

PUBLIC EDUCATION AND TECHNOLOGY:  
A MUST FOR OUR CHILDREN'S FUTURE

By:

Gail Aadland, Andrea Carter, Jennifer Cudmore, Shawn Gale,  
Crystal Jilbert, Kirk Roberts, Terri Szramek, Kathy Weise

For:

ECOMP 6101  
INSTRUCTOR: GEORGE BLAKESLEE

JULY 2005

## TABLE OF CONTENTS

<u>Category</u>	<u>Page</u>
Technology and Students .....	3
Assistive Technology .....	6
Technology and Teachers.....	8
Technology and Parents .....	9
Technology and Community .....	10
Success Rates of Technology .....	11
Teacher Technology Examples .....	17
WebQuest Technology Examples .....	18
Assistive Technology Examples.....	19
Pro Technology .....	20
References .....	22

The Public Education system needs to incorporate technology in order to advance learning, as proposed by the authors and others. Our paper will focus on several areas that have experienced success as a result of technology in the schools. Technology and public education must go hand in hand; without technology, how can learning even occur in the 21<sup>st</sup> century?

### Technology and Students

Teachers' access to personal computers at school and at home has increased to the point where, by 1998, 93% of teachers in grades 4-12 were using computers as a part of their professional lives (Becker, 1999). A majority of teachers now have a computer in their classroom and nearly 80% have one at home. Most teachers find computers useful for preparing handouts for lessons, recording students' grades, and doing other work of knowledge professionals. However, what is most significant about teachers' involvement with computers is not their own professional use, but the role teachers play in directing students' use of this still-maturing and rapidly changing technology.

In order for technology to effectively promote engaged learning for all students, certain elements inside and outside the classroom must be in place. Technology is a tool that gives everyone an equal chance to learn. Given its significance in national and local policy, the first issue concerns equity, or the goal universal participation. Universal participation, as a policy goal, means that all students in all schools have access to and are active on the information highway in ways that support engaged learning.

Technology will have the greatest impact on students when integrated into the curriculum to achieve clear, meaningful objectives. Central to this change in expectations for student learning has been an acknowledgment of the complexity of three key factors that must be considered in evaluating the impact of technology on student achievement (Porter, 2003):

- The term *technology* refers not to simply one type of technology but to a wide range of electronic materials and methods for learning. It can apply to the use of computers

in education, but it also can apply to video production and distance learning classes.

Each type of technology has different uses and fulfills different learning goals.

- Assessing the effect of technology on student achievement is a complex process.
- Changes in the classroom correlate with changes in other educational factors as well.

The keys to raising student achievement are to provide students with a solid foundation to motivate them to learn. As each school becomes comfortable completing instructional and technical projects, the school begins to reach out and utilize its technology skills to impact the community. A shift has taken place in recent years from teaching technology to focusing on using technology to support curriculum. It can no longer be looked at in isolation but rather as a planned program of school change as it relates to students. Technology can broaden the range of students' thinking. Students routinely use technology tools to find information and interpret data and present results.

Utilizing technology to support the curriculum is much more of a challenge than teaching technology in isolation. When considering the use of technology in the classroom, one must be clear about why the technology is important and how it is going to facilitate and enhance learning for all students. The Department of Education addressed these questions in an article titled "Technologies Impact on Learning" (1995). This article clearly states that technology can enhance the achievement of all students, increase families' involvement in their children's schooling and improve teachers' skills and knowledge. Technology enhances student achievement in both the areas of advanced and basic skills as follows:

- Basic Skills
  - Multimedia used to teach many learning styles
  - Audio/Video brings the material to life
  - Distance learning brings the world to the student's doorstep
- Advanced Skills
  - Internet and CD ROMs are used for research purposes
  - Organization of complex information and recognition of patterns
  - Enhance the ability to draw inferences
  - Enhance organizational and problem solving skills

Individual ten-year studies conducted by Apple and The Department of Education showed overwhelming similarities in their results when students are provided with a technology-rich environment:

- Performed better on standardized test scores
- Explored and represented information dynamically in many forms
- Expanded social awareness
- Became more confident, independent learners and self-starters

Education Department study showed many of the same results as the Apple assessment:

- Improved test scores
- Improved attendance
- Increased student comprehension
- Motivation, attitude
- Increased comprehension

Technology leads to the above successes because of its versatility. The use of technology in the classroom allows the teacher and the learner to tap into all seven of Howard Gardner's Intelligences. This gives the teacher the opportunity to teach to all learning styles.

In 2000 the state of Maine recognized the importance of not only teaching technology, but also more importantly integrating it throughout the curriculum. What is known as the Maine Learning Technology Initiative (or MLTI) was implemented throughout the state to assist the growing need of integrating technology into the classroom. This program provided every seventh grader with a laptop to not only use while in the confines of the school but to also take home to assist with homework. This program impacted learning by improving flexibility within the classroom and giving students and teachers the ability to work within the following parameters:

- With the laptops the students are more likely to get their ideas down quickly so that they can go back to organize and revise their work at a later date
- Students are highly engaged in learning because they are motivated by the use of the computer
- The use of the laptops gives the students immediate feedback
- The laptop allows for differentiated instruction
- The lower students have more opportunity for repetitive practice and use of visuals
- The students in the middle of the class can talk about the lesson until they thoroughly understand the concepts

- The higher students can work at their own pace

The state of Maine is not the only state that felt the need to implement a complete technology overhaul. The New York State Department of Education devised a three-year, \$14.1 million plan to integrate computer technology and teacher training into 55 school districts. This project adds enough computers to bring the student to computer ratio from 24:1 to 7:1. Student assessment is the key to determining if classroom technology integration is an effective teaching tool. Many departments of education have invested millions of dollars into technology and technology training for classroom teachers.

The outcome of the New York State project reflected a 7.5% increase in the Regents Math Exam and an 8.8% increase in the Regents English Exam. In the elementary level there was an increase in the 6<sup>th</sup> grade math exam, although this information is inconclusive because in order for an accurate percentage the technology would have had to be withheld from a sample group of students (Mann, Schafer, 1997).

Utilizing technology in the classroom not only enhances student learning by increasing motivation, test scores, giving students the opportunity to work at their own pace, and to learn new communication techniques with people from all over the world, but it also prepares them for the future. For some students the future may mean higher education and for others it may mean preparation for the workforce. In this day and age computers and technology is infused into all aspects of everyday life—from the classroom to the home and in the workforce. The ultimate goal of educators is to assist in providing students with the tools and skills necessary to succeed in future endeavors, and in today society future endeavors undoubtedly mean the use of technology in some form.

### Assistive Technology

Student use of technology is not limited to desktop computers, LAN-connected classrooms and educational software. Some students require technology to function in a classroom and fit in like their peers; this is in reference to students that have special needs. Whether technology is

mandated by an IEP (Individual Educational Plan) or used by a teacher to modify the educational process for a struggling student, Assistive Technology (AT) is an asset. Assistive Technology is defined as “a device, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of a child with a disability” (Bowser, 2000). “In education, this increasingly refers to computer-related applications” ([www.enablingtech.ie](http://www.enablingtech.ie), ND). As of 1997, assistive technology became a part of the Individuals with Disabilities Education Act (IDEA) making it a law for school districts to provide special needs students with assistive technology. A district can no longer fail to provide technology to students, at least those with disabilities. Districts and individual schools now need to budget and set goals for educational technology integration so that all students have an equal chance at educational success.

Schools need a technology budget and to include technology integration as a resource for students. Schools all over are now able to offer assistive technology; as a result, special needs students benefiting from the inclusion of technology are doing today what their counterparts a few years ago never could imagine doing (Curtis 2005). Many special needs students spend most of their educational career feeling inferior to their peers. Imagine the feeling of success a struggling student can achieve with the use of assistive technology? It's something many of us take for granted.

Technology used by students is an enhancement to the curriculum and what the students are learning. Technology for special needs students is often the only way to bridge the gap between success and failure. The integration of technology in schools is not just a nice idea; it is a 'have to' for some students and with the modifications to IDEA in 1997, it has become law. The examples below listed under “Assistive Technology Examples” show how technology has enhanced the educational experience for students that have special needs. Without technology integration, these students would not be able to experience classroom or learning success; the

modifications that technology gives to them helps increase their learning potential. All of our students deserve a fair chance at success.

### Technology and Teachers

Not only does technology help increase the value of the education a student receives, it is also beneficial to educators. Technology helps increase lesson plan value, makes administrative tasks more efficient, and helps with professional growth (Herdman, 1995). Resources available to teachers are endless. Listed below are just a *few* of these:

- Internet access to unlimited lessons plans to help enhance daily lessons
- Internet access to bring the world into the classroom
- Software that can be used in conjunction with the textbook
- New textbooks that provide Internet activities for students
- Digital cameras, video recorders, scanners, and other new hardware items that allow teachers to train students on how to boost projects to make them more meaningful and impressive
- Test generator software
- Internet grading systems that allow students and parents immediate access to graded assignments/tests/grades
- Word processors to increase the professionalism of reports
- E-mail to receive timely reports and information
- Online courses to further education
- Online student portfolios

"Teachers may be forgiven if they cling to old models of teaching that have served them well in the past. All of their formal instruction and role models were driven by traditional teaching practices. Breaking away from traditional approaches to instruction means taking risks and venturing into the unknown. But this is precisely what is needed at the present time" (21<sup>st</sup> Century Learners, 2002). What this statement implies is that it is vital for teachers to not continue to "do it the way it has always been done." More importantly, we can prepare our

students for futures that involve technology—whether it is a mechanic, nurse, engineer, teacher, etc., by creating a foundation they can build off of. Technology is not a passing fad; as educators it is important to embrace it and make it meaningful and useful in the classroom. “Our children can’t wait. The future is now. We need to be preparing them for a future that few of us can even visualize” (Edwards, 2004). If the effort of the school district is based on limiting technology, then this same district is providing a disservice to the community.

"Education is the only business still debating the usefulness of technology. Schools remain unchanged for the most part, despite numerous reforms and increased investments in computers and networks" (Paige, 2004). Perhaps this type of logic will change as more educators enter the profession prepared for technology to be an integral part of the job. There is no basis for technology to be hurtful in the classroom. Technology is a tool to be used to enhance learning. It does not replace the teacher in the classroom; it enhances the learning environment. With technology, educators can create engaged learners who are excited about education!

### Technology and Parents

Children and young people are among the most active citizens of the new era of the information age. Often, children are the first in their family to make use of and master the new technology. Computers and technology are here to stay and that is changing the way young people learn, play, and get ready for their future work life. Children are increasingly using new technologies in their schools, libraries, homes, and communities. Information literacy skills are increasingly being expected of young people. Young people fluent in information resources will likely have advantages in the workplace. The Children’s Partnership Organization published an Internet article entitled, *What’s at Stake? —Why Computers Matter to Your Child*. This article outlined the following statistics: In the decade of the 2000s, an estimated 60% of new jobs in America will require technological skills and computer know-how; workers with computer skills earn 10-15% more than workers without these skills; in May 1997 nearly 10 million children

were online—a five fold increase from fall 1995; and 89% of parents believe that computer skills are important to their child's educational success (Schacter, 1998).

Parents can and want to help their child(ren) become more technologically literate. Research has shown that family involvement in a child's education is one of the most important ingredients for success (Children's Partnership, 1998). Here are some ways that parents can help their child(ren) become more technologically literate:

1. Parents need to check that their child's school has and is making use of the appropriate technology to enhance each child's learning. Schools need to be integrating technological resources that are available to them to help close the learning gap between children who are prepared for information-era jobs and those who aren't (Learning Partnership).
2. Parents need to be aware of their child's online activities to ensure that they are involved with sites that are fun, useful and safe. Parents should share the experience of going on-line with their child and using the Internet to be a medium of rich learning opportunities.
3. Parents should be a child advocate for all children in the community by checking on the educational and technological resources available within the community library, boys'/girls' clubs and other local agencies that serve the needs of children.

### Technology and the Community

But parents are not the only adults that should advocate for improved learning opportunities through technology. School board, city council, county, state and federal elected officials also need to be involved and aware of the technological needs of the community as a whole.

Student use of technology for school does not occur in a vacuum. Student's experiences and those of their states, districts, schools, teachers, and parents strongly affect how the Internet is adopted for use in schools (Levin, 2002). Community and local companies can do their part to create or sponsor content or information sites aimed directly at kids of all ages. Classes could be offered through a local agency such as adult education or the library to educate families and

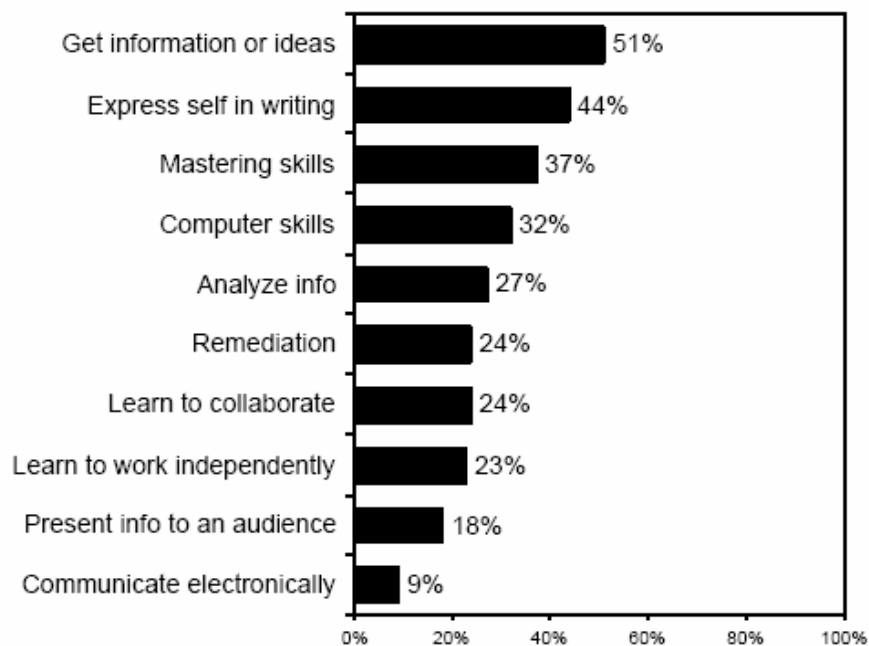
community members about technological literacy. Schools and community agencies should address the learning gap created by those who have the technology and those who do not. Technology resources should be a priority made available to the community as a whole.

Students with a rich background in technology use are coming to school with different expectations, different skills, and access to different resources than their peers who do not have the background in technology (Levin, 2002). School district personnel should regard the current research on successfully developing, evaluating, studying, and implementing a wide range of technology-based education programs (North Central Regional Educational Laboratory, 2004).

Technology and Success Rates

Looking at teachers’ primary objectives for computer use can illustrate how teachers are utilizing technology. The most popular use for computers among the surveyed teachers was research. “There is a strong relationship between teachers’ general philosophical viewpoint about what constitutes good teaching and the particular objectives they view as most central to their use of computers with students” (Becker, 2000).

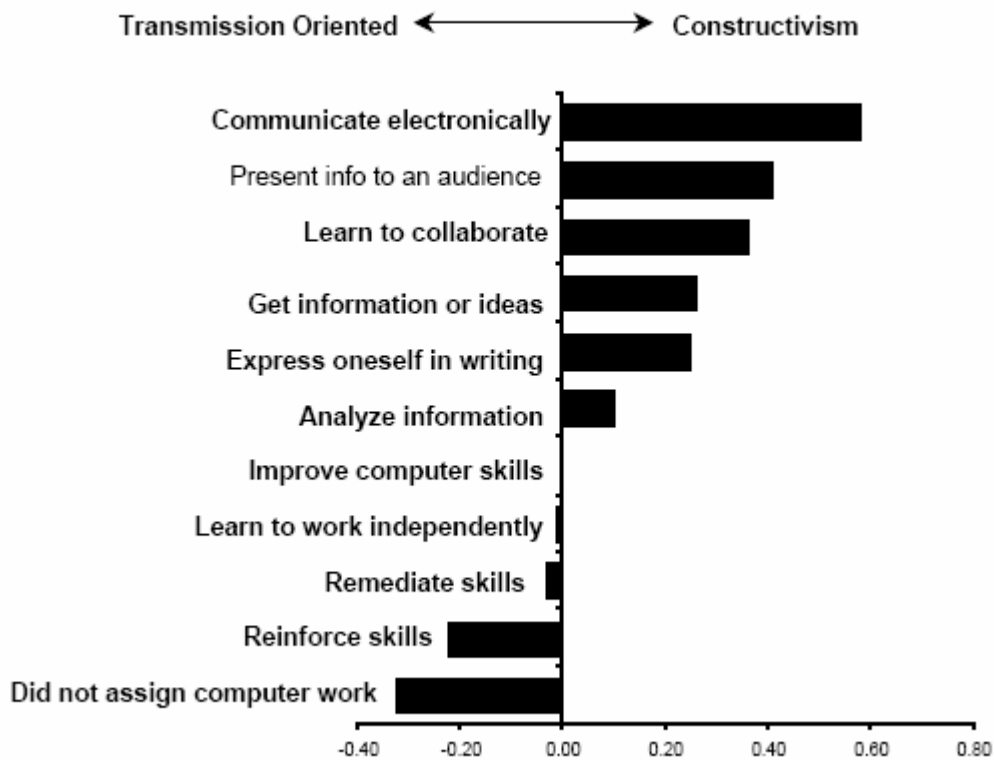
**Figure 7**  
**Teachers’ Primary Objectives For Computer Use**  
**(% of Teachers That Report the Following Objectives As Among Their 3 Most Important)**



Sample: Probability sample; teachers who used computers with their selected class.

Figure 8 shows the difference of computer use based on teaching style. Teachers that fall into the “transmission” style, for the most part, did not assign computer work. The “transmission” teachers that assigned computer work focused on reinforcing skills and remediation. Teachers that are more “constructivist” in their approach mostly used computers to communicate electronically, present to an audience, and learn to collaborate (Becker, 2000). When looking at the success of technology in the classroom, teaching styles need to be taken into account. If a group of teachers that are not using the technology provided or only using it for reinforcement and remediation, results will be skewed.

**Figure 8**  
**Objectives For Computer Use Are Also Linked To Teaching Philosophy**  
**(Transmission Oriented vs. Constructivism)**

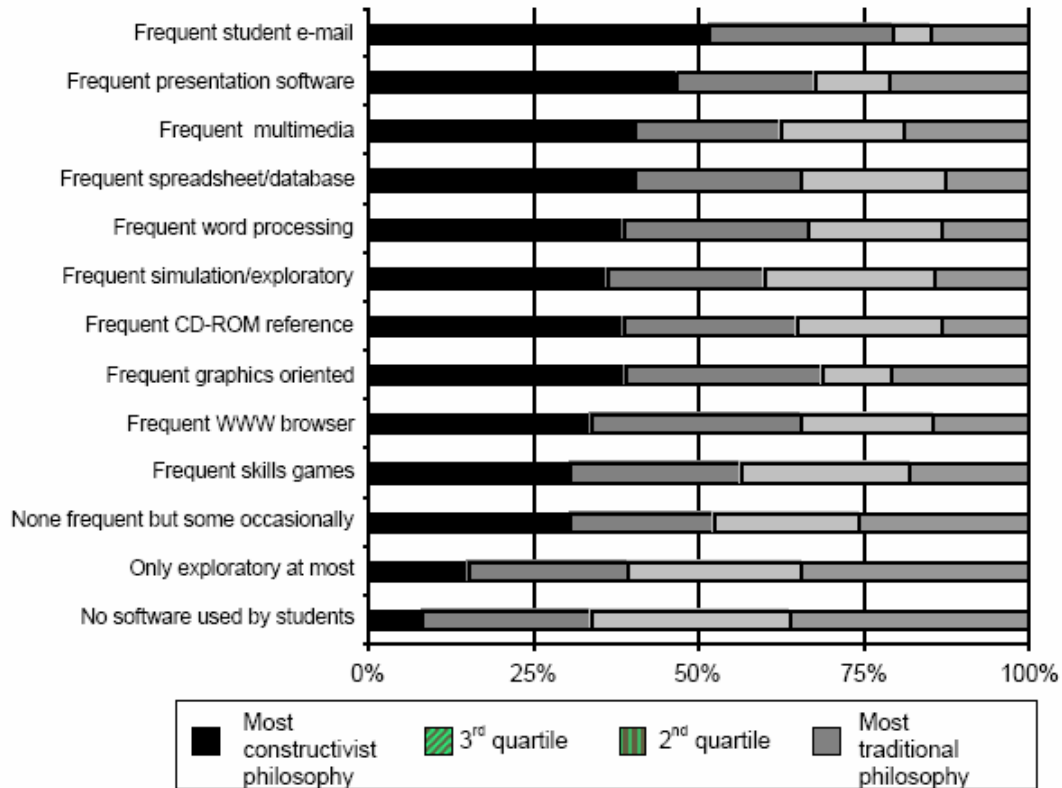


Sample: Probability sample; teachers who used computers with their selected class.

Figure 9 elaborates on the information found in Figure 8. The computer use is broken up by software by teaching philosophy. The chart confirms that “transmission” teachers and

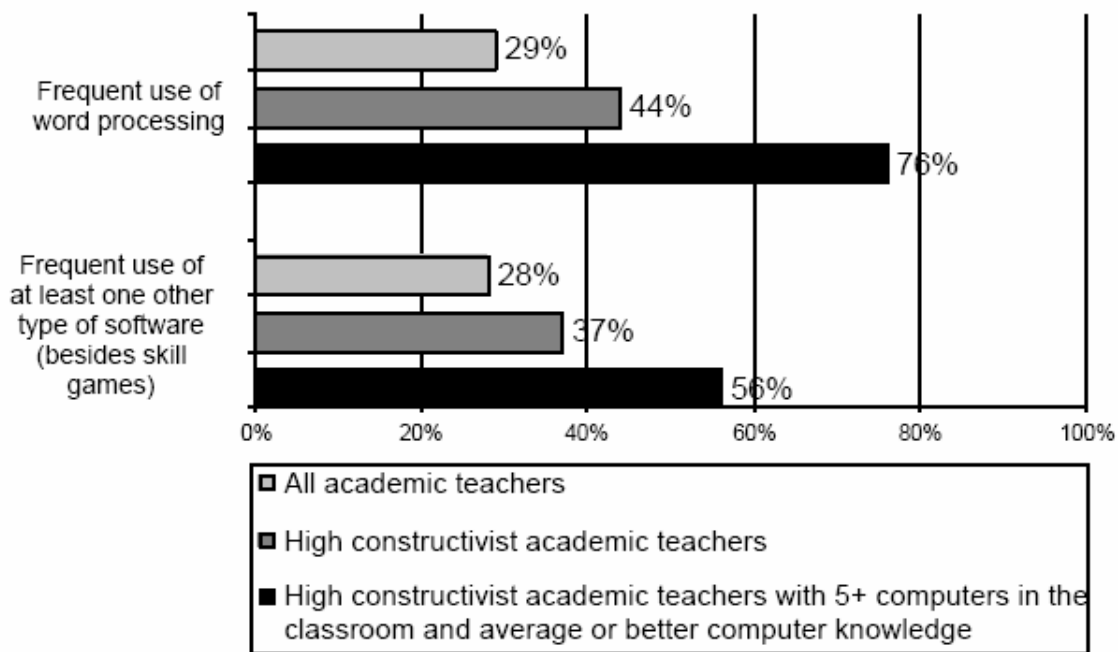
“constructivist” teachers are almost polar opposites. It also illustrates that software that promotes critical thinking and collaboration is rarely used by “transmission” teachers. This information should further help clarify the correlation of teaching styles and effective uses of technology.

**Figure 9**  
**Frequent Use of Software (In 10+ Lessons)**  
**by Teaching Philosophy**



There is a massive difference in computer use between constructivist teachers with five computers in their classrooms and constructivist teachers that do not have five computers in the classroom (Becker, 2000). Figure 10 displays the increased computer usage when systems are more convenient for regular student use. The increased use occurs in word processing and non-game computer software. This increased use is important in raising student achievement.

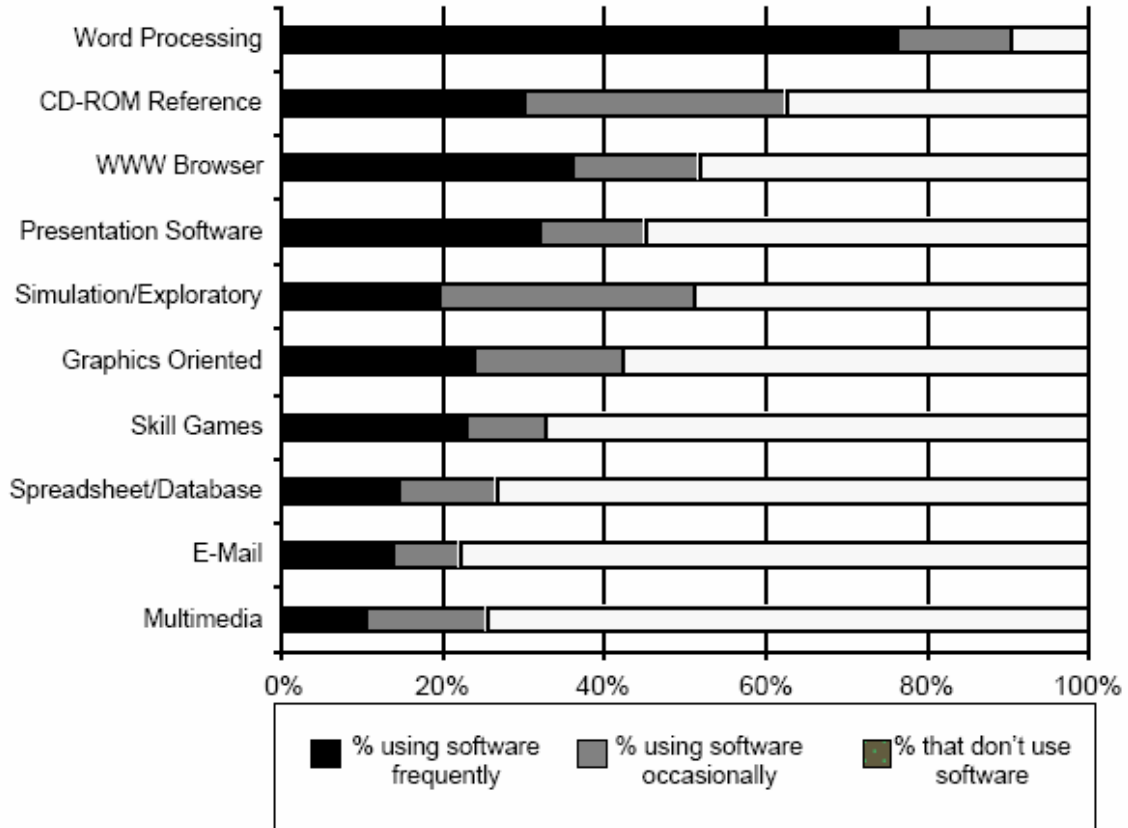
**Figure 10**  
**Frequent Use of Software by Facilitating Condition**



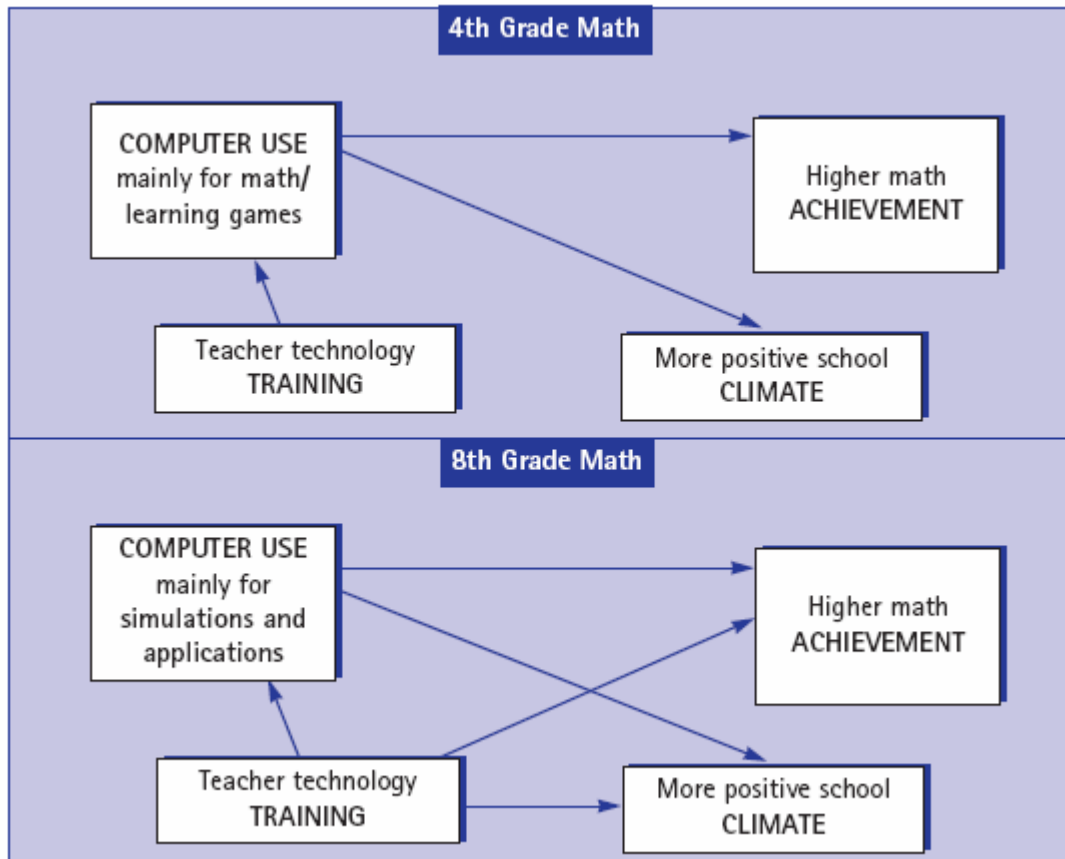
Sample: All academic teachers in probability and purposive samples.

Figure 11 shows that computer use amongst constructivist teachers with average or better computer knowledge and five or more computers in their classroom is substantially higher than the teachers with little or no computer knowledge (Becker, 2000). There is a definite pattern that develops around computer usage. Teachers with convenient access to computers are more likely to have students use the computers on a regular basis, and constructivist teachers with convenient access to computers are most likely to have students use the computers on a regular basis. The quality of the computer usage is related to the teacher's philosophy. Constructivist teachers are more likely to provide students with meaningful interactions with technology.

**Figure 11**  
**Software Use Among The Most Constructivist Quartile of Secondary Academic and Elementary Teachers Who Have 5+ Computers in the Classroom and Average or Better Computer Knowledge**



In Wenglinsky’s National Study of Technology’s Impact on Mathematics Achievement it was found that “eighth-grade students who used simulation and higher order thinking software showed gains in math scores of up to 15 weeks above grade level.” Higher order uses of computers and professional development for teachers are related to the academic achievement of both fourth- and eighth-grade students in the area of mathematics (Wenglinsky, 1998).



SOURCE: Educational Testing Service, "Does it compute?" an analysis of 1996 National Assessment of Educational Progress.

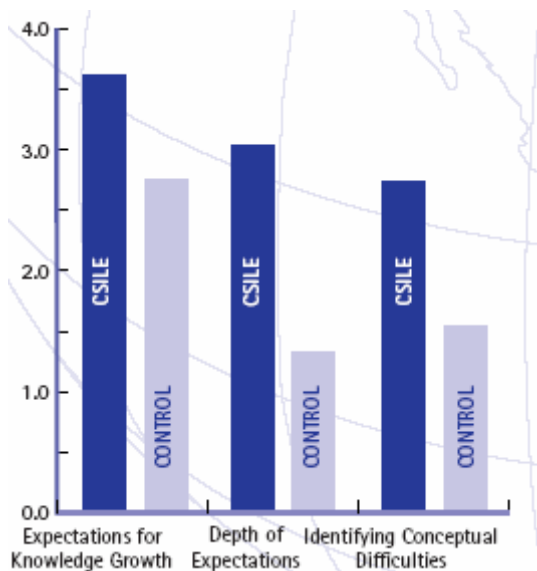
## 6. Scardamalia & Bereiter's Computer Supported Intentional Learning Environment (CSILE) Studies

Recent advances in networked technologies are making working on a computer a social and collaborative enterprise. Marlene Scardamalia and Carl Bereiter's (1996) Computer Supported Intentional Learning Environment (CSILE), the most widely studied collaborative computer application in schools today, had entire classrooms of children conceive, respond to, and reframe what is said and written over time on computers. CSILE students ask questions, search for other students' answers to their questions, comment on and review other students' work, and then restructure and formulate answers to their original inquiries. Eight years of research on CSILE has demonstrated that:

- CSILE students surpass students in control classrooms on measures of depth of understanding, reflection, and also on standardized reading, language, and vocabulary tests.
- CSILE maximizes student reflection and encourages progressive thought, taking multiple perspectives, and independent thinking.

The advances in networked technologies make computer work full of social and collaboration opportunities (Scardamalia and Bereiter, 1996). The following chart illustrates the success of the Computer Supported International Learning Environment (CSILE). "CSILE

students surpass students in control classrooms on measures of depth of understanding, reflection, and also on standardized reading, language, and vocabulary tests.” CSILE also maximized student reflection and encouraged progressive thought, exploring multiple viewpoints, and thinking for oneself (Scardamalia and Bereiter, 1996). The differences between the control group and the CSILE group are clearly illustrated in the chart found below.



### Examples of Technology for the Teacher

An excellent example of technology used as a tool to assist teachers, students, administration, support staff, and parents is an online grade book. Our district piloted this software during the spring semester of 2005 and the entire district will be using it this school year. Both students and parents have passwords to allow them access to their or their child’s grades. As soon as a teacher inputs graded assignments, it is reflected for the student. This helps the teacher from many standpoints—students have instant access to grades and missing assignments which eliminates the teacher’s need to provide this information via missing work printouts or other ways. Also, at the end of the term, all the teacher has to do is send the completed grades and they are submitted for report cards. This grade book can be accessed from any computer, so grades can be entered from home very easily. This helps the parents because

they no longer have to rely on their child providing them with the appropriate grades for assignments and test—they can check it out for themselves. It helps the students because they always know what the grade they are receiving is—it also provides a checkpoint for teachers in case they have entered an incorrect grade. It helps administration and support staff with the processing of report cards—they only have to print them. No longer do grades or disks need to be collected from staff and entered in—it's all done already. The time factor involved dramatically reduces the amount of time needed to manually figure grades.

### WebQuest Examples

Utilizing technology in the language arts classroom for something other than an expensive paper and pencil is almost unheard of in some classrooms; however looking at more constructivist uses of technology will assist any language arts teacher in the most beneficial use of technology. Gail's favorite use of technology for the language arts classroom is the WebQuest. She created a WebQuest for every literature study completed as a class. She discovered that her students are more motivated to read the book, because there is a project that requires them to know specific things that happen in the book. The students seem to feel more ownership of projects that give them choices and allow them to think for themselves. Several links for her students are provided to use to add to their project; however they are in charge of how the project turns out.

Two examples of these WebQuests can be found at [www.coralacademy.org/451](http://www.coralacademy.org/451) and [www.coralacademy.org/annefrank](http://www.coralacademy.org/annefrank). Creating a WebQuest can be somewhat time consuming, but the end results justify the time spent in preparation. Gail has found that projects that actively engaged students in the learning process alleviate hours of grading. When the projects are complete, she simply uses the rubric to grade the final project. The students see the rubric ahead of time, so their final grade is not a surprise. There are WebQuests available to use that other teachers have created at <http://webquest.sdsu.edu/>.

### Assistive Technology Examples

The 2004-2005 school year was the first time Shawn used assistive technology in the classroom to help a student blossom and be able to function more like her peers. Using an AlphaSmart 3000, Betsy was able to increase her application and skills in writing and written answer-type homework. The AlphaSmart 3000 is a laptop-sized word processing device that allows students to type text directly into the device, edit it, or send to a computer to a printer. Betsy, who had a writing process deficit, used the AlphaSmart to type stories, answers to essay questions, or complete spelling assignments in a timely manner. Previous to using the AlphaSmart, she would struggle for up to 20 minutes to write the answer for just one question. Writing stories at home were a nightmare for her. Her mother told me that since Betsy used the AlphaSmart starting in November there was an increase in her writing skills that could not have happened if she were required to have handwritten assignments.

Shawn has another special needs child that benefited greatly from this technology. He was able to work with the Special Education Department of his school to obtain an AlphaSmart for him to use with no problem. Our school had the budget to get some more AlphaSmart units, and Kieran is now able to have his own unit to use in school and at home. Again, the use of this technology makes a huge difference in how Kieran is able to function in the classroom. His IEP can now give him the least-restrictive environment using this technology to get his work done in class like his peers.

Lukas, a student at a Spokane High School had a dream: to play the euphonium in the school's band. However, a debilitating birth defect left him with limited use of his limbs. Since he couldn't participate in sports, he used band as an outlet for his creativity and energy. At first he could only play one note in the musical score. This meant he would sit and wait for his one note to come up, and then play it with all his heart. The band teacher, knowing that Lukas would love to do more, sought out the help of Robin Amend, a musical repairman and inventor. Amend's grandfather was able to play in a band with only one arm, so he took on this challenge

in a personal fashion. Soon after, Amend had developed a euphonium that had its valves operated by a joystick that Lukas could maneuver. Now Lukas can play all the notes he needs in the band (Curtis, 2005). Where would Lukas be without the inclusion of technology in school? Although he has a positive attitude and a winning personality, how long could he have kept up his hopes without the technology that provided him with the means to his dream?

One final example of the integration of assistive technology benefiting students is the use of the Kurzweil software Shawn uses to help struggling readers. This year he had one student that was to use the Kurzweil technology to help him read for comprehension in content areas. Ryan loved to use this program. He could take his textbook to the room that had the scanner and software. Then he would scan in the text to be read and pick a computer voice to read the text back to him. He would follow along in his book as he listened. Ryan liked it so much that his enthusiasm spread throughout the class and soon other students were asking to go with Ryan to “have the computer read to them.” It worked out great for me, too, since there were about five other students that were low readers and could use the Kurzweil to help them to prepare for tests.

The Kurzweil is effective because it can provide a method of reading that is multimodal. It can make the most of auditory, visual, and kinesthetic modes of learning to give the user a three-dimensional learning environment (Antonius, 2005). Students can use the Kurzweil software to improve their writing skills, also. This software allows the user to hear the computer speak what they are typing, view the piece they are reading as they type, or view their draft as they type and/or listen (Bridges, 2004). This software can and does benefit a wide range of learning difficulties.

### Pro Technology

As educators, there is a responsibility to ensure each and every student is prepared for life after school in the best way possible. In the 21<sup>st</sup> century, technology education is a must and a key to success. With the inclusion of assistive technology to the Individuals

with Disabilities Education Act in 1997, for many students technology inclusion has become law. By including technology in the education system, all students will be better trained for entrance to the workforce. Technology-savvy students will be contributing to better their communities with their knowledge. Including technology in the education system helps all: students gain beneficial skills, teachers have access to more tools, parents have better access to teachers and updates on their students, and communities have better prepared individuals entering the workforce. To ensure students the most opportunities in life, technology in school is a must.

## References

- (NA) (2002) 21st century learners: the need for tech-savvy teachers. Retrieved June 25, 2005, from [http://www.pt3.org/technology/21century\\_learners.html](http://www.pt3.org/technology/21century_learners.html).
- (NA) (2004) Supporting Writing Using Kurzweil 3000. Retrieved on July 12, 2005, from [ftp://ftp.setbc.org/pub/pdf04/supp\\_wrt.pdf](ftp://ftp.setbc.org/pub/pdf04/supp_wrt.pdf).
- (NA) (ND) Enabletech: guidelines for the use of assistive technology in education. Retrieved on July 12, 2005, from <http://www.enabletech.ie/>.
- (NA) North Central Regional Educational Laboratory. Critical issue: using technology to improve student achievement. Retrieved July 6, 2005, from <http://www.ncrel.org/sdrs/areas/issues/methods/technology/te800.htm>.
- (NA) The Children's Partnership. What's at stake? —why computers matter to your child. Retrieved July 6, 2005 from <http://www.childrenspartnership.org/pub/pbpg98/part198.html>.
- Antonius, K. (2004), web cast by Bridges Canada. Retrieved July 12, 2005, from [http://www.setbc.org/setbc/conf/docs/ka01\\_frame.html?refpage=/setbc/conf/docs/ka01.html](http://www.setbc.org/setbc/conf/docs/ka01_frame.html?refpage=/setbc/conf/docs/ka01.html) on 8 July 2005.
- Becker, H.J. (July 2000). Findings from the teaching, learning, and computing survey: is Larry Cuban right? Retrieved June 17, 2005, from <http://www.crito.uci.edu/tlc/findings/ccsso.pdf>.
- Bowser, G. (2000). Considering your child's need for assistive technology. Retrieved July 13, 2005, from [http://www.ldonline.org/ld\\_indepth/technology/bowzer\\_reed.html](http://www.ldonline.org/ld_indepth/technology/bowzer_reed.html).
- Curtis, D. (2005) Assistive technology: enabling dreams. The George Lucas Educational Foundation. Retrieved on July 12, 2005, from [http://www.edutopia.org/php/article.php?id=Art\\_1241&key=137](http://www.edutopia.org/php/article.php?id=Art_1241&key=137).
- Department of Education (1995). Technologies impact on learning. Retrieved June 23, 2005, from <http://www.nsba.org/sbot/toolkit/tiol.html>.
- Edwards, M. (2004). Toward a new golden age in american education: how the internet, the law and today's students are revolutionizing expectations. Retrieved June 25, 2005, from <http://www.ed.gov/about/offices/list/os/technology/plan/2004/index.html>.
- Herdman, R.C. (1995) Teachers and technology: making the connection. Washington, DC , US Government, Printing Office. Retrieved June 25, 2005, from <http://www.wws.princeton.edu/cgi-bin/byteserv.prl/~ota/disk1/1995/9541/954104.PDF>.
- Levin, D., Arafah, S. et al. (2002) Pew Internet & American Life Project. The digital disconnect: the widening gap between internet-savvy students and their schools. Retrieved July 6, 2005, <http://pew/internet.org/PPF/r/67/reportdisplay.asp>.
- Mann, D., Schafer, E. (1997). Technology and achievement. Retrieved June 23, 2005, from <http://www.asbj.com/achievement/ci/ci10.html>.

Paige, R. (2004). Toward a new golden age in american education--how the internet, the law and today's students are revolutionizing expectations. Retrieved June 25, 2005, from <http://www.ed.gov/about/offices/list/os/technology/plan/2004/index.html>.

Polster, S. (June, 2003). Maine laptop program shows strong results. Retrieved July 14, 2005, from <http://www.matr.net/print-7224.html>.

Schacter, J. (1999). The impact of education technology on student achievement what the most current research has to say. Retrieved June 10, 2005, from <http://www.mff.org/pubs/ME161.pdf>.