

How *Jamestown Reading Navigator*[™]
Supports Research-Based Instruction
for Struggling Adolescent Readers

Technology

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About This Paper

This paper presents research-supported best practices related to instruction of struggling adolescent readers—that is, students in grades 6–12 who are reading at least two levels below grade level—and describes how *Jamestown Reading Navigator*[™] supports those practices.

What Is *Jamestown Reading Navigator*?

Jamestown Reading Navigator is a reading intervention program designed specifically for students in grades 6–12 who are reading two or more reading levels below their grade in school. The program provides direct, explicit instruction and modeling of good reading practices, together with opportunities for students to practice and apply these reading strategies.

Jamestown Reading Navigator combines online activities featuring interactive multimedia for students to complete; engaging and appropriate online and print texts for students to read; an audio component for further guided or independent study; student writing in response to reading; student recording of fluency passages; an assessment program to monitor students' progress; an independent measure of progress monitoring; and teacher support materials, including professional development, lesson plans, instructional recommendations, and reteaching skills support. Major areas of focus for *Jamestown Reading Navigator* include

- Comprehension skills and strategies, designed for application to content-area reading
- Vocabulary
- Writing
- Fluency
- Decoding/phonics (for students with a particular need in this area)

The *Jamestown Reading Navigator* Learner Management System helps teachers manage individual student learning and provides ongoing, up-to-the-minute information on how students are performing. Online professional development modules and on-site professional development sessions offered by Jamestown Education help educators—teachers, administrators, literacy specialists, and others—learn how to implement *Jamestown Reading Navigator* more effectively. These sessions also provide information and suggestions to help educators develop effective strategies for working with struggling adolescent readers.

Jamestown Reading Navigator has been developed based on the most up-to-date research and expert thinking in adolescent literacy, drawing on more than 30 years of experience in reaching adolescent readers with the popular Jamestown Education print series. This paper describes the match between *Jamestown Reading Navigator* and the best available instructional thinking in a variety of specific areas that are important to the success of struggling adolescent readers, as described below.

Introduction

A Critical Need to Support Struggling Adolescent Readers

Problems with literacy have serious and long-lasting consequences. A lack of literacy skills is “one of the most commonly cited reasons” for students to drop out of school (Biancarosa & Snow, 2006, p. 7). A resource guide on adolescent literacy prepared for the Southwest Educational Development Laboratory described the problem as follows:

For secondary-level students . . . the social and economic consequences of not reading well can be cumulative and profound: the failure to attain a high school diploma, a barrier to higher education, underemployment or unemployment, and difficulty in managing personal and family life. Years of failing at what is deemed a hallmark of intelligence and worth can also leave struggling readers with emotional consequences, such as anxiety and low self-esteem, that affect personality and interpersonal relationships. These effects within and beyond the classroom walls show that by the secondary grades educators can no longer defer solutions to future development or instruction. (Peterson et al., 2000, p. 6)¹

¹ Peterson et al. (2000) is laid out in a paginated PDF format, but the format does not include page numbers. Page references for quotes from Peterson et al. (2000) that are given in this paper have therefore been calculated on the basis of page numbers shown in the document table of contents.

Numerous sources attest to the scope of the challenge. *Reading Next* cited both results from the National Assessment of Educational Progress (NAEP) and the opinions of experts in adolescent literacy that “as many as 70 percent of students struggle with reading in some manner” that requires instruction differentiated for their specific needs (Biancarosa & Snow, 2006, p. 8, citing Loomis & Bourque, 2001; NCES, 1999, 2006; Olson, 2006).

Adolescents struggle with literacy for a variety of reasons. For some, English may not be their first language. Others may have mild learning disabilities. In many cases, students may simply lack experience and skill with reading. Unfortunately, difficulties in reading don’t cure themselves, but instead tend to get worse as students get older—a phenomenon reading experts refer to as the “Matthew Effect” (Stanovich, 1986). These students need literacy instruction that addresses the specific challenges they face, using the best available research-based methods and principles, in order to improve their chances of succeeding both during school and afterward.

The State of Research on Struggling Adolescent Readers

Over the last two decades, attempts to improve student literacy on the national level have focused largely on elementary instruction, and particularly on early literacy—that is, literacy at the primary grades. For example, the focus of the Reading First initiative was on improving literacy at the primary levels. Recently, however, a number of efforts—including research summaries for a variety of sources, publication of the *Reading Next* report and other documents from the Alliance for Excellent Education, and position statements from organizations such as the National Reading Conference and the International Reading Association—have helped create a higher profile for instructional issues related to adolescent readers, and particularly the large proportion of adolescents who struggle with reading.

Initiatives such as the No Child Left Behind Act have raised expectations for instruction. Instruction is expected to be backed with solid research that concludes it is likely to result in the desired impact on student learning. Unfortunately, research on what constitutes effective literacy instruction for adolescents is still limited. According to the editors of a volume intended to “compile from the best researchers in the field a summary and synthesis of adolescent literacy research and practice,”

As of 2003, there is not a body of research to tell us appropriate interventions that will help struggling middle and secondary school readers who can barely read. As of 2003, we still do not have a body of research to provide us with appropriate interventions to help high school readers who can read fluently but remain 3 or 4 years below grade level in reading. (Jetton & Dole, 2004, p. 6)

Although research on what constitutes effective literacy instruction for adolescents is limited in significant ways, there is substantial support in research and expert opinion for a variety of specific instructional recommendations. The state of knowledge with regard to effective instruction for struggling adolescent readers fits the description of *best available evidence* as characterized by U.S. Department of Education Assistant Secretary Grover J. Whitehurst: that is, “the integration of professional wisdom with the best available empirical evidence in making decisions about how to deliver instruction” (Whitehurst, 2002).

The Reading Next Report

A critical milestone in recent efforts to highlight the challenges related to adolescent literacy was the publication of *Reading Next*, a report to Carnegie Corporation of New York focusing on the needs of adolescent readers (defined in the report as those in grades 4–12), with a special emphasis on the needs of struggling readers. Preparation of this report included the following steps.

- A panel of five nationally known and respected educational researchers was convened in spring 2004, together with representatives of Carnegie Corporation of New York and the Alliance for Excellent Education.
- These panelists drew up a set of recommendations for how to meet the needs of struggling readers, including 15 specific elements of effective adolescent literacy programs that had “a substantial base in research and/or professional opinion” (Biancarosa & Snow, 2006, p. 12). These included both elements with an instructional focus and recommended infrastructure elements to improve adolescent literacy.

- The resulting paper was reviewed and augmented at the 2004 meeting of the Adolescent Literacy Funders Forum (ALFF).
- An Appendix was compiled of literature supporting each of the report’s main recommendations.
- In 2006, a second edition of the report was published.

The *Reading Next* recommendations thus represented a synthesis of research-informed expert opinion that serves as an important touchstone for much of what is known about effective adolescent literacy instruction. Several caveats, however, are in order with regard to using the recommendations as a yardstick for measuring instructional programs in general, and *Jamestown Reading Navigator* in particular.

- While all 15 elements identified by *Reading Next* are characterized as having “a substantial base in research and/or professional opinion” (Biancarosa & Snow, 2006, p. 12), the report nonetheless cautions that “the optimal mix of these factors has yet to be determined. . . . Nor does the remediation of adolescent literacy difficulties involve indiscriminately layering on all fifteen key elements. Choices should be matched to school and student needs” (Biancarosa & Snow, 2006, p. 29). The expectation is not that each literacy program should necessarily include all 15 elements, but that developers and adopters of such programs should select those elements that seem best matched to their specific circumstances.
- The focus of *Reading Next* is explicitly on “the large population of struggling students who already decode accurately but still struggle with reading and writing after third grade” (Biancarosa & Snow, 2006, p. 11). The report thus does not include recommendations related to areas such as decoding and fluency that may be important for readers who are struggling at a more basic level.
- Several of the elements of *Reading Next* relate to how infrastructure impacts adolescent literacy learning. The most that any purchased instructional program can do in these areas is to provide support to schools and districts as they implement these elements.

Development of This Paper

Development of this research-based white paper included the following steps.

- A top-level review of *Reading Next* was conducted to identify claims and recommended practices, including both those that are associated with the 15 key elements of adolescent literacy identified in the report and those that appear elsewhere in the report. As part of this review, information was collected about the sources in the Appendix to *Reading Next*, which listed literature supporting each of the 15 key elements.
- Well-known experts in the field of adolescent literacy were consulted to identify key, current, and reputable sources related to instruction for struggling adolescent readers. These included both experts who had been consulted during the development of *Jamestown Reading Navigator* and an independent expert not previously associated with the program.²
- Key documents were identified for review, with priority given to two types of documents:
 - *Broad policy-oriented research reviews and surveys of expert opinion, developed by reputable institutions and authors, with a goal of identifying key elements in effective adolescent literacy programs*
 - *More focused research syntheses and meta-analyses from reputable sources, describing the state of research and/or theory related to a specific relevant topic in adolescent literacy (e.g., comprehension, writing, formative assessment)*

² Key contributors included Dr. Thomas W. Bean, professor in literacy/reading and coordinator of doctoral studies in the Department of Curriculum and Instruction, University of Nevada at Las Vegas; Dr. William G. Brozo, professor of literacy, Graduate School of Education, George Mason University; and Dr. Douglas Fisher, professor of language and literacy education, San Diego State University. Drs. Brozo and Fisher had previously consulted with the development team for *Jamestown Reading Navigator*. These experts provided input into interpretation of the research literature, as well as recommendations of sources to review, but are not responsible for writing the summaries of the literature or for developing the correlations of the instructional recommendations to *Jamestown Reading Navigator*.

In addition to these two types of documents, some specific research reports were also identified for review, in the case of studies that were particularly germane to topics under investigation.

- Sources were reviewed and summarized, with special reference to
 - *Specific instructional recommendations*
 - *The nature of the evidence supporting each recommendation*
- Instructional recommendations were consolidated from multiple sources.
- Cross-comparison of the research-based recommendations and *Jamestown Reading Navigator* verified that *Jamestown Reading Navigator* supports each research-based recommendation listed in this paper.

In the final paper as presented here, each section spells out specific instructional recommendations that are supported by a mix of research and expert opinion. A table then provides information on how *Jamestown Reading Navigator* aligns with each recommendation.

Key policy-oriented documents and research syntheses that were reviewed for this paper are listed in the References section of the complete White Paper.

TECHNOLOGY

“Technology is both a facilitator of literacy and a medium of literacy. Effective adolescent literacy programs therefore should use technology as both an instructional tool and an instructional topic.”—*Reading Next* (Biancarosa & Snow, 2006, p. 19)

Technology as a Tool

Technology, including computer technology, has been used in many ways to support reading instruction—from multimedia-supported access to electronic texts, to student production tools such as word processors, to delivery of structured instruction, including student opportunities for guided practice using reading skills. According to a synthesis of research on adolescents, computer technology, and literacy,

Research suggests that consistent interaction with computerized reading instruction in areas such as vocabulary assistance and guided reading instruction can help adolescents with reading and text comprehension. (Kim & Kamil, 2004, p. 362, citing Boyd, 2000; Reinking, 1988. See also Kamil, 2003.)

Along similar lines, a volume on improving content-area literacy included the recommendation “*Use technology to promote learning with text,*” citing potential benefits in terms of “new methods of presenting information, new ways of structuring and organizing instruction, and new ways to motivate students to learn” (Readence et al., 2004, p. 11; emphasis in original). Likewise, a review of research on language and academic literacy for adolescent English language learning found,

The incorporation of technology into instruction for ELLs is seen as promising, as the practical relevance and often two-way nature of the work are thought to positively impact student motivation. . . . However, research on the effects of technology interventions on reading and writing development for adolescents conducted thus far is still inconclusive and the number of studies that have focused on ELLs is small. (Short & Fitzsimmons, 2007, p. 37, citing Kim & Kamil, 2004)

This conclusion by Short and Fitzsimmons highlights the difficulty of identifying specific research-verified practices related to technology and reading instruction. Although a large body of research exists, the sheer breadth of technology applications means that research on specific computer approaches and designs is often thin on the ground—a problem that is exacerbated by technology’s ever-changing capabilities.

In light of this challenge, it is not surprising that recommendations related to the use of technology as an instructional tool for adolescent literacy often refer largely to its potential—ways that technology can be used, in many cases without a body of confirming research about the effectiveness of specific technology uses. The best available evidence typically represents a combination of expert opinion, analysis, and studies of specific instances of technology applications, from which experts often derive broad recommendations with respect to effective uses of technology.

Technology as a Topic

Changes in communication technology have prompted literacy scholars to look more broadly at what constitutes literacy and at what skills students need in order to communicate successfully in the world of today and tomorrow. As Alvermann (2001) put it,

The idea that literacy is reinventing itself through new digital technologies . . . has enormous implications for teachers at the middle and high school level, as does the fact that these new technologies are fundamentally and irreversibly affecting how ideas get represented in texts and communicated. . . .

Everyday literacy practices are changing at an unprecedented pace, and speculation as to the impact of interactive communication technologies and multimedia on current conceptions of reading and writing is evident on many fronts. At the center of much of the discussion is the perceived need to develop adolescents' critical awareness of how all texts (print, visual, and oral) position them as readers and viewers within different social, cultural, and historical contexts. (pp. 16–17, citing Luke & Elkins, 1998; de Castell, 1996)

Viewed this way, technology represents not only a means of instruction for adolescent readers, but also an array of distinct communication media, with their own language conventions and literacy requirements. In order to achieve competence both in interpreting meaning and in communicating via technology—both increasingly critical skills in today's world—students must master these conventions and requirements and learn to apply broader literacy skills in a technology context.

Instructional Recommendations

Technology as a Tool

- **Flexible pacing.** Describing uses of technology for content-area literacy, Readence et al. (2004) noted, “When properly used, computers encourage experimentation in education. Students can test ideas and discover concepts as they work at a pace that best suits their ability and interest” (p. 19). Similarly, Kim and Kamil (2004) identified allowing students “to learn at a comfortable pace” as one of the advantages of computer-assisted instruction (p. 352). This observation suggests the potential of the computer to fulfill calls for flexible pacing in student instruction, such as that of Tomlinson (2004): “Flexible pacing is important in addressing learner variance. . . . When the instructional pace is too rapid or too slow for a particular student, learning is impeded. Thus, teachers should consider varying time allotments for student work based on varied student needs rather than assuming that time must be fixed and invariable” (Tomlinson, 2004, p. 240, citing Ben Ari & Shafir, 1988; Dahloff, 1971; Oakes, 1985).
- **Reinforcement and guided practice.** Describing ways that technology can be used as a tool for instruction, *Reading Next* stated, “As a tool, technology can help teachers provide needed supports for struggling readers, including instructional reinforcement and opportunities for guided practice. For example, there are computer programs that help students improve decoding, spelling, fluency, and vocabulary, and more programs are quickly being developed to address comprehension and writing” (Biancarosa & Snow, 2006, p. 19). This suggests a value in using technology specifically for reinforcement and guided practice, focused on key content and skills that are needed by struggling readers.
- **Customized support.** Among the advantages of computer-assisted instruction as “an alternative or adjunct to traditional reading instruction,” Kim and Kamil (2004) identified “the opportunity [for students] to access customized support” (p. 352). This suggests a value to students in providing instruction on the computer that differentiates based on specific student needs.
 - *Along similar lines, a discussion of technology use for adolescent English language learners found that “In general, computer-based literacy instruction can promote reading and writing development for adolescent ELLs” but cautioned that “instruction should be highly scaffolded” (Short & Fitzsimmons, 2007, p. 37). The review specifically recommended audio support for visual text: “The use of audio books can also support students’ literacy development, especially if students follow along with a written text; the recordings provide students with models for pronunciation and read-aloud fluency. For students whose spoken English is better than their reading skills, hearing the words read aloud can aid in vocabulary comprehension” (p. 37).*

- **Active text processing.** Another aspect of computer-assisted instruction that was identified by Kim and Kamil (2004) as a potential advantage in teaching struggling readers was “the opportunity . . . to process text actively” (p. 352). This suggests a value to using the capabilities of the computer to have students interact with texts.
- **Structured computer environments.** After reviewing research related to the use of computers to teach reading, Kim and Kamil (2004) concluded, “Research suggests that adolescents may not have developed a sophisticated repertoire of strategies for learning with computers, and that structured multimedia learning environments can be beneficial for facilitating literacy development. . . . Software that includes elements that compel adolescents to read and process the text, such as providing fixed rather than optional assistance, seems to have a stronger potential to be helpful” (p. 362, citing Reinking & Rickman, 1990; see also Kamil, 2003, p. 23). They endorsed the approach of “offer[ing] computerized reading instruction that is highly structured, such as vocabulary assistance that routinely follows up difficult target words with definitions, or the strategic arrangement of specific reading hints and suggestions to help guide students through texts” (p. 363).
 - *In particular, Kim and Kamil argued that students should be provided with “strategies for navigating through linked text. . . . [S]pecial provisions, such as computer prompts for students to attend to important details in the text and to provide strategic reading assistance, may be necessary to help students successfully utilize multimedia environments for learning” (p. 362). Along similar lines, Kamil (2003) stated, “Adolescents are likely to benefit from the provision of specific reading prompts while reading on the computer, and the addition of guidance that helps them to attend to salient information in the text, such as target vocabulary words” (p. 23).*
 - *Kim and Kamil also found that a highly structured environment was desirable in computerized writing instruction. Based on their review of the research, they stated, “[A]n emerging finding in the area of computerized writing instruction suggests that structured guidance . . . [is] likely to influence how successfully adolescents utilize multimedia environments for learning” (p. 358). They recommended, “In addition to the potential motivational benefits of applying computers to writing, computerized instruction can assist adolescents by providing detailed writing prompts, structured guidance with prewriting and drafts, [and] strategies and activities for writing essays” (p. 363).*
- **Decoding.** As noted above, a specific area that was identified by *Reading Next* where computer programs can help “provide needed supports for struggling readers” is decoding (Biancarosa & Snow, 2006, p. 19).
- **Fluency.** Another area that was specifically identified by *Reading Next* where computer programs can help struggling readers is in their development of fluency (Biancarosa & Snow, 2006, p. 19). Similarly, a review of research on effective instruction for adolescents who struggle with word identification endorsed computer activities and games as tools for promoting fluent word recognition, including multiple opportunities to practice recognition of the same words (Curtis, 2004, p. 128).
- **Vocabulary.** Several sources referenced vocabulary learning as an area where computers can have an impact for struggling readers.
 - *As noted above, Reading Next stated, “[T]here are computer programs that help students improve . . . vocabulary” (Biancarosa & Snow, 2006, p. 19).*
 - *Also as noted above, Kim and Kamil (2004) identified vocabulary assistance as one of the areas where “consistent interaction with computerized reading instruction . . . can help adolescents with reading and text comprehension” (p. 362).*
 - *The National Reading Panel (NRP) reported, “While the use of computer technology in reading is still in its infancy, the few studies reported in the literature suggest that this may be a powerful way of increasing vocabulary. . . . Two possibilities arise here. The first is that the computer might be used as an adjunct to direct vocabulary instruction. In this way, students could obtain more practice in learning vocabulary. A second possibility is that computer technology could bring to bear many different media. This is one way of adding a number of different modalities to the teaching of vocabulary and, consequently, helping ensure more effective vocabulary learning” (NICHD, 2000, p. 4-26, citing Reinking & Rickman, 1990; Heise et al., 1991; Davidson, Elcock, & Noyes, 1996; Heller, Sturmer, Funk, & Feezor, 1993). Two of the studies cited by NRP (Reinking & Rickman, 1990; Heise et al., 1991) included adolescent readers in their findings.*

- *With regard specifically to use of multimedia in vocabulary instruction, Baumann et al.'s (2003) review of research on vocabulary instruction cited a third-grade study in which "Higgins and Cocks (1999) investigated incidental word learning with CD-ROM storybooks. Using a CD-ROM of Jack Prelutsky's The New Kid on the Block, they charted students' learning of six target words through the animation, which was designed to illustrate words as students clicked on them. The mean gain was 3.43 words from pretest to posttest, and 40 percent of the students were able to define all six target words correctly after their reading of it in hypermedia" (p. 760). While this study represents a lower grade range than that served by Jamestown Reading Navigator, it suggests the potential of computer animation for helping teach vocabulary words.*
- **Writing.** Several top-level findings indicate that computer technology can be an effective element of writing instruction. In particular, word processing is likely to have a positive effect on students' writing, as described in the *Writing Next* report (Graham & Perin, 2007). More generally, Kim and Kamil (2007) found, "Although the effectiveness of computerized compared to traditional writing instruction is unclear, prior studies have found that computers can be one effective way to provide adolescents with writing assistance" (p. 363, citing Palumbo & Prater, 1992). As noted above, they also identified potential benefits for student motivation in using computers for writing instruction (p. 363).
 - *Writing Next identified use of word processors as a research-supported practice for effective writing instruction, with an effect size of 0.55 based on a meta-analysis of 18 studies.³ According to Writing Next, "The use of word-processing equipment can be particularly helpful for low-achieving writers," with an effect size of 0.70 for low-achieving writers compared to 0.51 for students in general (Graham & Perin, 2007, p. 17). Identifying advantages of word processing, the Writing Next authors stated, "Typing text on the computer with word-processing software produces a neat and legible script. It allows the writer to add, delete, and move text easily" (p. 17).*
 - *Based on their review of the research related to computerized writing instruction, Kim and Kamil (2004) identified "strategic instruction" as "likely to influence how successfully adolescents utilize multimedia environments for learning" (p. 358). This suggests a potential benefit in providing instruction on the computer that helps students master writing strategies.*
 - *According to Kim and Kamil (2004), "One research finding . . . suggested that students with lower writing ability might need longer interactions with computerized writing instruction to achieve notable benefits. The provision of multiple and consistent opportunities to write with computers is likely to help students with a range of writing abilities gain valuable experience and proficiency with the conventions of composing on the computer" (p. 363, citing Rosenbluth & Reed, 1992).*
- **Assessment systems.** Describing the importance of formative and summative assessment, *Reading Next* referenced the capability of computer systems to record and store information about student performance, which can then be used by teachers, administrators, students, and parents to monitor student progress and make revisions to instruction as needed. For example, describing the importance of formative assessment, the *Reading Next* authors stated, "Data should be cataloged [sic] on a computer system that would allow teachers, administrators, and evaluators to inspect students' progress individually and by class" (pp. 19–20). Similarly, discussing summative assessment, *Reading Next* stated, "[T]hese assessments are designed specifically for implementation with continuous progress-monitoring systems. These systems would allow teachers to track students throughout a school year and, ideally, over an entire academic career, from kindergarten through high school" (p. 21).

3 Cheever, 1987; Cirello, 1986; Dalton & Hannafin, 1987; Dybdahl, Shaw, & Blahous, 1997; Espinoza, 1992; Hagler, 1993; Head, 2000; Jackiewicz, 1995; Lam & Pennington, 1995; Lerew, 1997; Lichtenstein, 1996; Lowther, Ross, & Morrison, 2003; Lytle, 1987; Miller, 1984; Moore, 1987; Philhower, 1985; Shinn, 1986; Silver & Repa, 1993. Fourteen of the studies included students at grade 6 or older. Studies included students with a learning disability, students with mild handicapping conditions, students with English as a second language, low-achieving writers, above-average writers, and students representing a full range of writers found in typical classrooms. Effect sizes for individual studies ranged from -0.18 to 1.74. Three of the studies had negative effect sizes.

Technology as a Topic

- **Developing familiarity with technology.** As cited above, *Reading Next* described technology as “both a facilitator of literacy and a medium of literacy . . . both an instructional tool and an instructional topic” (Biancarosa & Snow, 2006, p. 19). From this perspective, an important objective of technology-based literacy programs such as *Jamestown Reading Navigator* can be to help students develop familiarity and ease of use with basic technology-related procedures.
- **Literacy skills for technology environments.** Writing further about technology as a topic of instruction, the *Reading Next* authors stated, “[T]echnology is changing the reading and writing demands of modern society. Reading and writing in the fast-paced, networked world require new skills unimaginable a decade ago.” (Biancarosa & Snow, 2006, p. 19). This statement reflects the importance that many writers on adolescent literacy have placed on helping students acquire the specific media-related literacy skills required in order to interact effectively with the Internet and other technology environments. For example:
 - “Adolescents’ interests in the Internet, hypermedia, and various interactive communication technologies . . . suggest the need to teach youth to read with a critical eye toward how writers, illustrators, and the like represent people and their ideas—in short, how individuals who create texts make those texts work. At the same time, it suggests teaching adolescents that all texts, including their textbooks, routinely promote or silence particular views” (Alvermann, 2001, p. 2).
 - “As technological innovations transform traditional boundaries of communication, entertainment, and learning, technology infuses the lives of adolescents. . . . The consequences of this changing technological landscape include an expanded definition of literacy and a wider range of skills and competencies necessary to be successful when engaged in literacy activities” (Kim & Kamil, 2004, p. 351).
- **Processing text and graphics.** Research analyzed by Kim and Kamil (2004) led them to conclude that “adolescents may need assistance to process various types of multimedia effectively” (pp. 353–354, citing Moore & Scevak, 1997; Small, Lovett, & Scher, 1993; Moore, 1993; Kirby, 1993; see also Kamil, 2003, pp. 22–23). They recommended, “In particular, adolescents can benefit from learning strategies for processing visual information, and learning how to integrate visual and textual information” (p. 362, citing Kirby, 1993; Moore & Scevak, 1997).

How Jamestown Reading Navigator Incorporates Technology

The following table describes how *Jamestown Reading Navigator* incorporates practices related to effective use of technology described above.

Summary of Technology Recommendations	Application Through <i>Jamestown Reading Navigator</i>
Pacing of instruction should be flexible, to match students’ ability and interests.	Because students work individually online, they advance through <i>Jamestown Reading Navigator</i> at their own pace. They are able to move more quickly through familiar skills and vocabulary and spend more time on material they find difficult. Teachers are informed (via the Learner Management System) of how much time it takes students to complete each activity in the program, allowing teachers to monitor each student’s progress and pacing.

Continued ➡

Summary of Technology Recommendations	Application Through <i>Jamestown Reading Navigator</i>
<p>Technology should provide instructional reinforcement and guided practice on key content and skills for struggling readers.</p>	<p><i>Jamestown Reading Navigator</i> reinforces student learning and provides guided practice with key content and skill areas for struggling readers. Students receive instruction, practice using their skills and knowledge, and receive feedback to help improve their performance.</p> <ul style="list-style-type: none"> • Students with low reading levels are taught decoding and phonics skills and then are guided to practice those skills as they read in context. • Students are provided with extensive, modeled oral fluency practice. • Students are instructed in how to use specific reading comprehension skills and strategies and then practice using those skills over time with a variety of texts. • Students learn key vocabulary and practice understanding and using it in context. • Students practice writing in a variety of genres, on a variety of topics, with guidance in how to carry out the writing process and write effective compositions. • Students practice reading and writing skills with a variety of content-area texts, reinforcing their ability to use these skills in content-area contexts.
<p>Technology should provide customized support to students, such as audio support for visual text.</p>	<p><i>Jamestown Reading Navigator</i> provides support that is customized to specific student needs in a variety of ways.</p> <ul style="list-style-type: none"> • Students are placed into the program at a level that corresponds to their current reading level, as measured through a placement test. • Students can test out of journeys (lessons) that teach content and skills they already know. • Students can access customized support as they complete the online activities, including use of the Tutor buttons to access suggestions and content reteaching, and access to an online dictionary. • Extensive audio support is provided for key instruction, reading tips, and directions. Teachers can choose to make audio support available for the online reading selection in each journey, allowing students to read along while listening to text. Audio recordings are also available for the <i>inClass Reader</i> selections. • Substantive feedback as students are completing the online activities helps them improve their performance. • Students who do not do well in the online assessments are retaught skills and content and then take another assessment online. If they still do not do well, they are targeted for additional instructional support from the teacher, using the <i>Reteaching Skills Support</i> activity suggestions and print materials that are provided with the program.

Continued ➔

Summary of Technology Recommendations	Application Through <i>Jamestown Reading Navigator</i>
<p>Technology should provide students with opportunities to interact with text.</p>	<p>In <i>Jamestown Reading Navigator</i>, students interact with the text selections in a variety of ways.</p> <ul style="list-style-type: none"> • Prior to the activity, students are taught a reading skill to use in conjunction with the reading selection and are pretaught key vocabulary from the selection. • Also prior to the activity, students complete an activity—typically including a graphic organizer, a background builder, or an anticipation guide—to activate prior knowledge about the topic of the selection. For example, students are often prompted to complete a KWL (Know/Want to know/Learned) chart or a word web. • Students use the computer to accept a suggested purpose for reading or write their own purpose. • As students are reading the text selection, reading tips remind them to use comprehension strategies. • Students are also prompted to answer comprehension monitoring questions as they are reading the selection. Immediate feedback reinforces correct answers. • Students can use the Add a Note feature to record thoughts while they are reading the selection, linked to specific points in the text. Students can access these notes at any time during reading, and also after reading while reviewing the selection before the Journey Test and during the writing assignment. • Vocabulary words in the text selection are hyperlinked to word cards. Students can access these word cards, read information about the definitions of words, and record notes on the word cards—for example, ways that the word is used in the selection. Students can also access an online dictionary to look up words that are not vocabulary words. • After the reading, students revisit their purpose for reading, decide whether they accomplished that purpose and then tell what they learned from reading the selection or are offered possible ideas about why they failed to accomplish their purpose. Students also revisit and update their work from the before-reading activity (e.g., updating the KWL chart). • Students complete a writing activity that typically requires them to incorporate content from the text selection or build on the selection in some way. Students are able to access the selection while completing the writing activity.

Continued ➡

Summary of Technology Recommendations	Application Through <i>Jamestown Reading Navigator</i>
<p>Computer programs should provide a structured environment for students' reading and writing instruction.</p>	<p><i>Jamestown Reading Navigator</i> provides a highly structured approach to reading and writing instruction.</p> <ul style="list-style-type: none"> • Students are placed at an appropriate starting point in the program and guided through a linear sequence of journeys, quests (units), and treks (levels). • Within each online journey, students are guided through a consistent, linear sequence of activities. • Students are provided with explicit directions on how to complete each online activity. • Strategic reading assistance is provided for every reading selection. As students read, they are prompted to answer comprehension monitoring questions. They are reminded to add notes related to the reading selection, reference the hyperlinked word cards, and employ reading skills applicable to the selection they are reading. • Students automatically receive help and reteaching if they do poorly on assessments of specific skills and vocabulary in the online journeys, without needing to ask for assistance. • Writing activities include detailed writing prompts, structured guidance with prewriting and drafts, and strategies for writing essays.
<p>Computer technology can be an effective tool for helping students learn decoding.</p>	<p>Computer technology is the basis of <i>Jamestown Reading Navigator's</i> approach to decoding instruction. Computerized features that are used to teach decoding include the following:</p> <ul style="list-style-type: none"> • An animated emcee and vowel characters lead the student through the journeys. This technology component increases motivation and interest, and also provides a visual and auditory experience that reinforces word meanings and pronunciations. • Students complete decoding activities by dragging, clicking, and typing words and word parts. <p>For more details, see the section on Decoding earlier in this paper.</p>
<p>Computer activities and games should be used to help students develop fluency, including multiple opportunities to practice recognition of specific words.</p>	<p>Computer technology is central to <i>Jamestown Reading Navigator's</i> approach to helping students develop fluency. Computerized features that are used to help students develop fluency include the following:</p> <ul style="list-style-type: none"> • Students hear an expert reader read an excerpt from the selection. The expert reader models good fluency by reading with expression, accuracy, and appropriate speed. The student can listen to the expert reader as many times as he or she likes. • Students practice reading the excerpt and record it up to three times, allowing students to listen to themselves and choose their best recording. • Word recognition activities provide students with multiple opportunities to identify the same words: <ul style="list-style-type: none"> – Trek 1 includes numerous computer activities that strengthen word recognition by having students match words to pictures, choose a word that best answers a question, and type/choose the correct word to fit into the line of the poem. – In Treks 2–4, students complete quick match and cloze activities to strengthen recognition of vocabulary words. <p>For more details, see the section on Fluency earlier in this paper.</p>

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Summary of Technology Recommendations	Application Through <i>Jamestown Reading Navigator</i>
<p>Computer technology should be used to help students learn vocabulary, including opportunities for practice and use of multimedia.</p>	<p><i>Jamestown Reading Navigator</i> provides extensive on-computer vocabulary instruction. Computerized features that are used to help students learn vocabulary in Trek 1 include the following:</p> <ul style="list-style-type: none"> • Within each journey, students are introduced to five new sight words and practice recognizing and using the sight words in an interactive exercise. For example, students may see a sentence on screen and be instructed to click on the sight word that is spoken or to insert the sight word into the appropriate sentence. Every introduction of vocabulary words in Trek 1 includes oral pronunciation of the words. • Students are introduced to 10 word family words, in two groups of five—typically related to two word families. • Three times in a journey, students listen to and read a poem, with animated illustrations, that contains sight words and word family words. • Students practice word family words in a variety of interactive formats, with immediate feedback to reinforce understanding. Students complete two activities for each word family and then complete activities combining words from both word families. <ul style="list-style-type: none"> – Students first gain familiarity with the words by typing an initial letter or letters based on the audio recording of the word. – Students then practice inserting the words into the appropriate sentences (either by clicking or typing). • Supplemental words and their meanings are introduced to help students transfer their word family knowledge. Students practice recognizing the supplemental words in an interactive format by matching the words to the appropriate picture. • Students complete scored review activities with immediate feedback covering both sight words and word family words. If students fail the assessments, teachers are alerted in the Learner Management System. Students’ reports indicate whether they require sight words intervention, word family intervention, or both. <p>Computerized features that are used to help students learn vocabulary in Treks 2–4 include the following:</p> <ul style="list-style-type: none"> • Within each journey, students are initially taught eight key vocabulary words before they encounter them in the reading selection. Each vocabulary word is pronounced orally, and students are taught the meaning of the word and given a sample sentence. • Students complete a quick match interactive activity that reinforces meanings of the words. • A My Notes section provides a place for students to add memory aids, associations, sample sentences, etc., to create a personalized “word card” for each word. Students’ word cards and notes are saved in their personal Vocabulary Journal for access elsewhere in the program. • Within the text selection, vocabulary words are hyperlinked to their associated word cards. Students can add or modify their notes on the word cards as they read the selection. • Students who do poorly on an assessment of vocabulary knowledge within a journey view a Look Back at the Vocabulary section that features flash animation to reteach the meaning of vocabulary words. If further reteaching is needed beyond that point, the program alerts teachers through the Learner Management System reports. <p>For more details, see the section on Vocabulary earlier in this paper.</p>

Summary of Technology Recommendations	Application Through <i>Jamestown Reading Navigator</i>
Writing instruction should include use of word processors.	Students writing in <i>Jamestown Reading Navigator</i> use a program with basic word-processing capabilities, including copying, pasting, and deleting.
Writing instruction on the computer should incorporate structured guidance, strategic instruction, and multiple interactions with technology.	<ul style="list-style-type: none"> • <i>The Jamestown Reading Navigator</i> writing component provides structured guidance and instruction in writing strategies with each writing assignment. For more details, see the Writing section earlier in this paper. • Frequent opportunities to interact with the technology are provided through the writing assignments in each journey, and in each quest in Treks 2–4. For example, if students require two 45-minute online sessions to complete each journey, then they are likely to complete a writing assignment during every other <i>Jamestown Reading Navigator</i> session.
Computer systems should be used to record formative and summative assessment information and make it available for monitoring student progress.	Ongoing assessments within <i>Jamestown Reading Navigator</i> provide information on student performance. This information is stored on the computer, and can be accessed by teachers, administrators, and others through an array of Learner Management System reports. For more information, see the Formative and Summative Assessment section earlier in this paper.
Instruction should help students become comfortable with basic technology procedures.	<p>As students work in <i>Jamestown Reading Navigator</i>, they acquire experience with a range of basic technology-related skills:</p> <ul style="list-style-type: none"> • Using a Web browser • Logging on to the <i>Jamestown Reading Navigator</i> Web site • Navigating and interacting with the <i>Jamestown Reading Navigator</i> home page and screens • Sending and receiving e-mail messages • Making voice recordings on the computer • Interacting with activity and program features (clicking buttons, scrolling, using volume and video controls, etc.) • Using a keyboard to enter text • Using a mouse to make selections on screen • Using a word processor to write online
Students should acquire media-related literacy skills required for technology environments.	<ul style="list-style-type: none"> • Within each of Treks 2–4, a journey (lesson) focuses on helping students learn to analyze media, which includes critically looking at information from books, newspapers, magazines, TV, radio, and the Internet. As part of this skill, students are taught to consider, question, and interpret information. They think about who provided the information for a text, what the purpose of the text is, and whether it can be trusted. • Students also complete a journey in each of these treks (2–4) that focuses on understanding an author’s purpose and another journey in each trek focusing on understanding an author’s viewpoint. • Additionally, Internet articles are used for text selections in many of the online journeys within <i>Jamestown Reading Navigator</i>—providing students with guided practice in applying reading skills and strategies to the types of texts they might encounter on the Internet.

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Summary of Technology Recommendations	Application Through <i>Jamestown Reading Navigator</i>
Students should be taught strategies to interpret visual information and integrate visual and text information.	<i>Jamestown Reading Navigator</i> includes lessons in Treks 2, 3, and 4 that teach students how to interpret information from graphics, particularly charts, graphs, and maps. Additionally, text selections with embedded graphics in some of the online journeys provide students with practice in integrating visual and text information.

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