Implementing Technology: A Change Process

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ABSTRACT

The state of Kentucky has embarked upon a large scale systems change effort to integrate Universal Design for Learning (UDL) principles, including use of digital curriculum and computerized reading supports to improve overall student achievement. A major component of this initiative is the use of Read & Write Gold. As higher expectations are placed on student outcomes, Read & Write Gold offers a host of instructional advantages leading to improved performance for Kentucky's K-12 students.

INTRODUCTION

The state of Kentucky has embarked upon a large scale systems change effort to integrate Universal Design for Learning (UDL) principles, including use of digital curriculum and computerized reading supports to improve overall student achievement. A major component of this initiative is the use of Read & Write Gold. Read & Write Gold (RWG) is the one reading and writing tool for struggling students. Parents and teachers of elementary, middle and secondary school students alike use this program to help students succeed in the classroom. With Read & Write Gold, students and educators can mark main ideas, extract outlines, create voice notes and add annotations. Convenient reference tools have been integrated such as dictionary, synonyms, syllables, audible spell checking, along with word prediction, to facilitate both reading and writing improvement and assistance.

Read & Write Gold also features text to speech and scanning capabilities. Printed Documents and text can be scanned in or opened from anywhere on the computer or online then saved and opened in proprietary format to utilize the powerful reading, writing, and learning tools.

The text to speech will read each word, sentence, paragraph or selected text. There is a choice of different voices which can be adjusted to suit each student by altering the pitch, speed, and volume.

DESCRIPTION OF THE PROBLEM

The Kentucky Commissioner of Education in a Memo to all Superintendents said the following.

> I have been informed that we have a very useful piece of technology available in over 95% of our schools that is being underused to benefit our students.
>
> Read & Write GOLD (RWG), developed by Text Help Systems, is software which supports reading and writing needs, bringing comprehensive literacy support through a unique set of tools for the user. RWG allows users to work in a truly inclusive environment using standard applications, such as Microsoft Word, Outlook and Excel and Acrobat Reader, to see text and hear text being read aloud along with tools to assist with the writing process.
>
> While RWG has been installed in many Kentucky districts for several years, it appears that implementation continues at low levels.
>
> Read and Write was designated for special education students to improve reading, but it can be used with more students and in additional areas. Since the software can be installed on any computer and used by any student, some teachers also use it as a tool for writing as well. (http://www.education.ky.gov/KDE/Administrative+Resources/Commissioner+of+Education/Messages+to+Superintendents/20060206+Read+and+Write+Gold.htm)

The increased accountability found in No Child Left Behind (United States Department of Education, 2001) and benefits offered by technology were the driving forces behind the movement toward UDL, along with the growing research base it offers. The challenge faced by educators was to find new ways to engage students with disabilities with the general curriculum to improve their educational performance. A secondary goal was to integrate UDL principles and technologies that could benefit all students, not just those with disabilities.

In Kentucky, as well as across the nation, reading and writing skills play a significant role in the achievement scores obtained on standardized and non-standardized tests. To address the areas of reading and writing skills, a four-pronged student-based approach was implemented initially by the Kentucky Department of Education and then assigned to Special Education Cooperatives. Cooperative staff worked in partnership with various support

agencies, while also providing direct services to districts interested in incorporating project components. These included locating and distributing accessible digital curriculum materials, school-wide availability and use of technology supports (e.g., text reader tools), accessible online assessment, and a broad array of technical support and implementation training. These areas were identified as critical to improve the achievement of Kentucky students, especially in the core areas of reading and writing.

Acquiring accessible curriculum materials were supported by recent legislation that amended Kentucky's textbook adoption law to encourage textbook publishers to offer accessible digital versions of textbooks offered for adoption in the state (Casebier, 2002). Starting in 2003, this legislation paved the way for publishers to begin offering digital curriculum materials aligned to Kentucky's textbook adoption cycle and specifications (Legislative Research Commission, 2003). These digital textbook files are then distributed to eligible students with disabilities in accordance with the copyright requirements of the Chaffee Amendment. This Kentucky legislation has prompted more publishers to examine the opportunities for producing and selling accessible digital text as a free market solution for all students (Association of American Publishers, 2002).

Currently, 95 percent or over 1000 Kentucky schools have purchased text reader software such as Read and Write Gold (RWG) from Text HELP (Ltd.). This software is promoted for use by all students for reading and writing support. The software provides a number of tools for students to access learning. First and foremost, it is a text reader that reads aloud individual words, sentences, and paragraphs in various formats (e.g., Word, Excel, PowerPoint, .Txt) back to the student who may not be able to read well, has a comprehension deficit, or has other related reading deficits. While this supports individual learning, it also avoids many stigmas experienced by students with reading disabilities (Hasselbring & Goin, 2004). It also allows students using a computer with headphones to read any content they choose without being singled out through a dependency on a teacher or other human supports because of their disabilities.

RWG also includes customization features for speech output, such as a number of voice styles in addition to controls for the speed, pitch, and tone of the voice output. These features allow students to customize their learning environment to their own liking. A key factor in this strategy has

been to encourage each school to acquire a text reader site license, rather than single-station licenses. The site license enables students to have the technology available where and when it is most needed, that being in general education settings versus only in special education resource rooms. Anecdotal evidence also suggests that use of this technology enhances many students' self-concept as well as perceptions by peers, allowing students with disabilities to go from a position of "stigma to status".

RWG provides a host of other supports that can benefit all students. RWG includes a comprehensive speaking dictionary, thesaurus, spell checker, word prediction, regular and scientific calculator, and other tools to help in the reading and writing process. Each one of the features can be used discretely with headphones. Using the speech output feature, students can read back definitions found in the built-in dictionary or passages they compose using the word prediction feature. Because each feature of RWG has the capability of speech output controlled by the students, these students are not hindered by their lack of reading skill. Through the click of a mouse or using alt key commands, the text reader software is able to read aloud digitized text, definitions, and writing passages that the students create and would like read back to them. Providing students the opportunity to hear what they have written allows them to make critical decisions and efficiently make changes to improve the quality of their compositions. This is especially important in the writing process.

CHANGE

By definition, a statewide implementation involves putting into practice a new idea, program, or set of activities among the people who are either attempting or expected to change (Fullan, 2003). Since implementation entails change, along the process it is necessary to consider the way that people face changes. According to Evans (1996) any innovation that requires the learning of something new and replaces something familiar, unavoidably creates anxiety for many people. Bolman and Deal (1991) believe that change creates hope because it offers growth and progress but it also stirs up fear because it challenges competence and power, creates confusion and conflict, and risks the loss of continuity and meaning. Furthermore, individuals and groups create habits and tend to resist change in order to preserve stability and permanence.

Research consistently finds that policy is not enough to go effectively from innovation to change; real change is always personal and organizational change always painstaking (Evans, 1996). Moreover, the assumption that the adoption of institutional policies that encourage the use of new technologies is all that is necessary for the successful implementation of the policy obscures the role of middle level leadership (Albury, 2001). Even the most effective change effort usually encounters some resistance. Thus, because resistance is inevitable, the primary task for managing change is not technical but motivational (Evans, 1993); building commitment to innovation among people who must implement it is essential for change to be accomplished.

Indeed, there is a broad recognition in the research literature that in times of great transition and perceived change, leadership becomes critically important; leaders recognize that the greatest impediments to success with technology are often related to people rather than to technology per se (Roepcke, Agarwal, & Ferratt, 2000). For any change to succeed participants must believe the change is for their benefit; their effort will be produce a desired result.

From Evans (1993) approach, implementation depends on five dimensions of change: the content of the reform, the faculty's willingness and capacity for change, the strength of school as an organization, the support and training, and the leadership. He emphasized the exceptional burden that leadership has in guiding people through the uncertainties of change.

Conditions for successful implementation may arise from the environment in which change is implemented. In the "Conditions for Change", a study based on a survey of 25 structured interviews completed cross-country, Ely (1990) propose a series of setting for successful technological change. Ely's conditions for change include: *dissatisfaction with Status Quo* – dissatisfaction with things as they are — *knowledge and skills*, *resources, time, incentives and rewards, participation,* and *leadership*.

Another framework that has practical implications for professional development is the Concerns-Based Adoption Model (CBAM) developed by Hall & Hord (1987). The CBAM "is an empirically-based conceptual framework which outlines the developmental process that individuals

experience as they implement an innovation and participate in staff development" (Hord, 1987, p. 12). The model holds that people involved in change evolve in the kinds of questions they ask as they use the innovation. As such, the CBAM addresses two spheres of the process of change: the *implementation progress*, with eight level of use; and the *stages of concern*, with seven levels of concern (see Fig. 1). Each level of use is associated with on of the stages of concern.

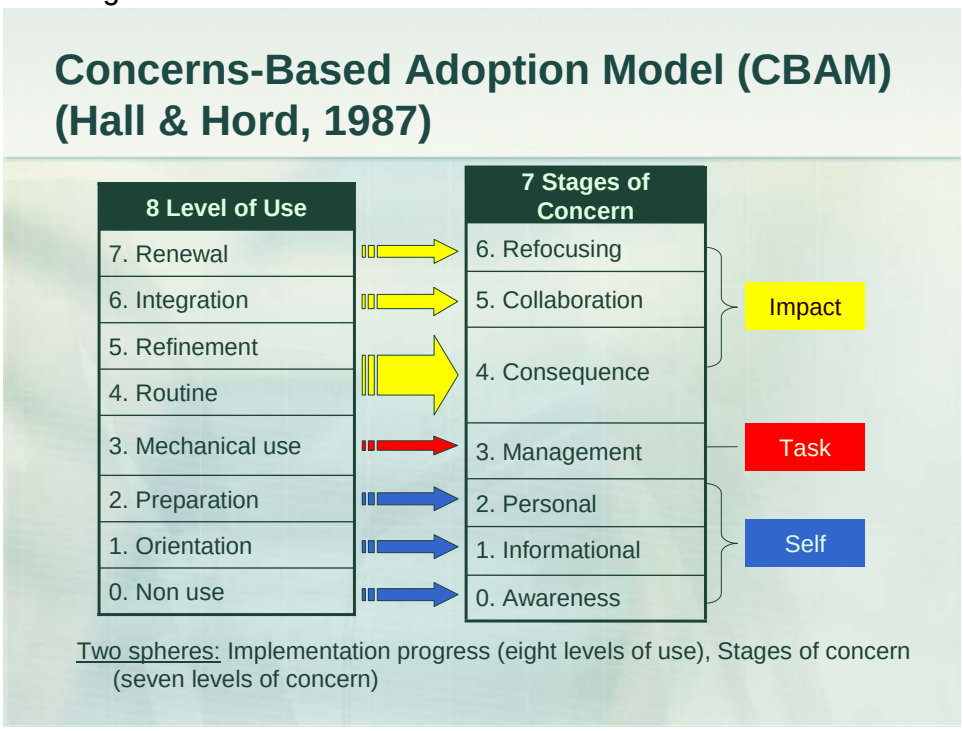

Fig. 1. The Concerns-Based Adoption Model

The CBAM Model provides advice for achieving a higher level of successful implementation of educational innovations. Concerns about the innovation were anticipated and using CBAM as a key diagnostic dimension change agents consider educational interventions. Primary focus is on people at the classroom level (e.g., teachers) who are expected to implement innovation. Secondary focus is on how leaders can facilitate or impede educational change.

PROGRESS

Ongoing training and support (Backhouse, 2003) play an important role in successful implementation. Without local, regional, and state level commitment to professional development and technical assistance, implementation will continue to be sporadic and limited. Caveland Educational Cooperative, a special education cooperative, offers important technical assistance to school districts within this region and has assigned staff members to provide district specific assistance and training. Western Kentucky University, Caveland Educational Support Center and regional teachers through the support of ETRAIN have developed a motivational training DVD to help teachers use Read and Write Gold.

The DVD offers a wide variety of qualitative data. In general, comments were available from teachers, students and administrators. Teachers said the following.

- The students have enjoyed and benefited from using the program.
- Gets my students interested in reading and wanting to write.
- My higher-level functional children can really benefit from this..
- It has helped my students become excited about reading.
- Students enjoy hearing what they have written. Sometimes it helps them figure out simple mistakes.
- My children enjoy using Read and Write. They like the voices reading back to them. We have typed in short stories to read back to them.
- We currently only have one computer on which the software can be used and so using the program has been limited.

Comments were solicited from students. From these comments one can see an overall satisfaction from the student's perspective. The content of student comments is summarized below:

1. I like the independence I feel working online.

2. I can concentrate better.
3. I like that I can work at my own speed.
4. Students frequently commented that they felt less embarrassed and intimidated having the computer read questions to them.

CONCLUSION

Students in the 21st century face higher expectations and more challenges than ever before. These students are also the beneficiaries of educational technology and instructional resources only dreamed of a decade ago. Teachers and administrators are also faced with new challenges to increase student learning, often with fewer resources and higher accountability measures.

Read & Write Gold blends educational technology with accessible instructional resources that allow students to control and customize the learning environment to meet their own unique learning style. In Kentucky, students with reading or writing disabilities are no longer solely dependent on teacher support when problems arise. With core content available in accessible digital formats paired with computerized reading and writing supports, students now have more tools to assist and manage their own learning needs. It also offers the benefits of individual empowerment. Using these tools and accessible content, students will be able to engage curricula and assessment materials without worrying about decoding skills, print disabilities, or the accompanying feelings of self-consciousness. Helping students reach their potential and become independent learners achieving at high levels is an important goal of public education. Through Read & Write Gold, the state of Kentucky has begun to move into the 21st century by enabling individual students to have access to the tools and support to achieve at truly high levels.

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