



Research Basis for Merit Software

Methodology

Whether students are learning reading, writing or math, a step-by-step approach helps foster critical thinking. This approach breaks down tasks or challenges into manageable parts. In the process, students are shown things they can master; they should eventually see their mastery stretch from smaller steps to larger content. Today in the United States, classroom work focuses not just on learning facts and procedures, but on metacognition—gaining awareness of strategies and the ability to control them (Schoenfeld, 1999).

Educational software can assist students in learning to read and react strategically. The right goal for an instructional program is helping students to become confident working with basics; to make connections; to gain skills, understanding and insight; to express themselves clearly; to be able to compare and contrast both familiar and unfamiliar concepts; to ask questions when they need help.

For students using educational software, constructive feedback needs to be frequent. Positive re-enforcement should occur at the successful completion of each step. This idea, first promulgated by Skinner in 1954, underlies the basis for the current Constructivist perspective on learning. “Interactive assessment...provides the means to scaffold next steps” (Shephard, 2000). Dynamic assessment is a major component of constructive feedback.

Bloom's Taxonomy, first published in 1956 and still regarded as a standard way of conceptualizing critical thinking, outlines cognitive processes into categorical levels—knowledge, comprehension and application, analysis, synthesis and evaluation. Both key words and the kinds of questions encountered within the software are what help students make progress throughout each cognitive level. It is equally vital for software programs to provide context clues and to support students' attempts to organize their thoughts.

Educational software should also offer students a variety of approaches, since effective readers tend to vary strategies. There should likewise be a good deal of interactivity between student and computer. It is in this manner that the student can become involved in the learning process. Instructional programs need to offer first prompts, then guided practice. There should be points at which students are able to generate questions.

It is the theories of Skinner, Bloom and the more contemporary Constructivists that serve as the foundation for Merit Software. The methodology behind Merit programs is that students should encounter self-paced learning, encouragement to continue, understandable language and interesting content, opportunities to see things in different ways, clearly delineated steps for dealing with material, straightforward instructions and introductions to material. They should likewise encounter frequent chances to print and see progress. They should experience a diversity of exercises such as fill-ins, multiple choice, two-answer questions, matching lists and puzzles. Students should be presented with opportunities to reflect in writing upon what they are encountering and receive help while organizing ideas in writing.

Relevance of educational technology

Studies suggest that educational software can accelerate the learning process. A group of teachers and administrators surveyed by the New York City Literacy Initiative suggest that using computer technology to complement class work will benefit learners concentrating on areas where they need improvement. If utilized properly, technology can assist students in learning independently and at an individual pace. In addition, students who are at ease using technology tend to take more time doing classroom assignments as well as showing a willingness to try new challenges (Denny, 2000).

Other recent studies have emphasized biological elements to explain the adaptability of the mind and brain (Schwartz, 2002). Analytic and linguistic ability can be improved through new activity, focus, and practice. Software usage can dynamically alter learning patterns.

Educational software should have a multiple impact on students, including enhancing self-confidence, improving comprehension and retention, and increasing motivation. Therefore, it is vital to provide students with the right technological tools. The purpose of educational software is to help students both in and out of the classroom. Technology augments “opportunities to access, evaluate and communicate knowledge” (Denny).

Students should be learning more than basics; they should be learning to connect concepts, to solve unfamiliar problems, to communicate ideas. They should finish instructional programs feeling challenged in an appropriate way, receiving a lasting impression and being able to apply what they have learned. Educational software should not only help to foster excitement about learning and enable help students to complete

their own computer-related goals but provide part of a foundation for advanced schooling and for a future profession.

Instructional software and readability

Since the educational psychologist Edward L. Thorndike began researching English vocabulary lists in the 1920s, formulas for readability have followed the general premise that the more often a reader encounters a word, the easier it is for him or her to remember and understand it. Delineating reading levels and choosing vocabulary lists for educational software—just as for traditional classroom texts—requires careful balance. Software reading content must be difficult enough to challenge students with new words as well as with more complex sentences. Content, however, must remain simple enough for students to be able to complete a software level through reading, concentration and practice.

Educational software should involve an up-to-date approach to readability. First, formula-use should employ major approaches for calculating readability: estimating the number of unfamiliar words versus the number of syllables per word and sentence length. Then, a variety of additional factors should always be considered. Tone, content, organization and design all influence the extent to which students regard a particular text as simple or difficult.

One major purpose of educational technology is to help students practice the most crucial reading skills: figuring out vocabulary from context, while re-enforcing key vocabulary words within a beginning context that demonstrates meaning. These skills should be re-enforced by practice and by the constant interactivity which software

provides. Merit Software's own reading levels and vocabulary lists are based partly on the Dale List of 3,000 Easy Words, the Harris-Jacobson Core Vocabulary and the EDL Core Vocabulary, along with advice from educational practitioners about current classroom materials.

According to the National Assessment of Educational Progress (U.S. Department of Education, 1998), students at an advanced reading level ought to be able to demonstrate overall understanding, provide literal and inferential information, use background knowledge, draw conclusions, and judge text critically as well as offer answers showing careful thought. Yet learners can only progress to such a point after they have basic skills in place. Merit believes that a major goal of educational software is to address such questions, going beyond what the traditional classroom can do in helping students to bridge the gap.

Research conducted with Merit Software

In 2003 Merit Software commissioned consultants at the Marshall University Graduate College in South Charleston, West Virginia to conduct a control versus treatment group research study utilizing several of its reading and language arts programs in classrooms at the Calhoun County Middle/High School in West Virginia. The purpose was to evaluate the effects of Merit programs on students in grades 6 and 8. The results of the study showed that treatment group students increased achievement growth in several sub-tests of the West Virginia standardized test scores.

The results of the study showed that treatment group students scored better than the control group in several sub-tests of the Stanford Achievement Test, Ninth Edition

(SAT-9). With a suitable complement of controls in place, treatment group students increased their SAT-9 Reading Vocabulary score by 13.1% of the total sample mean and their Reading Comprehension score by 10.5%. Membership in the experimental group also yielded an average gain of 11.1% for the SAT-9 Language Expression sub-test and an average gain of 8.3% for Spelling.

Resources

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