

Identification of Focus Area

San Juan Board of Cooperative Educational Services (San Juan BOCES) is applying to the Power Results Grant Program under the second identified focus area, “Integration of technology resources and systems with teacher training and curriculum development to establish research based instructional methods that can be widely implemented throughout the state.”

Abstract

Whole-Classroom Interactive Resource Development (WIRED) is a program to increase student achievement by providing whole-classroom interactive technology resources with effective, ongoing professional development for teachers that will support learning and help our districts meet their Educational Technology and Information Literacy (ET-IL) goals. In Year One, schools will be provided interactive whiteboards that will allow teachers to engage the entire classroom at one time with technology assisted activities. Graphing calculators, microscopes, and other digital equipment that can be used in conjunction with the whiteboards will be introduced in Year Two. All of these materials will support and encourage day to day collaborative interactions for students and teachers and be used to carry out collaborative student projects. This program will target teachers in grades three through eight from 13 schools in the San Juan BOCES region:

- Archuleta County School District: Pagosa Springs Elementary, Pagosa Springs Intermediate, Pagosa Springs Junior High Schools.
- Bayfield School District: Bayfield Elementary and Bayfield Middle Schools.
- Durango 9R School District: two elementary and one middle school.
- Ignacio School District – Ignacio Elementary, Intermediate and Junior High Schools
- Silverton Expeditionary School

Identification of Needs

San Juan BOCES is applying for Power Results grant funding to serve elementary and middle schools in each of our five member school districts. Three of our districts are considered high poverty with more students eligible for the National School Lunch Program than the state average: Archuleta County - 41.6%, Ignacio - 49.6%, and Silverton - 77.3%.

Ignacio Junior High School received a low ranking on the 2005-2006 School Accountability Report, failing to meet some targets for AYP in both math and reading. Ignacio School District has been identified for corrective action by the state. Durango did not meet AYP math targets for their high school students and has been identified for program improvement. Our districts are struggling with decreasing student proficiency in math as students advance in grade.

Summary of 2006 CSAP Math results for students in San Juan BOCES region				
Grade Level	% Advanced	% Proficient	% Partially Proficient	% Unsatisfactory
3	34%	43%	20%	2%
4	27%	48%	21%	4%
5	23%	46%	26%	4%
6	17%	41%	32%	9%
7	23%	31%	29%	16%
8	18%	28%	34%	20%
9	16%	27%	33%	23%
10	6%	26%	38%	28%

Comparative CSAP data for science proficiency shows that the percentage of students in the San Juan BOCES region ranked *advanced* in science decreases from 15% of students in third grade to just 5% of students in tenth grade and the percentage of students ranked *unsatisfactory* in science increases from 14% of third grade students to 21% of tenth grade students according to 2006 CSAP results.

The need for whole-classroom interactive resources was identified by participants in the Southwest Colorado Mathematics Initiative (SCMI) as a way to help teachers effectively incorporate technology into their classroom and improve student learning. SCMI is a professional development program nearing completion that served middle school math and other teachers in the region. SCMI was funded by a Title II, Part B, Math and Science Partnership Grant with the Colorado Department of Education and United States Department of Education and by ACT 2001, Improving Teacher Quality, a Title II Program Grant administered by the Colorado Commission on Higher Education.

Feedback from SCMI participants indicated an increased level of confidence and enthusiasm for using technology strategies and materials in their classrooms but a limited ability to implement them due to logistical constraints. Teachers explained it was difficult to hold the attention of an entire class with only one calculator. And while all of our districts do have computer access for students in either laboratory or workgroup settings, this forces a separation between the use of these tools and normal classroom activities. The need became apparent for a way to fully integrate technology into the whole classroom and curricula.

San Juan BOCES solicited input from our district administrators and teachers about their specific needs and thoughts about incorporating technology into their classrooms and curricula. One starting idea was to provide digital projectors and classroom sets of graphing calculators plus related professional development activities to schools. Initial feedback and brainstorming indicated this was a step in the right direction but not nearly enough to truly integrate technology into classrooms. The project was redrawn to include interactive whiteboards such as Smart Boards plus connected inquiry tools such as microscopes, cameras, range finders, and measurement probes.

Response has been very enthusiastic for this expanded program, designed to provide the training, equipment and ongoing support needed to establish whole-classroom interactive settings. Teachers suggested many different ways these tools would help them improve their instruction and student achievement by using this technology to better engage and motivate students, simultaneously reach students through all different learning styles, foster collaboration among students, enable and encourage students to share the results of their work, better meet the needs of special education students, provide an easy way to capture examples of student work for sharing and collaborating with other educators and parents, and to ensure and document that their students are meeting all of their district's ET-IL goals.

Our isolated location creates an especially high need for technology and information skills and literacy among students, teachers and all workers in this community. It can be prohibitively expensive and time consuming to travel to the Front Range or beyond to attend conferences or other professional development activities. The same is true for students wanting to visit a large museum, zoo or other activity. The technologies included in this program will bring Southwest Colorado much closer to the rest of the world by providing opportunity for interactive distance learning, virtual labs and field trips plus other multimedia educational experiences serving teachers and students.

The *WIRED* program itself will provide a local forum for area educators to collaborate with each other, another need expressed by our teachers. Building and district level teams will be created and given the opportunity to work together on a regular basis to support the program and each other. Regional activities bring together educators from all five of our member districts. This is especially needed by teachers from our smaller districts who may be the only district teacher covering their subject and grade.

Program Description

The *WIRED* program will serve elementary and middle school teachers from all five school districts of the San Juan BOCES region, targeting grades three through eight. The program will provide two whole-classroom interactive resource kits to each participating school. In Year One, each kit will include an interactive whiteboard, projector, speakers, computer, operating software and specialized software applications. Connected inquiry tools and data collection devices will be added in Year Two.

Each school will identify a team of teachers/staff to participate. Teams should consist of enthusiastic teachers covering all disciplines including language arts, math, science, special education and other school personnel such as a media specialist or front office staff.

Teams will receive initial training in the use and application of this technology during the summer of 2007. Initial training will present activities covering language arts, math and science topics, emphasizing how the technology can be used to enhance student skills in these areas and how teachers can use the technology to effectively communicate and collaborate. Participants will reflect on the activities presented, how they relate to the Colorado Model Content Standards and how the strategies presented may work in their classroom.

Teachers will be encouraged to test and use all equipment over the summer as they prepare for the upcoming school year. Each teacher will prepare a lesson plan that incorporates *WIRED* technology. Participants will meet together in a Regional Summit to present their lesson plans using the technology and will have opportunity to reflect on and discuss their experiences so far.

Teachers will begin using *WIRED* resources with students at the start of the school year. Coaching support will be provided to teachers on site, available to help with planning, observing or demonstrating classroom activities.

With the start of Year Two in October 2007, *WIRED* laboratories will be purchased for each district that include classroom sets of basic and graphing calculators, digital microscopes, cameras, range finders and measuring probes. Training will be provided to participating teachers in the effective use of these technologies in the classroom. It is our hope for these trainings to partner with the Enhancing Math Education program, a proposed Math Science Partnership being submitted by Fort Lewis College and Montezuma-Cortez School District to serve regional math educators following the end of SCMI. Professional development activities to help teachers integrate technology into their classrooms is an overlapping component of both projects and it makes sense to combine these activities.

Teams will meet regularly to reflect on and plan *WIRED* lesson plans and activities including the new laboratory materials. Participants will attend a regional Summit to participate with additional training, collaborate with other teachers about experiences with *WIRED* technologies and develop plans to use *WIRED* technology resources for a collaborative student project. Teachers will then execute the collaborative student project by the end of 2007. Teachers will follow up with a reflective analysis of

this activity and collaborate to prepare a demonstration and report about their experiences for their school boards in early 2008.

Teachers not involved in Year One activities will be encouraged to visit *WIRED* classrooms and meet with participating teachers during the fall. Districts will select a second group of teachers to receive training at the end of 2007. Schools will receive one additional *WIRED* whiteboard kit. Newly trained teachers will arrange a shared technology schedule to rotate the additional *WIRED* kit and laboratory resources through their classrooms for the remainder of the school year.

Teachers in the original Year One group will continue to work with their *WIRED* resources. All participants will be provided release time to visit each other's classrooms and ongoing support including on-site coaching. School and district teams will continue to meet regularly. Regional Summits will be conducted. Teachers will continue to plan, execute and reflect on *WIRED* lesson plans and classroom projects.

Districts will each identify two lead teachers to receive additional training and serve as in-house *WIRED* trainers, able to support the program in future years. In-house trainers will be able to coach other teachers in their buildings using *WIRED* resources and will conduct training sessions for new teachers. Lead teachers will be given the opportunity to attend a regional or national educational conference related to educational technology.

As done successfully with our SCMI program according to program participants, all teacher training will be developed following the Guiding Principles put forth in the Consortium for Policy Research in Education's Policy Brief: "*Helping Teachers Teach Well: Transforming Professional Development*," June 1995. Groups of teachers resemble typical classrooms in that they include people of all different skill levels and learning styles. Workshops will be designed to engage teachers with rigorous content, ideas, materials and collaboration with colleagues. Instructors will model constructivist teaching methods by demonstrating effective, open-ended questioning techniques, strategies for differentiated instruction and collaborative learning, and support reflective thinking by teachers about their practice.

Goals and Milestones

WIRED Program Goals:

- Increase student achievement by providing whole-classroom interactive resources with effective, ongoing professional development for teachers that will support learning and help our districts meet their Educational Technology and Information Literacy (ET-IL) goals.
- Support and encourage the use of whole-classroom interactive resources in day to day collaborative interactions: student to student, student to teacher, and teacher to teacher.
- Plan and execute thorough, ongoing evaluation of project impact on teacher practices and resulting student achievement.
- Plan and execute ongoing dissemination of project artifacts including online posting of teacher lesson plans and reflections, student projects, program level training and evaluation materials on website/bulletin board.
- Train and support lead teachers identified by each district to serve as program coaches and in-house trainers able to train and support other teachers in their districts. (Year Two)

WIRED Program Timeline and Milestones:

Year One, April 16 through August 31, 2007

- April/May: Districts/schools select and identify team members to participate.
Baseline evaluation data collected from schools, teachers, students.
Interactive Whiteboard equipment and software specified and purchased.
- June-July: Initial training in use and application of *WIRED* technology provided.
Teachers work independently and prepare lessons using *WIRED* technologies.
Year One progress report and preliminary evaluation completed.
- Aug. 2007: Regional Summit to present teacher lesson plans and prepare for classroom projects.
Students introduced to *WIRED* interactive whiteboards at start of school year.
- Sept. 2007: On-going support and coaching provided on site to participating teachers.
Teachers continue use of *WIRED* technologies and begin classroom projects.
Year One evaluation and final report completed.

Year Two, October 16, 2007 through June 30, 2008

- Oct.-Nov.: Continued support and coaching provided on site to participating teachers.
WIRED laboratory materials purchased and teachers trained in their use during
Regional Summit held for participating teachers.
- Dec. 2007: Participating teachers complete, reflect and report on classroom projects.
Districts/schools identify new participants to receive *WIRED* technology training.
Additional *WIRED* interactive unit purchased for each school.
- Jan. 2008: New teachers begin use of *WIRED* technologies with students.
Continued support and coaching provided on site to participating teachers.
Year Two progress report and preliminary evaluation completed.
- Jan.-Feb.: Teams present *WIRED* program demonstration and report to school boards.
Regional Summit held for participating teachers.
- March 2008: Districts identify lead teachers to receive training as in-house trainers.
Following training, in-house trainers begin to support other teachers on use of *WIRED*
interactive resources.
- June 2008: Participating teachers complete, reflect and report on classroom projects.
Regional Summit held for participating teachers.
- July 2008: Year Two evaluation and final report completed.
- Ongoing: Teachers post lesson plans with reflective comments to web site/bulletin board.
Feedback gathered and compiled from teachers and students about their experiences
using *WIRED* resources.

Critical Elements

The overall goal of the *WIRED* program is to increase student achievement. Research indicates that the use of multimedia technology in the classroom can raise student achievement by actively engaging and motivating them to learn (C. Kicielinski, *Raising Student Achievement with Technology: Jennings School District, St. Louis*, School Administrator, August 2005.) Research suggests that the use of technology can decrease absenteeism (*The Impact of Technology on Student Achievement*, Apple Computer, Inc, 2002). Interactive whiteboards are especially useful as they appeal to all types of learners including visual, auditory and tactile (W. Beelard Jr., *Student Engagement and Technology: Can Interactive Whiteboards Help?* Action Research Exchange, Summer 2002). And the effective use of technology resources can be particularly beneficial for students with disabilities (*Critical Issue: Using Technology to Improve Student Achievement*, NCREL, 1999 updated 2005).

The *WIRED* program will help schools achieve their ET-IL goals by providing technology resources for teachers to use regularly with their whole classroom, serving as more of an extension of the regular curriculum instead of an independent or special activity. As part of this program, participating teachers will be prepared and expected to lead student-driven, collaborative real world projects using *WIRED* resources. Results and reflections from these and other program activities will be available on-line.

The design of this project is intended to compliment and connect our district's existing ET-IL and general school improvement initiatives. San Juan BOCES and all of its member districts participate in E-Rate programs. Four of our districts, all but Silverton, have instituted Technology Plans with specific ET-IL goals and measures. Silverton is in the process of developing such a plan and is applying independently for a different (separate but compatible) Power Results grant for this year. Bayfield and Durango have both received Power Grant funding from CDE in recent years. This program is especially useful coming on the heels of SCMI which was able to provide top quality, in depth training in the use and application of technology with only a very limited amount of equipment.

Sustainability of the program will be ensured by providing advanced training to teachers in each district who will serve as in-house trainers and coaches for others. Discussion about the use and effectiveness of *WIRED* technology will be initiated with each school district's Board of Directors.

The *WIRED* program will serve to advance the Colorado Model Content Standards in all content areas including math, science, reading and writing:

- *Mathematics Standards 1-6*: "Students... communicate the reasoning used in solving these problems".
- *Science Standard 1*: "Students... design, conduct, communicate about ... investigations".
- *Science Standard 5*: "Students know and understand interrelationships among science, technology ...".
- *Reading and Writing Standard 4*: "Students apply thinking skills to their ... listening and viewing."
- *Reading and Writing Standard 5*: "Students ... make use of relevant information from a variety of media, reference and technological sources"
- Various skills and specific benchmarks associated with the individual lessons delivered using of *WIRED* technology.

Projects/Artifacts

WIRED technology will make it easy for students and teachers to record and share their work. Artifacts will be collected from all project participants and made available on a website/bulletin board. Participants will be encouraged to collaborate through the bulletin board, conversing back and forth about specific lesson plans or any other aspect of the program. These artifacts will provide a solid starting point for other schools and districts wanting to implement similar methods and technology and will include:

- Program Artifacts: syllabus; instructional lesson plans and material lists; evaluation instruments and summarized results.
- Teacher Artifacts: *WIRED* lesson plans with reflective writings and examples of student work.
- Student Artifacts: presentation of individual and group projects.

Evaluation

Ongoing, formative assessments including surveys and questionnaires will be collected from teachers and students and used to assess the links between the program plan, professional development activities and teacher and student outcomes; also for adjusting what isn't working. Feedback will be solicited following each professional development activity and at the end of each program year.

For Year One, summative evaluation will be performed to gauge the impact of program activities on teacher knowledge and skills. In addition to surveys and questionnaires, teachers will demonstrate their skills and command of the technology by actually using the *WIRED* technology to present lesson plans to instructional staff and to each other at the last Summer Workshop.

For Year Two, evaluation will continue to assess teacher practices and begin to track student achievement measures to *WIRED* program outcomes. Results of student and teacher surveys and questionnaires, teacher assessments of student work, student attendance data, and eventually CSAP results will be analyzed in relation to the amount, type, and fidelity of exposure to *WIRED* technology resources.

Baseline and endpoint data will be collected about teacher practices, the use of technology in their classrooms, teacher and student attitudes about technology and learning, and the ET-IL proficiency of students and teachers according to each district's Technology Plan. Schools will provide class lists for participating teachers and attendance records for all students for both the 2006-2007 and 2007-2008 school years. This is to establish a basis for comparison before and after the introduction of *WIRED* technologies. Data will be analyzed comparing information from teachers who do and do not receive *WIRED* materials and training, tracking information about student performance from student surveys, teacher assessments, attendance records, and CSAP results.

Much of the data needed to perform this evaluation is already being collected by schools as part of their ET-IL plans and other concurrent activities such as Safe and Sound School Programs and Wellness Initiatives. We will make every attempt to coordinate and consolidate data gathering activities with each district to avoid the duplication of efforts and to minimize the added time needed for teachers and students to complete the *WIRED* program assessments.

Reports will be prepared midway through each program year following the completion of each program year. All evaluation data will be presented and disseminated in a summarized format grouping students and teachers by the level of exposure to *WIRED* program activities. Every effort will be made to assure the confidentiality of individual student and teacher data.

Dissemination

On-line access to *WIRED* program material is a key element of the project intended to provide a convenient way for participants to collaborate and share what we learn. San Juan BOCES is in the process of creating a website/bulletin board for math educators as part of the follow-up and sustainability plans for SCMI. This site, the Southwest Colorado Math Educator's Forum (www.swcomath.org) will be expanded to serve *WIRED* program participants and include all artifacts and material produced through the program:

- Teacher lesson plans and reflective writings
- Student projects and presentations
- Program-level planning and training materials
- Evaluation instruments and summarized results

Students in *WIRED* classes will be encouraged to use the technology resources to present their work as part of parent-teacher conferences. Participating teachers from each district will collaborate to demonstrate and report on the use of this technology to their school boards.