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## **The Vermont Legislative Research Shop**

### **Distance Learning and Technology in the Classroom**

#### **Distance Learning**

Because of advances in interactive technology distance learning is now becoming a popular educational tool. Distance learning uses email, video conferencing, newsgroups, and electronic forums to heighten the level of education for students of all ages. According to the National Governors Association:

Internet-based distance learning is finding its way into U.S. high schools. Home schooled students, school districts without enough qualified teachers, and the children of migrant workers are generating the need for “virtual high schools.” Virtual high schools have emerged in Alabama, Arizona, California, Florida, Illinois, Indiana, Kentucky, Maryland, Massachusetts, Michigan, Missouri, Nebraska, New Mexico, and Utah. These programs can cross state lines, with course offerings open to students regardless of residence. Once a virtual high school is accredited, as some virtual high schools are, students can apply their course grades toward high school graduation.<sup>1</sup>

#### **Effectiveness of Distance Learning**

A recent *New York Times* article featured an example of the application of distance learning in the school Branson Online—an online high school founded in 2001. Because the town could not support a traditional high school due to its small population (the population of Branson, Colorado does not exceed eighty) it started an online school that currently has over 1000 students enrolled statewide. Some students are enrolled to allow themselves to access education while pursuing other goals. For example, one girl is currently enrolled while training as an ice skater for the Olympics, and another boy is enrolled to allow him to compete with his quarter horse in out-of-state livestock shows. While the school has been very successful in enrolling students, there are concerns that, for many students, Branson Online is just a way for them to drop out of

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<sup>1</sup> National Governors Association. “Using Electronic Assessment to Measure Student Performance”  
<http://www.nga.org/cda/files/ELECTRONICASSESSMENT.pdf> Accessed: 2/8/05

high school before they are legally allowed too at the age of 16. Overall Colorado online schools have shown mediocre academic achievement.<sup>2</sup>

In 1999 Doctor Sheila Tucker at East Carolina University conducted a study of students age 19-51 in post-secondary school to discover whether distance education was better, worse, or as good as traditional education. She found that “no significant differences were found between pre-test scores, homework grades, research paper grades and final course grades. However, there were significant differences between the two groups with regard to age, post-test scores, and final exam scores. Distance education students scored higher in all three categories”<sup>3</sup>

The North Central Regional Laboratory conducted a meta-analysis of studies on distance learning with funding from the U.S. Department of Education in 2004. The study analyzed the combined results of 14 different studies. The study concluded that distance learning is as effective as classroom instruction. However there was evidence “indicating that some applications of distance education appeared to be much better than classroom instruction and others were much worse.”<sup>4</sup> The analysis reports that “educators and other stakeholders can reasonably expect learning in a well-designed distance education environment to be equivalent to learning in a well-designed classroom environment.” A general conclusion was that “[t]he analysis showed that for the factors examined, distance learning did not outperform or underperform classroom instruction”, but the researchers warned “[t]he number of studies was small, and many studies did not report detailed information, so the results should be viewed as indications of tendencies rather than prescriptions for practice”.<sup>5</sup>

Doctor Walter F. Ryan of Indiana University Southeast conducted a study to assess the differences of a traditional high school mathematics course with a distance learning course. He looked at high school seniors from the province of Newfoundland and Labrador, Canada. In his research he found that the academic achievement and academic success of students who complete senior high mathematics courses by distance education was not significantly different from the achievement and success of students who completed senior high mathematics courses by traditional means. The collected data showed that students who studied advanced mathematics by distance education achieved the same level as the students who participated in traditional education.<sup>6</sup>

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<sup>2</sup> Dillon, Sam, “Tiny District Finds Bonanza of Pupils and Funds Online.” *New York Times*, February 9, 2005, p. A1.

<sup>3</sup> Dr Sheila Tucker, “Distance Education: Better, Worse, Or As Good As Traditional Education?”, Online Journal of Distance Learning Association, Volume IV, Number IV, Winter 2001  
<http://www.westga.edu/~distance/ojdla/winter44/tucker44.html>

<sup>4</sup> Cathy Cavanaugh et al., North Central Regional Education Laboratory, “The Effects of Distance Education on K–12 Student Outcomes: A Meta-Analysis”  
<http://www.ncrel.org/tech/distance/> accessed 2/17/05

<sup>5</sup> Cathy Cavanaugh et al., “The Effects of Distance Education on K–12 Student Outcomes: A Meta-Analysis”, North Central Regional Education Laboratory  
<http://www.ncrel.org/tech/distance/> accessed 2/17/05

<sup>6</sup> Walter F. Ryan, “The Effectiveness of Traditional vs. Audio graphics Delivery in Senior High Advances Mathematics Course”, *Journal of Distance Education*, 1996.  
<http://cade.athabasca.ca/vol11.2/ryan.html> Accessed 2-22-05

In a number of studies, there was evidence that a higher percentage of students dropped out of distance learning courses before the course was completed compared to students in a conventional classroom.<sup>7</sup>

### **United States Distance Learning Association**

As a way of spreading distance education throughout the fifty states, the United States Distance Learning Association (USDLA) was founded in 1987 by Patrick Portway, Dr. Smith Holt, and Dr. Ralph Mills. Their intent was to create new ways of merging the growing education and training needs with all of the growing concepts of communications technologies. They provide two training programs one which will teach students how to use distance learning successfully, and another to show teachers and administrators how to successfully implement a distance learning program. The USDLA serves as a catalyst for the formation of partnerships among education, business, healthcare, and government. In 2004 they created the Distance Learning Accreditation Board (DLAB), which has the purpose of reviewing and accrediting different distance learning institutions. Through DLAB they can evaluate the effectiveness of distance learning, the quality of institutions, and provide assurance through its publications and website.<sup>8</sup>

### **Technology in the Classroom**

In addition to distance learning, the following initiatives have been established in public education to promote educational technology.

**Washington** implemented the high-speed K–20 Network, giving schools across the state an unprecedented opportunity to connect students and educators with online resources. The video-conferencing component of K–20 will be the primary medium for professional development for educators, enabling the state to provide staff development programs in a cost-effective manner and offer teachers the convenience of accessing conferences from a remote location.<sup>9</sup>

**Pennsylvania** has been pursuing initiatives to greatly increase availability of technological resources for education. “Act 183 of 2004 created several opportunities for school entities to promote and accelerate broadband deployment. As part of the law, an annual \$10 million E-Fund was established to assist schools with purchasing services, hardware, technical assistance and distance education over the next six years.”<sup>10</sup>

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<sup>7</sup> Minnesota State Colleges and Universities, “A Review of Contemporary Research: the Effectiveness of Distance Learning in Higher Education” <http://www.nga.org/cda/files/ELECTRONICASSESSMENT.pdf> Accessed February 15, 2005

<sup>8</sup> Appalachia Educational Library, “Policy Services: The Telecommunications Act of 1996: A Guide for Educators”, <http://www.ael.org/rel/policy/fcc97.htm> Accessed February 15, 2005

<sup>9</sup> National Governors Association, “Education Technology: Changing the Way America Learns” <http://www.nga.org/cda/files/19990719EDTECH.PDF> Accessed: 2/8/05

<sup>10</sup> PA Department of Education, [http://www.pde.state.pa.us/ed\\_tech/cwp/view.asp?Q=110337&A=169](http://www.pde.state.pa.us/ed_tech/cwp/view.asp?Q=110337&A=169) Accessed 2/08/05

**Maine** implemented a unique program to equip all seventh and eighth grade students with laptop computers. This program has had a strongly positive reception such as an 82.7% students reporting improvement in their schoolwork<sup>11</sup>

**Michigan** has established a statewide virtual high school available to all students in the state. The school offers core and elective courses, including foreign language, and twelve Advanced Placement courses;<sup>1</sup> The Michigan Virtual High School (MVHS) is an online resource that enables Michigan high schools to provide courses (all taught by certified teachers) and other learning tools that students wouldn't otherwise have access to. It was funded by the Michigan Legislature in July 2000 to be operated by the Michigan Virtual University ([MVU](#)), a private, not-for-profit Michigan corporation.<sup>12</sup>

**Tennessee** has substantially expanded its education technology capacity by increasing the number of computers connected to the Internet by 50,000 in 1999, bringing the total to more than 100,000 and giving all 900,000 students and 50,000 teachers in Tennessee the opportunity to use them. The Tennessee Department of Education used its Technology Literacy Grant to challenge K–12 teachers to integrate technology into their teaching using performance-based professional development activities. Preliminary results show gains of 40 percent to 75 percent in teachers' technology skills.<sup>13</sup>

**Colorado** used its Technology Literacy Challenge Fund Grant from the U.S. Department of Education to award infrastructure grants to public and private schools with high student-to-computer ratios. Thirty-one grants of \$10,000 each were awarded to nineteen elementary schools, nine middle schools, and three high schools.<sup>14</sup>

**Virginia** Standards of Learning (SOL) Technology Initiative aims to improve student achievement through the use of statewide Web-based computer resources. The initiative, focusing first on high schools, has three goals: provide a ratio of one computer for every five students, create Internet-ready local area network capability in every school, and ensure high-bandwidth capabilities for the delivery of instructional, remedial, and testing services.<sup>15</sup>

**Wisconsin** Technology for Educational Achievement in Wisconsin (TEACHWI) is providing public school districts with more than \$185 million in loans, grants, and subsidies for education technology during the next two years. The funds can be used for wiring, software, hardware, data and video links, teacher training, and other purposes related to education technology, except

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<sup>11</sup> National Governors Association, "Maine Laptop Program Shows Strong Results" [http://www.nga.org/center/frontAndCenter/1,1188,C\\_FRONT\\_CENTER^D\\_5667,00.html](http://www.nga.org/center/frontAndCenter/1,1188,C_FRONT_CENTER^D_5667,00.html)  
Accessed: 2/8/05

<sup>12</sup> Michigan Virtual High School Homepage, <http://www.mivhs.org/content.cfm?ID=30> Accessed: 2/15/05

<sup>13</sup> National Governors Association "Education Technology: Changing the Way America Learns" <http://www.nga.org/cda/files/19990719EDTECH.PDF> Accessed 2/8/05

<sup>14</sup> National Governors Association, "Education Technology: Changing the Way America Learns" <http://www.nga.org/cda/files/19990719EDTECH.PDF> Accessed 2/8/05

<sup>15</sup> Minnesota State Colleges and Universities, "A Review of Contemporary Research: the Effectiveness of Distance Learning in Higher Education" <http://www.nga.org/cda/files/ELECTRONICASSESSMENT.pdf> Accessed February 15, 2005

salaries or benefits for school district employees. To ensure that the state's education institutions work together the program coordinates access to information technology rather than duplicate existing services.<sup>16</sup>

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Compiled at the request of Senator Wendy Wilton by Daniel Wander, Richard Hodges, and Micah Rabin on February 22, 2005 under the supervision of Professor Anthony Gierzynski.

Disclaimer: This report was been prepared by undergraduate students at the University of Vermont under the supervision of Professor Anthony Gierzynski. The material contained in this report does not reflect official policy of the University of Vermont.

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<sup>16</sup> National Governors Association, "Education Technology: Changing the Way America Learns"  
<http://www.nga.org/cda/files/19990719EDTECH.PDF> Accessed 2/8/05