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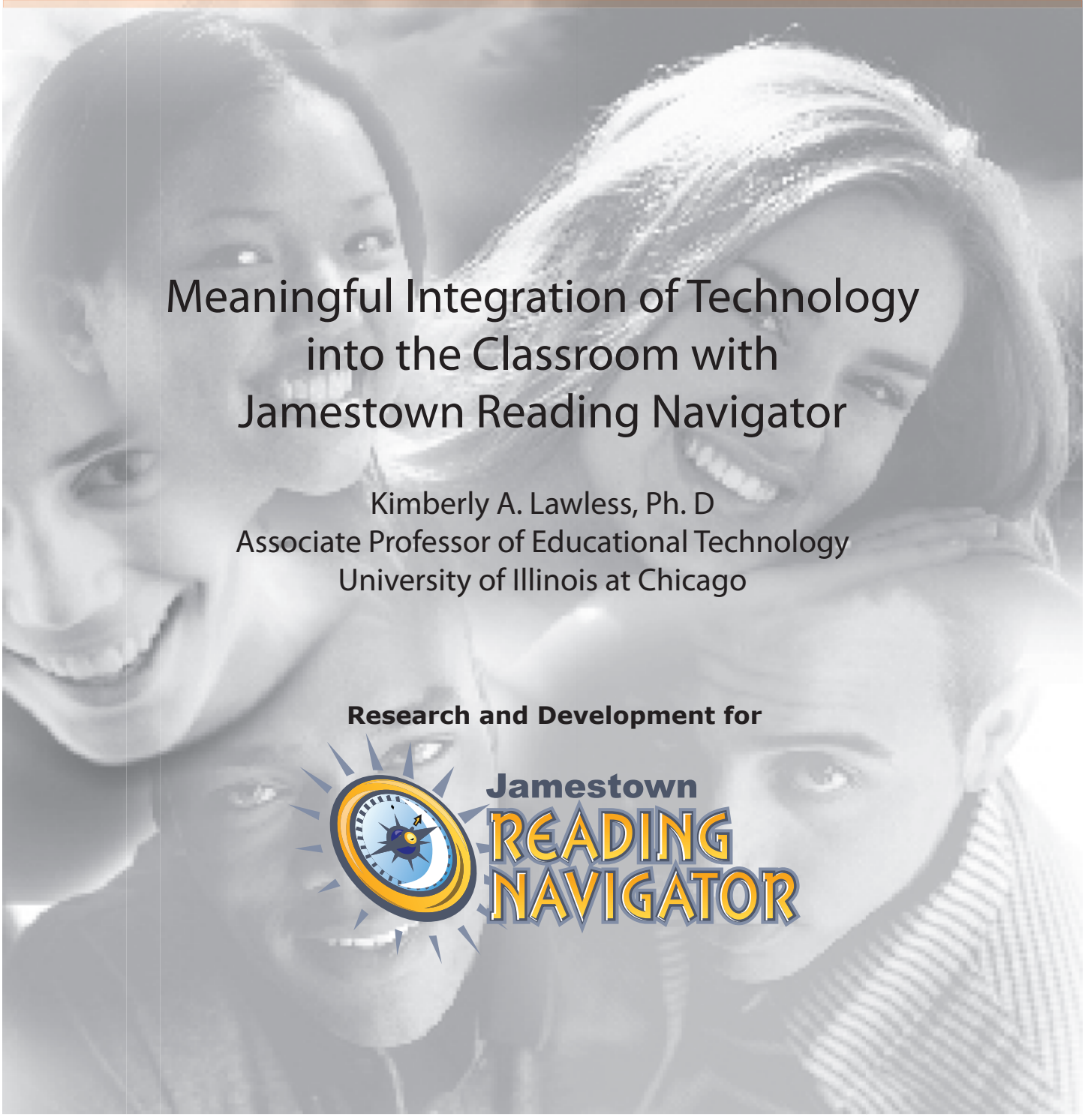

Meaningful Integration of Technology into the Classroom with Jamestown Reading Navigator

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Research and Development for

Jamestown READING NAVIGATOR

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by Kimberly A. Lawless

It is clear, based on several indicators, that technology has become an omnipresent feature of modern education. Consider first the presence of computers in the classroom. A recent survey of public schools indicates that from 1997 to 2002, schools more than doubled their computer infrastructure, yielding a student-to-computer ratio of 3.8 to 1. Further, the ratio of students to Internet-connected computers improved from nearly 20 students per computer to 5.6 students during this time (*Education Week*, 2003). There is also and upward trend in computer usage, particularly among children in the 9- to 17 age bracket, from about one third using computers in 1997 to about 87% in 2004 (Pew Internet & American Life Project, 2005; U.S. Department of Commerce, 2002). Survey research has also indicted that 94% of students between 12 and 17 who have computers in the home used the computer for homework. Nearly 71% of these students used digital resources as the primary source information on their most recent school reports or projects, while only 24% reported using standard library materials for the same task (Pew Internet & American Life Project, 2001). These statistics make it clear not only that computers are a prominent learning tool, but also that digital resources are rapidly overtaking their more traditional counterparts as the primary information sources in the K-12 setting.

As the use of computers in schools and classroom instruction has grown exponentially, the examination of how computers impact student learning has become a central educational focus. Findings show that when technology is meaningfully integrated into the curriculum, students

- delve more deeply into the content area
- are more motivated
- spend more engaged time on task
- move beyond knowledge and comprehension to application and analysis of information
- learn where to locate information in an information-rich world
- develop computer literacy by applying various computer skills as part of the learning process rather than in isolation (Dockstader, 1999)

The research above illustrates that technology can have a powerful effect on the quality of instruction and student outcomes. Disappointingly, it is frequently poorly integrated with other classroom activities (*Education Week,* 2003). Word processing and basic skills practice remain the most frequent uses of computers at all levels. Use of software applications that engage analytical thinking through simulations and multimedia production is relatively infrequent, particularly in high-need urban school districts (Becker 1999; Consortium for Research on Chicago Schools 2002).

The contrasts between traditional and innovative technology use underscore the observation that classroom teachers can use technology to support a variety of instructional models that differ in their goals and approaches to learning and teaching (Cognition and Technology Group at Vanderbilt, 1996). Some of the debates over the need for computers in classrooms and whether technology "works" hinge on differences in philosophies of schooling, theories of learning, and visions of the role(s) of technology. Initial uses of electronic technology some thirty years ago mirrored the then-dominant models of instruction: teacher-directed instruction in which students memorized facts and procedures (Suppes & Morningstar, 1968). As the limitations of this kind of learning became evident, many educators began exploring ways for technology to support models of instruction that emphasized learning with understanding and more active student involvement.

Teachers who integrate these approaches to technology-mediated curricula report that their classrooms are more student-centered, with increased student interest and active engagement. They are better able to meet their students' needs, have higher levels of demand, and expect more of their students. Furthermore, they report that computers impact students' inquiry-based analytical skills, problem solving, critical thinking, and comprehension (Hadley & Sheingold, 1993). In fact, students who engage with technology-mediated instruction in service of higher-order thinking skills performed better on the National Assessment of Educational Progress (NAEP) than did students whose teachers used technology for productivity needs or drill and practice (Valdez et. al., 1999; Wenglinsky, 1998).

So what does meaningful technology integration look like in the classroom? According to Eisenberg and Johnson (1996), there are two requirements: 1) the technology must directly relate to the content area, classroom assignments, and learning objectives; and 2) the use of technology must be stitched together in a logical and systematic model of instruction. In other words, meaningful technology integration involves the seamless and transparent utilization of technology—not the development of discrete and isolated technology skills—to generate specific academic outcomes. In such cases, successful technology-enhanced learning environments allow the curriculum to drive the technology usage, not the technology to drive the curriculum.

Jamestown Reading Navigator capitalizes on successful integration of technology in the classroom in two important ways. First, reading skills development is embedded within targeted content areas such as science or social studies, so students can practice reading in a context that promotes academic development. Second, the computer architecture that delivers *Jamestown Reading Navigator* journeys, or lessons, mirrors real-world uses of technology, enhancing learning efficiency. Specifically, by navigating through the materials and activity sequences, students develop vital new literacies required for twenty-first-century citizens, without taking time away from content goals.

Meaningful technology integration also exploits rather than constrains student exploration and individual preference. Providing opportunities for students to self-select resources and arrange content in personally meaningful ways produces higher levels of intrinsic motivation and results in higher levels of engagement (Becker & Dwyer, 1994). Each journey in *Jamestown Reading Navigator* offers students text and topic options as well as activity selections to individually tailor the learning environment to their specific needs. Moreover, technologies that allow students to interact with information from multiple modalities (text, images, audio) appeal to the learning styles of a wider variety of students, some of whom optimize information presented in a verbal context and others who learn better visually (Leu, 2002). *Jamestown Reading Navigator* incorporates text, graphics, animations, video, and audio to build background information, facilitate comprehension, and support skills development in an instructionally sound and stimulating interactive environment.

Finally, meaningful technology integration succeeds in providing learners with opportunities to revise, improve, and see progress in their thinking, as well as making their thinking visible (Bransford, Brown, & Cocking, 1999). The immediacy with which such feedback is provided is an especially salient feature of successful learning technologies. Rather than waiting until the end of a unit to do individual assessments, computer-based learning environments can poll student thinking and reasoning much more frequently and re-form content and instructional approaches on the fly, providing individually tailored remediation in areas deemed deficient. Increased and more frequent assessment not only facilitates cognitive gains but can also increase students' sense of academic self-efficacy, further contributing to successful and sustained learning interactions (Bandura, 1994). Through the use of student graphic organizers, anticipation guides, word webs, and teacher think-alouds, *Jamestown Reading Navigator* helps to capture students' thinking as a process rather than a product of learning. The computer-generated practice and testing features of *Jamestown Reading Navigator* deliver results immediately to students and automatically route students to remedial or more advanced instruction based on the results. More important, all student assessment data is stored in the *Jamestown Reading Navigator* computer-based Learner Management System so that teachers can monitor student progress, use that information to make evidence-based instructional decisions, and communicate online with individual students.

There is no doubt that technological literacies are now essential skills that learners in the twenty-first century must master. However, these skills cannot simply be added to a list of demands placed on overburdened teachers and students. Instead, instruction must focus on the meaningful integration of technologies as tools facilitating learning and assessment in a technology-rich society. While this paper does not provide an exhaustive list, it does attempt to highlight some of the more prominent aspects of fruitful technology implementations that meet curricular, teacher, and student needs. Following these guidelines is no guarantee for success, but hopefully this paper stimulates a deeper level of understanding of meaningful technology integration and how *Jamestown Reading Navigator* has been carefully crafted to successfully meet each of the features discussed.

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