ASSISTIVE TECHNOLOGY IN A FAILING SCHOOL: INNOVATIVE STRATEGIES FOR IMPLEMENTATION

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ABSTRACT

Educators in today's classroom face increasing challenges which include the changing complexities of student needs, the intricacies of the No Child Left Behind Act (NCLB), the demands of high stakes standardized state assessments and the continuous and often widely publicized issues associated with budget constraints. With all of these challenges, introducing trends in assistive technology to already overwhelmed and frustrated educators is a monumental task even if students, teachers and schools may ultimately benefit from such implementation. However, assistive technology may be the key ingredient needed to enhance the educational opportunities of all students. Discovering ways to approach teachers and spark their enthusiasm to use assistive technology to enhance educational opportunities for all students is a daunting yet necessary task. Consultants who navigate these unchartered territories require creativity and perseverance. They often begin their journey by initiating conversations and dialogue with directors of technology recognizing this as fundamental to successful implementation. However, after consulting with various schools and working with influential school personnel, this is only the first step in the equation. It is essential to develop unique and innovative strategies to connect with teacher flexibility, patience, open mindedness, positive attitudes, and high expectations.

Keywords: Assistive Technology, Special Education, Individuals with Disabilities Education Act (IDEA), No Child Left Behind (NCLB), Document Vocalization Software.

INTRODUCTION

Current Trends

Schools in today's digital age are filled with students who every day retrieve archived information with a mouse click or stream video footage of events occurring around the world right into their classroom computers (Hasselbring & Bausch, 2006). In these same schools, Hasslebring and Bausch report that millions of students cannot benefit as fully as possible from their education programs because of learning difficulties and digital technologies may be a lifeline to this latter group. Students with learning difficulties have often been categorized as the catch all group yet the instructional and curricular needs of this population are as varied as the term itself. However, the Individuals with Disabilities Education Act (IDEA) and the No Child Left Behind Act (NCLB) have been working in synchrony to institute change for this population of students that is affecting both regular and special education professions alike.

As more of these students are being educated in inclusive classrooms, where they are expected to participate in the grade-level curriculum but not always given specialized support, teachers are searching for effective ways to educate this particular population of students more efficiently. Unfortunately, many teachers are simply unaware of and lack training with the potential assistive technologies that are available to help empower students who often struggle to work independently with their grade level curriculum. Furthermore, assistive technologies are generally considered to be a financial burden for schools and are therefore not often very common in general education classrooms unless teachers are assertive and vocally address student needs with administration. When teachers become aware of assistive technologies and students begin to utilize appropriate assistive technologies, we are likely to see enhanced educational outcomes for this population of students.

Defining Assistive Technology

The phrase assistive technology (AT) is widely used in the field of education. Federal law defines assistive technology devices as any item, piece of equipment, or product system … used to increase, maintain, or improve functionally capabilities of individuals with disabilities (Individuals with Disabilities Education Act, 1990).

For years, assistive technology has often been used to provide curriculum access to students with low incidence disabilities - computer screen readers are used for students with visual disabilities, positioning devices are used for students with physical disabilities and auditory systems for students with hearing disabilities. Although these technologies have certainly improved access for this particular population of students, research suggests that there may be endless possibilities for the larger group of students receiving services because of high incidence disabilities- specifically learning disabilities (defined by the National Joint Committee on Learning Disabilities as a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written which may manifest itself in an imperfect ability to listen, think, speak, read, write spell or do mathematical functions).

Because this population of students is now generally included in the regular education classroom, regular education teachers who have often reported that they know little about available assistive technologies or how such tools may be used will no longer be able to rely on special education teachers for information about assistive technology (National Assistive Technology Research Institute, 2005). In fact, this research indicates that it is now essential for all classroom teachers to not only become familiar with available assistive technologies but to learn how to effectively use them in the classroom as well.

Assistive Technology and No Child Left Behind Act (NCLB)

Though accountability measures have been in place since the inception of education in America, educators have never before been under such scrutiny or systematic evaluation of teaching practices as they are now (McHenry, Griffith & McHenry, 2004). McHenry, Griffith & McHenry continue on to say that there is also an increased reliance on technology, the Internet and mass media that has yielded an ever-increasingly fast-paced American culture.

The "No Child Left Behind Act" of 2001 a far-reaching overhaul of federal education policy signed into law by President Bush in January 2002 has imposed an increase in the testing requirements that has set schools scrambling to find more efficient ways to assess academic skills and get students ready for high-stakes state exams (Education Week, 2003). As quoted in Education Week, computer-based assessments often provide immediate feedback and are thus unlike traditional standardized tests on paper which can take weeks or even months to score and return to schools. Additionally, while some studies suggested that students who had less experience with computers would score lower on computer-administered tests, recent studies find no evidence of such a disadvantage (Bennett, 2002; Higgins, Russell & Hoffman, 2005). Furthermore, some studies asked students who took computerized tests whether they would prefer to take future tests on computer or on paper. In all such studies for this review, the majority of students indicated their preference to test on computer (Bridgeman, Lennon & Jackenthal, 2001; Higgins, Russell & Hoffman, 2005; Glassnapp, Poggio, Poggio & Yang, 2005; Ito & Sykes, 2004; Johnson & Green, 2004; O'Malley et al, 2005; Richardson et al., 2002; Sim & Horton, 2004).

Thinking ahead, these new testing requirements are a true benefit for students with learning difficulties who often lose valuable instructional opportunities waiting for the results from the traditional paper and pencil assessments to determine if curricular changes are necessary. In fact, as Olson (2001) points out, computerized testing allows students to take tests in which one question at a time is asked; thus, lessening the possibility of filling out an answer sheet incorrectly. As a result, standards and outcomes are directly linked to assessment measures and this is likely to provide clearer descriptions of well students are meeting their goals. Thus, if students with learning difficulties could receive this immediate feedback, it is

likely that curricular and instructional practices would be quick to change. This in turn would potentially allow for a decrease in the amount of instructional time lost otherwise.

Putting it all Together

The required changes in the law as well as the need to enhance the educational outcomes for students with learning disabilities have quickly pushed schools to search for assistive technology that would not only support all students in the general education curriculum, but would provide them with the necessary data to enhance their overall school performance rates as well. As a result, many schools are often in a variety of discussions with software companies willing to market their products for a utilization evaluation. Specifically, school administrators are looking to determine if teachers would actually utilize such technology if given training and proper support and what supports are necessary for continued utilization. To assist with this process, a consultant was willing to initiate conversations with various companies. It was thought that the consultant would be a neutral observer who could establish an open dialogue with the companies without feeling obligated and pressured for a commitment.

After careful review and discussions with several software companies, there was one company that was willing to provide their product free of charge for purposes of this utilization evaluation. Specifically, the selected software company publishes a range of cross curriculum productivity tools that support the concepts of Universal Design for Learning (UDL) to help users of all age and levels of ability improve their reading and writing skills.

The Product

For purposes of this utilization evaluation document vocalization software was selected. The program itself had a variety of features that may enhance the educational outcomes and opportunities for all students. Specifically, one of the first features that supported the concepts of UDL for inclusive settings was the toolbar because it unobtrusively anchors at the top of the computer providing all users with a convenient way to select different tools and not be obstructed throughout the working session. Additional features which supported UDL for inclusive settings include:

- Read Aloud (Text-To-Speech)
- Web Pages Read Aloud
- Scanning Paper Documents to be Read Aloud
- Dictionaries that can Speak
- Word Translation
- Daisy Reader
- Speech Maker
- PDFAloud- allows users to listen to any PDF file on any computer network or the Internet
- Pronunciation Tutor
- Write Out Loud- as text is typed, the computer will speak aloud the text
- Spell Checker with a Phonetic Map
- Color Coding of Confusable Words - lists possible alternatives with audible definitions and sample sentences
- Word Prediction
- Speech Input- converts the spoken word into text
- Speaking Calculator
- Fact Finder and Fact folder- highlights words and searches the web for more information

As observed with the list presented above, the features provided by this software are extensive, varied and quite comprehensive in nature. Many of the features directly impact key areas of difficulty for this population of students. Thus, it was thought that the needs of students with learning disabilities may very well be met with such a diverse and integrated program.

However, teacher training and student utilization are certainly vital and without them, it is likely that a program such as this would not be adequately used within the daily classroom settings, thus maintaining the theory of assistive technology being a financial burden with few visible gains. Therefore, it was determined that a software utilization evaluation be conducted to study whether programs such as this would in fact be utilized in a school

setting and what supports were needed to assist teachers with the process of continued daily utilization.

Purpose of the Software Utilization Evaluation

The purposes of this particular document vocalization software utilization evaluation were primarily to determine if teachers would take advantage of a free Continuing Education Unit (CEU) training session to rate the training and learn how to implement a new piece of assistive technology, determine if the teachers would actually utilize the assistive technology once they had returned to their respective schools and establish what supports were needed for teachers to continue utilizing the program daily.

The more widespread purpose, as proposed by the state consultant, was to assist districts with the challenges of the mandated NCLB standardized testing requirements which are often quite difficult for students with learning disabilities. Specifically, if teachers within the district utilized the assistive technology, it could potentially offer a solution for current paper based high stakes assessments and future online assessments by providing a "read aloud" function for students whose IEP/504 plan call for "read aloud" support during high stakes assessment. Additionally, it could not only increase the number of students who would independently take the high stakes assessments and reduce the number of students who may need an alternate assessment but could also provide a "read aloud" tool for assessment that may be used for curriculum based activities throughout the year.

Software Evaluation Participants

After intensive discussions with the district information technology directors from various districts throughout the state to assure them that integrity of their overall technology systems district-wide would not be compromised, one district was selected and letters to all district principals were distributed requesting volunteers willing to participate in the utilization evaluation. There were over 50 inquiries. However, for ease of distribution and management purposes, a total of 20 teachers were selected to participate.

The school selected was considered a high priority urban school and it was determined that this school had a large population of students identified with a learning disability. The teachers were selected based on their grade level taught, interest in implementing and providing feedback on a new and innovative program and their technology literacy skills. They included regular education, special education, bilingual and information technology specialists, represented a range of grade levels (elementary through high school), were committed to using the software and providing feedback after a three month period of time, and were at least moderately computer literate (based on their own self-assessment).

All participants attended a full-day training session conducted in the computer lab in the school. They also participated in an hour long webinar session for follow-up clarification issues. The training sessions were provided by educational trainers from the company.

The software was installed in the school computer laboratory prior to training and was installed separately by district personnel in conjunction with company technology support specialists. The software was also installed on the classroom computers of all participants following the training sessions.

Training Evaluation Results

All 20 teachers who were selected to participate in the utilization evaluation attended the training sessions and were asked to evaluate the training based on a variety of indicators. All teachers rated the overall satisfaction with the training as most useful (5) on a scale of 1-5. Similarly, all teachers rated the training format based on usefulness of the content delivered, presenter's style, usefulness of the handouts, and presenter's responsiveness to questions and concerns as most satisfied (5) on a scale of 1-5. Some of the participants (4) indicated that they needed additional information about the software components prior to introducing it to students during classroom instruction. All other participants reported that they had an understanding of the component features of the software and had adequate opportunities for practice during the training sessions. All participants did indicate however, the need for additional individualized

practice on their own prior to introducing the program to students during classroom instruction. They continued on to suggest that their administrators needed to provide them with ample time during the contracted work day (without students) so that they could feel completely at ease with the program.

This finding was of particular interest to consultants who often work with school districts to establish plans for implementing curriculum changes. School districts often deplete their financial resources on new and innovative curriculums and training sessions. However, they are often quite discouraged when they learn that many teachers often return to their classrooms and never implement anything. The results from this training session suggest that teachers need to feel as if they are a part of the change process rather than feel as if they are just receiving additional mandates. When they are reassured that they will be provided with the supports and assistance that they need, through a documented plan, they are more likely to continue utilizing something that is new to them (even if it requires more work). If a documented plan for support and assistance is not evident, they are less likely to continue to use something new and more likely to put it aside often to collect dust on a shelf.

Software Program Utilization Results

After completing the training session conducted by the company, participants were asked to return to their respective classrooms and use the assistive technology software with their students during daily instruction once the software was installed on their classroom computers. Additionally, they were asked to use the software in a variety of settings (small group, individual and whole group) and with a variety of students (regular education, special education, ELL and at-risk). Finally, they were also asked to use the software with a variety of different subject areas and activities.

At the end of the school year, teachers were asked to complete a survey (attached) evaluating the program. 16 of the 20 (80%) of the participants completed the survey. Teachers who responded to the survey indicated that the software was primarily used for textbook and web-activities in the areas of reading and mathematics. Additionally, based on this three month trial, most teachers (14/16 teachers who responded) indicated that this program may very likely meet the diverse educational needs of students in current classrooms. The general consensus from the participants was that the program was easy to use, had audience appeal and was suitable for the students who utilized the program during the three month period of time. However, the following teacher highlights and recommendations were also noted:

- Students need time to learn the software (students were not independent users during the three month utilization trial).
- Students at the lower grades had difficulty using the software even with teacher support.
- Reading level is satisfactory for multiple ability levels at the upper elementary level (grade 3) and above.
- The examples and illustrations provided by the software are appropriate for a variety of student ability levels at the upper elementary level (grade 3) and above.
- Students maintain attention to the software program at the upper elementary level (grade 3) and above.
- The help options are easy to use and understand for grades 3 and above.
- It was difficult to implement on a daily basis without technology support readily available during the lesson.
- The program is easy to use with individual students, small groups, and whole group instruction.

Utilization Evaluation Outcomes

After conducting this software utilization evaluation, and compiling the information from the evaluations, there were several practical implications that appear to be critical to the success of such assistive technology utilization.

First, it was clear that teachers will take advantage of the chance to participate in a free workshop and training session to receive a program that may benefit their students in the classroom. The 100% participation rate

indicated that teachers certainly value this opportunity and are clearly invested in the idea of increased educational opportunities for their students. The notion that teachers are more accountable when they have invested financially was clearly dispelled by the results. School administrators should clearly take note and continue to work to develop partnerships with private companies who wish to market their educational products in schools.

Second, it was also clear that this assistive technology software program may very well enhance the educational opportunities for all students. The teachers clearly indicated that students will likely benefit from such a program. However, teachers were very forthright in saying that they did not want to have a trial and error session with their students - they wanted to make sure that they were sufficiently versed in the program components prior to introducing the program with students. Thus, because this type of program requires substantial practice for ease of use, it is recommended that training sessions are at least one full day with scheduled webinar or similar follow-up sessions. Without sufficient training from the initial onset and introduction to the software, it is likely that the program will not be used as designed and student access may be significantly reduced. The teachers also recommended that they needed to have additional time during the day (free from their students) to be able to practice with the program and develop confidence with the features before utilization would continue. Administrators should carefully review this implication prior to purchasing assistive technology software for their teachers.

Third, teachers certainly indicated that this particular software program would likely benefit students who were in upper elementary grade specifically grades 3 or higher. This finding is significant when we think about standardized testing requirements and specific grade levels for software introduction and usage. Currently, most states have testing requirements for all grades but emphasize Federal NCLB requirements which begin in the upper elementary grades. More specifically, if the trend is to move towards computer-base assessments, schools should carefully develop a plan for software training because it would not be advantageous for any student to use assistive technology on such high stakes assessments if it is not developmentally appropriate or if adequate training has not occurred. Because this particular program is likely to be more successful with upper elementary school students, schools need to think about when to introduce the software to teachers and students and have adequate time to train them before they use it for such mandated requirements that could change their educational curriculum.

Along this same line of thinking, schools also need to carefully select the teachers who participate in training sessions because teachers need to feel as if the program is of some value to them. If this type of assistive technology is more appropriate for upper elementary students, it would not be advantageous for administrators to use the traditional school-wide professional development training model. Additionally, although this model seems to be cost effective and efficient, it is not recommended based on the amount of individualized practice that is need for assistive technology training. Similarly, administrators and consultants should also be aware that the trainer of trainer model (often used due to financial constraints) would not likely adequately prepare teachers for their own classroom utilization. Thus, along with teaching curricular content, schools will now need to find time to teach skills related to adequate software program utilization. In thinking ahead, this recommendation alone may likely cause schools to cringe because they are already feeling the time and financial crunch burden.

Fourth, although technical support from this particular company was prompt and thorough, it may not be possible for any one company to support the volume and/or level of support that may be needed if any school district and/or state adopts such a policy of computer-based high stakes assessments. The technical and programmatic questions and issues related to this type of software are ongoing and without additional support and follow-through from the district or state level, it is likely that utilization will be extremely limited and the goal of increasing educational outcomes for all students through

the use of assistive technology may not be achieved.

Recommendation and Conclusion

Therefore, it is recommended that any district and/or state designate a support team that is exclusive to this type of software program implementation. Along these same lines, it may also be beneficial for districts or states to conduct a random survey to determine the scope of technology capabilities, personnel responding to technology issues and teacher and student security access capabilities.

The results from this brief assistive technology software utilization evaluation were clear. All participants were willing to continue utilizing the program after the trial ended but clearly stated that supports needed to continue. The use of assistive technology has become significant for all students (but especially for students with learning disabilities) in outcomes based education. By following these guidelines and avoiding the pitfalls mentioned, all educators will be proactive in creating an educational setting that will allow all students to maximize their true potential.

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Appendix

Follow-up Questionnaire

Please complete the following questions based on your students' experiences with the software program, using the following 5 point scale:

5-Excellent, 4-good, 3-satisfactory, 2-fair, 1-poor

Ease of Use

1. Students can navigate through the program with minimal teacher intervention

5__4__3__2__1__

2. Screen directions are consistent and easy for students to follow

5__4__3__2__1__

3. Help options are comprehensive and are easy for students to use

5__4__3__2__1__

4. The program is flexible enough to be used by a range of students with disabilities

5__4__3__2__1__

5. The program meets the educational needs of students

5__4__3__2__1__

6. Students can control pace and sequence of their work

5__4__3__2__1__

7. Students can exit from any screen and return to their work

5__4__3__2__1__

8. Computer presentation works more effectively/efficiently for my students than other methods of instruction

5__4__3__2__1__

Audience Appeal & Suitability

1. The program matches the students' interest level

5__4__3__2__1__

2. Reading level is appropriate for students

5__4__3__2__1__

3. Examples and illustrations are suitable for students

5__4__3__2__1__

4. Required time is compatible with student attention

5__4__3__2__1__

5. Audio is effective

5__4__3__2__1__

6. Video display is pleasing and functional

5__4__3__2__1__

7. Students used the program to access grade level texts and content

5__4__3__2__1__

* Circle Y for "YES" and N for "NO" for every category that applies.

Frequency of Use			Use With		
Daily	Y	N	Small Group	Y	N
Weekly	Y	N	Individual Students	Y	N
Other_____			WithTeacher	Y	N
			Without Teacher	Y	N
			Primary Students	Y	N
			Secondary Students	Y	N
Delivery Methods			Other_____		
Lesson/tutorial	Y	N			
Drill	Y	N			

Review Y N

Testing Y N

Other_____

How long did it take most students to be able to independently use the software? _____

Which subject areas were used with the program?_____

Did students use the software with: (check all that apply)

Textbooks ____

Tests ____

Web- activities ____

Library materials ____

Worksheets ____

Other ____

Would you recommend this program to other schools/districts? Y N

Explain_____

_____

_____

_____

_____

_____

Additional Comments:

Name:_____

Position_____

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