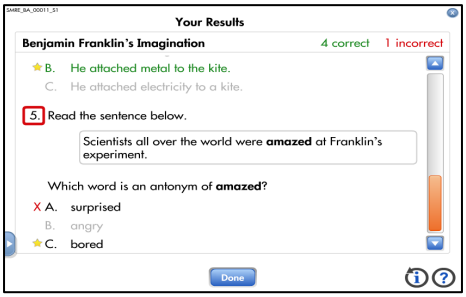
Research suggests that providing children with feedback can support and enhance the learning process and has shown it to be a vital element of effective instruction and practice in a variety of educational contexts (for reviews see Azevedo & Bernard, 1995; Hattie & Timperley, 2007; Kluger & DeNisi, 1996). Struggling learners, in particular, have been shown to benefit from feedback that is given immediately following a task or response as they are likely to have a more limited knowledge base and less developed self-monitoring processes (e.g., self-correcting errors; Azevedo & Bernard, 1995; Kulik & Kulik, 1988). Immediate feedback helps to correct initial errors in understanding and prevent inaccurate information from being encoded into memory.

Putting Research into Practice

SuccessMaker provides immediate performance feedback in assessment activities to facilitate student learning and understanding of targeted reading skills, strategies, and concepts, as well as to foster student motivation and achievement. Instructional feedback utilized in the interactive assessments provides students with a direct assessment of their response (i.e., item verification) as well as additional elaborative information regarding the target skill or topic. In text readers, students are returned to the text passage and prompted to re-read the material to locate the correct response, a strategy that promotes self-monitoring and self-regulatory processes.

Research: Ongoing Assessment

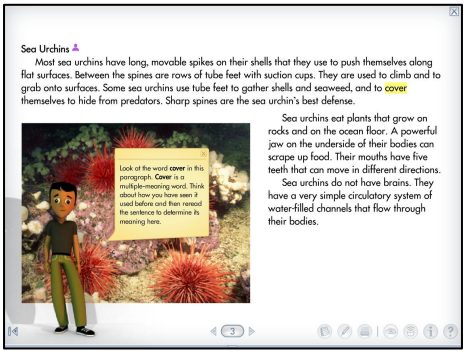
Based on their research synthesis, Bredekamp and Copple (1997) concluded that assessment should be ongoing, strategic, and purposeful. Furthermore, strong evidence supports formative assessment as an essential component of classroom work that raises student achievement. As teachers are informed of learners' progress and challenges with the material along the way, they can provide feedback to students and adapt their teaching to better meet students' needs (Black and Wiliam, 1998).



Benchmark Assessment *(second grade)*

Putting Research into Practice

SuccessMaker incorporates ongoing assessment via items and activities that check student understanding of key reading skills, concepts, and strategies. End activities for text passages contain various assessment items (i.e., highlighting, multiple choice, multiple select) that enable students to show what they have learned about the targeted skill objective in the lesson. Interactive practice activities reinforce targeted skills and provide students with additional opportunities to demonstrate skill mastery. Assessment questions are leveled to demonstrate proficiency in higher-order thinking skills.



Cognitive Coach: *Students select an avatar for their Cognitive Coach, a virtual tutor that provides guides the student through the reading and models reading strategies and skills (sixth through eighth grade).*

Research: Cognitive Tools, Scaffolding, and Pedagogical Agents

Technological tools can be used as a form of scaffolding to support students in their information processing, critical thinking, and knowledge construction and acquisition. Scaffolds such as guides, navigation support, expert modeling, pedagogical agents and prompts (Azevedo, 2005), allow students to participate at ever-increasing levels of competence; solving problems, carrying out tasks, and achieving goals that would normally be beyond their individual capability (for a review see Aleven, Stahl, Schworm, Fischer, & Wallace, 2003). Over time the supports are gradually withdrawn as the learners become more skilled and proficient (Rosenshine & Meister, 1992). Although there is a strong contention among researchers that cognitive tools can support and enhance student thought processes, there is little empirical research to substantiate this premise (Liu & Bera, 2005), especially with adolescents.

Liu (2004) examined whether a problem-based hypermedia learning environment would affect students' achievement and attitudes. A sample of 155 sixth-graders worked collaboratively on a science instructional

program that incorporated 13 cognitive tools including knowledge databases, expert modeling, design tools and a notebook. Students' ability levels and attitudes toward the learning activity were assessed after three weeks of use. Students made significant gains in their science concepts test and felt positively toward the program.

In a follow-up study, Liu and Bera (2005) examined the ways in which cognitive tools were used in the learning environment in order to determine if the tools provided the necessary scaffolding to support students' learning. The researchers found that students varied in their use of the types of cognitive tools (i.e., tools for sharing cognitive load, supporting cognitive processes, supporting otherwise out-of-reach activities and supporting hypothesis testing). Students with the highest achievement made more effective use of the cognitive tools than students with the lowest test scores (e.g., using the tools earlier in the activity, using more relevant tools).

Animated pedagogical agents are characters (life-like or otherwise) designed to facilitate learning in computer-based environments (for reviews see Kim & Baylor, 2006; Moreno, 2005). These agents are designed to a) adapt to student responses, providing personalized instruction and feedback as necessary and b) help motivate and engage the student by asking questions and offering encouragement. Agents can serve distinct functions in online environments (Baylor & Kim, 2005); they can motivate (motivator), demonstrate domain expertise (expert), provide feedback (tutor), simulate learning (virtual peer), or make adaptive suggestions (recommender). Current empirical research suggests that, when incorporated within online learning environments, pedagogical agents can enhance a student's ability to transfer learned skills to new situations as well as to increase their enjoyment in the lesson (Atkinson, 2002; Johnson, Rickel, & Lester, 2000; Moreno, Mayer, Spires, & Lester, 2001).

Moreno, Mayer, Spires and Lester (2001) assigned 48 seventh-grade students to a pedagogical agent (PA) group and no pedagogical agent (no PA) group. Students who learned with an animated pedagogical agent did not acquire more information, but did learn more deeply than students who learned in a more conventional text-based environment. Students were also more motivated and interested when participating in a computer-based lesson with the animated agent.

Putting Research into Practice

The metacognition component of SuccessMaker 6-8 Reading provides students with an opportunity to think about what is happening in their head as they read. The purpose of the Cognitive Coach (CC) is to guide the student through the reading passage by providing think-alouds and modeling reading strategies and skills. The 6-8 CC provides this modeling and guided questioning at the paragraph level within the interactive text reader. The coach is designed to represent an older more experienced peer who provides helpful hints for the student.

A portion of the text is highlighted to draw attention to the strategy the CC is modeling. Students read a page of text completely without interruption initially and then reread it with CC guidance.

Research: Personalized Instruction and Sequence

Computer-based learning environments enable the ability to personalize the nature and sequence of learning materials and tasks for each individual learner in order to facilitate the learning process (Corbalan, Kester, & Van Merrienboer, 2005). Personalization of instructional materials is thought to optimize learning because it takes into account an individual's responses and knowledge and allows for the creation of a learning path tailored to a specific child. By providing an individualized learning sequence, children are able to learn more effectively and efficiently because they are presented with material and instruction appropriate to their current learning needs (Chen, 2008).

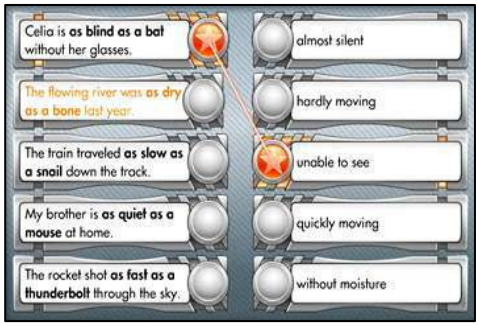
The key to an effective and efficient personalized approach is the use of metadata. Metadata includes characteristics of the learning resources such as description, keywords, cognitive demand, level, significance, relationships between learning objects, etc. These characteristics not only help with search functions to locate learning objects but more importantly they define the adaptivity when dynamically building lessons to support personalized learning. In other words, an adaptive engine selects, sequences, and presents learning resources based on the adaptivity metadata attached to these individual resources.

Find It!: *Interactive practice is presented in a format that is designed to be uniquely age-appropriate and engaging (eighth grade).*

Research has shown that effective reading programs should include differentiated instructional supports to enhance children's learning and understanding. Examples of instructional supports include providing children with ample opportunities to independently practice and apply concepts, skills, or strategies in a variety of contexts (Swanson & Hoskyn, 2001; Swanson & Deshler, 2003) and adjusting instructional and content levels to meet children's diverse needs and abilities (Tomlinson, 1999; Vygotsky, 1986). These support components have been shown to be effective in addressing the learning needs of struggling students, individuals with special needs (Broderick, Mehta-Parekh, & Reid, 2005; Swanson & Hoskyn, 2001), and gifted students (VanTassel-Baska & Little, 2003; VanTassel-Baska & Stambaugh, 2005).

Putting Research into Practice

SuccessMaker motion provides adaptive, differentiated, one-on-one instruction to accommodate and support student learning. Students execute a prescribed sequence of developmentally appropriate lessons that address key reading concepts, skills, and strategies in accordance with state education standards and grade-level expectations. Performance on specific activities and assessment items determines whether students require intervention or have mastered the requisite skills. Students who struggle with a particular skill are presented with remedial content (i.e., prerequisites and delayed presentation) at strategic intervals to facilitate learning and understanding. Remedial support elements included in the



That's a Match: *Interactive practice provides age-appropriate instruction and feedback for middle school learners (sixth grade).*

Messy Matching*: Positive feedback builds learner confidence and motivates the learner to continue (second grade).*

courseware present skill instruction and practice at a lower instructional level, reinforce previously mastered skills, and provide additional learning opportunities through repeated skill instruction and practice. This personalized learning sequence provides readers at all levels with access to the necessary instruction, practice, and assessment to achieve success.

Research: Engagement and Motivation

Motivation plays an important role in the reading process (Baker, Dreher, & Guthrie, 2000) and has been positively linked with children's achievement in school (Guthrie, et al., 1996). However, research suggests that children tend to develop less positive attitudes toward reading with age (McKenna, Kear, & Elsworth, 1995; Mazzoni, Gambrell, & Korkeamaki, 1999). To combat this trend, reading instruction can be engineered to engage and motivate readers. Effective programs include rewards, emphasize individual's efforts, and provide interesting and appropriate texts while teaching comprehension strategies (Block, Gambrell, & Pressley 2002; Guthrie & Davis, 2003). Fostering motivation can empower children to read independently, increasing their exposure to and understanding of varied texts.

Putting Research into Practice

SuccessMaker motivates students by providing an engaging learning environment that incorporates multimedia content (e.g., video, images, and songs), interactive activities, interesting texts, and rewarding audio support and animations. Incorporating these components reinforces targeted reading skills, strategies, and concepts, supports various learning styles (e.g., visual, auditory), and increases motivation and performance.

Research: Universal Access

SuccessMaker recognizes that individual differences in human development warrant the creation of an instructional program that embeds a variety of teaching methods, strategies, and modalities. As such, components in the program include design and instructional strategies to ensure universal access for all students. Whether students are gifted, acquiring English, or at risk due to a learning disability or socio-economic factors, or are typical learners, they need to practice and reinforce key reading skills.

Research suggests that children who struggle with reading comprehension benefit from the bimodal presentation of onscreen text coupled with audio support (Higgins & Raskind, 2000; Montali & Lewandowski, 1996). Children who have experienced this intervention have demonstrated significant improvement in word recognition and reading comprehension over control groups. These findings support the simultaneous presentation of audio and visual materials for instructional purposes (Moreno & Mayer, 2002).

Putting Research into Practice

SuccessMaker reading offers many key features for providing access to students with a wide variety of learning needs, especially for striving readers. The software provides immediate, corrective feedback and offers repeated practice on power objectives, as well as numerous opportunities to engage with text while learning language features, such as text structure and vocabulary. Key for students with reading disabilities or who are acquiring English, SuccessMaker Reading provides audio support for every text passage and practice activity. This benefits students by modeling pronunciation and building fluency. In the text passages, students can utilize the Read-to-Me function, enabling them to follow the text on-screen while being read to. Core assessment items and activities in the course also include audio support to assist English Language Learners and struggling readers. An interactive glossary that is fully audio-enabled is available for students who need additional support. Educators can tailor custom courses for both the striving reader and for those who are gifted to reinforce key skills or to challenge and provide enrichment.

Research: 21st Century Technology Integration

Over the years, a substantial body of empirical evidence has been amassed supporting the use of technology as an instructional tool in primary classrooms (for reviews see Blok, Oostdam, Otter, & Overmaat, 2002; Kulik, 2003; Murphy, Penuel, Means, Korbak, & Whaley, 2001; Pearson, Ferdig, Blomeyer, & Moran, 2005; Schacter, 2001). Overall, researchers have found that computer-assisted instruction has generally had a positive effect on a variety of student outcomes including their academic achievement and adjustment. In addition, prominent educational organizations such as the National Association for the Education of Young Children (NAEYC) have released position statements highlighting the importance of incorporating technology into reading curriculum. Thus far, technology has proven to be an effective tool through which students can receive instruction on a variety of skill and content areas, opportunities for repeated practice, and immediate feedback as to their progress (Pearson et al, 2005; Reinking, 2005; Snow, 2002).

Putting Research into Practice

SuccessMaker's computer delivery stimulates and engages technology savvy learners while providing an opportunity for learners who are less familiar with technology to begin building their digital literacy. Students are exposed to basic computing principles as they acquire core literacy skills to prepare them for future success in future grades when the requirement to use technology within the educational process expands. The one-on-one computing environment helps to build personal productivity and responsibility and encourages self direction through self-pacing and student choice to produce confident, independent students with a sense of ownership over their own learning. Many of the reading selections from the product reflect 21st century themes including global awareness, civic literacy, and health and wellness awareness.

As an instructional tool, SuccessMaker provides educators with the means to individualize and customize the curriculum and assignments to meet students' developmental needs. Content material is presented using a variety of modalities (e.g., visual, auditory) to help students master basic and more advanced reading skills and concepts. Through the courseware, students are able to work at their own pace, on materials presented at their instructional level. Beyond the reading curriculum, SuccessMaker encourages the development of critical thinking, problem solving, and communication skills. Additionally, the teacher has the chance to show individual content pieces as appropriate for the whole group, making use of 21st century classroom learning tools such as digital whiteboards.

To learn more about the SuccessMaker program, visit us at www.Pearsonschool.com/SuccessMaker.

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