The effect of technology on primary students' phonemic awareness achievement

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Abstract
The purpose for this project was to research current software programs focused on phonemic awareness and, through a process of evaluation of selected programs, determine a software program with phonemic awareness activities that would be suitable for teachers to integrate into K-2 reading instruction. Phonemic awareness is a strong indicator of future reading success (Stahl & Murray, 1994). Students that used technology that incorporates phonemic awareness activities have shown an increase in reading achievement. Three software programs were picked for evaluation using Sherman, Kleiman, and Peterson's (2004) criteria. Through an evaluation process this project concludes with recommendations for the inclusion of Leap Into Phonics as a purposeful program for integration into literacy instruction.
THE EFFECT OF TECHNOLOGY ON PRIMARY STUDENTS’ PHONEMIC AWARENESS ACHIEVEMENT

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Joy Marie Schirmer

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Abstract

The purpose for this project was to research current software programs focused on phonemic awareness and, through a process of evaluation of selected programs, determine a software program with phonemic awareness activities that would be suitable for teachers to integrate into K-2 reading instruction. Phonemic awareness is a strong indicator of future reading success (Stahl & Murray, 1994). Students that used technology that incorporates phonemic awareness activities have shown an increase in reading achievement (Bauserman, Cassady, Smith, & Stroud, 2005; Blanchard, McLain, & Bartshe, 2004; Brown, 2006; Howell, Erickson, Stanger, & Wheaton, 2000; Mitchell & Fox, 2001; Olson, 2007; Starkman, 2007; Tracey & Young, 2006; Underwood, 2000). Three software programs were picked for evaluation using Sherman, Kleiman, and Peterson’s (2004) criteria. Through an evaluation process this project concludes with recommendations for the inclusion of Leap Into Phonics as a purposeful program for integration into literacy instruction.
Introduction

Computers are here to stay (Maddux, 2003). According to Maddux, educators could not stop computers from coming into schools, even if they wanted. Schools have been trying to implement computers into classrooms over the past three decades. In 1981, 18% of schools had one or more computers (Sivin-Kachala & Bialo, 1994). In 1982, there were 5.5 million computers in use (Willis, 2003). Of those, 100,000 were used at school (Willis). This meant there was one computer for every 400 students (Willis). By 1987 the number of schools with more than one computer rose to 95% (Sivin-Kachala & Bialo). There were more than 4.4 million computers installed in US schools in 1993 (Sivin-Kachala & Bialo). In 1998 almost 9 million computers were being used in schools (Willis). By 2005, in US schools there was one computer for every four students (Hightower, 2009). Installation of computers continues to increase in US schools.

According to Johnson (2003), teachers have been dreaming up ways to incorporate computers into classrooms since the microprocessor was introduced. This invention of the microprocessor allowed the computer to come from a room-sized computer behind a glass wall to a portable computer on an individual desk (Johnson). Having a computer on a desk, it would make sense that technology would be integral in schools. With computers being small enough to fit on a desk, students and teachers have better access. Unfortunately daily use of computers has not become a reality (Maddux, 2003). Willis (2003) states technology is important for students, but not central in schools. Maddux reports teachers have not been given enough time during the day or professional development training to effectively and adequately integrate technology into the teaching
and learning experiences of the student’s learning. Instead of seeing microprocessors as instrumental to teaching and learning, most teachers use computers as a supplement, as a reward, or as an enrichment to student’s learning (Maddux).

However, technology-based experiences can be more than just supplemental to the literacy development of young readers. Maddux (2003) found using computers improves students’ attitudes towards learning. Technology can be used to motivate students and help them achieve. This technology can be in the form of an Integrated Learning System (ILS), Computer Assisted Instruction (CAI), hypermedia books, or the Internet. An ILS and a CAI provide students with activities at their skill level through drill and practice tutorials based on a curriculum (Underwood, 2000). The ILS and CAI manage and collect all the data for teachers to use in making instructional decisions. (Underwood). Hypermedia books are a combination of sounds, animation, and graphics with which students can interact on a computer after reading a story (Underwood). These books are highly motivating for students and can be used after the teacher reads the story to the class. The Internet is a worldwide network, which allows people to view “voice, data, graphics, and telecommunications” (Blanchard et al., 2004, p 6). The Internet is a useful tool for teachers to help reinforce a literacy area like phonemic awareness through games and websites in the classroom. All of these forms of technology can be useful in the classroom when teachers incorporate it into learning goals. However, most educational software used in classrooms today are drill and practice (Maddux). Drill and practice is when technology is the teacher and students are passive learners (Blanchard et al.). Using ILS, CAI, Hypermedia, and the Internet is constructivist, where students “construct’
their own learning” (Bauserman et al., p. 51). Drill and practice lacks students as the controllers of their learning.

Stahl and Murray (1994) found a strong correlation between phonemic awareness and later reading success. They defined reading success through the use of an informal reading inventory. Those students who lacked phonemic awareness skills in first grade were in the bottom quarter of their class four years later (Stahl & Murray). According to Stahl and Murray, phonological activities predict achievement with more accuracy than IQ, age, and socioeconomic status. Adams (1990) found a strong prediction of reading success between letter knowledge and phonological awareness. This was due to children needing to learn how letters and phonemes correspond in spoken words (Stahl & Murray). Not all researchers agree that phonemic awareness research supports the development of successful readers. Krashen (2002) disagrees with Stahl and Murray on the prediction of knowledge of phonemic awareness and reading success. In his meta-analysis of the studies from the National Reading Panel report (2000), he found few studies that measured phonemic awareness success on reading comprehension, which Krashen thinks is a better indication of reading success. Most studies tested phonemic awareness success using only phonemic awareness tests, isolated word lists, or spelling. Krashen located six published studies with a total of eleven comparisons. Of those six, only three used English-speaking students. Only one study was conducted in the United States. Krashen argues the meta-analysis he completed showed a low effect size between the comparison and control groups. Krashen states phonemic awareness is the “result of reading, not the cause” (p. 54).
Even with these disagreeing points of view on teaching phonemic awareness, most classrooms will continue to support instruction in phonemic awareness as a building block. The National Reading Panel (2000) research found phonemic awareness instruction is important in the development of reading. Research shows a correlation between computer use and success. Most researchers report positive results on students’ phonemic awareness achievement with the use of phonemic awareness technology as a supplement to classroom instruction (Bauserman et al., 2005; Howell et al., 2000; Mitchell & Fox, 2001; Tracey & Young, 2006; Underwood, 2000). Positive research on the impact of effectively using computer technology use in the classroom suggests that teachers can combine phonemic awareness instruction with supplemental technology software as another resource in the classroom.

**Rationale for Choosing Topic**

Phonemic awareness has become a focus in my school’s reading curriculum. Using games to teach phonemic awareness has been promoted. Combining technology with phonemic awareness instruction is an interest I have to help improve my students’ reading achievement. Researching phonemic awareness instruction and how to integrate that instruction with technology will help me in teaching my students. With this integration of reading instruction with technology I would like to increase students’ reading achievement data.

**Purpose of Project**

The focus of my project is to provide an overview and critique of three computer-based programs for instructing phonemic awareness in the classroom, with an ultimate goal of determining a program that is most effective for the classroom. I want to find
ways for teachers to effectively integrate technology for student success in reading. Also, I would like to know what computer programs teachers can use to help increase students’ phonemic awareness acquisition.

Importance of Topic

Technology availability in schools is increasing. However, teachers are not effectively implementing technology. Finding ways to incorporate technology in instruction to increase achievement will benefit students and teachers. This project will help provide insights for primary teachers for effectively implementing phonemic awareness software in their classroom.

Terminology

In this project there are terms that will be defined for clarity and understanding.

Phonemic awareness is understanding and manipulating sounds from the spoken language (National Reading Panel, 2000). Phonemic awareness is taught orally. Whereas, phonics is the relationship of written letters to the letter sounds (National Reading Panel). Understanding what you are reading is comprehension (National Reading Panel).

Computer assisted instruction (CAI) and Integrated Learning Systems (ILS) are programs that match a student’s skill level, provide drill and practice tutorials, work with a curriculum, and collect and manage data (Underwood, 2000). Hypermedia is highly motivating and has a combination of sounds, animation, and graphics that students interact with on a computer (Underwood).
Research Questions

This project is driven by the following research questions that helped shape the literature review and ultimately the project itself. What phonemic awareness computer program is best for teachers in my district to implement in their classroom? This primary question is further defined by the following secondary questions:

1. What specific phonemic awareness programs do students show the most achievement?

2. How do teachers integrate technology effectively in their classrooms?

3. What are effective strategies for teaching phonemic awareness using technology?
Review of the Literature

Technology is a valuable tool for teachers to use. Using technology to teach phonemic awareness is in early stages of development. One company developing technology for teachers is Wireless Generation or WG based in Brooklyn, New York (Starkman, 2007). WG creates hand-help devices that are used for one on one student assessment using the Dynamic Indicators of Basic Early Literacy Skills or DIBELS (Starkman; Olson, 2007; Brown, 2006). Starkman found reading improvements with instruction in phonemic awareness and the incorporation of technology at Brewster Elementary in Yakima, Washington and West Virginia Reading 1st schools. In Washington, HOSTS (Help One Student To Succeed) is used to assess and develop instruction for students struggling in reading (Starkman). The results show the growth these students make with the use of the HOSTS program. Of the participating students, 80% pass the state assessment (Starkman). In the West Virginia schools, WG is being implemented at 36 Reading 1st schools (Starkman). All 36 schools showed growth, with 33 of them meeting Adequate Yearly Progress (Starkman).

Research has been done on the effects technology has had on students’ progress in phonemic awareness. Current research supports using computer software to increase achievement (Bauserman et al., 2005; Blanchard et al., 2004; Brown, 2006; Howell et al., 2000; Mitchell & Fox, 2001; Olson, 2007; Starkman, 2007; Tracey & Young, 2006; Underwood, 2000). Researchers found WG using DIBELS, HOSTS, PLATO’s Beginning Reading for the Real World Level A, IntelliTools Reading, IntelliTools Reading, DaisyCastle, SuccessMaker, and CD-ROM talking books all increased student achievement in reading instruction.
Balanced Instruction

Phonemic awareness, phonics, fluency, vocabulary, and comprehension are the five components of a highly effective reading program according to the National Reading Panel (2000). Phonemic awareness may be the first skill beginning readers learn. Phonemic awareness consists of five levels from simple to difficult (Stahl & Murray, 1994). According to Stahl and Murray the five levels of phonemic awareness range from simple to difficult:

- Level 1 is remembering familiar rhymes.
- Level 2 involves recognizing and sorting rhymes and alliterations or beginning sounds
- Level 3 involves using syllables and phonemes to blend words together and isolating beginning sounds
- Level 4 is segmenting phonemes or being able to produce all the sounds heard in a word
- Level 5 involves adding, deleting, or moving phonemes to create new words or nonsense words

Phonemic awareness is one of the best indicators of reading success in later grades (Adams, 1990; Mitchell & Fox, 2001; Stahl & Murray). Reading success is defined as identifying isolated words and spelling. Phonemic awareness instruction in research shows better results in identifying isolated words and spelling with students in kindergarten and first grade (Mitchell & Fox).
Krashen (2002) disagrees with the findings of Stahl and Murray (1994) and Mitchell and Fox (2001). Krashen found few studies of "pure phonemic awareness" (p. 51). Krashen defines phonemic awareness as an "aural ability" or hearing ability (p. 51). Many times researchers use letters in phonemic awareness instruction, which is phonics and not "pure phonemic awareness" (p. 51). Reading success for Krashen was defined as comprehension, rather than isolated words or spelling.

Lack of Research

Most researchers agree there is not enough quality research about phonemic awareness using technology (Kamil & Lane, 1998; Matthew, 1997; Pearman & Lefever-Davis, 2006; Tracey & Young, 2006). Many times technology is not a focus for researchers because (a) researchers think other reading topics are more important, (b) computers cannot deliver quality reading instruction, and (c) the high cost for schools to implement programs (National Reading Panel, 2000). Teachers, principals, and school board members rarely have time to look for research to help implement quality technology (Maddux, 2003). More time and energy is spent on teaching, discipline, community relations, or budget concerns (Maddux). Teachers also lack quality professional development to effectively implement software (Bauserman et al., 2005).

Several researchers have investigated the number of technology articles available. They discovered technology is not in prominent journals teachers read (Tracey & Young, 2006). Kamil and Lane (1998) searched four major journals between 1991 and 1995. These journals included (a) Reading Research Quarterly, (b) Journal of Literacy Research, (c) Research in the Teaching of English, and (d) Written Communication. They found only 12 articles out of 437 or 2.7% of articles were about the relationship of
reading or writing and technology (Kamil & Lane). Only three of the 437 articles were about reading and technology (Kamil & Lane).

Another study completed in 2005 by Tracey and Young (2006) was based on Kamil and Lane’s (1998) study. Tracey and Young looked at the same major journals between the years of 1998-2002. Tracey and Young found literacy and technology in only 4.9% of the articles. This is an increase of 2.2% in seven years. There has been little increase in technology articles over the past ten years, even though access to software programs has increased.

The National Reading Panel (NRP) conducted research and found 21 articles related to instructional uses of technology (NRP, 2000; Sherman et al., 2004). All the articles reported positive results associated with technology use in the classroom (Sherman et al.). The NRP has challenged researchers to answer important questions regarding technology:

1. What is the proper role for integration of computers in reading instruction? In what contexts can they be used to either replace or supplement conventional instruction?

2. What are the conditions under which multimedia presentation is useful or desirable in reading text?

3. What are the requisite characteristics of software to teach reading?

4. What is the appropriate mix of reading and writing instruction delivered by computer?

5. How can professional development programs be structured to help teachers effectively integrate computer solutions with instruction?
6. How are the effects of computer usage in pedagogy most effectively measured? Do conventional assessments measure all the learning that takes place in computer environments?

7. What is the utility of hypertext in instructional contexts?


_Integrated Learning Systems/Computer Assisted Instruction_

Using technology with reading instruction has been around since the 1960’s (NRP, 2000). The University of Illinois and Stanford University both researched using technology to help teachers instruct reading (Blanchard et al., 2004). Both studies used big mainframe computers, which consisted of a central computer and terminals for sixteen students (Bauserman et al., 2005). These mainframe computers were room sized. The need for both the physical space and money for these mainframes is the reason they were unpopular for classrooms (Bauserman et al). Stanford was testing whether _Computer-Assisted Instruction_ (CAI) could replace teachers in the classroom (Bauserman et al.). Programmed Logic for Automatic Teaching Operation (PLATO) was being developed at the University of Illinois at the same time as Stanford’s study (Bauserman et al.). PLATO is a drill and practice CAI software program (Blanchard et al.). It is a powerful teaching tool for teachers in the instruction of reading and math because teachers control the content students can access. Both researchers discontinued the technology studies because of the high cost to schools and the dwindling government funding for the universities to continue the research (Bauserman et al.). Since then, there has been a limited study of CAI and student achievement.
An Integrated Learning System (ILS) is a technology and management tool teachers can use to help students with differing instructional abilities in phonemic awareness. The ILS is a modern replacement of the early CAI (Bauserman et al., 2005). Since the ILS runs on smaller microcomputers, this has allowed the ILS to be implemented in schools for less cost. The ILS has multiple activities based on a student’s academic needs; it monitors each student’s data based on how the student is performing, and allows teachers to view the student progress (Bauserman et al.). The ILS gives teachers more control over the technology by allowing them to adapt to students needs and manage the data to make reading decisions in the classroom (Bauserman et al.; Sherman et al., 2004). Data driven decisions are important for teachers to make all learners successful. The teachers can look at data to see where students need more support. In this capacity, an ILS can make a teacher’s job easier, but the ILS should not replace the teacher directed instruction (Bauserman et al., 2005; Howell et al., 2000; Mitchell & Fox, 2001; Tracey & Young, 2006). The ILS is a supplement to support a teacher and the district curriculum.

There are a few studies about ILS and the positive effect it has on increasing student’s phonemic awareness achievement. Students using the ILS programs SuccessMaker (Underwood, 2000), Waterford Early Reading program-Level 1 (Tracey & Young, 2006), Dairy Castle and Daisy Quest (Mitchell & Fox, 2001), PLATO’s Beginning Reading for the Real World-Level A (Bauserman et al., 2005), and Intellitools (Howell et al., 2000) all outperformed their comparison group.

SuccessMaker is an ILS program that includes an extensive curriculum for teachers to choose skills (Underwood, 2000). This program delivers instruction without teacher or student control (Underwood). Within the program there are different levels for the skills
presented (Underwood). The differentiating levels are important to allow students to move from easier to harder tasks depending on each student’s need. Activities in SuccessMaker include: vocabulary, cloze tests, sentence completion, and comprehension (Underwood). Students interact individually with the program. With the use of headsets, up to 30 students can use SuccessMaker at the same time. Underwood found 80% of the students enjoyed the SuccessMaker lessons and would rather work on the computer than in the classroom. She also discovered schools had better results when implementing the software correctly. This meant involving all students in SuccessMaker, including students who performed poorly in reading; these students typically had been excluded from computer programs and pulled out of the classroom to work in a remedial setting.

Waterford is an interactive computer program best suited for Kindergarten students (Tracey & Young, 2006). The main emphases are letter recognition, phonemic awareness, vocabulary, and comprehension (Tracey & Young). It is a large software package with 910 separate activities that include sorting and matching games, fill in the blanks, and songs. The program is individualized to each student according to previous work completed. Teachers can monitor each student with the program’s data management system, which supports teachers in planning for daily lessons. Tracey and Young found that research on children using the Waterford software with teacher delivered phonemic awareness instruction showed “strong, positive, statistically significant results” with early literacy skills (p. 23). All experimental groups in their study had higher gains on the post-tests than the control group (Tracey & Young).

DaisyQuest and Daisy Castle are interactive CAI programs with colorful pictures (Mitchell & Fox, 2001). Both programs are oral and contain no written text. Explicit
Instruction is provided for each skill and each skill is explained and modeled on the computer before students interact with the program (Mitchell & Fox). As the students practice they receive feedback. There are three levels for each skill introduced and students are rewarded with clues to find objects in each program (Mitchell & Fox). DaisyQuest focuses on rhyme identification and identification of beginning, middle, and ending sounds (Mitchell & Fox). Daisy Castle focuses on segmenting individual phonemes and blending (Mitchell & Fox). Mitchell and Fox studied data from these two programs in classrooms where literacy instruction was defined as a balanced approach. Data from both programs showed phonological awareness was enhanced by CAI when direct teacher instruction was also included (Mitchell & Fox).

PLATO includes practice and reinforcement of skills (Bauserman et al., 2005). The skills are presented in units with interactive games, activities, and stories and students receive immediate feedback from the program (Bauserman et al.). Skills include: phonological awareness activities that consist of rhyming, identifying beginning, middle, and ending sounds, and blending onsets and rimes (Bauserman et al.). In this program, print concepts are focused on through letter identification with computer display of directionality of written text (Bauserman et al.). PLATO also presents the skills of letter identification, vocabulary development, and comprehension strategies of main idea and sequencing (Bauserman et al.). Bauserman et al. found that the experiment group outperformed the control group on phonological awareness, print concepts, and listening comprehension. They found that the PLATO program instruction worked best when matched with the local district standards and benchmarks (Bauserman et al.).
Intellitools Reading is a program that uses the computer to present stories to students (Howell et al., 2000). Each story has predictable text and pictures (Howell et al.). In this program the main story is called an anchor story (Howell, et al.). Intellitools Reading also includes word study. These words come directly from the anchor story and work with onset and rime (Howell et al.). Each story has structured writing activities to complete, with little books to go with each anchor story. These anchor stories include practice in sight words and in decoding words (Howell et al.). The students in the experimental group scored at or above the control group on the posttest (Howell et al.). When Intellitools Reading was used within a balanced reading program, it was effective in improving phonemic awareness scores (Howell et al.).

Technology can help teachers make informed decisions regarding students’ needs in reading. Mitchell and Fox (2001) and Howell et al. (2000) find technology can help students who are at risk in reading, when programs are carefully selected to fit the curriculum. Bauserman et al. (2005) caution that activities within the software chosen should match the district’s standards and benchmarks. They suggest that students should be given multiple opportunities with the computer program to learn and practice new phonemic awareness concepts, such as rhyming, blending, or segmenting. This research suggests that technology is another way to help some students have more success in school in the early grades of Kindergarten and 1st grade.

Hypermedia/Multimedia

CD-ROM storybooks are the most popular form of Hypermedia teachers currently use. Storybooks or “talking books” (Underwood, 2000, p. 139) are popular stories on CD-ROM for students to read. These books are essentially paper books placed on
computers (Sherman et al. 2005). Students can read the story or use the mouse to click on activities embedded within the story (Sherman et al.). Storybooks offer students additional opportunities to practice reading connected text or stories (Pearman & Lefever-Davis, 2006). Hypermedia storybooks present stories as both auditory and visual (Sherman et al.). Students can hear the story and view pictures at the same time. Pearman and Lefever-Davis suggest that storybooks reach all students regardless of ability because they provide scaffolding in the form of feedback, highlighting text as it is read, or integrating sounds. These storybooks allow students to direct information on the computer screen by using a mouse and clicking words, characters, or objects within the story (Boone, Higgins, Notari, & Shea, 1996). For example, a reader can direct information on the screen by clicking on a word, allowing that text to be highlighted, spoken, or animated. This enables students to be engaged in their own investigations of the text being read. Such experiences can allow all students, with minimal computer instruction, to be successful with storybooks.

Teachers are cautioned not to use storybooks and technology just because they have them (Pearman & Lefever-Davis, 2006). Such technology is not a way to fill time or get students on computers. The activity should be meaningful to students, such as reading a story on the computer after hearing and discussing it in class (Pearman & Lefever-Davis). Pearman and Lefever-Davis suggest one way to make activities meaningful is through text that is highlighted. This makes reading new words easier and provides a link between letter and sound associations (Pearman & Lefever-Davis). Underwood (2000) and Pearman and Lefever-Davis also caution about having phonemic awareness and phonics activities in the middle of the story, as the story would be interrupted and the meaning
could become distorted. This happens when students are reading the story and click on actions that do not aid a student’s comprehension. They may never come back to the story, choosing to play games instead. The greatest concern with these distractions is that students may view reading as a game instead of meaning making (Pearman & Lefever-Davis). Pearman and Lefever-Davis prefer storybooks with phonemic awareness games before or after the story. This set-up gives students the instructional support in phonemic awareness while not disturbing comprehension.

Only one study was found on Hypermedia and its effects on phonemic awareness (Boone et al., 1996). The study reported positive results with the high and middle ability groups but negative results with the low ability group. High ability was defined as reading above grade level, middle ability as reading on grade level, and low ability as reading below grade level. In their study, Boone et al. created interactive Hypermedia lessons for each letter of the alphabet. The low ability group focused on the lessons as well as the high and middle ability groups. All students had the same interactions with the software to learn the letters of the alphabet (Boone et al.). The low group did not have as much success with phonemic awareness as the other groups (Boone et al.). Boone et al. concludes that the poor performance by low ability students may be due to less exposure to the skill, as students were only allowed access to each lesson once. High and middle ability students may also have had an advantage of prior letter knowledge greater than those students in the poor ability group.

Technology as a Supplement

Researchers argue that teachers should not replace phonemic awareness instruction solely with technology (Bauserman et al., 2005; Boone et al., 1996; Howell et al., 2000;
Mitchell & Fox, 2001; Pearman & Lefever-Davis, 2006; Sherman et al., 2004; Tracey & Young, 2006). Students still need direct instruction from teachers with technology providing the additional practice. In other words, technology should be a supplement to a school's current curriculum, designed as a function to support teachers, not to replace them (Bauserman et al.; Boone et al.; Howell et al.; Mitchell & Fox; Pearman & Lefever-Davis; Sherman et al.; Tracey & Young). Teacher delivered instruction is important for all students because teachers provide the perfect scaffold for students to learn and teachers know the needs and instructional levels of their students (Mitchell & Fox). Using a computer program at times to supplement that learning is appropriate. Finding software to support the local curriculum can enhance student performance through reinforcement of skills taught by a teacher, such as phonemic awareness. This software should be a support that is instructional, rather than just drill and practice (Boone et al.). Instructional programs engage students and allow them to internalize or retain concepts better.

Technology and Assessment

Many schools throughout the country use technology to assist teachers in assessing student’s phonemic awareness. One company, Wireless Generation (2009), has created software to allow teachers to easily assess phonemic awareness achievement. Teachers are also using HOSTS (a computer file used to store information on where to find a node on a computer network), blogs (a type of website, usually maintained by an individual with regular entries), and podcasts (a series of digital media files, usually audio or video, made available for download via a specific web location).

Wireless Generation has created Mobile Classroom Assessment or mClass (Brown, 2006; Olson, 2007; Starkman, 2007). This tool helps teachers assess students using
Dynamic Indicators of Basic Early Literacy Skills or DIBELS (Center on Teaching and Learning, 2009). New Mexico, West Virginia, Colorado, and Maryland are a few states using this technology with their students (Brown; Olson; Starkman). According to Olson, there are 100,000 teachers in 49 states using this technology. One-third of those schools are Reading First schools (Starkman). Reading First schools receive state and federal funds to focus on improving achievement scores in reading.

Students in New Mexico take the DIBELS test using a hand-held computer (Olson, 2007). This allows teachers to administer the test and receive results faster (Starkman, 2007). The results of these tests are uploaded to Wireless Generation’s website (Olson). From the website teachers and administrators can view data for a class, school, or district to see performance (Olson). “It [technology] helps them [teachers] work smarter, not harder.” (Brown, 2006, ¶ 2).

Brown (2006), Olson (2007), and Starkman (2007) believe that mClass technology allows teachers to make better decisions based on data from assessments. The teachers can analyze the data faster because the computer computes and reports the results sooner than before. In New Mexico the data is used to make instructional decisions regarding reading instruction (Olson). Teachers can instantly view results and make immediate decisions regarding student progress or struggles (Brown; Olson; Starkman). Using this data, teachers can plan or adjust their lesson plans according to the assessment results to meet the needs of all students in their class.

Teachers also feel more empowered with the new technology (Olson, 2007). Before his technology, teachers felt the purpose of reporting data was only for state use. Now teachers see using the data for “their own purpose.” (Olson, 2007, p. 26). This purpose is
to plan lessons for all students using immediate data results instead of months old data. Wireless Generation claims this new technology gives teachers back 4-5 days of instruction (Olson). The gained instructional time allows teachers the opportunity to meet more students’ instructional needs in reading.

Allowing teachers to manage data in a meaningful way benefits students the most because parents are also part of the data communication. With the new technology, parents can view their child’s data online (Brown, 2006). These websites also instruct parents in ways to help their child at home (Brown). Increasing the communication between parents and teachers helps students achieve more by giving parents access to assessment results sooner and by providing ideas to support students who are struggling.
Methodology

The purpose of this chapter is to explain the methodology I used to locate and select software programs for my project. I searched the articles from my literature review for definitions and criteria used in selecting software for classroom use. This chapter is organized into three parts: the literature review, criteria for software selection, and selection of software.

Literature Review

For my literature review, I searched ERIC EBSCO and Education Full Text (Wilson). I used the key words phonemic awareness, technology, assessment, ILS, Hypermedia, and combinations for these. I chose articles based on the information found in them. I kept articles that were about phonemic awareness, software programs that researched the effects of phonemic awareness, assessment that used technology, and history of technology.

Criteria for Selecting Software

I used criteria from the articles in my literature review to help me in the selection of programs to include in my project. First I had to decide whether I would use an ILS or Hypermedia software program. I chose to use an ILS system. An ILS program has three main components (Underwood, 2000). These include the content on the software in the form of tutorials and assessment modules from many subject areas and levels (Underwood). The second component is the computer records the students’ performance (Underwood). Finally, ILS programs have a management system for teachers to view
Selecting Software

I used Sherman et al.'s (2005) six points to help me select three ILS programs. First all three had to fit into my districts current reading curriculum. The software needs to address the major goal of my district, which is to increase student comprehension on district-wide assessments. According to Stahl and Murray (1994) success in phonemic
awareness leads to later success in reading. Using Stahl and Murray’s research and my
district’s comprehension goal, the software packages I choose must include phonemic
awareness components. All the software must be appropriate for Kindergarten or 1st
grade students. Based on these components I choose the following programs (1)
Waterford Early Reading Program, (2) Leap Into Phonics, and (3) Working Phonics. All
three of these programs include a strong phonemic awareness component, address the
district’s goal of improving comprehension, and all three would fit well into my district’s
current reading curriculum for K-1.
The Project

This project involved presenting four informational sessions on three computer-based phonemic awareness programs with K-2 staff in my district. Using the selected three software programs as described in methodology, the staff was provided with a demonstration and discussion on each program. Finally, the three programs were reviewed based on the six points for selection of computer software (Sherman et al., 2005) and a recommendation was provided. The following is the design for this project, followed by an Epilogue that provides information on the outcome of the implementation of this project in my district.

Waterford Early Reading Program

To start my presentation, I will introduce myself, explain the reason for being there and state the reason I chose technology as my topic, and provide an overview of the session (slides 1-3).

The beginning of the first session contains three slides (slides 1-4) about reading instruction (see Appendix A). The fourth slide provides information about the five areas needed for balanced instruction: phonemic awareness, phonics, fluency, vocabulary, and comprehension (National Reading Panel, 2000). The fifth and sixth slides provide information on phonemic awareness as an important part of balanced instruction. Slide 6 provides examples of the different levels of phonemic awareness activities (remembering rhymes, recognizing and sorting, blending, segmenting, and adding deleting or moving phonemes).
Next, I will present research that supports the use of technology to increase reading achievement (slide 7). I will connect this slide to our district goal of increasing comprehension through improved test scores and our building emphasis on using phonemic awareness instruction in the younger grades (slide 8).

My presentation will continue in slide 9 with the introduction of three types of programs designed to increase reading achievement (integrated learning systems [ILS], computer assisted instruction [CAI], and Hypermedia). The connection between CAI and ILS will be explained, along with the purposes for and examples of ILS (slides 10-12). Hypermedia is then highlighted providing both descriptions of Hypermedia along with benefits in using Hypermedia in instruction (slides 13-14). In this part of the presentation I also will discuss the importance of using technology as a supplement (slide 15), not a replacement. Also included will be the criteria used to select the three software programs (slide 16).

Before presenting the three program, I will provide an explanation for how the three programs were chosen (slide 17). The process will be described, including a verbal overview of Sherman et al.’s (2004) suggestions for narrowing choice, and I will review the need for phonemic awareness in early literacy development and the need to correlate programs with district needs. I will then introduce the three programs identified for consideration: Waterford Early Reading Program, Leap Into Phonics, and Working Phonics (slide 18).

After this brief introduction, we will focus on the first program Waterford Early Reading Program and look at a demonstration of the program. This will take approximately one hour. The demonstration begins by showing staff how students access
the program (slide 19). Then games and activities are shown. Also, assessments for some levels are demonstrated. After viewing the games, activities, and assessments, staff are given time to discuss how this program utilizes our curriculum (slide 20).

The demonstration continues with an explanation of the reports stored by the program (slide 21). Teachers will look at individual and class reports. Teachers will be asked to discuss the benefits and disadvantages of the reports as they relate to their own classrooms and their teaching needs.

To end this session, I showed the teachers the Waterford website where they can access more information (slide 22). The cost to implement this program was shared (slide 23-24). Before filling out their discussion tool, teachers will be asked to discuss the positive and negative qualities of the program (slide 25). Then each teacher will be asked to fill out a discussion tool (Appendix B). The form asks participants to write about something they squares with their beliefs, to write about any question or questions they may have about the program, and to highlight three points about the program that they found important. The discussion tool is designed to facilitate a discussion on beliefs, questions, and main points to remember during the session, and to be used during the fourth session to discuss all three programs presented.

*Leap Into Phonics*

To start the second session, I will begin with the slides from the first session describing an ILS program and Sherman et al.'s (2005) six points for selecting software (slides 2-5; see Appendix C). This review is designed to refresh teachers’ memories on the previous session and set the stage for the current session.
In slide 6 of this session I will review the three computer program choices. Then we will begin the Leap Into Phonics demonstration (slide 7). The demonstration will take approximately 45 minutes. To start, I will demonstrate the phonemic awareness assessments given to help place students at the correct level (slide 8). I will discuss with them that the program recommends this test is administered to all Kindergarteners. Next I will show the teachers the reports that can be generated for individual students and classrooms. Within this section, I will discuss the instructional connection. This piece generates individualized activities based on student test scores. I will share with them the activities, which are located in the teacher’s guide included with the program.

Then we will move into the games and activities within the program (slide 9). I will explain the game board where students decide the activities to play. Teachers will be shown how to create an account for students and set the levels of play. After explaining this, teachers will be given 20 minutes to create an account and explore the program individually. Each teacher will have access to his or her own computer.

After the 20 minutes of exploring the program, teachers will be asked to discuss how this program fits into our district’s curriculum (slide 10). Teachers will be given time to discuss the benefits and disadvantages to the reports. I will present the cost of the program (slides 11-12) and the website for more information. Then each teacher will fill out a discussion tool (Appendix B). The discussion tool is used to facilitate a discussion on beliefs, questions, and main points to remember from this session, and to be brought to the fourth session when all three programs are reviewed.

*Working Phonics*
For the third session, I will start with a review of the characteristics of an ILS program and Sherman et al.’s (2004) six points for software selection (slides 2-5; see Appendix D). This will give teachers a chance to refocus on the expectations for selecting ILS software.

I then will introduce the website for Working Phonics (slide 6). Teachers will be given time to read through the information on the website. Then they will have 20 minutes to view the online demo for the program (slide 7). The company representative for Working Phonics will be present to answer any questions the teachers may have.

At the end of the demonstration, teachers will be asked to discuss how this program fits with the district reading curriculum (slide 8). They also will discuss the benefits and disadvantages of the reports generated by the program. I will share with teachers the cost to implement the program (slides 9-10). Then each teacher will fill out a discussion tool (see slide 11; see Appendix B). The discussion tool is used to facilitate a discussion on beliefs, questions, and main points to remember from this third session to be shared during the fourth session and compared with the other two programs.

**Summary of Programs**

To start the last session, I will review the district and building level goals to help remind teachers why we were picking a program to implement (slide 2; see Appendix E). I also will review for the teachers the characteristics of an ILS program (slides 3-4) and Sherman et al.’s (2005) six points (slide 5). This slide is designed to help the teachers focus on the six points as we discuss and select one program.
To start the discussion, each teacher will be asked to review the three discussion tools (Appendix B) filled out at the conclusion of the previous three sessions (slide 6). They will be asked to get into small groups to share beliefs, questions, and points they thought were important to remember. This discussion should generate thoughts and questions to help them compare the three programs.

Teachers will be assigned to participate in two small groups to discuss and fill out a table (see Appendix F) to compare the three programs (slide 7). They will be given 20 minutes for each discussion group. The table that the teachers will complete is based on the six criteria from Sherman et al (2005). Discussion points include the advantages and disadvantages of each program, how each program fits the district’s curriculum, students’ independent use, professional development needs, and the cost. After filling out the table, teachers will be asked to discuss within small groups the best choice for the district. Then we will come together as a whole group to share our findings and make a decision on a program for implementation in the following school year.

Epilogue

From my own analysis of these three programs, the Leap Into Phonics program appears to be most effective based on the fact that it met all the criteria and was most cost effective for the district (see Appendix F). It is my hope to be able to share these programs and the process of program selection with K-2 teachers in my district. Through this process we will be able to better understand the efficacy of programs available and be able to make thoughtful decisions about the inclusion of technology in our classrooms.
Conclusions

The purpose of this project was to identify computer programs where increased student achievement was demonstrated, to effectively integrate technology into classrooms, and to learn effective strategies for implementing phonemic awareness instruction through the use of technology. This section is organized with subheadings for future school outcomes and for each research question, with discussion regarding each question. Limitations of this project as well as recommendations for teaching practice are also discussed.

Future School Outcomes

Technology use in schools continues to increase. Teachers can incorporate technology into their instruction to increase student achievement (Bauserman, Cassady, Smith, & Stroud, 2005; Blanchard, McLain, & Bartshe, 2004; Brown, 2006; Howell, Erickson, Stanger, & Wheaton, 2000; Mitchell & Fox, 2001; Olson, 2007; Starkman, 2007; Tracey & Young, 2006; Underwood, 2000). There are software programs available that are easier to implement than others. My district is currently in the process of integrating more technology into the curriculum. I was unable to complete my presentation because technology was not a focus during staff development this year. I am hoping within the next year I can present my research project to the district to help teachers find a software program to supplement our curriculum. Technology professional development will be a focus in the next few years. With my research, I hope to help teachers in my district to make good decisions about supplemental instructional materials in an efficient and timely manner. I believe my research project will be very useful for
teachers in my district as it is important for teachers to have awareness of technology, and especially of how to choose technology that will best serve the needs of their students.

*What Specific Programs Do Students Show the Most Achievement?*

Students showed the most achievement when using ILS programs, rather than Hypermedia programs. ILS programs provide activities for students based on individual needs, monitors student progress, and allow teachers to view student progress (Bauserman et al., 2005). Students showed achievement with SuccessMaker (Underwood, 2000), Waterford Early Reading program-Level 1 (Tracey & Young, 2006), Dairy Castle and Daisy Quest (Mitchell & Fox, 2001), PLATO’s Beginning Reading for the Real World-Level A (Bauserman et al.), and Intellitools (Howell et al., 2000).

*How do teachers integrate technology effectively in their classrooms?*

Sherman et al. (2004) discussed six key points for implementing technology effectively into a classroom. Teachers must complement the existing curriculum, select programs to meet district goals, decide cost, hardware, and professional development needs for each program, narrow the choices with all stakeholders, and decide on a program using recent research (Sherman et al.). Boone et al. (1996) stressed the importance of students being able to independently use the computer, so teachers are not wasting instructional time logging students onto the computer.

*What are effective strategies for teaching phonemic awareness using technology?*

Teachers are still the most important resource for teaching phonemic awareness. Technology should be used as a supplement, not replacement of teachers (Bauserman et al., 2005; Boone et al., 1996; Howell et al., 2000; Mitchell & Fox, 2001; Pearman &
Lefever-Davis, 2006; Sherman et al., 2004; Tracey & Young, 2006). Teachers know the ability of the students better than a computer. It is appropriate to support phonemic awareness instruction with the use of technology. Teachers are cautioned not to use technology exclusively.

Limitations

This study was limited to the review of journal articles about technology. There are many other forms of literature available such as textbooks, trade books, and dissertations that were not researched.

Recommendations

Based on my findings, I would recommend teachers use technology in their classroom as a supplement to instruction. There are many programs available to support different areas of instruction. The best one I found for my district is Leap Into Phonics. Teachers should be vigilant in picking software based on Sherman et al.’s (2004) six points. These six points can help teachers find the right match for their classroom.

I would also recommend teachers continue to research on this subject. There are new technologies available everyday. Within my research, I found new ways to assess students using technology. Teachers need to stay current of the research to support the instruction in their classrooms.
References


Olson, L. (2007). Instant read on reading, In palms of their hands. Education Week, 26(35), 24-34.


Introduction

♦ The purpose of these sessions are to learn more about software and to choose one program to implement in K-2 classrooms.

♦ I chose technology because there is so much out there to use, but little guidance from the district.
Session One Overview

♦ Review balanced literacy and Phonemic Awareness
♦ Look at research and technology
  ■ ILS and CAI
  ■ Hypermedia
♦ Criteria for selecting software
♦ Waterford Early Reading demo

Balanced Instruction

♦ Five Components
  ■ Phonemic Awareness
  ■ Phonics
  ■ Fluency
  ■ Vocabulary
  ■ Comprehension

(National Reading Panel, 2000)
Phonemic Awareness

- Phonemic Awareness is the first skill beginning readers learn.
- Phonemic Awareness is one of the best indicators of later reading success. (Adams, 1990; Mitchell & Fox, 2001; Stahl & Murray)

Levels of Phonemic Awareness

- According to Stahl & Murray (1994) there are five levels of phonemic awareness:
  - Remembering familiar rhymes
  - Recognizing and sorting familiar rhymes and alliterations or beginning sounds
  - Blending
  - Segmenting
  - Adding, deleting or moving phonemes to create new words.
Research

Current research supports using computer software to increase reading achievement.

(Bauserman et al., 2005; Blanchard et al., 2004; Brown, 2006; Howell et al., 2000; Mitchell & Fox, 2001; Olson, 2007; Starkman, 2007; Tracey & Young, 2006; Underwood, 2000)

District Goal

One goal for our district was to improve reading scores.

A K-2 goal is to use balanced literacy instruction to improve reading-phonemic awareness is one component.

(National Reading Panel, 2000)
Types of Programs

- Integrated Learning Systems (ILS)
- Computer Assisted Instruction (CAI)
- Hypermedia

ILS and CAI

- An Integrated Learning System (ILS) is a technology and management tool teachers can use to help students with differing instructional abilities in phonemic awareness.
- The ILS is a modern replacement of the early CAI. (Bauseman et al., 2005)
ILS and CAI cont.

♦ Multiple activities based on student's needs
♦ Monitors student data
♦ Allows teachers to view progress

(Bauserman et al., 2005)

Examples of ILS

♦ HOSTS (Help One Student To Succeed)
♦ PLATO's Beginning Reading for the Real World Level A
♦ IntelliTools Reading
♦ DaisyQuest and Daisy Castle
♦ SuccessMaker
Hypermedia

- CD-ROM stories are the most popular form of hypermedia.
- Essentially paper books placed on computers.
- Students read a story and interact with the story using a mouse.
- Auditory and visual presentation

(Sherman et al., 2004)

Benefits of Hypermedia

- Reach all students regardless of ability
  - Scaffolding with feedback
  - Highlighting text
  - Integrating sounds

(Pearman & Lefever-Davis, 2006)
Technology as a supplement

Technology should be a supplement to the schools current curriculum to support teachers, not replace them. (Bauserman et al., 2005; Boone et al., 1996; Howell et al., 2000; Mitchell & Fox, 2001; Pearman & Lefever-Davis, 2006; Sherman et al., 2004; Tracey & Young, 2006)

Criteria for Software Selection

Sherman et al. (2004) presented six points to use when selecting software.
- complement the current curriculum.
- district’s goals and needs are addressed
- identify software
- bring decision makers together
- decide on software
- use current research to back up decision
Picking Three Programs

I used Sherman et al.'s (2004) first three points to narrow the choices.

All three programs complement STC's current reading curriculum.

All three programs include Phonemic Awareness instruction.
- Phonemic Awareness is a need for students.
- This need correlates to the district goal of increasing comprehension.

Identifying the Three Programs

- Waterford Early Reading Program from Waterford Institute
- Leap Into Phonics from Leap Into Learning
- Working Phonics from Curriculum Associates
Waterford Early Reading Program

According to the website, Waterford Early Reading program “is a comprehensive, research-based curriculum that teaches children how to read, write, and keyboard.”

www.waterford.org/corporate_pages/Program_ERP.jsp

Waterford Demonstration

Demonstration from the Waterford Company.
- Student access
- Games and activities
- Assessments

How does the Waterford Early Reading Program match our curriculum?
Slide 21

Waterford Demo con’t

- Share out discussions on curriculum.
- Reports demonstration
  - Individual reports
  - Class reports
- Please discuss within your group the advantages and disadvantages of the reports.

Slide 22

Waterford Website

- For more information, please visit the Waterford Website at:
  
  http://www.waterfordearlylearning.org/index.html
  
  - Username and password are connected
Waterford Cost Includes

- 15 Software programs
- Staff development (12 maximum)
  - 1 on-site
  - 1 connected day
- Installation
- Support
- 6 Classroom kits

Total Cost

To implement the Waterford Early Reading Program the total cost would be $51,037
Discussion on Waterford

◆ Within your small group, please discuss the software using our curriculum and district goals.
◆ What did you like about the program?
◆ What areas need improvement?
◆ Fill out the discussion tool before you leave.
Something that SQUARES with my beliefs:

A question that keeps going AROUND my mind:

Three POINTS to remember:
Session Two Overview

- Review ILS and criteria for selecting software
- Leap Into Phonics demo
- Discussion of Leap Into Phonics
- Fill out discussion tool
ILS and CAI

- An *Integrated Learning System* (ILS) is a technology and management tool teachers can use to help students with differing instructional abilities in phonemic awareness.
- The ILS is a modern replacement of the early CAI. (Bauserman et al., 2005)

ILS and CAI cont.

- Multiple activities based on student’s needs
- Monitors student data
- Allows teachers to view progress

(Bauserman et al., 2005)
Criteria for Software Selection

- Sherman et al. (2004) presented six points to use when selecting software.
  - complement the current curriculum.
  - district's goals and needs are addressed
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  - bring decision makers together
  - decide on software
  - use current research to back up decision

The Three Programs

- Waterford Early Reading Program from Waterford Institute
- Leap Into Phonics from Leap Into Learning
- Working Phonics from Curriculum Associates
Leap Into Phonics

- Leap Into Phonics "develops strong phonemic awareness skills in prereaders."

www.leapintolearning.com/index.html

Leap Into Phonics Demo

- Assessment to place students
  - Recommended giving to all Kindergarten students
- Reports
  - Individual
  - Class
- Instructional connection using assessment data as guide
Games and Activities

♦ Game board for activities
♦ Create a student log
♦ Set the levels of play within the game
♦ Interact with the software
  ■ You will be given 20 minutes.
  ■ Games and activities are set up on a game board, click the game you want to play.
♦ Discussion after 20 minutes.

Discussion of Leap Into Phonics

♦ What are the advantages and disadvantages of the program?
♦ Discuss the reports and assessments that come with the program. Are they measuring and reporting what our district needs?
♦ How does the program fit with our curriculum and district goals?
Leap Into Phonics cost includes

- 15 software programs
- 15 teacher's guides
- Customer service provided online, but no formal training

Total cost of Leap Into Phonics

- The total cost to implement Leap Into Phonics into 15 classrooms is $1011.75

Discussion Tool

- Please fill out the discussion tool before you leave.
- This will be used at our fourth session to facilitate discussion.
Appendix D

PowerPoint Presentation on Phonemic Awareness and Technology

Session Three

Slide 1

Technology and Phonemic Awareness
by Joy Schirmer
Session 3
Working Phonics

Slide 2

Session Three Overview

- Review ILS and criteria for selecting software
- Working Phonics demo
- Discussion of Working Phonics
- Fill out discussion tool
ILS and CAI

- An *Integrated Learning System* (ILS) is a technology and management tool teachers can use to help students with differing instructional abilities in phonemic awareness.
- The ILS is a modern replacement of the early CAI. (Bauserman et al., 2005)

ILS and CAI cont.

- Multiple activities based on student’s needs
- Monitors student data
- Allows teachers to view progress

(Bauserman et al., 2005)
Criteria for Software Selection

- Sherman et al. (2004) presented six points to use when selecting software.
  - complement the current curriculum.
  - district's goals and needs are addressed
  - identify software
  - bring decision makers together
  - decide on software
  - use current research to back up decision

Working Phonics

- "Enjoyable activities build phonemic awareness as students see, hear, say, and use the words, paving the way for reading success!"

Working Phonics Demo

- Please go to:

- Review the features on the website
- Click on Online Demo
- Explore the demo for 20 minutes

Working Phonics Discussion

- What are the advantages and disadvantages of the program?
- Discuss the assessments. Do they measure what the district wants?
- How does Working phonics fit with our curriculum and district goals?
Working Phonics cost includes

- 15 CD-ROM programs
- Teacher guides

Working Phonics Cost

The cost to implement Working Phonics into 15 classrooms is $524.25.
Discussion Tool

♦ Please complete your discussion tool.
♦ We will use it to facilitate discussion during our last session.
District Goal

- One goal for our district was to improve reading scores.

- A K-2 goal is to use balanced literacy instruction to improve reading-phonemic awareness is one component.
  (National Reading Panel, 2000)
**ILS and CAI**

- **An Integrated Learning System (ILS)** is a technology and management tool teachers can use to help students with differing instructional abilities in phonemic awareness.
- The ILS is a modern replacement of the early CAI. (Bauserman et al., 2005)

**ILS and CAI cont.**

- Multiple activities based on student’s needs
- Monitors student data
- Allows teachers to view progress
  (Bauserman et al., 2005)
Criteria for Software Selection

Sherman et al. (2004) presented six points to use when selecting software.

- complement the current curriculum.
- district's goals and needs are addressed
- identify software
- bring decision makers together
- decide on software
- use current research to back up decision

Discussion Tool

In your group, take 20 minutes to discuss your reflections from the three discussion tools.

- Beliefs
- Questions
- Points to remember
Discussion of Software

- Please take the table with you to your small groups.
- You will be assigned to 2 small group discussion groups.
- You will be given 20 minutes with each group to discuss and fill in the table.

Discussion Topics

- Please discuss the following with both groups:
  - Which programs support the curriculum?
  - Can students use computers independently?
  - Are the games and activities more than drill and practice?
  - What professional development do we need to implement the program? What is provided by each company?
  - Is the cost reasonable?
  - What is your software recommendation?
### Software Choice

What software choice do you recommend the district implement?

<table>
<thead>
<tr>
<th></th>
<th>Waterford</th>
<th>Leap Into Phonics</th>
<th>Working Phonics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complements STC's curriculum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phonemic awareness target skill</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student's use computer independent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program more than drill and practice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional development provided</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STC has appropriate hardware</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, but only to run on the laptops (OS 8.6-9.2)</td>
</tr>
<tr>
<td>Cost is reasonable</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

See Appendix F
My Recommendation

I recommend our district implements the Leap Into Phonics software.
This decision was based on:
- District and building goals
- Independent use of the software by students
- Interactive games and activities
- Cost of the program
- Discussion from teachers

Leap Into Phonics Implementation

Leap Into Phonics will be implemented into the Literacy Block in the fall.
## Table to compare software

<table>
<thead>
<tr>
<th></th>
<th>Waterford Early Reading Program</th>
<th>Leap Into Phonics</th>
<th>Working Phonics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complement’s STC’s current reading curriculum. (Sherman et al. 2004)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Phonemic Awareness is a target skill in the program.</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Students can use the computer independently. (Boone et al., 1996)</td>
<td>Yes</td>
<td>Yes</td>
<td>No information available</td>
</tr>
<tr>
<td>The program is more than drill and practice. (Boone et al., 1996)</td>
<td>Yes, lessons interactive, there are teacher resources to use within classroom as well.</td>
<td>Yes, lessons are interactive.</td>
<td>Yes, lessons are interactive</td>
</tr>
<tr>
<td>Types of professional development needed to implement program. (Sherman et al., 2004)</td>
<td>Once purchased, the company provides training on how best to implement this program into our district.</td>
<td>Customer service provided. There is no formal training from the company.</td>
<td>Customer service provided. There are professional development topics offered, but none for this program.</td>
</tr>
<tr>
<td>STC has the appropriate hardware to run the program. (Sherman et al., 2004)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, but only to run on the laptops (OS 8.6-9.2)</td>
</tr>
<tr>
<td>Cost to implement the program. (Sherman et al., 2004)</td>
<td>$51,037.00-see pricing sheet in appendix</td>
<td>$1011.75-includes 15 classrooms and 15 teacher guides</td>
<td>$524.25-includes 15 classrooms</td>
</tr>
</tbody>
</table>