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ABSTRACT

In their 1989 report to the Colorado General Assembly, the Colorado Telecommunications Advisory Commission expressed the widely held belief that regardless of where they live, all Colorodans deserve and can benefit from a statewide telecommunications infrastructure connecting all Colorado schools, libraries, institutions of higher education and government offices with each other and with the rest of the world, providing access to local and remote instructional programs and information resources. This document focuses on benefits of telecommunications technologies in the K-12 setting. It lists barriers that these technologies can help staff and learners overcome and identifies ways technology can enhance education by providing: flexibility for individual needs; immediate access; new and relevant presentation modes; ways to motivate students; ability to enhance learning for students with disabilities; opportunity for analytical and divergent thinking; encouragement for teachers to take a fresh look at how they teach and ways in which students learn; well-designed, meaningful tasks and activities; and the potential for effective group work across distances. The document provides examples of how interactive telecommunications technologies are enabling remote learners in Colorado to have access to resources and instruction, and how telecommunications networks can provide school districts, schools, administrators, teachers, and other staff with multiple opportunities to increase efficiencies. The use of other business applications to greatly reduce amount of time and effort required to accomplish current and future tasks is also identified. (AEF)

Telecommunications in the K-12 Environment

February 1998

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"Your zip code should not dictate the quality of your education."

Access and Equity to Effective Instructional and Information Resources in the K-12 Environment Via Telecommunications Technologies

"Your zip code should not dictate the quality of your education."

When the Colorado Telecommunications Advisory Commission wrote this in their December 1989 report to the Colorado General Assembly, they were expressing the widely held belief that regardless of where they lived, all Colorodans deserved and could benefit from a statewide telecommunications infrastructure connecting all Colorado schools, libraries, institutions of higher education and government offices with each other and with the rest of the world - providing access to local and remote instructional programs and information resources.

In the K-12 setting, telecommunications technologies, if used properly by trained practitioners and learners, can provide students, teachers, administrators and other staff members with resources to enhance their instructional and administrative programs. These technologies can help staff and learners overcome limited budgets, remote locations, time constraints, great distances, socio-economic isolation, geography and other barriers to:

- provide educators and learners with *access to instructional and information resources* not otherwise available,
- help learners *improve their achievement* in a standards based curriculum, and
- provide learners and staff with tools to *improve their efficiency and effectiveness.*

Technology can help students and teachers succeed in a standards based curriculum. It can contribute to the development of schools where the walls between classrooms and the outside world have disappeared, where children are exposed to complex, real-world issues, challenged to sift through the raw materials of the Information Age, and empowered to communicate their ideas to a global audience. (Benton Foundation World Wide Web site). It can:

- Provide the flexibility to *meet the individual needs* and abilities of each student;
- *Reduce the risk of student failure* by providing alternative learning opportunities
- Provide students with immediate *access to richer source materials* including primary source materials;
- Present *information in new, relevant ways* which help students understand, assimilate and use it more readily;
- *Motivate and stimulate* learning;
- *Enhance learning* for students with special needs;
- *Motivate* students to try out new ideas and take risks;
- Encourage *analytical and divergent thinking*;
- *Encourage teachers to take a fresh look at how they teach and ways in which students learn;*
- Help students learn when used in *well-designed, meaningful tasks and activities*; and
- Offer potential for *effective group work across distances.* (the National Council For Educational Technology – Australia (NCET) 1994)

Interactive technologies (including the Internet and videoconferencing) can provide opportunities to "individualize the educational experience to accommodate the needs, interests, proclivities, current knowledge, and learning styles of each particular student." (*Report to the President on the Use of Technology to Strengthen K-12 Education in the United States.* President's Committee of Advisory on Science and Technology, Panel on Educational Technology. March 1997).

Telecommunications technologies can equalize the playing field for all learners regardless of their race, religion, ethnicity, gender, disability, age or place of residence. It can help provide them with access to instructional courses, staff development programs, information resources and subject experts by overcoming the barriers of time, distance and/or geography. No longer must learners who are geographically or socio-economically isolated settle for second best.

Interactive telecommunications technologies (including the Internet and videoconferencing) enable remote learners to take courses, conduct research and share resources with their peers and subject matter experts in their local communities or communities of interest.

- Learners in Flagler, Wiggins, Hayden, Lyons and Denver or in any of the over 65 Colorado communities where their schools are connected to interactive video networks or the more than 125 communities with satellite downlinks in their schools can take advanced or other high-interest/low enrollment courses. These instructional courses, staff development programs and information resources, and those made available via the Internet, provide learners of all abilities with the opportunity to explore and excel in areas in which they could never have found challenging courses or course materials. Programs delivered by remote distance learning course providers, neighboring schools and regional and distant institutions of higher education enable many high school students to graduate with a high school diploma and either a majority of the courses needed or a full associates degree from a community college under the post-secondary options act. (East Central BOCES - Fifth Year Program);
- Community members take college courses and participate in training, certification and information programs without leaving their communities (Deer Trail and other schools on local interactive video networks);
- Clusters of school districts, by working together, provide learning opportunities that they could not provide to their students and teachers independently (multiple Colorado distance learning networks provide courses and staff development programs).
- Students, who may not have done well elsewhere, succeed in classes as members of an electronic, virtual high school. The Monte Vista On-line Academy provides forty high school students, many of whom are at-risk, with an environment that meets their learning styles, schedules, interests or other circumstances. This program is so successful that they will increase enrollment to 60 learners during the 1998-99 school year.
- Teachers and administrators use telecommunications technologies (e-mail, the world wide web, etc.) to communicate with colleagues and subject matter experts. (e.g.: *Genetic Engineering via Telecommunications* is a course that has been delivered via the Internet from Air Academy High School to hundreds of students and teachers in over 50 high schools during its five years of delivery. This course links Colorado teachers, learners and experts from across the country.

- Learners of all ages can access remote information resources (e.g.: "electronic card catalogs" for libraries throughout the world, complete magazine articles and abstracts of research papers) via the Access Colorado Library Information Network (ACLIN).
- Information can and will be purchased and stored in more cost effective and accessible ways depending upon local needs and the price and characteristics of the resource itself. Some information resources will be classroom specific. Others will be accessible throughout the school via local area networks (LANs) while still others will be purchased at the district level and made available to multiple schools throughout the district via their wide area networks (WANs). Some very expensive or limited use resources may even be purchased regionally or by a single Colorado entity with access provided to all districts and libraries in the region or across the state via the Internet or a statewide multi-use network. This will increase the number of information resources available to teachers, students and community members. (Nancy Robbins, Mesa School District 51)
- Teachers with like interests can participate in cooperative planning activities across great distances or with the teacher in the next classroom with whom they have difficulty meeting because of conflicting schedules (Nederland Elementary School, Boulder Valley School District) while administrators can "meet" to discuss common problems or share information.
- Students use the Internet (primarily e-mail and the world wide web) and other technologies to demonstrate mastery of content standards. They conduct research accessing local and remote information resources, store data and other information, create documents and other projects and publish and otherwise disseminate these materials to their teachers, community members, their peers, other researchers, and college and university students interested in becoming teachers. By publishing their projects beyond the classroom, learners collaboratively develop information resources, improving the quality of the writing. (Benton Foundation World Wide Web site)
- Schools participate in partnerships with community or distant businesses to provide their students with unique learning opportunities that would not otherwise be available. (e.g.: HP Mentor Program)

Telecommunications networks can provide school districts, schools, administrators, teachers and other staff with multiple opportunities to increase efficiencies. According to John Ackelson, Director of Information Management, Adams County School District Twelve and chair of the Colorado Information Processing Association (IPA) information technologies and telecommunications networks greatly increases the effectiveness of data collection, information processing and data reporting.

- The ability to collect, store, access, analyze and distribute fiscal and student data to meet specific and ever changing information needs provides administrators and others with the information needed to make informed decisions.
- Personnel resources formerly allocated to the collection and processing of data are being redirected to provide direct support for the instructional program.
- With full implementation of the automated data exchange, state data needs will be met in a fraction of the time because data will be transmitted via standardized formats in a more accurate and useable mode.
- According to the 1996 Colorado *Data Analysis/Feasibility Study* (CTMG), school districts reported that they would benefit from an estimated average annual savings of

$3190. Through data collection at the record level, nearly 50% of CDE's forms could be eliminated and many others could be drastically reduced in size. Further, electronic access for analysis to the summary data collected by CDE will benefit 81% of Colorado school districts.

- The demands for student achievement data will increase as the state continues to move toward measuring against the model content standards. The collection of this data from school to district and district to state with a minimum of handling can increase access without overly burdening staff.

Additionally, the use of other business applications can greatly reduce the amount of time and effort required to accomplish current and future tasks.

- The automation of food service functions can facilitate all areas from charging students and teachers for their daily lunches to maintaining food and supply inventories and from balancing daily accounts and sending this information to the district business office to maintaining employee attendance records. (Boone County R-IV Schools, Hallsville, Missouri)
- Teachers will be able to take attendance, collect lunch money, compute student grades and complete discipline reports and send this information directly to both the school and district offices immediately without completing any forms or leaving their classrooms. (Boone County R-IV Schools, Hallsville, Missouri)
- Providing school and other district personnel with the ability to initiate and process purchase requisitions on-line can greatly decrease the time it takes to process orders and the paperwork and staff needed to accomplish this. Once this ordering information is in the system, orders can be electronically sent to the district warehouse and contractors further decreasing delays and costs. (Poudre School District, Fort Collins, Colorado)
- Enabling school and district personnel to access contract information on-line will further cut delays and costs in the ordering process in addition to providing more accurate and timely information to staff. (State of Colorado, General Support Services)
- The posting of bid solicitations on-line provides vendors with more timely access to the procurement process providing quality goods at lower prices. (State of Colorado, General Support Services)
- E-mail can reduce the amount of time needed to contact individuals in the school district, community or throughout the state, nation and world. This improved communications can improve access to information and enhance operations. (Colorado Telecommunications Advisory Commission)
- Videoconferencing can reduce the need to travel within the district and to distant meetings saving travel costs and time. (Colorado Mountain College)

Telecommunications technologies and local, regional and statewide networks connected to the Internet for national and worldwide communications can enhance the instructional programs and administrative functions of all Colorado schools by increasing student achievement, access to information and human resources, and productivity.

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