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Leading Change in Virginia Schools: The Virginia Initiative for Technology and Administrative Leadership

by *Bruce Benson, VSTE Journal Editor-at-Large*

A demand for different kinds of skills and knowledge exists throughout society for citizens to be successful at work, to work with people from diverse cultures and backgrounds, and to obtain goods and services in their daily lives. Students must develop more than basic literacy competencies to succeed in the 21st century.

Students need to be skilled in communication, publication, experimentation, problem solving, knowledge and concept construction, and the use of 21st century tools. School administrators must set expectations in their school communities that demonstrate a commitment to creating innovative, integrated, and technologically rich classrooms that help students develop these 21st century skills.

In Leading Change, John Kotter (1996) states the importance of distinguishing between management and leadership. Kotter defines management as a "set of processes that can keep a complicated system of people and technology running smoothly" and includes aspects of "planning, staffing, controlling, and problem solving." Kotter states that "leadership is a set of processes that creates organizations in the first place or adapts them to significantly changing circumstances. Leadership defines what the future should look like, aligns people with that vision, and inspires them to make it happen."

In the current era of high stakes testing and increased accountability for student performance, principals have clearly become instructional leaders. However, there is a need for additional leadership in the effective integration of instructional technology in our schools, a role that rests clearly with school administrators. School administrators must set expectations in the technology arena for teachers and students.

Leading Change, continued

So what is it that principals need to know, understand, and be able to do related to technology in our schools? The Collaborative for Technology Standards for School Administrators (TSSA Collaborative) facilitated the development of a national consensus on what PK-12 administrators should know and be able to do in order to optimize the effective use of technology to enhance student learning and improve school management and operation. The TSSA Collaborative identified six areas of focus for administrators, including leadership and vision; learning and teaching; productivity and professional practice; support, management, and operations; assessment and evaluation; and social, legal and ethical issues (http://cnets.iste.org/tssa/).

However, developing standards and putting standards into practice is another matter. We are fortunate in Virginia to have an avenue to do just that. The Virginia Initiative for Technology and Administrative Leadership (VITAL) is that avenue. VITAL is an intense professional development leadership experience in the integration of technology best practices for principals and superintendents in Virginia. The initiative recognizes the need for Virginia's educational leaders to be given rich and relevant experiences that take advantage of the power of technology to support and improve teaching, learning, and leadership in Virginia's schools.

The goal of the VITAL is to provide engaging experiences that will allow administrators to be able to:

- Lead and manage systemic whole school change processes;
- Support effective professional development;
- Attain knowledge of technology and student learning;
- Be better able to lead the integration of technology into instruction to advance student learning;
- Create and maintain technology plans that reflect sound decision making and planning; and,
- Facilitate the effective integration of technology.

Participation in VITAL begins with a school division conducting a technology-needs assessment. Once the assessment has been completed, a team including the lead trainer, superintendent, division principals, and project coordinators map out a professional development path to meet the needs of the division. To ensure relevance and long-term success, all professional development is built around principles of adult learning. In addition, VITAL professional development is geared specifically to address challenges faced by practicing Virginia administrators.

"VITAL is real training for the real job of integrating technology into every facet of school life, particularly instruction." Karen Marcus, Principal, Woodbrook Elementary School Albemarle County Public Schools, Va.

VITAL is funded in part by a grant from The Bill and Melinda Gates Foundation, with the Virginia Educational Technology Alliance (VETA) serving as the core fiscal agent. Developmental partners include the Virginia Department of Education, Virginia Tech, University of Virginia and the College of William and Mary. Upon completion of the program, participants receive a $500 stipend, which may be used toward their choice of support technologies such as handheld computers, instructional software or classroom equipment.

Leading Change, continued

"[VITAL] is an excellent example of a staff development and support structure that provides administrators with the opportunity to build, and more effectively utilize, the technology skills necessary to be effective instructional leaders." Don Vale, Principal, Joseph P. Henley Middle School, Albemarle County Public Schools, Va.

Participation in VITAL is open to any practicing division superintendent or building level school principal in Virginia, including public and state-approved non-public schools or divisions. The division superintendent and principals must commit to completing the initial needs assessment, taking part in several days of professional development based on the identified needs, follow up support sessions, and carrying out to the best of his/her ability the goals identified in the program.

"This is my seventh year as an administrator in Albemarle County and I feel that I'm being challenged and stretched in ways that I have never experienced before and this is directly related to VITAL. I feel that I'm truly part of a professional inquiry based learning community where active participation and meaningful conversation takes place around issues of leadership that are crucial to what we value in Albemarle County." Michele Del Gallo, Principal, Crozet Elementary School, Albemarle County Public Schools, Va.

VITAL engages school leaders and provides a framework for learning experiences where participants learn to use technology in support of best practices in both instructional and administrative application. It is an excellent opportunity for school leaders in Virginia to define what the effective integration of technology in instructional and administrative practice looks like, develop strategies to align people with that vision, and inspire them to make it happen.

If you would like more information about participating in VITAL, visit the VITAL web site at http://www.virginiaedleaders.org or contact Chris O'Neal, Director of VITAL, at coneal@virginia.edu.

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Media Selection: Mapping Technologies to Intelligences

by *Walter McKenzie*

This article includes excerpts from Mr. McKenzie's book Multiple Intelligences and Instructional Technology: A Manual for Every Mind. Eugene, Oregon: ISTE, 2002. Used with permission.

In the unfolding Information Age media dictates the delivery of all the data we encounter. From the time we rise in the morning until we retire each night, the ways we consume information help to shape our knowledge base and our decisions.

Yet people are not always conscious of each medium they encounter; mode of delivery seems to get lost in the mix as we are inundated by volumes of information in endless cycles. While it is easy to become desensitized as consumers of information, as educators we are in a unique position to maximize media selection and get a handle on this explosion of information for our students. As McLuhan suggested prophetically, the medium may not only be the messenger, it may be the message.

When I am discussing the current state of technology with teachers around the country, it becomes clear that they feel bound by their access to technology, regardless of their situation. If a teacher has a television-computer setup, then that is what he or she will use in the classroom. On the other hand, if there is an LCD projector hooked up to a teacher demonstration station in a fully equipped lab, he or she will be more apt to use that set up. Teachers have always made the best of whatever they've got at hand. You can still easily find Apple IIe labs with filing cabinets full of 5" disks in use in school systems. Of course it's dated technology, but it's what we have to work with. Teachers make due.

Gardner's multiple intelligences theory challenges us to look beyond our available technologies and stay focused on the fact that we are teaching children rather than teaching information. As we become ever more aware of the paths to learning, we are even more in need of vehicles to accommodate all these different modalities in the classroom. Half a century ago this would have been an even more daunting task. But in the Information Age, we have technologies evolving, even as we speak, that hold new promise to reach all learners.

This is an incredible opportunity for educators, as the impact of brain research and technology together support our conviction that all children can be successful. The question we must ask ourselves is not about access but appropriate use of technology. Certainly we have more choices today, but how do we discern media that are most appropriate for a given learning task? When it comes to technology,

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Media Selection, continued

media selection is a critical piece in the instructional design process. Unfortunately in this age of media saturation, media selection is often overlooked when mple1menting a lesson in the classroom.

What is the first step in proper media selection? Like all good instruction, the learner must always come first. What knowledge base do they bring to this lesson? Is it introductory, guided practice or remediation? What technology skills are they proficient in and what do they need to learn? Also, what intelligence strengths do they possess and which intelligences need to be further developed? All of these questions help to tailor the lesson to meet students at a level at which they are ready to learn.

With the student piece in place, the learning objective is the next consideration in media selection. Is the objective appropriate? What do you expect learners to be able to do by the end of this lesson? How can you structure the lesson to make this possible? How will you be able to measure student success in accomplishing this? In answering these questions, you come a step closer to identifying appropriate technologies for your lesson.

Before looking to the technologies to which you have access, though, it is important to next look at the intelligences you wish to target in supporting your students to meet the stated objective. Considering the learner and the lesson objective, which intelligence or intelligences should you target to make the lesson a success? And once you have answered this question, which technologies best accommodate these intelligences? These questions will help you lock in the technology or technologies that are appropriate for your lesson.

The process flows accordingly:

Learner ➢ Objective ➢ Intelligences ➢ Technology

By considering instructional design factors in this order, you can successfully select appropriate media for any lesson in your classroom. Considering the learner and objective will be second nature to most teachers. But how do we consider the intelligences with regard to technology?

It is tempting to select the technology you want to use and then make it "fit" the intelligences. However, does that process truly help you identify appropriate strategies, or is it simply going through the motions of justifying your personal preferences? Rather, start with your knowledge of intelligences and consider which media will naturally support them. The table on page 7 summarizes examples.

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Media Selection, continued

Intelligence	Technologies
Verbal/Linguistic	Textbook, pencil, worksheet, newspaper, magazine, word processing, electronic mail, desktop publishing, web-based publishing, keyboard, speech recognition devices, text bridges
Logical/Mathematical	Lecture, cuisenaire rods, unifix cubes, tangrams, measuring cups, measuring scales, ruler/yardstick, slide rule, graphing calculators, spreadsheet, search engine, directory, FTP clients, gophers, webquests, problem solving tasks, programming languages
Visual/Spatial	Overhead projector, television, video, picture books, art supplies, chalkboard, dry erase board, slide shows, charting and graphing, monitor, digital camera/camcorder, scanner graphics editor, html editor, digital animation/movies
Bodily/Kinesthetic	Construction tools, kitchen utensils screw, lever, wheel and axle, inclined plane, pulley, wedge, physical education equipment, manipulative materials, mouse, joystick, simulations that require eye-hand coordination, assistive technologies
Musical/Rhythmic	Pattern blocks, puzzles, musical instruments, phonograph, headphones, tape player/recorder, digital sounds, online pattern games, multimedia presentations, speakers, CD ROM disks, CD ROM player

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Media Selection, continued

Intelligence	Technologies
Intrapersonal	Journals, diaries, surveys, voting machines, learning centers, children's literature, class debate, real time projects, online surveys, online forms, digital portfolios with self-assessments
Interpersonal	Class discussion, post-it notes, greeting cards, laboratory, telephone, walkie-talkie, intercom, board games, costumes, collaborative projects, chat, message boards, instant messenger
Naturalist	Magnifying glass, microscope, telescope, bug box, scrap book, sandwich bag, plastic container, database, laserdisc, floppy drive, file manager, semantic mapping tools
Existentialist	Art replica, planetarium, stage drama, classic literature, classic philosophy, symbols of world religions, virtual communities, virtual art exhibits, virtual field trips, MUDs, virtual reality, simulations

Let's take a closer look at each intelligence and the media that will offer appropriate support. Always well accommodated in the classroom, the verbal/linguistic intelligence can be even more effectively used through modern technologies. Set aside the traditional textbook, pencil, and paper and consider the ways word processing promotes not only composition but also editing and revising in ways that streamline the Writer's Workshop approach. Desktop publishing and web-based publishing take this idea to new levels of efficacy as students can see their work celebrated within the classroom and beyond in the "virtual" world. Electronic mail is a wonderful way to promote verbal/linguistic learning, as students are prompted to inquire of and respond to correspondents through written text.

The logical/mathematical intelligence is promoted through activities that stimulate reasoning. It can include a traditional lecture, analyzing data through a spreadsheet, conducting queries using a search engine or directory, participating in the problem solving process of a WebQuest, and even mastering a programming language or a networked system of computers.

Media Selection, continued

The visual/spatial intelligence especially benefits from technology in modern education because there are so many new ways to stimulate this path to learning. While the overhead projector, slide projector and TV/VCR have been around for thirty years or more, the use of digital slide shows is a newer way to create, manipulate and present learning in the classroom. Charting and graphing has been made so much easier from the days gone by through all kinds of applications (word processors, draw/paint programs, spreadsheets, databases), and graphic editors allow us to manipulate any image to meet our needs. Throw in the possibilities for website design and construction and the recent advances in digital animation and movies and you can easily see why the visual/spatial intelligence is so aptly supported by technology.

The bodily/kinesthetic intelligence is stimulated by physical interaction with one's environment. When used in instruction, students who manipulate materials can develop a greater understanding of skills and concepts. Diagramming on the board, sorting manipulative materials by attributes, participating in a group simulation, or using an adaptive switch in order to input responses into a computer are all examples of how the bodily/kinesthetic intelligence can be accommodated.

The musical/rhythmical intelligence is the intelligence of patterns. It is accommodated in a variety of ways via technology. For example, using the tape recorder in a listening center with books to follow along prompts the use of this intelligence. Incorporating digital sounds into a multimedia presentation also accommodates this path to learning. Playing online pattern games like Mastermind and Concentration can be very musical/rhythmical. Even looking for visual patterns in the classroom or the schoolyard fosters musical/rhythmical thinking.

The intrapersonal intelligence is stimulated through activities that bring feelings, values and attitudes into play. For example, conducting a class debate on an environmental issue, following a real time expedition through uncharted islands, completing online surveys on an issue being studied in the classroom, completing an online form as a facilitating event for a unit of study, or evaluating one's own digital portfolio full of work from a semester or marking period are all ways to nurture the intrapersonal intelligence.

The interpersonal intelligence can be accommodated through class discussion on relevant topics, collaborative projects that enrich and extend the curriculum, synchronous chat between groups of students or with experts, participation in newsgroups on an assigned topic, and even mailing lists that allow multiple classes to all share ideas and experiences asynchronously.

Organizing and making sense of information in categories and hierarchies stimulates the naturalist intelligence. Creating a database to sort and search through data is a wonderful naturalist exercise. Using a laserdisc on weather is an effective way to share scientific phenomena in the classroom. More than any other activity though, semantic mapping is decidedly the most naturalist. Consider the use of the software application "Inspiration" in visually mapping out understandings of facts and concepts and how it allows the learner to manipulate ideas.

The existential intelligence is stimulated through learning experiences that reinforce one's sense of the "big picture" of learning. Newspapers, magazines and

Media Selection, continued

virtual communities all help students feel like they belong to something larger than their family or classroom. Virtual art experiences and field trips help students to vicariously experience beauty and awe as it exists in the world far beyond the classroom. Even online interaction with significant people through interviews and archives can promote the use of the existential intelligence.

The one caveat that has to be made here is that applications are not so neatly categorized by intelligences. Even though an HTML editing program like DreamWeaver seems to be a visual tool at first glance, consider the intra- and interpersonal dynamics that come into play as a website is formed. Or then again, the listening center described above might actually be construed as a verbal/linguistic activity rather than a musical/rhythmic task. In fact, it is both. My point is this: the only way to determine the intelligences a technology stimulates is to look at the task the technology is being used to accomplish. The technology itself is not a goal for instruction; it is merely a tool to help you accomplish that goal. It is in the process of instruction identified by a learning objective that we see the true nature of any technology and its relationship to the intelligences.

Dr. Sheryl Asen has identified ten criteria to guide incorporating technology into instruction. By using these criteria to plan for and evaluate the use of ~~a~~ technology, we can determine how well the technology supports educationally sound instruction.

1. Students are involved in tasks that are broad in scope and challenging. Activities should span a range of related, intellectually demanding experiences that are not divided into fragmented tasks. (existentialist)

2. Students, rather than the teacher, have control over the learning.
   The teacher serves as more of a guide, coach, and resource rather than a supervisor or administrator. (intrapersonal)

3. Students work collaboratively and cooperatively.
   Learning tasks should not be accomplished in social isolation. (interpersonal, kinesthetic)

4. Students practice and apply communication skills during learning.
   Learning tasks should promote questioning, discussion, and interaction. (verbal/linguistic)

5. Students participate in varied learning tasks.
   This includes both variations in the format of the activities and in their objectives. (musical/rhythmic, kinesthetic)

6. Students have opportunities to address learning tasks in different ways.
   Different approaches to a presented activity can be explored. (naturalist)

7. Students learn and apply higher order thinking skills through problem solving tasks and reflection.
   Activities do more than ask students to recall rote facts, terms and definitions. (logical/mathematical)

Media Selection, continued

8. Students are encouraged to offer varied solutions to a given problem. Reasoned answers and appropriate products are not limited to pre-set responses.
   All justifiable and fitting answers and products are accepted. (visual/spatial)

9. Students are encouraged to contribute personal ideas and experience to the learning task.
   Student input into the learning process is valid and valued. (intrapersonal)

10. Students are intrinsically motivated by the prescribed learning tasks. Accomplishing the task is rewarding on its own merits regardless of the technologies being used. (existentialist)

Note how well Asen's criteria match with Gardner's intelligences. From the objective to the assessment and every step in between, multiple intelligences can help teachers to expand their repertoire of instructional strategies and balance their selection of resources and materials, including technology.

By taking the intelligences into consideration, teachers can more effectively make use of the technologies they have at their disposal for instruction. The key is to place consideration of the intelligences into the media selection process after the learner and objective but before actually considering your technology options. In this way, teachers can avoid allowing technology to dictate their instructional choices and put it in its proper place in instruction: as a delivery vehicle for content, concepts and skills.

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Changing Focus: Using Digitial Imagery for Descriptive Essays

by Arlene Lewis

Most English teachers are well aware that a word processing program is an effective tool for revision, but editing can also be done with paper and pencil. This writing assignment made use of some of the unique features of word processing programs, allowing students to make alterations that couldonly be accomplished using a computer.

The descriptive essay is a stock feature of most English curricula. Because I wanted my high school juniors to be challenged with more than the usual tasks of describing their bedrooms or their favorite vacation spots, I decided to couple digital photography with their writing. We started by reading descriptive essays to better understand that a descriptive essay, like all essays, has a purpose and a focus. Next, we discussed what kinds of photographs would inspire a rich description. Although we would be staying on school property, it was springtime, so the possibilities were endless. To avoid the entire class wandering about outside searching for the perfect photograph, students completed index cards with brief descriptions of the kinds of scenes or objects they wanted to describe.

For example, some students wanted to take pictures of the parking lot while others preferred the flowering bushes in front of the school. Each card was numbered to correspond to the student's turn using the camera. (If multiple cameras are available, the entire process can be streamlined considerably.) Students knew exactly where they wanted to go and what they wanted to photograph before they ever left the classroom.

Before class, I borrowed a Sony MVC-FD71 digital camera from our school library, making sure that the camera was fully charged by checking the display that appears after the camera is switched on. It indicates the number of minutes of use remaining in the camera. I then inserted a blank 3.5-inch disk into the disk drive of the camera. Using the default setting for standard quality, I could store 25-40 pictures on one disk.

Once the class assembled outside, I demonstrated how to use the camera. One rule that I emphasized was that they must immediately put the strap of the camera around their necks upon receiving the camera. I didn't want any of my students being liable for the expense of repairing or replacing the school camera when it was accidentally dropped. Then I showed them how to use the camera's telephoto and wide-angle features by pressing a button on top of the camera. Digital cameras tend to be very sensitive to any kind of movement by the operator. To steady their grip on the camera, I recommended that once they were focused and ready to take a picture, they breathe in and hold as they **firmly** pressed down the "Record" button. Once the camera display showed the word

Changing Focus, continued

"Recording," the picture would be in the camera's memory file and they could relax.

Even though students had pre-selected the scenes they wanted to record, there were still some "surprises" outdoors, like the bird that alighted on the flagpole, which gave students a totally new subject for their essays. While students waited for their turns with the camera, they recorded their observations of nature in their journals every five minutes, noting any changes in the scenery. These observations provided descriptive details that could later be used to enhance their essays.

When students returned to the classroom, they began to consider what would be the focal point of their compositions. We discussed the difference between a narrow and broad focus. For example, their essays could have a very narrow focus, such as a single flower on a bush. Still within a narrow focus, they could concentrate on the entire flowering bush. Widening the focus, they could describe the bush as a part of the whole front landscape of the building. Broader yet would be a description of the bush as part of a spring scene in Leesburg, Va. Finally, from the broadest perspective, the bush would be a rather minor detail in the entire panorama of the spring season.

Before going to the computer lab, I copied the files from the digital camera disk to a folder on the shared network drive. Because I knew the exact order of students using the camera from the index cards they filled out, it was easy for me to rename each numbered JPG file with the student's name.

When students entered the lab, they were instructed to go to Microsoft Word and then to "Insert Picture" from the "File" menu. Next, they opened the appropriate folder in the shared network drive and then opened their specific file to see the picture they took. Once students inserted their photographs from the file into a new Word document, they could use the photo editing toolbar to crop their pictures and literally narrow the focus of their compositions. The photograph became just the flower, not the whole bush, if that were the main subject of the description. They could alsophysically change the focus or perspective of the essay by using the same tool bar to lighten or darken the images. Some students, in fact, omitted all color and presented a rather dismal picture of spring in Leesburg. The use of the toolbar to reconfigure their photographs meant students could "match" the picture to the desired effect and theme of their essays. They typed their descriptive essays just below where they had inserted their pictures. The photographs became an integral part of their essays and students could take pride in two creations, the image and the accompanying text.

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Continuous Speech Recognition Technology: Educational Applications and Best Practices

by Richard C. Snider, Ph.D.

There are a growing number of articles exploring the effectiveness of speech recognition technology in helping students with learning disabilities compensate for written language difficulties. Despite the potential advantages of this technology in supporting students with learning disabilities, little effort has been made to look at the software and suggest best practices for the utilization of speech recognition in the classroom.

The purpose of this article is to introduce speech recognition technology, provide a brief overview of the literature involving speech recognition and individuals with learning disabilities, and then offer several practical suggestions for getting started with speech recognition technology in the classroom.

Introduction to Speech Recognition Technology

Speech recognition is the ability of a computer and program to recognize and carry out voice commands or take dictation. Using speech recognition software, users can tell computers to execute commands and dictate text directly into a word processor on a computer.

In general, speech recognition software used for dictation involves the process of the user speaking into a microphone, the computer processing the spoken words through a sound card, the software analyzing the sounds and matching them against a template, and the matched words appearing as text in a word processor (Raskind, 1993). Some modern speech recognition systems can be used immediately, but most actually learn the characteristics of each person's voice over time, resulting in increased accuracy the more the system is used.

Discrete Speech

Throughout the early to mid-1990s, all marketed speech recognition systems relied on discrete speech technology. Using this technology, users were required to pause between words during dictation. These systems were classified as speaker-dependent, which means that each user had to train the system to recognize his or her dictated speech. The training consisted of users reading selected text passages and took anywhere from one to three hours to complete (Cavalier & Ferretti, 1996).

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Speech Recognition, continued

Continuous Speech

In April 1997, Dragon Systems, Inc. marketed the first continuous speech recognition system, Dragon NaturallySpeaking. This system allowed users to dictate text into the computer using natural conversational speech (Dragon Systems, 1999). Unfortunately, the use of the more complex continuous speech technology required much more memory than the previous discrete speech software, and if a computer did not have the necessary memory to run the software, accuracy was greatly reduced (Williams, 1998).

Like the speaker-dependent discrete systems, the NaturallySpeaking user would train the system by reading from a set of text passages, which allowed the software to closely match his or her dictation style. The more consistently the user dictated the text passages, the better the system's recognition rate (De La Paz, 1999).

Current continuous speech recognition systems, such as IBM's Via Voice and ScanSoft's NaturallySpeaking, allow the user to dictate text into the computer in a more conversational manner, but they still aren't completely natural because accuracy depends on consistent and clear pronunciation. Although most systems capitalize the first word of each sentence, in order to dictate effectively, the user must also learn and use commands for capitalization, punctuation, and modification of dictated text. Most systems allow the user to format and edit dictated text using either voice commands or the keyboard (De La Paz, 1999).

Even though manufacturers claim accuracy rates of 95-99% (Essex, 1999), many factors affect the actual accuracy of these systems. These factors include what content is being dictated, how similar the words or phrases are to one another and the variability in the user's speech that may occur due to fatigue, a cold, or mispronunciations. Other factors that can influence accuracy include the environment in which the system is used, such as placement of the microphone and the surrounding noise level, and the quality of the equipment used with the system (Williams, 1998).

Once the user becomes accustomed to using continuous speech input and the software has been trained to recognize his or her voice, it is possible to achieve input rates of up to 130 words per minute. Additionally, most modern products provide support for commonly used packages like Microsoft Word, so it is not necessary to learn how to use a new set of word processing features in addition to becoming familiar with speech input commands (Williams, 1998).

Applications

Continuous speech recognition technology has the potential to make a great difference as a solution for individuals with disabilities. With current speech recognition systems being relatively easy to use, cost efficient, and capable of running on a standard computer system, many researchers and teachers are beginning to explore the use of this technology to assist individuals with disabilities in school, at home, and in the workplace. Examples include the use of speech recognition systems to control the environment for individuals who have physical and/or cognitive disabilities and the use of the technology to help improve the speech accuracy of individuals with hearing impairments (Cavalier & Ferretti, 1996).

Speech Recognition, continued

Recently, a few researchers have begun investigating the use of speech technology as an alternative for students with learning disabilities to get their thoughts down on paper (Higgins & Raskind, 1995; Raskind & Higgins, 1998; De La Paz, 1999).

Learning Disabilities and Speech Recognition

Higgins and Raskind (1995) conducted an experimental study indicating that speech recognition is beneficial to postsecondary students with learning disabilities in the area of written composition. The researchers indicated that discrete speech recognition promotes use of the more developed oral vocabularies of the participants as indicated by the use of larger words.

Raskind and Higgins (1998) followed their 1995 study with a three-year longitudinal study that looked at academic, behavioral, and attitudinal changes as a result of using speech recognition. The data were collected using interviews, questionnaires and self-reports. Over the three-year period, participants significantly increased their GPAs and their use of the lab-based speech recognition systems. The overall attrition rate of the students also decreased during that time. Furthermore, an examination of databases documenting use of services and data from several questionnaire responses indicated that students who participated in the study increased their overall independence by relying less on family members, friends, and classmates to help them compensate for their disabilities.

Although there are currently no published research articles to support the assertion that continuous speech recognition technology can offer students with learning disabilities in the area of written expression a superior method to write as compared to traditional methods, several authors have cited this technology as a possible tool to support these students. MacArthur (1999) and De La Paz (1999) both indicated that dictation using continuous speech recognition software has an advantage over keyboarding and handwriting because it helps circumvent the issues of producing words. The authors also mention that speech software offers individuals with learning disabilities the possibility of composing by dictation without having to rely on another person to transcribe their writing. De La Paz, however, does mention that there are potential difficulties with using continuous speech recognition for individuals who have learning disabilities. The author indicated that although continuous speech recognition, like dictation, may help users circumvent the production difficulties of writing, it creates additional demands that include careful speech, error correction and editing procedures. In order to address these issues, De La Paz recommended using knowledgeable educators to guide individuals with learning disabilities as they begin using the technology.

Suggestions for Using Continuous Speech Recognition in the Classroom

Although the literature seems to indicate that continuous speech recognition technology can be potentially useful to assist students with learning disabilities to get their thoughts down on paper, there could be difficulties for the classroom teacher in using this technology if it is not properly implemented. The following recommendations are based on my most recent reviews of the literature and my experiences in using speech technology for over eight years as a K-12 special education consultant and as a university researcher. These suggestions are not

Speech Recognition, continued

specific to any one software package, but can be generalized to any number of speech recognition programs.

Guided Training

Guided training sessions are invaluable in teaching students to use speech recognition technology. When properly implemented, guided training sessions allow educators to teach students techniques for correctly using the software and allow them to monitor student progress and provide immediate feedback to help improve their skills. This type of training session is likely to assist students with disabilities to overcome initial frustration with using the speech recognition technology and allow them to get comfortable with using the software. Guided training is important as the students learn to create their voice models, dictate, and edit their work.

Creating the Voice Model

Although some speech systems will allow users to begin dictating without first training the software to recognize their voices, these systems are typically less accurate until the software adapts to the user's voice. Most speech systems will require the user to read several selected stories first in order for the software to adjust the factory template to the user's voice enough to accurately recognize dictated text. Typical training times are usually about thirty to forty-five minutes.

Usually the systems will have two to four stories and may require the user to read half of them in order to begin dictating. Since it tends to increase the overall accuracy of the speech software, it is beneficial to have the students read all of the available training text before they begin dictating for the first time. Remember, however, this does not have to be done in one session and, in fact, should probably not be since the student will tire. Break up the training into several sessions and let the students take breaks during each session so they will be at their best as they read the text. Allowing the students to get a drink of water is also helpful after reading long sets of passages. If a student gets tired or uncomfortable during training, he/she is more likely to make errors during reading and this will reduce the accuracy of the speech software. This type of voice training will maximize the initial accuracy of the software and minimize frustration as the students begin using the speech recognition technology. This may increase the training time, but it is well worth it for the students.

Unfortunately, students with learning disabilities having more severe writing and accompanying reading disabilities often have difficulty reading the stories required for training the speech technology systems. In this instance, depending on the software and the student, it may work to turn off the microphone, read a sentence of the training story to the student, turn the microphone back on, and have the student repeat the sentence. This may take a little practice and may require more time to complete the training, but could allow the student ultimately to use the software.

Dictation

Once the student has trained the software and begins dictating into the word processor, it is necessary to monitor progress and provide feedback. As a knowledgeable educator, it is important to know that the continuous speech

Speech Recognition, continued

systems use algorithms that work best when the users speak phrases, sentences, or even paragraphs at a time – not single words. Although many continuous speech systems claim a user can speak in a "conversational style," it is vital for the user to slow down his or her speech and to enunciate his or her words a little more clearly than normal during speech. Often when students first begin to dictate, they will mumble, which results in a high error rate, but when reminded to slow down and speak clearly the students are able to achieve a much higher accuracy rate while using the speech software.

Editing

Individuals with learning disabilities may have more difficulty with the editing process using continuous speech recognition technology than they do with typical discrete speech systems. Higgins and Raskind (2000) noted in a study on remedial effects of speech recognition that correcting individual words using the continuous speech systems may be more difficult since these words may be harder to identify and isolate within phrases or sentences, whereas the older discrete speech systems allowed users to dictate and correct words one at a time.

Using the voice to get the text into the computer is the primary advantage of voice recognition for individuals with learning disabilities. Allowing students to use the mouse and keyboard to make corrections to the dictated text reduces the cognitive demands of trying to do so by voice and helps with the editing process. Finally, although there is little or no research to directly support this assertion, multi-modal communication theory would support using computer-based voice output technologies to highlight and read the dictated text to the students in order to help them edit the content.

Conclusions

Continuous speech recognition technology has the potential to work well for individuals with learning disabilities to get text into a word processor if implemented properly through the use of guided training, thorough training of the voice model, and clear and precise dictation of the text. This technology can be combined with the mouse and even the keyboard for editing of the text if necessary. As an educator, do not be hesitant to use continuous speech technology with other tools if it will help you accomplish your primary goal – to provide a better learning environment for your student.

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Speech Recognition, continued

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Voice over IP: Why next generation communications are growing in interest for schools

by Monica Maher

Implementing Voice over IP (VoIP) in the classroom is about empowerment – empowering school administrators with greater security and business communications within their school system, while cutting costs by leveraging existing data networks.

Voice over Internet Protocol, or IP Telephony as it is commonly called, is the ability to transfer voice over data networks. In this manner, voice is transmitted much like data - in tiny manageable packets using the Internet Protocol. IP, simply stated, is the set of rules that are applied to these packets that allow them to be sent to a proper destination, or IP address. It can be thought of as the postal system for network traffic. Transmitting voice over data networks utilizes the existing infrastructure (wiring) already in place, hereby converging networks and cutting down management costs. It is this convergence of networks upon which the industry name 'Convergence Technologies' was coined.

Until the past few years, Voice over IP had its roots in the world of big business, with companies primarily interested in taking advantage of its toll bypass capabilities (avoiding normal long distance tolls by traveling over private networks). These enterprise implementations led the way for enhancements to VoIP, opening doors of new functionality and cost savings for many potential VoIP users. Compounded with the unfortunate events of Columbine and 9/11, VoIP has also taken on the practical functionality of enhancing security by increasing levels of communication, awareness and response. This, in particular, has caught the eye of school administrators who have been tasked with increasing security within their classrooms. The answer has been in the form of IP enabled phones, which not only provide a line to the outside world, but messaging and application abilities as well. Now teachers have instant access to the main office, other classrooms, parents, and maybe most importantly, emergency numbers. These IP phones are also able to broadcast text messages and real-time news reports, adding yet another layer of security.

This new technology is not only well suited for the school system's needs, but also well suited for their budgets. In fact, schools are finding out that they can cut

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overall costs by making a few changes to their existing network to empower multiple methods of communications over one converged network. This has allowed schools to eliminate the expensive costs associated with building out a separate telephone network, which prior to VoIP, would have been required to bring dial tone and applications to the classroom. Convergence also provides greater network or facility management. Instead of maintaining separate networks, equipment and support contracts, schools are able to consolidate their efforts and focus on one.

These IP enabled phones offer many benefits beyond dial tone, including the ability to run applications much like a computer would run an office suite application. Cisco Systems Inc., the worldwide leader in networking and Internet technology, offers IP Phone models that are specifically designed to integrate with and display the applications. The phones have an oversize screen with push buttons to toggle through the applications that even a technology novice can maneuver through. These applications offer a myriad of options and features that can be custom designed to fit your school systems needs.

Virginia-based engineering consulting firms, such as AAC Associates Inc., have met with great success designing and installing VoIP solutions for school systems. Doug Bowlds, Vice President of Convergence Technologies at AAC illustrates,

"We've found that in many schools, voice over IP services can be added by making a few changes to their existing network infrastructure. With the addition of these services, not only have schools seen better communication and return of investment, but we have taken this one step further and developed applications tailored towards streamlining everyday functions and increasing security."

These applications are a natural compliment to IP Phones and Cisco's VoIP product specifically because the phones themselves are XML clients. XML, or eXtensible Markup Language, provides a mechanism whereby data can be sent to – and received from – the phones. Frederick County Public Schools in Virginia have been working with AAC Associates to converge networks and increase productivity with the implementation of Cisco SystemsÒ IP Phones. Rob Yost, Director of Information Technology at Frederick County Public Schools, affirms their decision to implement explaining,

"Implementing their (AAC Associates) VoIP solution and customized XML applications has dramatically increased communication and efficiency between our 20 networked facilities. The faculty has reported high satisfaction with the new phones and adapted very quickly to their user friendly applications."

AAC's customizable suite of phone applications include, but are not limited to:

- An attendance system
- A student hall pass management system

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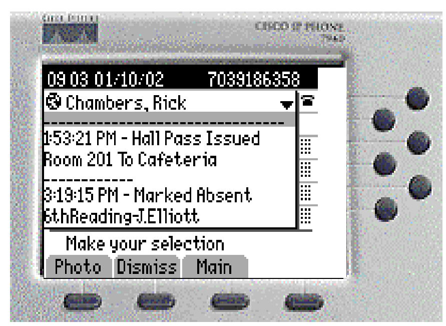
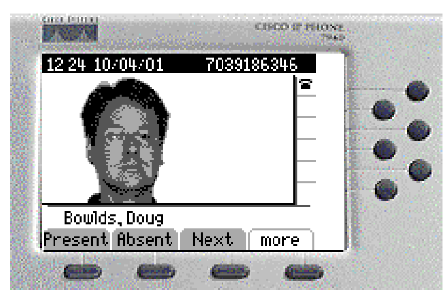
- Methods for assigning and monitoring student disciplinary actions
- Mechanisms for alerting teachers to student medication requirements
- Scheduling and reserving audio/visual equipment
- Providing greater visitor control and awareness
- Scheduling conference rooms
- Timekeeping for temporary employees
- Issuing daily reports including absentees and substitute teachers bulletins
- Instant messaging to the phones

One of AAC's published suite of applications, appropriately labeled "PhoneTopÔ K-12," has or is currently being implemented in various school districts in Virginia, such as Frederick County and Louisa County Public Schools, just to name a couple.

Indeed, these PhoneTop applications have been of great interest to many schools that have battled automating their every day functions. For Example, consider hall passes. If Johnny needs to go to the front office, the teacher can allow a "trusted student" to use the phone to issue Johnny a hall pass. The teacher may not necessarily want to allow that same student access to the teacher's PC to issue a hall pass as confidential student information might reside on the PC. Imagine that any administrator in the school can, at a glance, see how many students (and their identities) are out on hall pass in the entire school at any given moment. Imagine being able to control just how many students are allowed visitation to the school library simultaneously.



The attendance, hall pass, detention, and student locator modules each provide a picture of the student on the phone's LCD for identification purposes. This is particularly useful at the beginning of the school year with all those new faces to have to learn, as well as throughout the year for substitute teachers and other temporary faculty members. The PhoneTop attendance module can even issue email notifications to parents of truant students. The attendance module also interfaces with the school's student information system.



Robert Frost Middle School in Fairfax County Public Schools, Virginia, was the first school in the district to implement a Cisco VoIP System. AAC designed the system and, along with their team partner, CMS Information Services, installed it for the school. Here's what school officials had to say about their new phone system:

Voice over IP, continued

"By adding phones to classrooms, we bring a new level of professionalism to teaching. In addition to the important benefit of increasing security for students and staff, the phones make it easy to improve and increase the level of home-school communication. In the end, the children benefit." Leslie Kent, Principal, Frost Middle School, Fairfax County Public Schools, Va.

"The new Auto Attendant system allows us to efficiently route parent calls directly to the department they seek. Of course they can option out at any time to quickly talk to a human receptionist. The system also allows us to easily change our menus and provide bulletin-type information, such as school closing notices, to our parents. It has certainly decreased the call volume in the main office which allows us to better attend the needs of the students and the parents who visit the office." Rosemary Barry, Assistant to the Principal, Frost Middle School, Fairfax County Public Schools, Va.

While these types of functions may be available via software for the PC platform, they are often cost-prohibitive or cannot easily be maintained and administered by school personnel. With a VoIP system in place, network administrators can easily maintain and deploy new applications from a centralized site, thereby eliminating the need to outsource, or for many, drive to each individual site to perform maintenance administration. That's precisely the empowerment that VoIP provides: not only can the school administer the phone system and its applications, but this simplified administration will also free up their time, increasing overall personnel efficiency.

With such a high level of functionality and services, AAC realized that it was important to make sure that the phone systems were secure and had fail-over capabilities in the event of an outage. To meet this requirement, AAC designed a scalable architecture, well suited for schools to prevent public phone outages, including the kind of outages that occurred on 9/11. Bowlds of AAC explains,

By installing VoIP systems at various schools sites within a district and adding a "red phone" at each of the locations, we have been able to operate the phones over a private wide area network to act as a back-up to the Public Switched Telephone Network (PSTN). In this manner, we are able to ensure uninterruptible communications between the school board and the principals at each school, even in the event of a major outage.

This has teachers and parents breathing a sigh of relief because their communications will always be available. To help you find out what's required to implement VoIP in your school system, IP Telephony companies, like AAC Associates, can do a readiness evaluation on your existing network. Through interviews and equipment evaluations, you can find out the associated costs for your particular solution in order to begin transforming your schools' communication systems.

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Electronic Portfolio Production for Performance Assessment of Undergraduate Learners

by Amy Keefe, Edward Kobrinski, Phyllis Keen, Ed.D., Christopher Mattia, and Christopher Moersch, Ed.D.

Introduction to Electronic Portfolios

For several years, teacher education programs across the nation have been turning to performance-based assessments for documenting learner performance. Performance-based assessment requires learners to provide an answer or create a product that demonstrates personal knowledge or skills, or better understanding of what is learned and put it into practice. The Interstate New Teacher Assessment and Support Consortium (INTASC) is in the process of developing standards that

> …are performance-based: that is, they describe what teachers should know and be able to do rather than listing courses that teachers should take in order to be awarded a license. This shift toward performance-based standard-setting is in line with the National Board [for Professional Teaching]'s approach to developing standards and with the changes already occurring in a number of states (INTASC, 2002, The Standards, ¶ 1)

Portfolios provide one way to meet the emerging national model of performance-based assessment. Recently, teacher education programs have begun expanding the prevalent paper portfolios in favor of electronic portfolios as culminating projects for pre-service teachers. Grant Wiggins, in an interview featured by the George Lucas Foundation (2002), suggests that technology be paired with performance assessment:

> Once we get beyond the idea that assessment is more than just quizzes and tests and that assessment is the documentation of whereby you make this case that the student has done something significant, this body of evidence, if we want to stick with that judicial metaphor, that proves that the student actually learned something, then technology is an obvious partner. (¶ 5)

Additionally, the national emphasis on the integration of educational

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technology in the K-12 classroom requires that teacher education programs prepare teacher candidates to use such technologies. In a recent survey conducted by the National Center for Education Statistics [NCES], the increase of computers in K-12 classrooms was readily apparent, with total student usage of computers rising from 59 percent to 69 percent in the four years between 1993 and 1997. Not surprisingly, the results of the survey further revealed that the average public school contained 110 computers in the year 2000 (NCES, 2002). Thus electronic portfolios are becoming an increasingly accepted vehicle for teacher candidates to showcase their technological skills. By demonstrating that they are able to effectively use technology, pre-service teachers are modeling what they'll eventually use in the classroom.

Barrett (2000) explains that teachers who effectively use technology are more likely to teach students who do the same: "If teachers develop electronic teaching portfolios, their students will be more likely to have their own electronic portfolios" (¶ 4). Because states are starting to implement technology standards for teachers and students, the next logical step for teacher education programs is to adopt similar technology standards. An electronic portfolio combines performance assessment and technological proficiency that is demonstrable to accreditation bodies.

Hicks, Carico, and Glasson (2001) described the integration of electronic portfolios in Virginia Tech's secondary licensure program. The electronic portfolios created by students in the program are designed to assess and document the INTASC, the National Board of Professional Teaching Standards (NEPTS), and professional standards for teaching and learning within each content discipline. The electronic portfolio model described also addresses technology standards, which have been incorporated into accreditation of teacher education programs by the National Council for Accreditation of Teacher Education (NCATE) and the Commonwealth of Virginia.

Although the Educational Studies Department at St. Mary's College of Maryland (SMCM) uses a slightly different framework for electronic portfolios than does Virginia Tech, it also uses them as a means of assessing student teachers.

What distinguishes the electronic portfolio from a paper portfolio is the container – electronic media rather than paper. In an electronic portfolio, which is published on the web or on a compact disc, students compile video clips, scanned images, audio recordings, sample presentations, and documents electronically. Essentially, the electronic portfolio shows rather than tells as college supervisors and, later, potential employers watch and hear the teacher candidate in the classroom. Martin-Kneip (1999), who discusses the use of professional portfolios in her book, Capturing the Wisdom of Practice, summarizes the effectiveness of a traditional portfolio as a reflective and display tool. Portfolios enable educators (pre-service and in-service) to improve upon, portray, and assess their work.

"They are collections of purposeful and specialized work, capturing a process that can never be fully appreciated unless one can be inside and outside someone else's mind. They validate current expectations and legitimize future

Electronic Portfolio, continued

goals" (¶ 1). Martin-Kneip speaks to the effectiveness of a traditional portfolio, yet her comments are equally applicable to electronic portfolios.

The Maryland State Department of Education has released state technology standards for pre-service and in-service teachers comparable to the International Society for Technology in Education's National Educational Technology Standards for Teachers (ISTE NETS-T). Both sets of standards provide benchmarks and guidelines for integrating curriculum technology and improving teacher efficiency through the use of technology. The electronic portfolios created by SMCM students indirectly address Maryland's technology standards while directly addressing teaching standards. Clearly, a student who creates an electronic portfolio is meeting the Maryland Teacher Technology Standards (MTTS) by demonstrating that she or he is able to, for example, "use productivity tools to publish information and organize, categorize, and store information for efficient retrieval" (MSDE, 2002).

With this in mind, the faculty of the educational studies department elected to require students to organize their electronic portfolios around the four domains of Danielson's (1996) framework for teaching: planning and preparation, the classroom environment, instruction, and professional responsibilities in addition to expecting that the electronic portfolios would demonstrate the Maryland Teacher Technology Standards. We have found that Danielson's domains in SMCM's electronic portfolios can, and do, accommodate various MTTSs, depending on which artifacts are chosen to illustrate the domains. Because Danielson's domains provide a framework for showcasing the essential elements of teaching, St. Mary's pre-service teachers have also been able to use their electronic portfolios during interviews in various states that use other teaching standards because the overall content is consistent.

The SMCM approach to the electronic portfolio organization and guidelines differs from that of Virginia Tech's Teacher Education in the Sciences and Humanities (TESH) electronic portfolio organization. TESH requires that student electronic portfolios include evidence of meeting standards set forth by the National Board for Professional Teaching Standards (Hicks et al., 2001). This gives pre-service teachers versatility to use their electronic portfolios nationally, but SMCM expects that their students' work will also be showcased internationally. While this may seem like an ambitious goal, one recent graduate took her electronic portfolio across an ocean to interview for a teaching job in Hawaii. Several SMCM students have completed their student teaching semester in Australia, Costa Rica, and Bermuda, indicating that our graduates will soon start seeking international employment. By requiring that teacher candidates follow the structure of Danielson's framework for teaching, their electronic portfolios showcase their universal teaching skills, including selecting and executing appropriate instructional strategies, managing instructional groups, and communicating effectively with students' parents. The necessity of such skills is not unique to Maryland or the teacher education program at SMCM, but essential to teachers in all locales, of all subjects.

Creation of the electronic portfolios

The Educational Studies faculty and staff at St. Mary's College of Maryland employ a best-practice approach to technology training. Learners in the teacher

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education program who decide to create electronic portfolios are first taught to organize and manage their digital assets. Students create an electronic "sandbox" to store their digital assets. This file structure is named a sandbox because this is where they "play" with their assets – editing, compressing, and manipulating them until they are ready to be put into the directory structure of their electronic portfolio sites. Student sandboxes are organized in the same way as their electronic portfolios: by Danielson's domains. Within each domain folder, students place their assets in subfolders named for the type of asset, whether audio, video, document, image, or presentation.

Storing assets in the appropriate folders is just the beginning of digital asset management. Students are also taught to clearly label assets so they can be retrieved easily. In addition to assigning a file name indicative of the asset, such as "readlessonplan.pdf," students are encouraged to include the domain, in case assets get misplaced. Following this standard, an item named "d1_readlessonplan.pdf" could be quickly identified as a reading lesson plan to be included in Domain 1 (note that some digital assets may be illustrative of more than one domain). After students have learned the basics of effective digital asset management, they are supported with "just-enough-in-time training" to digitize their assets. This style of training addresses the specific needs of students by providing learning experiences as they are needed and as individuals are ready for each new skill.

Rather than teaching all candidates creating electronic portfolios the same technology skills, SMCM support staff spends time with individuals and small groups of students providing need-based instruction and guidance on a variety of technology skills. Some of the more common skills that pre-service teachers learn when creating their electronic portfolios are scanning, editing digital video, manipulating digital images, capturing digital audio, and using digital cameras. Teacher candidates use applications that are the product standard and preferred design process when working with their digital assets. Sample applications include Adobe PhotoShop, Quicktime, and Macromedia Dreamweaver.

The electronic portfolio templates were created using Dreamweaver. After compressing their digital assets to make them web-ready, students are taught to create asset pages using these templates. Assets are inserted in asset pages and linked to the appropriate domain page. Asset pages include captions or short explanatory narratives accompanying images, audio, and video. Similar to TESH's student electronic portfolios, SMCM electronic portfolios contain educational philosophies and examples of teaching and learning and are published to the web.

Teacher candidates' experiences with electronic portfolios in the field

The creation of electronic portfolios has had mixed success for students in the SMCM teacher education program. After learning skills necessary to create an electronic portfolio, students become extremely proficient using technology and are eager to apply their new skills in the classroom. Unfortunately, often the technological infrastructure in the schools where they student teach, and later are employed, does not support the same level of technology implementation.

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Formative data analysis further supports this observation. Each semester, students in the teacher education program take the Level of Technology Implementation (LoTi) survey designed by Moersch (2001). Through a web-based self-administered questionnaire, the LoTi estimates "the use of technology as an interactive learning medium" (Moersch, 2001) and assigns a LoTi score, 0-6. A score of zero indicates a teacher showing a "perceived lack of access to technology-based tools (e.g., computers) or a lack of time to pursue electronic technology implementation. Existing technology is predominately text-based (e.g., ditto sheets, chalkboard, overhead projector)" (LoTi Breakdown, Non-Use, ¶1). A teacher performing at Level Six perceives technology as

> a process, product (e.g., invention, patent, new software design), and/or tool for students to find solutions related to an identified 'real-world' problem or issue of significance to them. At this level, there is no longer a division between instruction and technology use in the classroom. Technology provides a seamless medium for information queries, problem solving, and/or product development. Students have ready access to and a complete understanding of a vast array of technology-based tools to accomplish any particular task at school. The instructional curriculum is entirely learner-based. The content emerges based on the needs of the learner according to his/her interests, needs, and/or aspirations and is supported by unlimited access to the most current computer applications and infrastructure available. (LoTi Breakdown, Refinement, ¶1)

When a recent group (January 2000) of pre-service teachers took the survey prior to their professional semester of full-time student teaching, 45.5 percent of the students were performing at or above Level 3 as applied to their Current Instructional Practices component of the LoTi. In December 2000, after their student teaching experiences, the group took the survey again. Only 4.5 percent of the teachers were performing at or above Level 3. A teacher performing at Level Three typically meets the following description:

> Technology-based tools including databases, spreadsheet and graphing packages, multimedia and desktop publishing applications, and Internet use complement selected instructional events (e.g., field investigation using spreadsheets/graphs to analyze results from local water quality samples) or multimedia/web-based projects at the analysis, synthesis, and evaluation levels. Though the learning activity may or may not be perceived as authentic by the student, emphasis is, nonetheless, placed on higher levels of cognitive processing and in-depth treatment of the content using a variety of thinking skill strategies (e.g., problem-solving, decision-making, reflective thinking, experimentation, scientific inquiry). (LoTi Breakdown, Infusion, ¶1)

This decline was largely attributed to different standards for the technological infrastructure in the K-12 settings, including computers that are older and slower than what the students use on campus, fewer available peripherals than at campus computer labs, and sluggish dial-up Internet connections. Such trends are not unique to SMCM's student teachers and their experiences in local K-12 schools. Solomon (2002) describes the digital divide that exists nationally in K-12 schools:

Electronic Portfolio, continued

(Schools) that began purchasing computers many years ago or that have limited resources may be using older equipment with less capability. The sheer size of their investments in technology and infrastructure prevents them from tossing the old and bringing in the new in a time frame that would allow them to take advantage of recent advances. (p. 18)

In keeping with this statement, it is apparent that classroom technology integration is somewhat insufficient in Maryland schools. A recent Maryland State Department of Education Technology Inventory reported that only 70% of MD school staff demonstrates "intermediate" technology integration, being able to "integrate applications in some activities, and can help students use technology" (MSDE, 2002). Despite this discouraging finding, other data from the same report indicates that a lack of technology infrastructure is not the root of the K-12 classroom technology integration problem:

> The digital divide exists, but is less at the technology infrastructure level. The digital divide widens significantly with the progression from technology infrastructure towards effective use, application and full integration into classroom curriculum. Considering this information, more thorough training of pre-service and in-service teachers in appropriate classroom applications of technology will result in more effective and frequent integration. (MSDE, 2002)

At SMCM, students in the teacher education program are taking advantage of opportunities to practice integrating technology in the K-12 classroom. With the help of a United States Department of Education Grant, Preparing Tomorrow's Teachers to Use Technology, (U.S. Department of Education Grant#P342A010037) the second group of student teachers to go through the St. Mary's program found innovative ways to integrate the technology they had learned while creating electronic portfolios in their K-12 classroom lessons. Each student was issued an Apple iBook laptop to use during their student teaching semester beginning in August 2001, and an additional Instructional Technologist was hired in the educational studies department.

These resources resulted in advanced scores on the LoTi component of Current Instructional Practices, with the new cohort scores jumping from 37.5 percent to 50.0 percent assessed at or above LoTi level 3. It is the expectation of the Educational Studies Department at the college that their students' LoTi levels will continue to increase over time. Beginning in the Spring 2002 semester, students applying for student teaching during the following fall semester were given the option to enroll in a Technology in the Classroom course to learn ways to effectively use technology in the K-12 classroom, including creating WebQuests and selecting and integrating age-appropriate software. Most of the students opted to take the course and were issued an iBook for the semester to support their classroom efforts.

It was during this same semester that the majority of students enrolled in Technology in the Classroom took courses that required approximately five hours of classroom visits in the classroom where they were placed for student teaching. When students visited the K-12 classrooms, they were able to see the potential

Electronic Portfolio, continued

application of instructional techniques they were learning in Technology in the Classroom. Several students from this group also elected to take a summer 2002 independent study course focusing on the creation of electronic portfolios.

Creating electronic portfolios has had positive outcomes beyond increasing pre-service teacher integration of technology in the K-12 classroom from the standpoint of graduates of the teacher education program at St. Mary's College. These pre-service teachers have found that they are more marketable to potential employers because they can serve as technology resource personnel in K-12 schools.

Often, classroom teachers are called on to provide technological support and aid to other teachers in their schools, and these pre-service teachers who have learned the skills necessary to construct electronic portfolios can do this. They are also prepared to be advocates in the school system for adopting and procuring appropriate classroom technology in the K-12 school. When one recent graduate of the program took her electronic portfolio to an interview with an elementary school principal, she reported that he was "blown away by my ePort! He was just as interested in how I'd made it as he was in the content of it." Additionally, new teachers who have created electronic portfolios are already meeting new technology standards, such as the Maryland Teacher Technology Standards as a result of learning the skills necessary to construct an electronic portfolio.

Teachers who create electronic portfolios are likely to utilize more performance-based assessment with their learners. Although all K-12 students may not be ready to create electronic portfolios using Dreamweaver, they can still learn to create multimedia presentations using applications such as Hyperstudio and PowerPoint. As with teachers' electronic portfolios, students' multimedia presentations are not dependent on Internet access. Schools that do not have high-speed Internet connections are just as able to support multimedia production stations for student and teacher use. Teachers and learners can use a variety of multimedia applications and hardware to create presentation portfolios, publishing them to the Internet when their school becomes connected. At SMCM, students creating electronic portfolios view them in an Internet browser during the production stage, but do not publish their electronic portfolios on the Web until they are finished. Some choose never to publish them to the Internet for privacy reasons, using compact disc copies of their portfolios to share with potential employers.

Other uses of electronic portfolios

The use of adaptations of electronic portfolios for assessment has spread across campus at SMCM to include seven departments and approximately 20% of the student body. Although the project started as a means for student teachers to showcase their teaching skills and philosophies, it has reached a variety of disciplines on campus. SMCM students and faculty in several disciplines have adapted the original templates to meet their needs, deviating from Danielson's (1996) domains as appropriate. The college administration is even considering the adoption of electronic portfolios as an alternative to traditional paper portfolios as an evaluative tool for faculty promotion and tenure. The ePortfolio structure and www.vste.org

Electronic Portfolio, continued

templates were adapted to be used as a platform for collecting Writing Center tutor and student writing samples.

Biology students utilized the electronic portfolio templates and wireless iBooks to document their research projects at Turneff Atoll, Belize during the spring of 2002. Each of the 5 groups (2-3 students each) designed, conducted and documented a field experiment to investigate various biological and ecological processes. A class website was established on an instructor iBook and made available to all of the students via a wireless base station in the field. All data collected by each group was entered into the electronic portfolio templates on the group's iBook and posted on the class website. Digital images, video and audio of the terrestrial and aquatic environments were collected and posted on the class website in the field for utilization as study aids by the students. The field Web site was subsequently transferred to the main campus web servers upon return to campus.

Visiting students from Shanghai, China (summer 2001, 2002) created electronic portfolios to document their progress and experiences during a six-week intensive study of English as a conversational language. Students were expected to use the target language, English, while learning how to enter and manipulate text, images, audio and video electronically in the electronic portfolio templates. Each student portfolio was continually updated and posted on the campus web server to provide friends, family and colleagues back in Shanghai an opportunity to monitor the progress of the students.

By using Danielson's Framework for Teaching as a basis for the organization of electronic portfolios, pre-service teachers at St. Mary's College of Maryland exemplify both their classroom competencies as well as their ability to create a performance-based assessment tool in a way that has universal appeal. They also demonstrate their technological talents as they showcase their work in a multimedia format. As these students move into the professional world as classroom teachers, they will likely integrate performance-based methodologies in their lessons and assessments.

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Amy Keefe, Ed Kobrinski, Phyllis Keen, and Chris Mattia are members of the PT3 project team at St. Mary's College of Maryland. Christopher Moersch is the external evaluator for the grant. You can contact the lead author, Amy Keefe, at adkeefe@smcm.edu.

Technology in Education
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One Day in The Life of A Victim

by Sharon Hurwitz

The following article, submitted by the recipients of the VSTE 2002 Mini-Grant award, describes the activities of two teachers at Bethel High School (Hampton, Va.) as they engaged their students in an innovative project that helped them learn about prejudice and victimization. For more information about VSTE mini-grants, see: http://www.vste.org/community/minigrants.html

"Sticks and stones may break my bones, but words will never hurt me."

As teachers and parents, we often teach this saying to our children, hoping to counteract the negative and hateful words they will encounter during school. But words can hurt when they are used to criticize a child for their physical appearance, their sexual orientation, or their racial background. It is because of this pervasive taunting in our urban high school of 2000 that the reading specialist and I, a former English teacher and now school-based technology specialist, decided to create a project that could be used by English teachers and/or social studies teachers. It had to be engaging, had to involve reading and technology, and had to help them become aware of another person's values, experiences, and way of life. We chose the WebQuest.

The WebQuest is an inquiry-centered or problem-centered activity in which students interact with information they have obtained primarily from resources on the Internet. Bernie Dodge of San Diego State University is credited with being the "Father of the WebQuest." The WebQuest gives students freedom to learn using multiple learning styles, thus keeping them actively engaged. Most WebQuests follow a pattern or template, giving teachers a useful and easy way to develop them.

They contain two major subdivisions – a student section, which takes the students through a series of interactive activities, and a teacher section, which gives teachers all they need to know in order to help their students. In the student section, students log onto the Internet (http://www.sbo.hampton.k12.va.us/webquest/index.htm), find the WebQuest site, and follow the directions. After reading an introduction, they are asked to do a series of activities, which usually include researching information on the Internet and developing a project, which can be shared with the class. There is often an evaluation component within the WebQuest so students know exactly what is expected of them.

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One Day, continued

In One Day in The Life of A Victim, students read an introduction about how prejudice leads to people being victimized. They are then directed to a page, which describes several young adult novels about young people being victimized because of their race, religion, physical or mental handicap, or sexual orientation. Students choose one novel to read, and everyone reading the same novel works together in a group to finish the activities. They conduct research about the group being victimized, which is then used to develop web pages.

The first time we did this project with 54 developmental reading students, they created a quilt with each square showing their feelings about respect of diversity. The second time, we had the students create iMovies showing their feelings. We were able to do this because VSTE provided us with the funds to purchase a digital movie camera.

Students loved doing this project because it gave them choices – which novel to read, which activities, and which culminating project. They were able to work in groups, which reduced their fear factor of using new technology (Like they were afraid! We were more afraid than they were – they just jumped right in!). And they learned from the experience. Students wrote with sensitivity and a newfound tolerance of differences in others.

After the Project

As happens with all good projects, every project has a life of its own. As we learned more about the use of iMovie and as we introduced it to students, they bragged about what they were doing to other students and teachers. We started getting requests from teachers on how they could use the program with their students and in their content. We were able to come up with the following activities.

- All About Me – The AVID class created an iMovie to tell about their program.
- Sheroes from Herstory – After reading biographies about famous women in history, students created iMovie slide shows about their subjects.
- Interpretation of a Theme – Students in the video club were studying theme and chose to create an iMovie depicting Patriotism. They used scanned pictures from newspapers (9/11), video clips, and patriotic music to compose their movie.

What We Learned

Imovie is a versatile and exciting tool that will engage students in the analytic process. They spent more time on picking out the exact pictures and music to fit their theme or subject. They spent hours editing their features to make sure the timing was perfect. In a word, they loved iMovie.

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