2009-2010 Title II-D Evaluation Report

Nevada Department of Education

Nevada Department of Education
700 East Fifth Street
Carson City, NV 89701

December 1, 2010

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Nevada Department of Education

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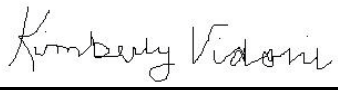
Nevada Department of Education
Office of Assessment, Program Accountability, and Curriculum
700 East Fifth Street
Carson City, NV 89701
(775)687-9131
kvidoni@doe.nv.gov

Keith Rheault, Superintendent of Public Instruction
Prepared by Kimberly Vidoni, Educational Technology Consultant

Contributing External Evaluators:
PG Shrader and Neal Strudler, University of Nevada, Las Vegas
Michelle Richardson and Sue Chambers, Churchill County School District
Clark County School District
Talbot Bielefeldt, International Society for Technology in Education

Submitted by Kimberly Vidoni



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Executive Summary

This document is a compilation of evaluation reports for the 2009-2010 Title II-D Nevada Enhancing Education Through Technology (EETT) grant activities. 2008-2009 EETT competitive grantees in Nevada were required to participate in a statewide evaluation conducted by the International Society for Technology in Education that resulted in a cohesive, well-planned evaluation. However, rules for Title II-D prevented the Nevada Department of Education (NDE) from administering competitive funds for this evaluation and the evaluator was required to bill each grantee individually for evaluation. This process complicated the evaluation for grantees, evaluator, and NDE alike. 2009-2010 grantees were not required to participate in a statewide evaluation, but were instead required to submit annual, summative evaluation reports to NDE and grantees were allowed to choose the evaluator. These are the reports gathered to compile this report.

The 2009-2010 EETT program was comprised of three sections: 1) American Recovery and Reinvestment Act (ARRA) grants, 2) competitive grants, and 3) formula grants. An overview of each section is provided below.

ARRA Grants

Nevada received approximately $4 million in EETT ARRA funds that were distributed competitively to district grantees to participate in the Pathway to Nevada's Future program. Pathway equips classrooms with digital-age technology and provides online professional development to teachers and principals so they learn the skills necessary for preparing students for 21st century careers.

Pathway is a homegrown, Nevada project that was created by and administered by school district personnel in Clark and Washoe County School Districts. At least two teachers and one principal from each of Nevada's seventeen school districts participate in the program that requires participating in intensive, online professional development. Using technology to provide Pathway professional development is cost effective in that it eliminates travel costs to attend face-to-face professional development activities that can be quite costly in a state as geographically vast as Nevada. The first year evaluation of this program was conducted by evaluators at the University of Nevada, Las Vegas and submitted as a single report that is included in the first section of this report titled *2009-2010 Title II-D ARRA Report* that begins on page 6.

ARRA Title II-D, Enhancing Education Through Technology FY10 Funding	
Consortium Name	**FY2010-11 Funding**
Pathway to Nevada's Future	$4,092,691.44
State Admin	$158,581.56
Total	**$4,251,273.00**

Competitive Grants

Nevada distributed approximately $861,000 in competitive EETT funds in 2009-2010 to four grantees. Three grantees were multi-district consortia and the remaining grant was awarded to Nevada's largest school district, Clark County School District. 2009-2010 competitive grants were awarded for two-year projects. The second year funds are being distributed during the 2010-2011 fiscal year and awards are based on the percentage of total 2009-2010 funds awarded to each grantee. The four 2009-2010 evaluation reports are included in section titled *2009-2010 Title II-D Competitive Reports* that begins on page 54. The table below is an itemization of Nevada EETT competitive funds for the 2009-2010 fiscal year.

Title II-D, Enhancing Education Through Technology FY09 Competitive Funding	
Districts	**Allocations**
Washoe, Douglas, Lyon County School Districts	$ 204,286.45
Clark County School District	$ 211,799.29
Churchill, Humboldt, Lander, Mineral, Nye, Pershing, Storey County School Districts	$ 216,006.19
White Pine, Lincoln County School Districts	$ 185,909.06
Total	**$ 818,000.99**

Formula Grants

NDE distributed roughly $821,000 in formula EETT funds to all seventeen Nevada school districts. Grants ranged from $176 to $650,000. The chart below depicts the amounts allocated to each district. Submission of evaluation reports were required for grantees receiving more than $25,000 of which only two districts meet this criterion, Clark and Washoe County School District. At the time this report is being compiled, only Clark has submitted an evaluation report for its formula grant activities that is included in the section titled *2009-2010 Title II-D Formula Reports* that begins on page 144.

Title II-D, Enhancing Education Through Technology FY09 Formula Funding	
Districts	**Allocations**
Carson	$ 10,843.16
Churchill	$ 8,623.51
Clark	$650,796.13
Douglas	$ 5,160.48
Elko	$ 8,920.13
Esmeralda	$ 176.19
Eureka	$ 260.57
Humboldt	$ 3,778.00
Lander	$ 1,049.07
Lincoln	$ 1,547.42
Lyon	$ 8,745.29
Mineral	$ 1,795.53
Nye	$ 12,716.30
Pershing	$ 1,546.33
Storey	$ 298.11
Washoe	$ 99,691.23
White Pine	$ 2,053.39
Total	**$818,000.83**

District Evaluation Reports

The remainder of this report is comprised of the six evaluation reports submitted by 2009-2010 Title II-D grantees. Evaluations were conducted over the course of the grant year and were submitted in October of 2010.

2009-2010 Title II-D ARRA Report

Pathway to Nevada's Future:

Year One (1) Report

P.G. Schrader and Neal Strudler

Prepared for: Loretta Asay
Title: Coordinator, Instructional Technology
Curriculum and Professional Development, CCSD;
Project Manager, Pathway to Nevada's Future Project

Date: October 5, 2010

Prepared By:

P.G. Schrader, Ph.D.
3098 Maple Ridge Ct.
Henderson, NV 89052
peegee@peegee.net
860.655.5470 – cell
702.895.3331 – work
702.895.4898 – fax

Neal Strudler, Ph.D.
8554 Manalang Rd.
Las Vegas, NV 89123
nstrudler@gmail.com
702.355.9490 – cell
702.895.1306 – work
702.895.4898 – fax

Executive Summary

This document reports the findings associated with the planning, development, and implementation of Year 1 of the Pathway to Nevada's Future project. Year 1 covers the timeframe from November 2009 until September 2010. Data sources include online surveys, online discussions, module artifacts, project meetings, and interviews of project personnel.

During the planning phase, the milestones outlined in the grant proposal were accomplished. In terms of project implementation, Modules 1 and 2 were designed, developed, and implemented. The modules were delivered via an online course management system, Moodle, which hosts content as well as the social interaction component to the Pathway Project. In addition to serving resources, assignments, and materials, this system allows a common, virtual location for participants to discuss topics, exchange ideas, and respond to questions.

Summary of Findings

- *Attitudes Toward Technology:* Participation during Year 1 in Pathway promoted significant increases in all but participants' attitudes toward *interactive tools*.
- *Dispositions Toward Teaching with Technology*: Participation during Year 1 in Pathway promoted significant increases in each area of participants' dispositions toward teaching with technology.
- *Self-Efficacy with Technology:* Although Module 2 influenced participants' self-efficacy associated with *daily tasks,* this was not the case for Year 1 overall. However, participants' self-efficacy associated with *pedagogical tasks* increased as a result of Year 1 content.
- *TPACK:* All categories of TPACK significantly increased during Year 1.
- *Community of Practice:* A community of practice was promoted and developed early in Module 1. This sense of community served as a support for self-directed learning in during Module 2.
- *Challenges in Module 1:*
    - Time: Participants spent considerable time on assignments.
    - Voluntary Participation: Individuals who volunteered participated in a different way than those who were recruited. Some newer recruits were seen as "reluctant participants" by facilitators and were not necessarily personally invested in technology or the project.
- *Challenges in Module 2:*
    - Collaboration: The choice to reduce and/or eliminate the required collaboration in Module 2 was an informed decision by experience and feedback from participants. This change was well received by both participants and facilitators. However, if learning activities are increasingly differentiated and individualized, it may be a challenge to continue to grow the evolving community of practice under the particular structure of Module 2.
    - Administrators: Due to various challenges, administrators did not participate in Module 2. Although this may have been an appropriate decision and made for justifiable reasons, the gap between administrator activities and the activities of teacher participants continues to widen.
- *Overall Challenges During Year 1*:
    - Support: Support of both participants and facilitators was instrumental in the success during Year 1. This will be necessary and a potential challenge in the future.
    - Attrition: Consistent participation is a challenge as participants leave teaching or change schools. During Year 1, approximately 33% of participants changed in some way.

Summary of Recommendations

- *Focus Activities:* Activities should be focused, perhaps limiting the scope of offerings.
- *Continued Support:* It is recommended that facilitators continue their high level interaction with participants.
- *Moodle Organization:* It is suggested that facilitators continue dialogue (e.g., via emails, forums, or surveys) with participants to ensure that changes to Moodle are optimal and well received.
- *Balance Activities:* It is recommended that facilitators target a balance between collaboration and independent, focused activities.
- *Differentiated Activities:* It may be useful to allow participants to further differentiate their assignments and work to align with their own interests.
- *Differentiated Scheduling:* Smaller, manageable groups (e.g., content area groups) that can still interact as a community (e.g., groups of 40-60 participants) should be examined for future modules.
- *Continue to Build Communities of Practice:* Fostering communities of practice should remain a goal of instruction, whether or not an individual module is comprised of independent work.
- *Facilitation:* Ways to decrease the demands on facilitators should be explored and identified.
- *Administrators:* It is recommended that administrators continue to be involved in ways appropriate to their role in schools (e.g., evaluators, facilitators, administrators).
- *Extend Communities:* It may be beneficial to extend communities beyond participation in specific Modules.
- *Unified Experience:* It is recommended that Pathway be viewed as a unified experience, all modules of which should be completed before meaningful learning is expected.

Table of Contents

The following sections and information are presented in this report:

1. Introduction

i. Summary of Grant Intent

The Pathway to Nevada's Future project is a statewide initiative intended to change teachers' technology integration practices through the development and implementation of an online professional development program. Additionally, the project is intended to identify appropriate packages of effective classroom technology.

The Pathway project grew out of the Nevada Educational Technology Plan and statewide concern about student engagement and achievement. Participating teachers and administrators are taking part in a two-year professional development program, funded through Federal ARRA. The project is focused on recognizing and addressing the needs of 21st century students through the framework of the revised Nevada Educational Technology Standards, which align to the National Educational Technology Standards for Students (NETS-S).

There are two primary objectives of the Pathway project, to: 1) change teacher behavior through online, collaborative professional development about technology integration; and 2) determine packages of effective classroom technology resources and professional development for planning and budgeting purposes. These objectives relate to the overall goal of increasing student achievement by providing engaging and motivating classroom experiences made possible by technology integration.

All of the professional development is being conducted in an online environment. Curriculum specialists, online technology experts, and higher education professors are working together to develop and refine four modules. The modules will be archived for future professional development needs across the state. To facilitate the implementation of strategies learned, each participating teacher has access to a minimum set of technological tools, including student laptops and mobile handheld devices (iPod Touches). Data are being gathered on the use of these tools throughout the project to inform future budgeting, planning, and professional development.

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ii. Initiating the Project

The Nevada Pathway Project reflects an extensive collaboration between school districts across the state to provide professional development for selected teachers that support and enhance teaching and learning with technology. In considering the number of entities involved, the project has done quite well in implementing the scheduled activities outlined above. Several synchronous online meetings enhanced project planning and implementation with district representatives serving on the project's advisory committee. Meetings were conducted and archived through Clark County School District's Centra system and consistent efforts have been made by project leaders to set a collaborative and inclusive climate for the advisory meetings.

2. Summary of Progress

i. Planned Activities and Accomplishments

Contact with project staff and personnel officially began in November 2009. Although planning began in May, the official grant documents and funding were completed in late November. This marked the official beginning of the Pathway Project. Year 1 activities continued through late August 2010. During Year 1, the Pathway Project accomplished numerous goals and completed several activities associated with the management, implementation, and evaluation of the project. Table 1 outlines the Year 1 activities that were described in the grant proposal, their anticipated completion date, and the date they were completed.

Table 1. Year 1 Activities and Accomplishments

Management	*Planned Completion*	*Completion Date*	*Data Source/Evidence*
Hire Curriculum Specialist	September, 2009	September, 2009	Hired Terra Graves Sara Stewart was introduced as a facilitator, but funded by a separate grant
Personnel briefed	September, 2009	September, 2009	Centra Meetings
Calendar for Year 1	September, 2009	September, 2009	Grant Document, Meeting Notes
Contracts with consultants and evaluators	September, 2009	January, 2010	Signed contract, data collection
Coordinate credit options	October, 2009	December, 2009	UNLV Course Listing: CIT609
Recruit participants and administrators	September – October, 2009	December, 2009	Orientation: http://cpdmoodle.ccsd.net/
Hire tech support	August, 2009	August, 2009	Hired Conrad Allen
Provide support to teams	December, 2009 – ongoing	December, 2009 – ongoing	http://cpdmoodle.ccsd.net/
Implementation	*Planned Completion*	*Completion Date*	*Data Source/Evidence*
Develop/Plan PD	September – December, 2009	December, 2009 – ongoing	http://cpdmoodle.ccsd.net/
Establish Teacher goals	December, 2009 – January, 2010	January, 2010 – ongoing	
Equipment Purchases	August – October, 2009	November, 2009 – January, 2011	Budget and purchasing records
Pre-tests and surveys	January, 2010	January, 2010	Section 7, this document
State Tech Conference 2009	October, 2009	October, 2009	Wide
Online PD	January, 2010 – ongoing	January, 2010 – ongoing	http://cpdmoodle.ccsd.net/ (see below)
Summer PD	June, 2010	June – July, 2010 (3 sections)	n/a
Evaluation	*Planned Completion*	*Completion Date*	*Data Source/Evidence*
Data collection: Module 1	September, 2009 – ongoing	May, 2010	Appendix A
Data collection: Module 2	June, 2010 – July, 2010	July, 2010	Appendix A
Interim Report 1 (Module 1)	January, 2010; June, 2010	August 24, 2010	Report on file
Interim Report 2 (Module 2)	July, 2010	October 3, 2010	Report on file
Year 1 Summative Report	October 1, 2010	October 4, 2010	This document

ii. Important Events and Milestones

The key events and landmarks during the implementation of Year 1 are outlined below:

- Participation in Pathway began:
  - November 20, 2009
- Webinars:
  - Cheryl Lemke: December 1, 2009 (first webinar).
  - Dr. Dan: April 14, 2010 (optional)
- Registration for University Credit:
  - Late December
- Module 1: Building Knowledge and Skills:
  - Five blocks: January 20 - May 11, 2010
- Module 2: Setting Goals and Project Planning:
  - Session 1: June 7 – June 25, 2010
  - Session 2: June 14 -July 2, 2010
  - Session 3: July 12 – July 30, 2010

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iii. Scheduled Activities/Objectives/Milestones Not Accomplished

All activities and objectives that were planned during this segment of the project have been completed or are in progress. However, some activities and their schedules were adjusted. As noted above, during Year 1, it was necessary to make some curricular changes to the online professional development. In particular, coordinators adjusted the workload and their expectations based on participant feedback. In addition, grant awards, approvals, and contracts were completed during November 2009, December 2009, and January 2010. As a result, some planning and implementation was necessarily postponed (e.g., the initial evaluation report). Dates of completion can be found in Table 1.

3. Online Professional Development

i. Moodle Course Management Software

The Online Professional Development is delivered via Moodle, a course management system. Moodle was chosen because it was open-source and involved no additional cost to acquire the software. A server was purchased, configured and maintained through separate funding. Further, Moodle has a long history of providing an excellent environment for distance learning and course delivery. Moodle allows for a wide range of interaction among instructors and students. More importantly, Moodle logs user interaction, participation, and all of their contributions. Additionally, there are hundreds of plug-in modules that may be added to extend the functionality of Moodle to meet the varied needs of Pathway's online professional development. As a result, this system was selected to deliver the project as well as collect data about its participants.

Participating teachers were assigned to one of eight small groups—two for English language arts, two for mathematics, two for science, and two for social studies. In addition larger groups were configured for each of the subject area groups (i.e., one for English language arts, one for mathematics, one for science, and one for social studies) and an "All" group includes all participants for broad discussion topics.

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ii. Module 1 Content

The content of Module 1 primarily involved an overview of resources, tools, and strategies intended for a variety of settings (see Figure 1). Activities ranged from conceptual readings, webinars, videos, and discussions, to hands-on assignments that exposed participants to a range of tools. Results indicated that participants significantly increased in their knowledge, attitudes, and self-efficacy associated with technology and technology integration. Further, a valuable community of practice was created in which participants became comfortable sharing ideas with and helping each other. However, analysis of progress, assignments, and online discussions indicated that the amount of material was overwhelming for many of the participants. Time spent completing assignments was a significant barrier for many participants. Further, the organization of Moodle was not extremely clear for all participants. As a result, adjustments to the delivery of Module 1 were implemented during the professional development. Changes were well received and participants' experiences were positive overall.

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iii. Module 2 Content

The content of Module 2, titled *Setting Goals and Project Planning*, was offered in three separate, three-week sections during the summer of 2010 (see Figure 2). For their convenience, Pathway teachers had the option of participating in one of these sessions that were offered June 7-25, June 14-July 2, and July 12-30. The module included several hands-on assignments and exposed participants to a range of tools. These included two major learning activities: 1) participants created a website to house their Measurable Achievement Plans (MAPs) and portfolios, each of which were introduced in Module 1; and 2) participants pursued self-directed, individualized study in what was called the *Monster Training Garage*. This component included a wide range of suggested topics from which to choose. In addition to the variety of materials and activities, Module 2 included optional group discussion forums.

1. *MAP.* Participants' professional websites were created using Google Sites to showcase key work undertaken and outcomes achieved in the project. Google Sites was selected because it is relatively easy to use and it works well with other Google tools introduced in the project (Docs, Calendar, Picasa, etc.). A template was provided to help guide the process. Teachers were assigned to post their MAPs ongoing portfolio, both of which were begun in Module 1. The MAP is a variation of action research to be implemented in Module 3 and possibly Module 4.
2. *Monster Training Garage.* This activity was designed to allow participants to delve deeper into learning more about specific technology tools, concepts, and resources. They were given options

to work through a number of tutorials that provide "how to" instruction in available tools such as *MS Office, Google Tools, iWork, Edmodo, Jing, Prezi, PB Wiki, multimedia creation, blogging, podcasting, digital storytelling, and Slideshare.* Options for research plans included *various iPod and iTunes resources, Thinkfinity, Route 21, and Edutopia.* A total of 28 options were given including the option to propose exploring resources beyond those listed. Figure 2 displays the organization and layout of Module 2 content.

The theoretical orientation of the project continued to be driven by a vision for how learning and teaching should change and a framework for what students should know and be able to do based on the Nevada Educational Technology Standards (based on the NETS-S) and the Partnership for 21st Century Skills (P21). In addition, the project employed the TPACK framework (Koehler & Mishra, 2008; Mishra and Koehler, 2006) for guiding learning activities for teacher development and curriculum implementation.

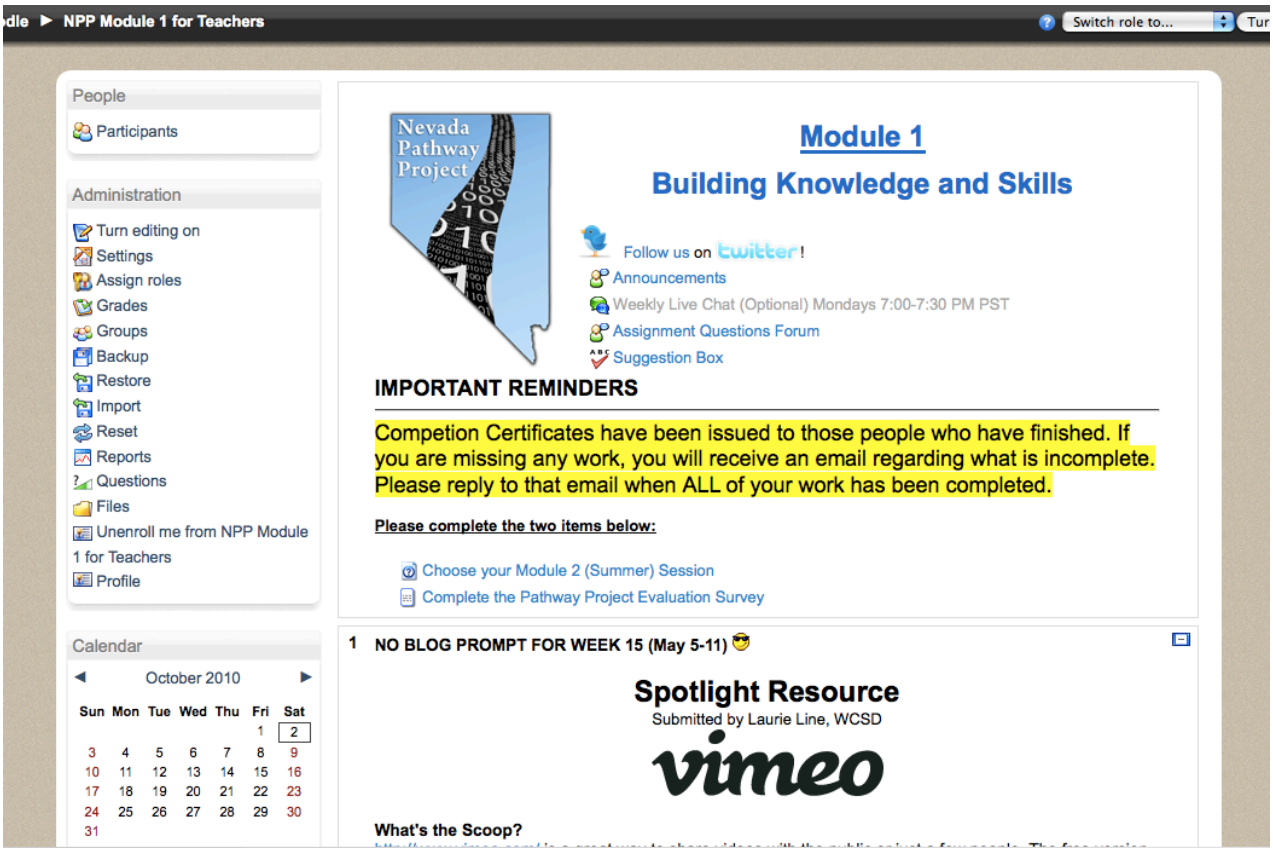

Figure 1. Module 1 Content

Figure 2: Content of Module 2

4. Review of Year 1 Activities

Modifications from the original design were made to Module 1 and these changes informed the design of Module 2. For example, facilitators reworked the overall layout early in Module 1. This approach was extended into Module 2. In terms of content, facilitators also made several adjustments. These changes were based on participant feedback during Module 1, but impacted both Module 1 and their decisions for Module 2. In interviews, the facilitators confirmed their efforts in this regard. A review of participant comments confirmed that these design and content changes were helpful in improving navigation, clarity of content, and reduction of stress for both modules in Year 1. A more detailed overview of the changes to the modules is provided below.

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i. Modifications to Module 1

Based on participant feedback through emails, comments, and discussions, facilitators reported making several modifications during the implementation of Module 1. As evident from the open-responses, a key challenge to the Pathway Project involved time and the complexity of assignments. Pathway instructors indicated that they received numerous emails detailing the tremendous time involved in completing the assignments. This trend was confirmed by tracking surveys administered from Moodle, allowing facilitators to quickly determine how much time participants spent on each block. In some cases, the time spent was 10 or more hours in excess of the time anticipated. Based on this feedback, the facilitators opted to reduce the number of assignments and created weekly checks to avoid overloading project participants.

Another prominent change involved altering the Moodle layout. For example, assignments were changed to give them a visual "priority." Further, content was delivered in blocks and the most recent block was moved to the top of the page. Previous blocks were arranged in order from the most recent toward the top of the page to the oldest toward the bottom of the page. This contrasts to the standard organization of Moodle, which sequences activities in a linear progression down a single page. Although this change did not solve all of the clarity issues, a review of participant comments confirmed that these design changes were helpful in improving navigation and clarity for some.

Participants' comments in Moodle suggested that these changes were well received and helped contribute to what appears to be a very positive online environment. Although participants expressed a desire for additional time to experiment with the technology and tools involved in the project, the facilitators appear to have achieved a pragmatic balance between structured professional development activities and time for experimentation. The facilitators confirmed their efforts in this regard in interviews and have incorporated greater flexibility in some of the subsequent learning activities and the overall approach to Module 2.

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ii. Modifications to Module 2

Unlike Module 1, which lasted several months, Module 2 was approximately three weeks in duration. Further, Module 2 was divided into three sections, which allowed a better facilitator-to-participant ratio. This change provided greater flexibility for participants to schedule their work in Pathway. In addition to accommodating schedules, facilitators reduced the content demands during Module 2. Participants also worked somewhat independently on their projects and there were no required discussion forums in Module 2. These changes were significant compared to Module 1, which involved considerable interaction among participants over an extended period of time.

When asked about possible modifications to Module 2, both facilitators stated that they wouldn't change anything for future iterations. They liked having the option of three sessions and appreciated the opportunity to interact with fewer students at one time. They did, however, state that some content from Module 1 perhaps should be saved for Module 2, which would necessitate some reorganization of the content presented. Overall, these changes allowed the opportunity for participants to focus on their own interests with considerable flexibility and allowed facilitators to more easily manage the Module and provide meaningful input to participants.

iii. Participation and Attrition

The online professional development software (i.e., Moodle) logs user interaction, participation, and all of their contributions. As a result, this system was leveraged to collect information about the state of the online professional development during Year 1. These data indicated that the project involved 189 total participants including school administrators, participating teachers, project coordinators, and project staff. Of these, 38 did not access the online professional development. However, 131 participating teachers were actively engaged in the online professional development at some point during Module 1. Reports indicate that only eight teacher participants were inactive for more than four weeks and 12 were inactive for more than three weeks during Module 1.

Due to the duration of Module 2, the best indicator of participation is the MAP project. It was reported that 118 participants successfully completed Module 2. A listing of MAPs submitted included URLS for 116 websites. This represents a completion rate of 98.3% for the participants engaged in Module 2.

During Module 1, several participants were unable to continue their participation in the Pathway project. Reasons include reduction in workforce separation from teaching (RIF), voluntary separation from teaching, changing schools, or voluntary separation from the project. In one unfortunate case, a participant died. The majority of these participants were replaced and some additional participants were introduced to the project. Collectively between Modules 1 and 2, there was nearly a 33% change in participation. The following table highlights the changes in participation by content area and district.

Table 2: Year 1 Attrition and Change in Teacher Participation

County	Number of Teacher Participants	Module 1 Attrition	Module 2 Attrition	Additions	Total Year 1 Changes	% Change
Carson	4	1	1	0	2	50.00%
Churchill	4	0	0	0	0	0.00%
Clark	65	20	2	1	23	35.38%
Douglas	4	0	0	0	0	0.00%
Elko	6	0	0	0	0	0.00%
Esmeralda	3	0	3	0	2	66.67%
Eureka	2	0	1	0	1	50.00%
Humboldt	2	2	0	0	2	100.00%
Lander	2	0	0	0	0	0.00%
Lincoln	2	1	0	0	1	50.00%
Lyon	4	0	0	0	0	0.00%
Mineral	2	0	0	0	0	0.00%
Nye	4	6	1	0	7	175.00%
Pershing	2	1	0	0	1	50.00%
Storey	2	0	0	0	0	0.00%
Washoe	14	0	0	0	0	0.00%
White Pine	4	2	0	0	2	50.00%
Total	*126*	*33*	*8*	*1*	*41*	*Overall Change: 32.54%*

5. Year 1 Evaluation Methods

The Pathway Project is highly complex, involving numerous entities, outcomes, and variables. The two main objectives of the project are to: 1) change teacher behavior through online, collaborative professional development about technology integration; and 2) determine packages of effective classroom technology resources and professional development for planning and budgeting purposes. This evaluation employed a mixed methods approach to evaluate these objectives, triangulate the results and contextualize inferences. Data included quantitative data from various instruments, qualitative interviews with project facilitators, participant artifacts, and forum discussions. Data were gathered using a battery of instruments administered to all participants, once during orientation (baseline) and at the end of each module. All content and discussions were archived, and reviewed, coded, and analyzed for themes to draw inferences regarding the overall goals and objectives of Pathway. This report examines progress and findings associated with Year 1.

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i. Objective 1: Change Teacher Behavior

Researchers have identified a link among cognitive, affective, and psychomotor domains when examining dispositions, knowledge, and behaviors (see; Alexander, 2003; Alexander, Jetton, & Kulikowich, 1995; Bloom, Englehart, Frost, Hill, & Krathwol, 1956), particularly as it pertains to interventions, training, or human performance (Schrader & Lawless, 2004). Specifically, research indicates that these domains are interrelated. A high self-efficacy associated with technology typically corresponds to high levels of technology use. Similarly, one's disposition toward technology (or teaching with technology) is related to teaching behaviors. To positively impact behavior, it is necessary to address all components within this paradigm (Ertmer & Ottenbreit-Leftwich, 2010; Schrader & Lawless, 2004).

As a result, three separate survey instruments were developed by the evaluators to measure participants' attitudes, dispositions, and self-efficacy associated with educational technology and teaching with technology. Further, items from a Technological, Pedagogical, and Content Knowledge (TPACK) scale were adapted from an existing set of items developed by Schmidt et al. (2009). Items on the Attitudes Toward Technology Tools survey pertained to questions about technology in general and its potential in education. Items on the Dispositions Toward Teaching with Technology survey pertained to teachers' perceptions of technology and its role as an educational tool. The items on the Self Efficacy survey pertained to participants' confidence in performing a variety of tasks (e.g., building a web page, emailing attachments) that involve technology. Finally, the items on the TPACK survey involved participants' evaluation of their technological, pedagogical, and content knowledge and were intended to offer insight into teachers' pedagogical practices.

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ii. Objective 2: Effective Strategies for Online Professional Development

The second objective concerns the nature and delivery of the online professional development. As a result, different data and methods were necessary to capture the dynamics of participant interaction and facilitator involvement. Specifically, all course materials and online discussions within the Moodle forums were exported as text files and coded using HyperRESEARCH Qualitative Analysis Tool. Qualitative analyses followed a constant comparative method and continued throughout the Module (Strauss, 1987), Data were triangulated as a review of documents, materials, and field notes from Pathway served to confirm the trustworthiness of data gathered (Lincoln & Guba, 1985).

Materials were read, reviewed, and coded. Codes began with a common set that established by the researchers and guided by the evaluation questions. Codes were revised as necessary to reflect the data that were analyzed. Participants were also asked to list "3 things you think are going well", "3 things you would improve, " and "3 things you hope to learn before the end of Pathway." Responses were examined for similarity and like responses were combined. From these data, it was possible to identify aspects of instruction that facilitated learning as well as suggestions for improving the project.

6. Year 1 Evaluation Results

i. Demographic Results

Participants in the Pathway project were asked to complete a demographic questionnaire at the beginning of their participation. Although there have been some changes in project participation since that time, the following results reflect the demographics of Pathway participants based on the pretest data. Overall, there are several attributes that are shared among participants in the project. Nearly equal numbers of participants reported having a Bachelors (32.9%), Masters (29.4%), or Masters +30 (36.5%) as their highest degree. One participant reported having earned a doctorate. The most common ethnicity reported was white (78.9%). Other ethnicities represented were: Black (4.4%), Hispanic (3.3%), Asian or Pacific Islander (3.3%), and American Indian or Alaskan Native (2.2%). A total of 7.8% did not report an ethnicity. In terms of age, participants ranged from 22 to over 55 years of age. The most common age range was 35-39 (22.2%), but there were comparable numbers of participants reporting that their ages fell between 30-34 years (15.6%) and 40-44 years (16.7%).

At the beginning of Module 1, these baseline data were collected and examined to describe the general profile of Pathway participants. Due to the possible influence of attrition, a similar analysis was conducted at the beginning of Module 2. In general, findings confirmed that participants indicated that they held a high opinion of the role of technology in the classroom and reported being moderately skilled in technology use. There were many areas, however, in which they were not skilled and had room to benefit from the planned modules. Overall, these data suggest that the population of Pathway participants was an appropriate cross section of teachers across the state and the group was well suited to interact with the professional development materials, provide formative feedback for refining the modules, and apply their learning in classrooms across Nevada.

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ii. Baseline Results: Pretest

Participants also completed a number of Likert-type survey instruments designed to measure their attitudes toward technological tools, dispositions toward teaching with technology, technology self-efficacy, and their Technological, Pedagogical, and Content Knowledge (TPACK). Surveys were created and scored on 1 to 5 scales. The Attitudes scale was scored (1) not at all useful to (5) extremely useful with a not applicable option (n/a) if they were not familiar with the tool. The Disposition and TPACK scales were scored (1) strongly disagree to (5) strongly agree. The Technology Confidence scale was scored (1) not at all confident to (5) extremely confident with an n/a option if they were not familiar with the tool. For the purpose of this report, these data are intended to provide general profiles of participants and their potential to succeed in the project.

Attitudes Toward Technological Tools. As expected, participants indicated that some tools might be more useful than others. In general, respondents were familiar with common tools and less familiar with specialized, subject-specific tools. However, while participants varied in their appreciation of the common tools, those who were familiar with specialized tools valued them more highly. For example, participants varied in their acceptance of concept mapping software as a useful tool but generally rated it as a useful or very useful tool (46.5%). By contrast, there were relatively few participants who were unfamiliar with the category or felt that it was not relevant to their teaching (12.7%). Alternatively, proportionally more participants (30.2%) were unaware of probeware and the associated data collection tools. However, those who reported some knowledge of probeware also indicated that it was a useful or very useful tool (37.3%). This trend was evident in ratings associated with common instant messaging tools and Web 2.0 tools like blogs and wikis as they compared to more specialized tools like Interactive simulations and Website creation software.

Dispositions Toward Teaching with Technology. In general, this group of participants has a high opinion of the role of technology in the classroom. The average rating on a 5-point Likert-type scale was above four in every case with the exception of item seven: Technology should be central to instruction, which was rated a 3.82 on average. From these data, we infer that all participants value the use of technology but would assert that content is principal in instruction. Items in the TPACK instrument (below) address how content, pedagogy, and technology may be intertwined.

Technology Self-Efficacy (Confidence). Similar to their awareness of tools as reported in the Attitudes section, participants reported high self-efficacy ratings associated with easy skills (e.g., email, grades, search, etc.) but low self-efficacy with respect to more complex skills (e.g., video chat, web page creation, etc.). This suggests that the population has a solid foundation to begin a professional development program that is mediated by advanced technologies. While participants report valuable skills, there are many areas in which they are not skilled and have room to improve and grow.

TPACK (Technological Pedagogical Content Knowledge). Common across the TPACK items was participants' high rating of their strengths associated with their content areas. In general, participants believe that they know their content areas (M = 4.5), can engage in a way of thinking aligned with their content area (M = 4.4), and provide meaningful instruction associated with that content area (M = 4.5). At pretest, ratings indicate that technological knowledge, integration of technology, pedagogy, and content are areas in which participants might improve. While they have reported high levels of skill in their content area, data analysis suggests that they have room to grow.

Overall Profile of Pathway Participants. From these data, we conclude that the teacher participants in the Pathway project represent an appropriate cross section of trainees. Participants are experienced teachers (at least three years) and confident in both their ability to apply basic tools and to teach in their content areas. We assert that this group, at a minimum, has the requisite skills to engage with the Pathway professional development. Further, we assert that this group has the potential for improvement to allow for an appropriate evaluation of the Pathway modules and training materials as specified in the grant intent. Lastly, the majority of participants were recruited early. Analysis of participants' goals suggests that they are commensurate with the characteristics required of successful online professional development and learning. Ultimately, the group of individuals appears well suited to interact with the professional development materials in a meaningful way and provide important feedback for the future improvement and delivery of instruction.

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iii. Data Screening and Analysis

Data were examined for normality and visually scanned for outliers. No immediate issues were detected. However, there were at least 15 and as many as 31 items per scale and comparatively few participants (i.e., approximately 127). To increase the parsimony of the model and improve the predictability of the analyses, a principal components analysis was applied to the data to reduce the number of variables (Stephens, 1996). This technique also revealed patterns in participant responses. Specifically, items from each scale were compared in terms of how they relate to one another. These patterns were examined and named based on the themes they appeared to reflect.

The principal components analysis of the *Attitudes Toward Technology Tools* scale revealed four stable components that were named *interactive tools, production tools, delivery tools*, and *specialized tools* based on the nature of how the tools are used. Analysis of the *Dispositions Toward Teaching with Technology* scale revealed two stable components that were named*: student centric uses* and *teacher guided uses* based on what type of pedagogical activities are involved. Analysis of the *Self-Efficacy* survey revealed two stable components that were named: *frequent daily tasks* and *pedagogical tasks* based on how confident participants were in these areas. Analysis of the *TPACK* survey revealed six components that were named: *technological knowledge*, *pedagogical knowledge, technological pedagogical knowledge, TPACK, content knowledge*, and models of TPACK. These factors aligned with the structure from Schmidt et al. (2009). See Table 3 for items, components, and a brief description of the nature of those components.

Table 3: Component Variables and Items

Attitudes Toward Technology Tools Scale	*Items*	*Variance Explained*
Production Tools: Items that pertained to tools used to create resources.	10, 11, 12, 13	18.18%
Delivery Tools: Items referred to technology typically used to deliver information (e.g., the WWW, presentation software, etc.).	1, 2, 5*, 9	15.37%
Interactive Tools: Items pertained to dynamic tools that are often used because they provide feedback (e.g., games, concept maps, etc.).	4, 5*, 6, 14, 15	15.56%
Specialized Tools: Items dealt with technology that often requires more training or is developed for specialized uses (e.g., modeling tools, simulations, etc.).	3, 7, 8	11.13%
	Total	*60.24%*
Dispositions Toward Teaching with Technology Scale	*Items*	*Variance Explained*
Student Centric Uses: Items related to technology used by students (e.g., homework, learning, etc.).	1, 2, 3, 4, 5	33.82%
Teacher Guided Uses: Items that pertain to technology used by the teacher for instructional purposes (e.g., record keeping, building assignments, etc.).	6, 7, 8, 10, 11, 12, 13, 14, 15	24.64%
	Total	*58.46%*
Self-Efficacy Scale	*Items*	*Variance Explained*
Frequent Daily Tasks: Items pertained to tasks done regularly as part of daily teaching activities (e.g., sending email, entering grades, etc.).	1, 2, 3, 5	35.35%
Pedagogical Tasks: Items related to the tasks that involved more pedagogical thought (e.g., start a video chat, build a web page, etc.).	4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	24.64%
	Total	*59.98%*
TPACK Scale	*Items*	*Variance Explained*
Technological Knowledge: Items pertained directly to participants' knowledge of technology.	1, 2, 3, 4, 5, 6, 7	17.37%
Pedagogical Knowledge: Items pertained to participants' knowledge of pedagogy.	11, 12, 13, 14, 15, 16, 17, 18	14.26%
TPACK: Items pertained to TPACK in general.	19, 20, 24, 25, 27, 28	13.95%
Models of TPACK: Items pertained to the manner in which participants see their instructors modeling TPACK practices.	26, 29, 30, 31	9.27%
Content Knowledge: Items pertained to participants' content area.	8, 9, 10	9.06%
Technological Pedagogical Knowledge: Items pertained to participants' knowledge of using technology to teach in their content area.	21, 22, 23	8.51%
	Total	*73.41%*

* Denotes complex loading item.

iv. Objective 1: Change Teacher Behavior

To address objective 1, components from the factor analysis were examined for growth among three time periods: baseline, the end of Module 1, and the end of Module 2. Subsequently, a Repeated Measures Analysis of Variance (RMANOVA) was applied to the 84 sets of complete data using the component variables to determine key areas of change. Wilks' Λ is a likelihood ratio test for multivariate analyses and was used to examine the significance of the RMANOVA. For Year 1 overall, results indicated that there were significant main effects with respect to all but two variables (attitudes toward *interactive tools* and self-efficacy associated with *frequent daily task*s). Subsequent analyses indicated that participants' ratings in each area grew over time. Further, the estimate of effect (partial η^2) for each significant change is considered to be meaningful. Specifically, Cohen (1988) added that significant results should be contextualized. As such, effect size is used as indicator of the social importance of any significant quantitative test. Cohen described η^2 = .01 as small, η^2 = .06 as medium, and η^2 = .14 as large. The tests in this analysis all exceeded the .14 range in their estimate of effect, suggesting that the results are meaningful.

Although results from Year 1 indicated that the Project exhibited overall gains, more discreet analysis of the modules revealed that each excelled in few distinct areas. For example, participants did not report a significant increase in their *pedagogical knowledge* or *technological pedagogical knowledge* during Module 1. However, participants reported significant increases in these variables during Module 2. Year 1 results indicated that there were similar gains overall. From one perspective, this may suggest that Module 2 was more adept at facilitating the development of pedagogical knowledge. However, Module 2 was considerably shorter than Module 1. It is possible that Module 2 extended the work begun in Module 1 and provided authentic, personal examples of pedagogical practice that may have resonated with participants. In either case, the finding highlights the fact that the two modules differed in content and instructional approach, but when combined as a collective experience, each served the overall goals of the project. See Tables 4-7 for the significance levels, relevant statistics for each set of variables, and noteworthy differences across time periods.

Noteworthy Differences Across Time Periods: Attitudes toward Technological Tools

The variable *delivery tools* represent technology used to present information. Teachers typically adopt technologies in this area early, as the implications are easy to integrate into existing instruction. From these data, it is interesting to note that neither module is independently responsible for the overall change during Year 1. By contrast, the variable *interactive tools* represents complex technologies that are both challenging to learn as well as challenging to implement into most curricula. In many ways, *interactive tools* require new skills and concomitant shifts in pedagogical perspectives. Although this is a focus of Pathway (e.g., Web 2.0 sites, interactive iPod tools), meaningful change may not take place until Year 2.

Noteworthy Differences Across Time Periods: Dispositions toward Teaching with Technology

Both variables associated with participants' dispositions toward *student centric* and *teacher guided uses* of technology did not reveal significant changes during Module 1. However, both variables exhibited significant increases during Module 2 and Year 1 overall. In this case, greater attention was dedicated toward independent work and hands-on activity during this module. However, it was already noted that Module 2 was significantly shorter than Module 1. As a result, these differences may have been the result of a strong foundation for change that began in Module 1 and extended throughout the rest of Year 1. These variables will need to be monitored during Year 2.

Noteworthy Differences Across Time Periods: Self-Efficacy

With respect to participants' self-efficacy ratings, Pathway content addressed *pedagogical tasks* directly. Much of the content focused on addressing the manner in which technology could be integrated into curricula. Participants' perceived competence appeared to increase in each module as

well as Year 1 overall. Indirectly, participation in Pathway demanded continued practice of common tasks to interact with material, respond to prompts, and complete assignments (i.e., *frequent daily tasks*). It is somewhat surprising that there was no significant change in Module 1 with respect to participants' self-efficacy associated with *frequent daily tasks.* Further, there was a significant increase for this variable during Module 2. However, this change did not manifest itself for the year overall. This may be partially explained by the fact that although Module 2 was shorter, it was considerably more independent and participants relied on their own skills as well as the guidance of their peers to accomplish the two main activities of Module 2.

Noteworthy Differences Across Time Periods: TPACK

The TPACK scale was reduced to six component variables, all of which exhibited significant increases across Year 1 overall. However, several of these variables did not reflect significant increases in participants' ratings for one or more modules. In general, TPACK was introduced during Module 1 as a framework upon which the professional development was delivered. Overall, Module 1 focused on expanding participants' understanding, awareness, and knowledge of technological content. Although discussions pertained to the implementation and integration of technology in classrooms, there was more focus on the tools themselves. This may have accounted for the lack of difference in *pedagogical knowledge*, *technological pedagogical knowledge* and *TPACK* during Module 1. By contrast, Module 2 was applied and allowed participants to focus on their individual interests. There was opportunity to exchange ideas with peers, although this was not required. The approach and content focus of Module 2 may have accounted for the significant changes to *pedagogical knowledge* and *TPACK.* Collectively, the content in Module 1 and Module 2 address *technological pedagogical knowledge*. This may have accounted for the overall Year 1 increase with respect to this variable, although there was no significant increase during either Module 1 or Module 2. Whether or not the changes were significant, they were all in the positive direction (i.e., gains), supporting the conclusion that Pathway is having a positive impact on participants.

Table 4: Attitude Scale Outcomes

Variable Name		Module 1: Building Knowledge and Skills	Module 2: Setting Goals and Project Planning	Year 1 Overall Change
Production Tools	Wilks' Λ	.913	.827	.590
	F value	F (1,114) = 10.821	F (1,84) = 17.571	F (2,82) = 28.534
	Significance (p)	.001	< .001	< .001
	partial η^2	.087	.173	.410
Delivery Tools	Wilks' Λ	Not significant	Not significant	.853
	F value			F (2,82) = 7.056
	Significance (p)			.001
	partial η^2			.147
Interactive Tools	Wilks' Λ	Not significant	Not significant	Not significant
	F value			
	Significance (p)			
	partial η^2			
Specialized Tools	Wilks' Λ	.952	.932	.821
	F value	F (1,114) = 5.720	F (1,84) = 6.143	F (2,82) = 8.914
	Significance (p)	.018	.015	< .001
	partial η^2	.048	.068	.179

Table 5: Disposition Scale Outcomes

Variable Name		Module 1: Building Knowledge and Skills	Module 2: Setting Goals and Project Planning	Year 1 Overall Change
Disposition toward Student Centric Uses	Wilks' Λ	Not significant	.870	.707
	F value		*F* (1,85) = 12.700	*F* (2,84) = 17.415
	Significance (*p*)		.001	< .001
	partial η^2		.130	.293
Disposition toward Teacher Guided Uses	Wilks' Λ	Not significant	.923	.778
	F value		*F* (1,85) = 7.091	*F* (2,84) = 11.985
	Significance (*p*)		.009	< .001
	partial η^2		.077	.222

Table 6: Self-Efficacy Scale Outcomes

Variable Name		Module 1: Building Knowledge and Skills	Module 2: Setting Goals and Project Planning	Year 1 Overall Change
Self-Efficacy Toward Frequent Daily Tasks	Wilks' Λ	Not significant	.954	Not significant
	F value		*F* (1,85) = 4.071	
	Significance (*p*)		.047	
	partial η^2		.046	
Self-Efficacy Toward Pedagogical Tasks	Wilks' Λ	.872	.884	.584
	F value	*F* (1,116) = 17.036	*F* (1,85) = 11.144	*F* (2,84) = 29.976
	Significance (*p*)	< .001	.001	< .001
	partial η^2	.128	.116	.416

Table 7: TPACK Scale Outcomes

Variable Name		Module 1: Building Knowledge and Skills	Module 2: Setting Goals and Project Planning	Year 1 Overall Change
Technological Knowledge	Wilks' Λ	.865	.855	.592
	F value	*F* (1,115) = 17.970	*F* (1,85) = 14.399	*F* (2,84) = 28.943
	Significance (*p*)	< .001	< .001	< .001
	partial η^2	.135	.145	.408
Pedagogical Knowledge	Wilks' Λ	Not significant	.949	.855
	F value		*F* (1,85) = 4.605	*F* (2,84) = 7.115
	Significance (*p*)		.035	.001
	partial η^2		.051	.145
TPACK	Wilks' Λ	Not significant	.918	.692
	F value		*F* (1,85) = 7.588	*F* (2,84) = 18.705
	Significance (*p*)		.007	.001
	partial η^2		.082	.308
Models of TPACK	Wilks' Λ	.749	.814	.542
	F value	*F* (1,114) = 38.230	*F* (1,85) = 19.400	*F* (2,84) = 35.531
	Significance (*p*)	< .001	< .001	< .001
	partial η^2	.251	.186	.458
Content Knowledge	Wilks' Λ	.938	Not significant	.868
	F value	*F* (1,115) = 7.654		*F* (2,83) = 6.303
	Significance (*p*)	.007		.003
	partial η^2	.062		.132
Technological Pedagogical Knowledge	Wilks' Λ	Not significant	Not significant	.805
	F value			*F* (2,83) = 10.066
	Significance (*p*)			< .001
	partial η^2			.195

v. Objective 2: Effective Strategies for Online Professional Development

Quantitative results support the effectiveness of the online professional development to impact teacher change in attitudes, dispositions, self-efficacy, and TPACK. Qualitative analysis confirmed these findings and complements quantitative data with illustrative details of key issues involved. Qualitative data sources included interviews with project facilitators, participant artifacts including their Measurable Achievement Plans (MAPs), forum discussions, and open responses from teacher surveys.

The post-module evaluations included open-ended items in which participants were asked to describe what they think is going well, what they would improve, and what they hope to learn before the end of Pathway. Additionally, participants' e-portfolios, including their MAPs, provided further data addressing the effectiveness of the professional development.

Survey Prompt: What is Going Well?

Technology Growth. After combining like responses, the most frequently identified strength of the project following Module 1 centered on the degree of learning that the participants were undergoing. One respondent noted, "My eyes have definitely been opened to new opportunities and options." Another stated, "I have learned a lot about the technologies out there. I am excited to try more of them in my class." Many cited various Web 2.0 resources and other useful websites, increased knowledge of the iPod Touches, and use of the Moodle content management system.

Following Module 2, the most commonly cited praise and strength of the project again pertained to the participants' degree and amount of learning. A large number of participants identified the creation of professional websites as an area that is going particularly well. As one teacher noted,

> *I feel that creating a website was the best thing I learned during this module. I have never been able to do this until now. I feel confident in teaching my students how to create websites to improve and show what they learn throughout the year.*

Another added, "It was great to create the website that we are using to SHOWCASE what we are doing in Pathway." Others commented on ways in which they intended to apply and extend their use of their own websites. One stated, "I am constantly thinking of ways to update my site and I want to be able to use it with my students and my colleagues." Another confirmed, "The website is a great application I will be incorporating."

Many comments illustrated teachers' extended learning of new applications and tools and their growing self-confidence in using technology. As one stated, "I have a better idea of 21st century tools my students can use. Another noted that the project has teachers "reaching out beyond our comfort zone to learn new technologies." Finally, one teacher articulated what several expressed: "I love all of the new technology that I am learning about."

Technology Access. Respondents also frequently lauded the increased access to technology that resulted from participation in the project, "using the awesome technology—iPods and laptop cart." Teachers also noted that the student use of technology was going well as was the motivation that both students and teachers were experiencing.

Collaboration. Many teachers cited the collaboration that they were experiencing with peers as a major strength of the project. Participants noted that they were able to share successes and difficulties and get new ideas through their online collaboration. As one teacher explained, people "seem pressured in terms of the time that it takes and the vast amount of resources to explore. The peer support for this level of change appears quite helpful." Another participant noted that the collaboration with other Pathway teachers resulted in a "fantastic pool of information."

Self-Directed Learning. As noted, Module 1 was highly structured and contained copious amounts of content. As a result of modifications to this approach, many respondents expressed praise for the organization of Module 2 and the time that it afforded for self-directed exploration. There was a clear appreciation for the differentiated approach of Module 2 that allowed participants to select topics to pursue. One respondent confirmed the sentiment expressed by several: "Module 2 was wonderful. I really enjoyed having the freedom to be in charge of my learning." Another confirmed "I love that we were given the opportunity to explore different web programs during this module."

Additional strengths cited include the improved organization of the Moodle site, clear expectations within the Module 2, and the knowledgeable and timely feedback provided by facilitators.

Prompt: Suggestions for Improvement?

When asked for what they would improve, teachers most frequently cited goals pertaining to their individual skills and knowledge of various applications encountered in the project. In terms of their suggestions for the project itself, analysis of responses indicate several areas for improvement, particularly following Module 1.

Required Workload. The most frequently cited area for improvement following Module 1 related to the amount of work required and the time it took to complete the assignments. Initially, this may be partially explained by the need to learn the Moodle environment in addition to module content. For some it reflects the engaging nature of the content, with multiple opportunities to explore learning resources.

*W*hile the content and range of resources were identified as clear strengths for some, other respondents suggested that there be less emphasis on the quantity and breadth of resources explored—with greater emphasis on depth. With a limited amount of time to work on project tasks, some respondents suggested that more time be allocated for working directly with the technologies and applications for implementation in the classroom. One teacher noted: "Assignments were almost too varied-it was hard to choose where to start and how to focus. I am hoping in future modules the scope will narrow just a bit." Another teacher added, "I appreciate being shown what's out there, but now I need more practice and guidance using it."

Suggestions about the amount of work required were substantially reduced following Module 2. While the content and range of resources were identified as clear strengths, some respondents still suggested that there be less emphasis on the quantity of resources explored—with greater emphasis on differentiation and focused activities based on interest. As one teacher noted, "There has already been a switch to exploration with a goal (lesson plans in mind). I hope that continues because I'm less frustrated putting in extra time when I create a lesson that excites me." Others echoed the sentiments of being allocated time in Modules 3 and 4 to "develop and experiment with current resources," "to follow up on my own creative ideas," "and to integrate the new technologies we are learning" including iPods, podcasts, blogs, and website development. One teacher suggested that they could "perhaps use a log for teachers to record time spent" on the "extra work required for actual implementation."

Clearer Expectations and Directions. The next most frequently cited improvement following Module 1 focused on having greater clarity for some assignments in terms of expectations, directions, and grading criteria. One respondent requested "more elaboration or examples on what to do for some of the assignments." A couple of others specifically referred to "communication about expectations as far as grades go." In addition, a number of participants commented that the organization of the Moodle site could be clearer and more

"user-friendly" for accessing course materials. One teacher noted, "After Moodle was revamped, it definitely got better, but having 2 or 3 places to look for things gets confusing." Another concurred, "The page set up is often confusing….Simplicity would be nice."

While survey data following Module 2 suggested that participant satisfaction with the clarity of directions and expectations significantly increased, the most frequently cited response following Module 2 focused on the need for clearer directions, particularly with regard to the portfolio. This finding indicates that this is still a concern for some. Interview data suggested that the project facilitators made a conscious choice not to be overly prescriptive in the portfolio assignment, which some might interpret as lacking necessary structure. A detailed template that addressed what to include and how to structure the portfolios, however, was provided and used by participants. In addition, facilitators indicated that issues related to the clarity of directions were often due to participants not fully reading the directions provided rather than shortcomings in the explanations.

Collaboration. Another set of suggestions focused on the need for more collaboration. Several suggested that they would benefit from more collaboration with their Pathway colleagues. One teacher suggested, "I think we should be encouraged to work with a partner on more assignments. Collaboration is essential and participants would be less frustrated." Another participant requested "more true interaction/collaboration with other online pathways teachers- not just my own colleague."

Local Technology Support. Other suggestions for project improvement included delays in getting equipment to some of the sites and various issues in getting the technology up and running. In this project, such technology-related issues are the responsibility of the districts and their participating schools. Following Module 2, this was less of a concern. However, one respondent stated, "Our IT in our school district is inadequate and slow to meet the needs of the Nevada Pathway Project. Currently, some of those needs have yet to be met."

Opportunities for Face-to-Face Meetings. Several people noted their preference for some face-to-face meetings. As one teacher noted, it would be nice to have "local collaborative informal meetings to discuss what we have learned, what is working, and brainstorm what is not." Another teacher added, "I would provide face-to-face opportunities…at least one every school quarter, where people in the same District can talk things out in person."

Prompt: Next Step for Future Learning/Additional Comments?

In another prompt, participants were asked to *list 3 things that they hope to learn before the end of Pathway*. The most frequently cited response following Module 2 pertained to more learning with the iPods and how they can be effectively used in their teaching and "how to better incorporate the Ipods into a daily classroom routine." Other learning goals included more general goals about "how to integrate technology seamlessly" into teaching, and in general to become a more effective teacher using technology. Finally, other comments cited further technology tools to learn including podcasts, video, and website development.

Praise for Facilitators and Project. The open-ended questions concluded with an opportunity for participants to add any additional comments that wanted to share. Positive comments largely outweighed negative ones, in a ratio of 6 positive for each critical one. In general, the comments were effusive with praise for the facilitators and the project. As one teacher wrote, "You both are doing wonderful. I'm excited to experience the next two modules." Another participant added, "I love this project! Thank you to the wonderful distance learning instructors."

Experience and Growth. Several commented on the benefits of the project. “This has been a fabulous opportunity and experience for me, and it has significantly improved my teaching and changed my life. Thank you for choosing me to be part of the pathway Project!” Another added, “Thank you for all the wonderful resources. I know I will be a better teacher, changing the lives of children as I take them along the 21st century path.”

Measurable Achievement Plans (MAPs)

A culminating activity completed at the end of Module 2 was the posting of teachers’ MAPs on their web-based e-portfolios. It was reported that 118 participants successfully completed Module 2. A listing of MAPs submitted included URLS for 116 websites, or 98.3% of participants who engaged in Module 2. A breakdown of the posted MAPs by subject area appears in Table 8.

Table 8: Measurable Achievement Plans by Subject Areas

Content Area	Number
English Language Arts (ELA)	38
Mathematics	20
Science	32
Social Studies	25
Social Studies/ELA	1
Total	116

In addition to creating their MAPs, participants were asked to identify a key standard to be addressed in their MAPs using a synthesis of two frameworks introduced during the project: the National Educational Technology Standards (NETS) and the Partnership for 21st Century Skills. Each participant was asked to identify one of seven of the delineated areas. Areas covered ranged from *life and career skills* to *critical thinking, problem solving, and decision making*. Table 9 shows a breakdown of the standards or areas addressed.

Table 9: Measurable Achievement Plan Breakdown by NETS/P21 Standards

NETS and P21 Standards Addressed	Number
Critical Thinking, Problem Solving, and Decision Making	29
Communication and Collaboration	24
Creativity and Innovation	22
Research and Information Fluency/Information Literacy	17
Technology Operations and Concepts/ICT Literacy	11
Digital Citizenship/Media Literacy	7
Life and Career Skills	6
Total	116

7. Discussion and Implications

Quantitative data following each of the first two modules during Year 1 supported the effectiveness of the project to significantly impact teacher change in attitudes, dispositions, self-efficacy, and TPACK. Module 1 introduced a wide range of core content central to goals of the Pathway Project and Module 2 reinforced and extended the learning initiated in Module 1 while also allowing the participants to "recharge their batteries." It is particularly impressive that these significant increases were recorded following Module 2, due to its limited duration and the brief amount of time since those measures were last administered. Such findings across the first year confirm a strong foundation for accomplishing Pathway's Objective 1: To promote change in teacher behavior through effective use of technology. Further, all accounts indicated that participants are well positioned for continued progress in the project during its second year of implementation.

Findings further supported the effectiveness of Pathway's strategies for online professional development—the second major objective of the project. Strengths identified include the technology-related learning that participants have undergone, the access to technology tools that pertain to the professional development, the collaboration fostered by the project, the opportunities for asynchronous, self-directed learning, the improved organization of the Moodle site, and the knowledgeable and timely feedback provided by facilitators.

In terms of the organization and the facilitators' instructional approach, facilitators solicited feedback from participants during Module 1. These results indicated that alternate approaches were warranted, which was confirmed by subsequent analyses. Findings from Module 2 validate the changes indicating the modifications were well received by both project facilitators and participants.

While Module 1 was highly structured and contained large amounts of content, Module 2 employed a greater degree of differentiated instruction. Participants pursued individual interests in the *Monster Garage* and demonstrated evidence of their learning by constructing a portfolio to house their MAPs. While Module 1 was structured with multiple assignments and expectations for ongoing interaction, Module 2 was self-paced and limited to two major assignments.

Overall, Module 1 was praised for the high levels of learning that took place, which was supported by quantitative analyses. Module 1, however, was criticized for the workload involved. Both project facilitators and participants lauded Module 2 as an excellent adjustment to the myriad demands during startup of the project and the high volume of content introduced in Module 1. As one of the facilitators stated, "I'm in love with all of Module 2." The facilitators agreed that they intended to build upon the success of Module 2 by incorporating further differentiated instruction in subsequent modules.

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i. Current and Future Challenges

Despite these positive outcomes, however, these data also imply several current and future challenges as they relate to the project goals. These challenges and their implications for future iterations of pathway were identified and are discussed below.

Equipment. Given the timing associated with the release of funding and the official start date of Module 1, not all districts were able to secure their equipment in time to begin the project. Even though some participants did not have their iPod touches, they still proceeded with the professional development. Unfortunately, this made participation and management more challenging until everyone had equal access to their tools. Although little could be done in this case, the time it takes to allocate funds and place/receive technology

orders will continue to be a challenge and should always be considered.

Facilitation. Several results focus on the praise for the facilitators during Modules 1 and 2. Facilitators were extremely involved, quick to respond, and provided knowledgeable guidance to participants. This degree and nature of facilitation has become integral to the Pathway experience. Without facilitators of similar ilk and capabilities, it is unlikely that future iterations of Pathway will achieve the same learning gains. It will therefore be necessary, and potentially a challenge, to identify facilitators who are able to maintain comparable quality while managing the professional development's complexities.

Participant Time Demands. Module 1 was marked by too much demand on participants' time. By contrast, adjustments made to Module 1 were well received, as was the approach to content in Module 2. However, there will likely need to be a balance between high expectations and what is appropriate for participants in online professional development. Research confirms that effective professional development consists of active, content-focused learning conducted over longer periods of time (Garet, Porter, Desimone, Birman & Yoon, 2001). However, the Pathway project has exceeded existing commitments of time and energy for some participants. Clearly, this balance is a challenge for any online professional development initiative that has high expectations, particularly for those involving new technologies and innovative approaches to teaching and learning.

Attrition. Another significant challenge for the project was attrition during Year 1. A few participants did not participate in Moodle as promised, some ceased participation in the project altogether, and others lost their teaching positions due to budget reductions. In other cases, districts were short on personnel to recruit teachers or teachers may have changed schools during the life of the project. In one unfortunate case, a participant died. Although the reasons for changes in participation vary and are not unforeseen in a project of this size, nearly 33% of participants changed during Year 1.

This amount of change in participation can lead to challenge in several ways. Participants who enroll late may not be able to catch up in time or, if they do, their experience is qualitatively different than participants who were able to fully engage within the community of practice that evolved during the project. Further, newer recruits were sometimes asked to participate rather than volunteer. Facilitators described this latter group as "reluctant participants." They were often difficult to motivate and appeared disengaged in the activities.

Continued Funding. The Pathway Project is a finitely funded initiative that provides technical support, infrastructure, and support for facilitators. Without this support, future implementations of the professional development would clearly be difficult and would have to be re-shaped according to available resources. Stipends, which may be used for materials or other items, were given to participants who completed each Module. Beyond the extrinsic rewards of the project cited often by participants, it would appear that the stipends served as an effective motivator for participants to persevere through a wide range of learning activities and project expectations.

Motivation. The level of rigor of the professional development activities resulted in meaningful learning gains for a majority, but also a clear overload and frustration for some. Overall, though, the approaches employed appear to have a achieved a good balance between "carrot" and "stick." This has implications in terms of motivation and also for the ability to replicate the project. Adequate funding for stipends and equipment appears to be a key component for successful implementation of the project.

Collaboration. The ability for facilitators to promote continued collaboration has been identified as an area of strength but also cited by some as an area for improvement. Facilitators required that participants work together during Module 1. This promoted a sense of community in which participants were comfortable and free to interact with one another. By contrast, Module 2 included the opportunity to ask and help answer questions in the

"Assignment Questions Forum." However, there were no active discussion forums beyond that. As intended, the questions and responses posted in the Assignment Forum were primarily to clarify details about the assignments and to later get help with logistics for creating and troubleshooting the web pages.

Unlike in Module 1 when participation in discussions was required, there was little higher-level discussion in Module 2 addressing issues of teaching and learning with technology. Thus, if subsequent learning activities are increasingly differentiated and individualized, it may be a challenge to continue to grow and/or support the evolving community of practice in the project. Both logistical and conceptual/theoretical discussions about effective teaching contribute to a productive community of practice and a balance of such interactions would be desirable to foster in Year 2.

Accountability and Support. A related challenge pertains to the evolving role of facilitators and their attempt to balance being supportive of participants while also holding them accountable to project expectations. Initially during Module 1, the professional development was modeled after a university course with numerous assignments and assessments conducted by the facilitators. In Module 2, facilitators opted to rely more on self-assessments by the teachers while also still holding them accountable to the expectations of the assignments. This could be viewed as an attempt to eliminate some of the scaffolding put in place initially to hold participants accountable to expectations. If the goal is to continue in this direction, as interview data suggest, the challenge would be to foster rigorous, high quality participant outcomes, holding them accountable to project goals while also shifting toward greater reliance on differentiated learning, self-assessment, and peer feedback.

Administrative Component. Another challenge involves the administrator component of the professional development. While Module 2 served as an effective follow-up to the ambitious offerings of Module 1 for teachers, project administrators did not participate in Module 2 and therefore did not derive similar benefits. Thus, while teachers seem well positioned to meet project objectives in Year 2, the readiness of project administrators is less clear.

8. Recommendations following Year 1

Based on data gathered and the challenges identified, the following suggestions are offered:

1. *Equipment:* Several participants voiced concern over beginning the project when they did not have the technology or materials to accomplish the assignments. Facilitators confirmed this problem, which was primarily due to timing and was a responsibility of the individual districts. Although a challenge sometimes, it is recommended that the PD begin only after equipment has arrived.
2. *Focus Activities:* Activities should be focused, perhaps limiting the scope of offerings. As has been the case, time commitments should be revisited and reduced as needed. This should be an ongoing consideration for each additional module. In the future, some of the volume of content presented in Module 1 might be distributed across the first two modules.
3. *Moodle Organization:* Facilitators commented on developing a clean and simple approach to activities and content within Moodle. Participant feedback confirms that the organization within Moodle has continued to improve. However, it is suggested that project facilitators continue to dialogue with participants via email, forums, or surveys to ensure that changes made are optimal and well received.
4. *Balance Activities:* In Module 2 and additional modules, it is recommended that facilitators target a productive balance between collaborative and independent, focused activities. This balance may come from activities formerly included in Module 1 to limit the intensity of that module while supporting collaboration in Module 2.
5. *Differentiated Activities:* The differentiation of activities was well received during Module 2. Following Module 1, it may be useful to allow participants to further differentiate their assignments and work to align activities with their own interests and teaching needs. Similar variations in scheduling and assignments should be considered in subsequent modules and in future iterations of Module 2.
6. *Differentiated Scheduling:* The ability to select a section provided participants with flexibility and an opportunity to focus their efforts. Similarly, this allowed facilitators the ability to manage significantly fewer participants at one time. Smaller, manageable groups (e.g., content area groups) that can still interact as a community (e.g., groups of 40-60 participants) should be examined for future modules.
7. *Continue to Build Communities of Practice:* As noted earlier, a strength of the Pathway Project is the capacity to build and support communities of practice. This should remain a high priority, whether or not an individual module is comprised of independent work. Collaboration can be facilitated and enhanced with existing technology and/or new technology (e.g., video conferencing) and opportunities for collaboration can also can be made available for Pathway colleagues during times when modules are not in session.
8. *Facilitation:* There may be ways to decrease the demands on the facilitators. In Module 2, facilitators opted to rely more on self-assessments by the teachers while also still holding them accountable to the expectations of the assignments. Continuation of such strategies should be considered keeping in mind that successful professional development requires a balance of high expectations and support.
9. *Administrators:* Administrators did not participate in Module 2 for a variety of reasons. However, educational change requires institutional support in addition to practitioner training and dispositions toward technology. It is recommended that administrators continue to be involved in ways appropriate to their role in schools (e.g., evaluators, facilitators, administrators).
10. *Extend Communities:* The “Home Room” section of Moodle provides Pathway members a location for resources and announcements. However, it may be beneficial to extend Home Room in a way that enhances and supports the Community of Practice. Alternatively, this could be accomplished through an external forum or social network

that would allow supported/scaffolded communication and exchanges during the breaks between Modules.

11. *Unified Experience:* Data indicate that collectively, Modules 1 and 2 are progressing toward the project goals. Independently, neither Module 1 nor Module 2 should be considered a complete experience, as they do not achieve all of the project goals on their own. It is therefore recommended that Pathway be viewed as a unified experience, all modules of which should be completed before meaningful learning is expected.

9. Conclusions

The advisory committee and staff conceptualized the Pathway Project as a sandbox for experimenting and gathering information. Data on relationships between content area and online professional development, the components needed for students to participate in statewide, collaborative projects, and the human resources needed to support online professional development are all being gathered to inform future online environments.

The Nevada Pathway Project is an ambitious statewide initiative with excellent potential to create viable models for professional development that impact student learning with technology. In considering the number of entities involved and the scope of the project, Pathway staff and participants have done well in implementing the initial activities as scheduled. Module 1 was delivered and modified based on helpful feedback and project logistics that arose were addressed. Equipment was purchased and distributed and management issues were addressed. Consistent efforts were made by project leaders and staff to establish a collaborative and supportive climate in both the administration of the project as well as in the online learning activities.

Another important outcome that resulted was the development of a statewide online community of practice to support innovative teaching. This includes participants from remote rural areas who would not readily receive this type of professional development in their local districts. While several participants noted that they would like to include some face-to-face meetings, the project appears to be working for a majority of the participants.

Based on feedback from Advisory Committee members, an unexpected outcome has been increased collaboration among instructional technology personnel across the state. In some districts, one person is responsible for grants, instructional technology, and technology support. In others, there are more staff members and these tasks are divided. A variety of webinars and online discussions, on topics not specifically tied to the Pathway Project, have spontaneously emerged as a direct result of the collaboration needed in the Pathway Project. There has been a dramatic increase in the sharing of resources and ideas among districts.

Although there are some inevitable challenges to a project of this scope, the project is having a positive impact on teachers' technology integration. Module 2 reflects an adaptive change of course from the startup of the project and the myriad demands of Module 1. Participants had the opportunity to take stock in their learning to date and to focus on their interests and needs. In addition, they created web-based e-portfolios to house their MAPs, which will be a key focus in Modules 3 and 4.

Quantitative and qualitative data confirm the effectiveness of both modules to significantly impact teacher change in attitudes, dispositions, self-efficacy, and TPACK. Despite the short duration of Module 2, data indicate that learning begun in Module 1 was effectively reinforced and extended. Although a range of positive outcomes was documented, several challenges have been identified and recommendations for Year 2 have been offered.

Overall, evaluation findings indicate that the Pathway Online Professional Development Project has been successful in terms of addressing Objective 1: to change teacher behavior through online, collaborative professional development about technology integration. Participants advanced their knowledge, skills, and dispositions, and appear well positioned for continued progress in the project during its second year of implementation. Further, the lessons learned and issues addressed have provided insights in terms of the manner and nature of online professional development and addressed Objective 2: to determine packages of effective classroom technology resources and professional development for planning and budgeting purposes.

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11. Appendices

i. Appendix A: Evaluation System

During the baseline data planning and collection phase, the external evaluation team completed the initial design of a database intended to house all data for the project (Figure 1). Further, an online system delivered from the Online Professional Development course management system (i.e., Moodle) was developed to deliver four instruments (Figures 2 and 3). The evaluation system was designed and developed expressly to collect and organize information from participants in the Pathway Project.

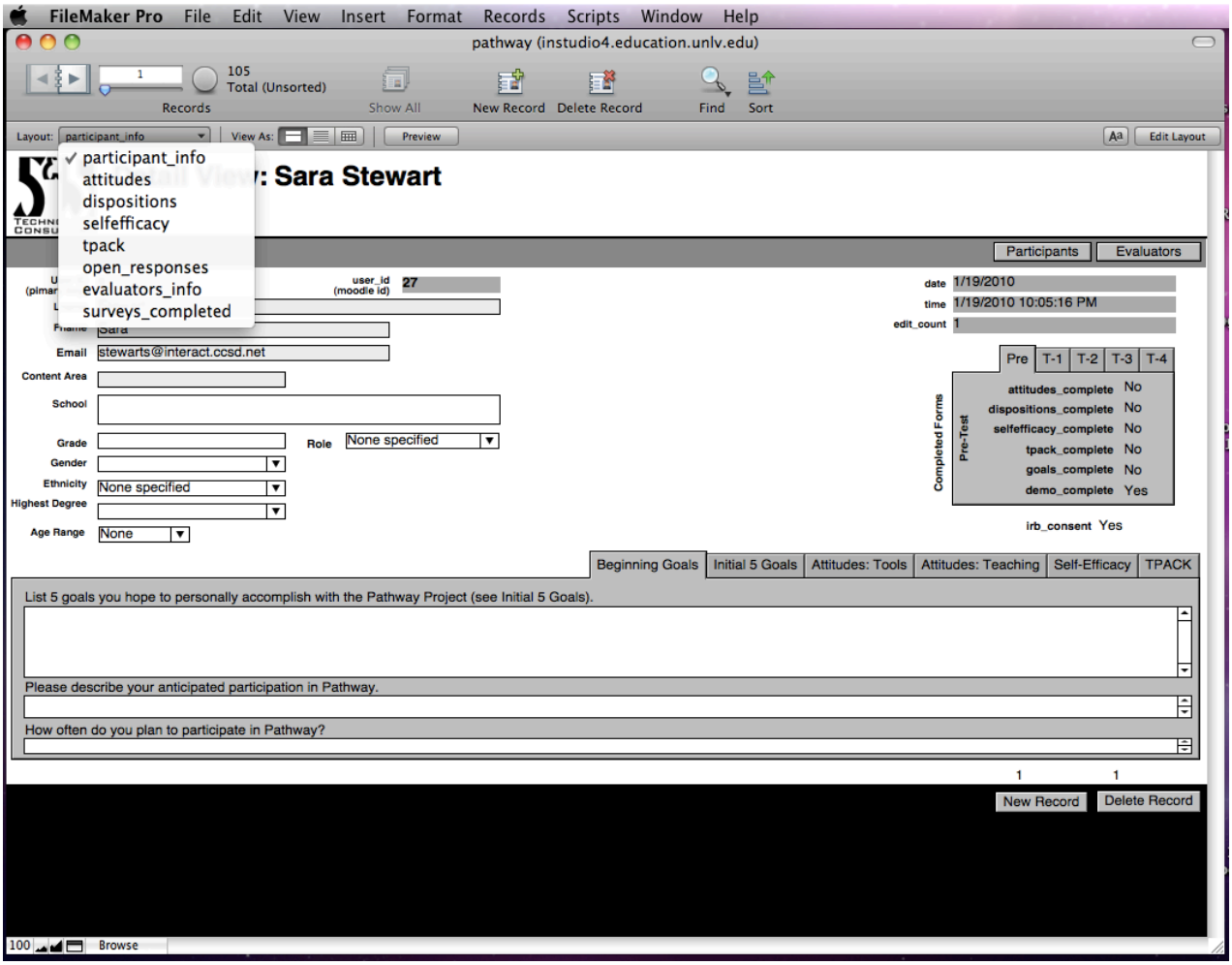


Figure 3. Back-end FileMaker Database

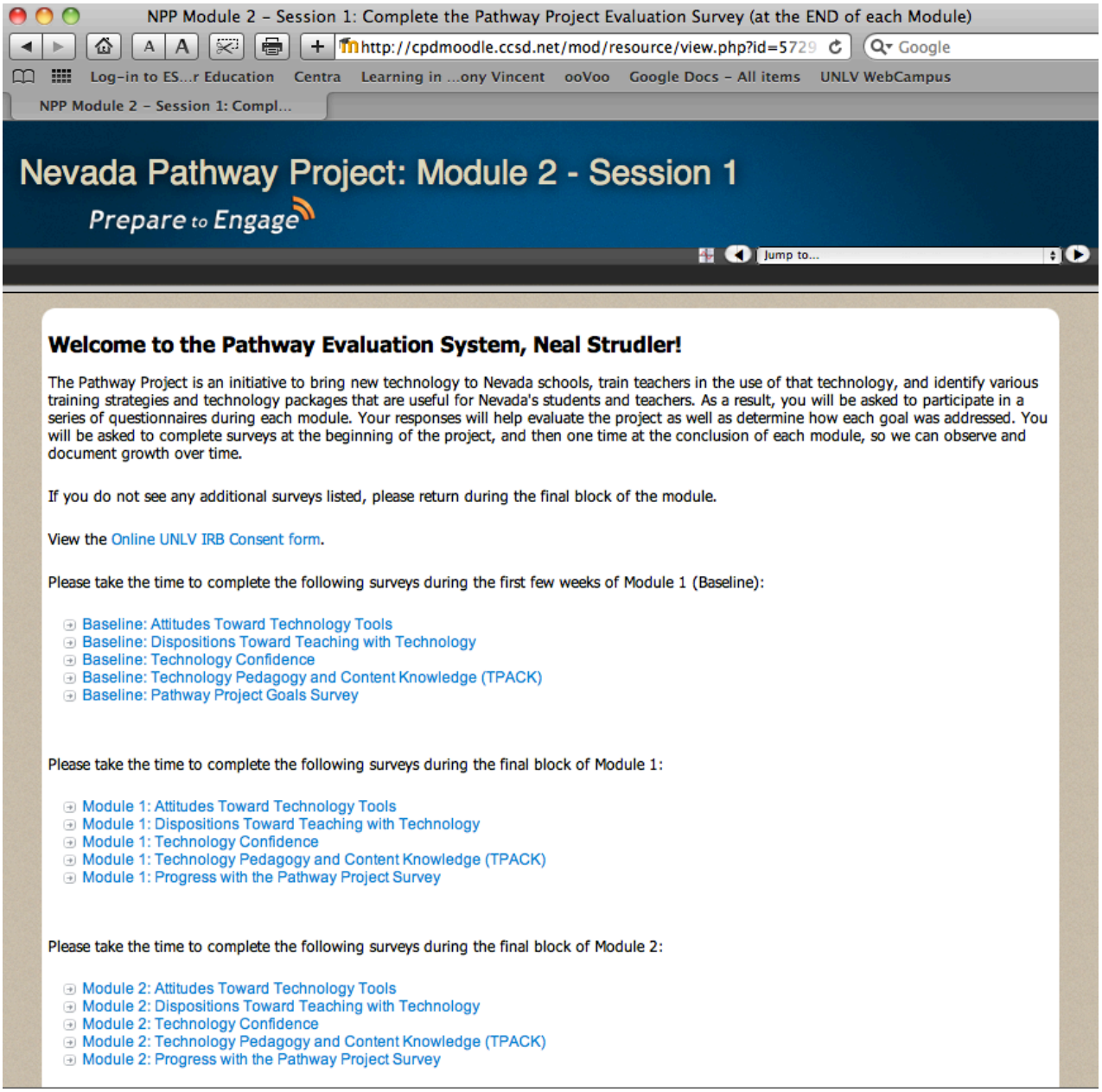


Figure 4. PHP Survey System deployed via the professional development system (i.e., Moodle)

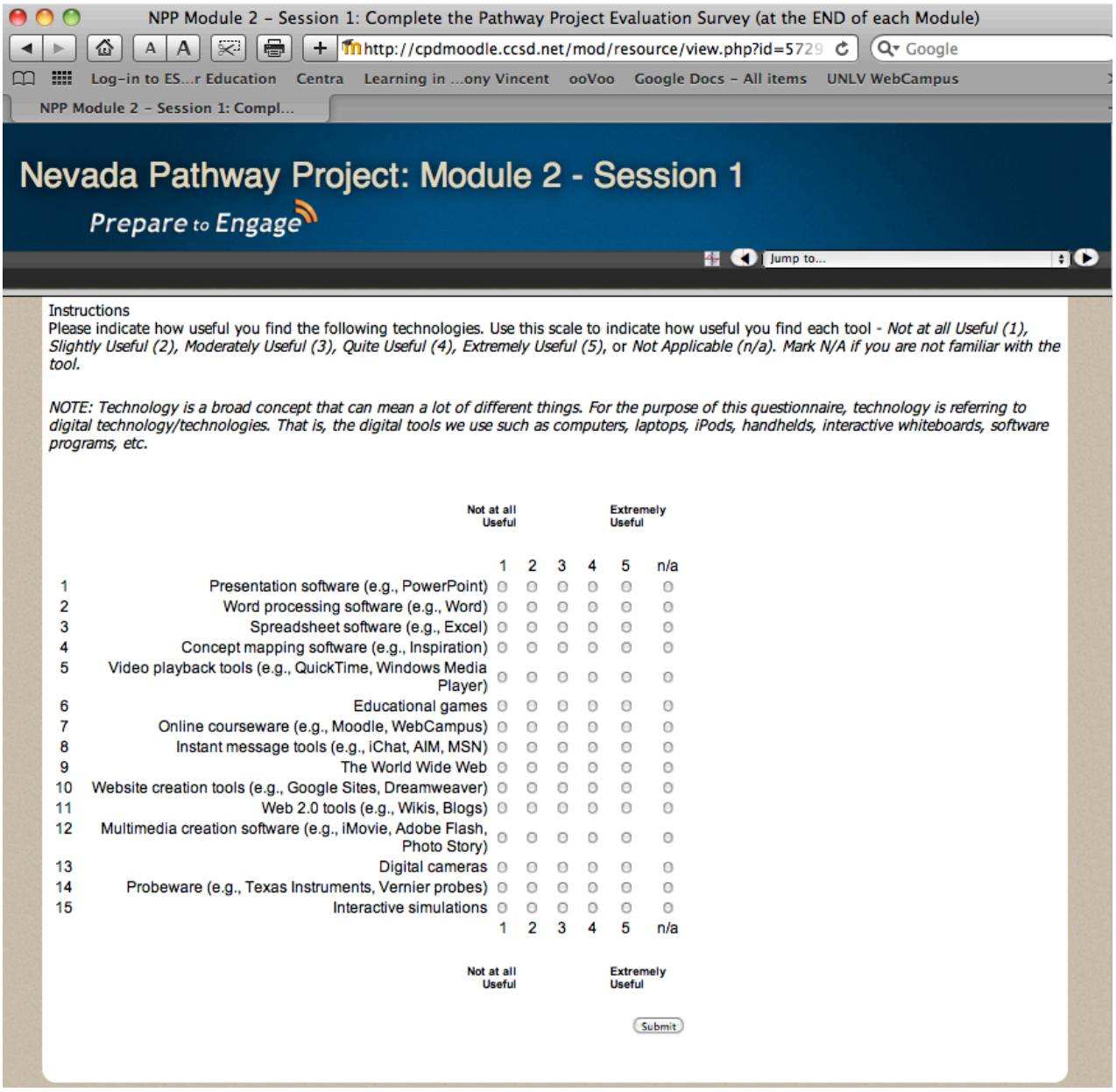


Figure 5. Example Survey within the Evaluation System

ii. Appendix B: Pathway Teacher Questionnaire

This questionnaire is being administered to all teachers who are participating in the Pathway Project. Your responses are confidential. You do not have to answer any question that you do not want to, just skip it and go to the next question.

NOTE: Technology is a broad concept that can mean a lot of different things. For the purpose of this questionnaire, technology is referring to digital technology/technologies. That is, the digital tools we use such as computers, laptops, iPods, handhelds, interactive whiteboards, software programs, etc.

Section A – Background Information

First Name: _____
Last Name: _____
Primary Content Area: _____
Current School: _____
Role In School: _____
Grade: _____

Your Age Range:
a) 21-24
b) 25-29
c) 30-34
d) 35-39
e) 40-44
f) 45-50
g) 51-54
e) 55+

Your Gender: Male / Female
Your Race/Ethnicity:
a) White
b) Black
c) Hispanic
d) Asian or Pacific Islander
e) American Indian or Alaskan Native
f) Other (please indicate) _____

Your Highest Degree:
Bachelors ___ Masters ___ Masters +30 ___ Doctorate ___

Goals:
1. List 5 personal goals you hope to accomplish as a result of the Pathway Project.
   _____
   _____
   _____
2. How involved do you plan to become with the Pathway Project?
   _____
   _____
   _____
3. How often do you plan to participate?
   _____
   _____
   _____

Section B – Attitudes Toward Technology Tools

Instructions

Please indicate how useful you find the following technologies. Use this scale to indicate how useful you find each tool - *Not at all Useful (1), Slightly Useful (2), Moderately Useful (3), Quite Useful (4), Extremely Useful (5). Mark N/A if you are not familiar with the tool.*

NOTE: Technology is a broad concept that can mean a lot of different things. For the purpose of this questionnaire, technology is referring to digital technology/technologies. That is, the digital tools we use such as computers, laptops, iPods, handhelds, interactive whiteboards, software programs, etc.

	Not at all Useful				Extremely Useful	
1) Presentation software (e.g., PowerPoint)	**1**	**2**	**3**	**4**	**5**	**N/A**
2) Word processing software (e.g., Word)	**1**	**2**	**3**	**4**	**5**	**N/A**
3) Spreadsheet software (e.g., Excel)	**1**	**2**	**3**	**4**	**5**	**N/A**
4) Concept mapping software (e.g., Inspiration)	**1**	**2**	**3**	**4**	**5**	**N/A**
5) Video playback tools (e.g., QuickTime, Windows Media Player)	**1**	**2**	**3**	**4**	**5**	**N/A**
6) Educational games	**1**	**2**	**3**	**4**	**5**	**N/A**
7) Online courseware (e.g., Moodle, WebCampus)	**1**	**2**	**3**	**4**	**5**	**N/A**
8) Instant message tools (e.g., iChat, AIM, MSN)	**1**	**2**	**3**	**4**	**5**	**N/A**
9) The World Wide Web	**1**	**2**	**3**	**4**	**5**	**N/A**
10) Website creation tools (e.g., Dreamweaver, Google sites)	**1**	**2**	**3**	**4**	**5**	**N/A**
11) Web 2.0 tools (e.g., Wikis, Blogs, etc.)	**1**	**2**	**3**	**4**	**5**	**N/A**
12) Multimedia creation software (e.g., iMovie, Adobe Flash, Photo Story)	**1**	**2**	**3**	**4**	**5**	**N/A**
13) Digital cameras	**1**	**2**	**3**	**4**	**5**	**N/A**
14) Probeware (e.g., Texas Instruments, Vernier probes)	**1**	**2**	**3**	**4**	**5**	**N/A**
15) Interactive simulations	**1**	**2**	**3**	**4**	**5**	**N/A**
	Not at all Useful				Extremely Useful	

Section C – Dispositions Toward Teaching With Technology

Instructions

Please indicate how much you agree or disagree with the following statements. Use this scale to indicate your level of agreement – *Strongly Disagree (1), Slightly Disagree (2), Neither agree nor Disagree (3), Slightly Agree (4), Strongly Agree (5).*

NOTE: Technology is a broad concept that can mean a lot of different things. For the purpose of this questionnaire, technology is referring to digital technology/technologies. That is, the digital tools we use such as computers, laptops, iPods, handhelds, interactive whiteboards, software programs, etc.

	Strongly Disagree				Strongly Agree
1) Technology helps students learn	**1**	**2**	**3**	**4**	**5**
2) Technology can promote deep understanding	**1**	**2**	**3**	**4**	**5**
3) Technology can help students complete homework	**1**	**2**	**3**	**4**	**5**
4) Technology can help students locate information	**1**	**2**	**3**	**4**	**5**
5) Technology can help verify information	**1**	**2**	**3**	**4**	**5**
6) Technology can enhance communication	**1**	**2**	**3**	**4**	**5**
7) Technology should be central to instruction	**1**	**2**	**3**	**4**	**5**
8) Technology can facilitate planning	**1**	**2**	**3**	**4**	**5**
9) Technology enhances record keeping	**1**	**2**	**3**	**4**	**5**
10) Technology permits the free exchange of ideas	**1**	**2**	**3**	**4**	**5**
11) Technology can enrich instruction	**1**	**2**	**3**	**4**	**5**
12) Technology is an effective instructional support	**1**	**2**	**3**	**4**	**5**
13) Technology can build online communities of students	**1**	**2**	**3**	**4**	**5**
14) Technology can build online communities of practitioners	**1**	**2**	**3**	**4**	**5**
15) Technology can create inclusive learning environments	**1**	**2**	**3**	**4**	**5**
	Strongly Disagree				Strongly Agree

Section D – Technology Confidence

Instructions

Please indicate your level of confidence in performing each of the tasks below. Use this scale to indicate your level of confidence - *Not Confident (1), Slightly Confident (2), Moderately Confident (3), Quite Confident (4), Extremely Confident (5). Mark N/A if you are not familiar with the tool.*

NOTE: Technology is a broad concept that can mean a lot of different things. For the purpose of this questionnaire, technology is referring to digital technology/technologies. That is, the digital tools we use such as computers, laptops, iPods, handhelds, interactive whiteboards, software programs, etc.

	Not at all confident	Extremely confident	
1) Check email	1 2 3 4 5		N/A
2) Enter student grades	1 2 3 4 5		N/A
3) Locate information online	1 2 3 4 5		N/A
4) Create an interactive presentation	1 2 3 4 5		N/A
5) Send attachments	1 2 3 4 5		N/A
6) Resize a digital image	1 2 3 4 5		N/A
7) Capture digital video	1 2 3 4 5		N/A
8) Share an audio file online	1 2 3 4 5		N/A
9) Create web page	1 2 3 4 5		N/A
10) Start a video-chat session	1 2 3 4 5		N/A
11) Track changes in a word document	1 2 3 4 5		N/A
12) Collaborate using a wiki	1 2 3 4 5		N/A
13) Utilize distance learning tools	1 2 3 4 5		N/A
14) Use an interactive smart board	1 2 3 4 5		N/A
15) Create an electronic quiz	1 2 3 4 5		N/A
	Not at all confident	Extremely confident	

Section E – Technology Pedagogy and Content Knowledge (TPACK)

Instructions

Please indicate how much you agree or disagree with the following statements. Use this scale to indicate your level of agreement – *Strongly Disagree (1), Slightly Disagree (2), Neither agree nor Disagree (3), Slightly Agree (4), Strongly Agree (5).*

NOTE: Technology is a broad concept that can mean a lot of different things. For the purpose of this questionnaire, technology is referring to digital technology/technologies. That is, the digital tools we use such as computers, laptops, iPods, handhelds, interactive whiteboards, software programs, etc.

TK (Technology Knowledge)	Strongly Disagree	Strongly Agree
1) I know how to solve my own technical problems.	1 2 3 4 5	
2) I can learn technology easily.	1 2 3 4 5	
3) I keep up with important new technologies.	1 2 3 4 5	
4) I frequently play around with technology.	1 2 3 4 5	
5) I know about a lot of different technologies.	1 2 3 4 5	
6) I have the technical skills I need to use technology.	1 2 3 4 5	
7) I have had sufficient opportunities to work with different technologies.	1 2 3 4 5	
CK (Content Knowledge)	Strongly Disagree	Strongly Agree
8) I have sufficient knowledge about [my content area].	1 2 3 4 5	
9) I can use a "[my content area]" way of thinking.	1 2 3 4 5	
10) I have various ways to develop my understanding in [my content area].	1 2 3 4 5	
PK (Pedagogical Knowledge)	Strongly Disagree	Strongly Agree
11) I know how to assess student performance in a classroom.	1 2 3 4 5	
12) I can adapt my teaching based upon what students currently understand or do not understand.	1 2 3 4 5	
13) I can adapt my teaching style to different learners.	1 2 3 4 5	
14) I can assess student learning in multiple ways.	1 2 3 4 5	
15) I can use a wide range of teaching approaches in a classroom setting (e.g., collaborative learning, direct instruction, inquiry learning, problem/project based learning)	1 2 3 4 5	
16) I am familiar with common student understandings and misconceptions.	1 2 3 4 5	
17) I know how to organize and maintain classroom management.	1 2 3 4 5	
PCK (Pedagogical Content Knowledge)	Strongly Disagree	Strongly Agree
18) I know how to select effective teaching approaches to guide student thinking and learning in [my content area].	1 2 3 4 5	
TPK (Technological Pedagogical Knowledge)	Strongly Disagree	Strongly Agree
19) I can choose technologies that enhance the teaching approaches for a lesson.	1 2 3 4 5	
20) I can choose technologies that enhance students' learning for a lesson.	1 2 3 4 5	
21) My teacher education program has caused me to think more deeply about how technology could influence the teaching approaches I use in my classroom.	1 2 3 4 5	
22) I am thinking critically about how to use technology in my classroom.	1 2 3 4 5	
23) I can adapt the use of the technologies that I am learning about to different teaching activities.	1 2 3 4 5	
TPACK (Technology Pedagogy and Content Knowledge)	Strongly Disagree	Strongly Agree
24) I can teach lessons that appropriately combine [my content area],	1 2 3 4 5	

technologies, and teaching approaches.		
25) I can select technologies to use in my classroom that enhance what I teach, how I teach, and what students learn.	1 2 3 4 5	
26) I can use strategies that combine content, technologies, and teaching approaches that I learned about in my coursework in my classroom.	1 2 3 4 5	
27) I can provide leadership in helping others coordinate the use of content, technologies, and teaching approaches at my school and/or district.	1 2 3 4 5	
28) I can choose technologies that enhance the content for a lesson.	1 2 3 4 5	
Models of TPACK	Strongly Disagree	Strongly Agree
29) Pathway Project Facilitators appropriately model combining content, technologies, and teaching approaches.	1 2 3 4 5	
30) My peer teachers in the Pathway project appropriately model combining content, technologies, and teaching approaches.	1 2 3 4 5	
31) My colleagues in my school and/or district appropriately model combining content, technologies, and teaching approaches.	1 2 3 4 5	
	Strongly Disagree	Strongly Agree

Section F – Pathway Open-Ended Items

Instructions

Please consider your experience in the Pathway Project and respond to the following questions.

Time 1: At the End of Module 1

1. List 3 things you think are going well with the Pathway Project.
2. List 3 things you would improve.
3. List 3 things you have learned already.
4. List 3 things you hope to learn before the end of Pathway.

Time 2: At the End of Module 2

1. List 3 things you think are going well with the Pathway Project.
2. List 3 things you would improve.
3. List 3 things you have learned already.
4. List 3 things you hope to learn before the end of Pathway.

Time 3: At the End of Module 3

1. List 3 things you think are going well with the Pathway Project.
2. List 3 things you would improve.
3. List 3 things you have learned already.
4. List 3 things you hope to learn before the end of Pathway.

Time 4: At the End of Module 4

1. List 3 things you think went well with the Pathway Project.
2. List 3 things you would improve.
3. List 3 things you learned.
4. Before Module 1, you indicated that you had **[five goals]**. Please select one that was well addressed and one that was not. How did Pathway influence your preparation?
5. Describe your overall involvement with the Pathway Project overall?
6. Approximately how often did you participate in the Pathway Project?

iii. Appendix C: Project Evaluation Team

Drs. P.G. Schrader and Neal Strudler serve as the evaluators for the Pathway to Nevada's Future project. Drs. Schrader and Strudler are responsible to complete the work associated with the Pathway evaluation, including instrument development, technology support, database creation, data collection, data analysis, and reporting. Further, team members have extensive background in educational technology and technology integration. A brief biographical sketch for each team member is provided below:

> Dr. P.G. Schrader: Dr. Schrader is an Associate Professor of Educational Technology at the University of Nevada, Las Vegas. P.G. has researched and published in the areas of large-scale program evaluation, technology integration, online literacy, learning, and immersive environments. He has extensive expertise in online evaluation methods, data collection, quantitative and qualitative methods, and instrument development.
>
> Dr. Neal Strudler is a Professor of Educational Technology and Assistant Chair in the department of Curriculum and Instruction at the University of Nevada, Las Vegas. Dr. Strudler has researched and published in the areas of effective technology integration, technology, educational change, and evaluation. He is a former seventh grade teacher and brings many years of expertise in evaluation and k-12 technology integration to the evaluation team.

iv. Appendix D: Rational for Not Emphasizing Standardized Tests

Related to documenting student learning, a conscious choice was made by project leaders and evaluators to employ measures that are well aligned with the project's goals. In his volume *Technology and Assessment*, Michael Russell, a nationally recognized expert in this area, characterized the problem and provided a strong rationale for not relying on standardized tests to assess the learning goals of this project. He explained:

> *Although it is attractive to use existing measures of learning such as standardized tests to examine the impact of technology on learning, standardized tests are often not well aligned with the learning that occurs with computers (Russell, 2006; p. 185).*

Russell added:

> *A second problem associated with standardized tests to examine impacts of technology on learning is that in the vast majority of cases, standardized tests do not allow students to use computers when working on the test…. Given that students will increasingly be using computer-based tools once they enter the workplace, the focus on cognitive residue or transferability of skills developed on a computer to skills demonstrated on paper seems short-sighted (p. 186).*

Finally, Russell concluded that it is critical "to employ measures of learning that are sensitive to the types of learning that occur when students use a given technology" (p. 202).

The National Research Council (2001) report *Knowing What Students Know* also addressed the role of technology in transforming both the kinds of learning that should be assessed and the assessment methods used. The report confirmed that there is often

> *a mismatch between the learning goals of many educational technology programs and the data obtained from standardized tests. Despite their inappropriateness, however, many persist in using such data as the primary basis for judging the effectiveness and value of investments in educational technology (p. 282).*

Thus, as the overall goal of this project is to increase technology integration in Nevada classrooms and provide students with innovative, 21st century learning experiences, the evaluation of student achievement will be based on multiple measures of student learning, including classroom-based measures developed by participating teachers and project staff that employ technologies encountered during the project. Further, this evaluation pertains to initial, baseline data and outcomes are expected to manifest after participating teachers have had sufficient time to a) learn the technology tools and strategies related to the professional development, and b) implement those tools and strategies with students.

References

National Research Council. (2001*). Knowing what students know: The science and design of educational assessment.* Washington, D.C.: National Academy Press.

Russell, M. (2006). *Technology and assessment: The tale of two interpretations*. Greenwich, CT: Information Age Publishing.

2009-2010 EETT Regular Competitive

Churchill County School District

Clark County School District

Washoe County School District

White Pine County School District

Project Overview

Churchill, Humboldt, Lander, Mineral, Nye, Pershing and Storey County school districts are involved in a technology collaboration project for SMART systems supported with professional development. This project is meeting two of the identified needs of the Nevada Commission on Education Technology statewide technology survey, to engage student centered instruction and professional development. It also meets an identified need for increased coordination and collaboration between the districts. In this case, the districts that are involved are all rural districts with limited resources for technology and for sustained professional development. This project tied the districts together and used the expertise in several of the districts to support the project. They "often times share resources and tackle common challenges that are not factors in larger, more urban districts", indicated by Gary Imelli, outside evaluator.

The project provides for the coordination of the project by Churchill County School District. The District has a SMART certified instructor/ licensed teacher in the district as a result of a previous technology project, eMINTS. The instructor utilizes technology to teach the functions of the SMART interactive whiteboard system to teachers. Once they are familiar with the technology and the use of SMART applications, the instructor provides them the structure to incorporate the technology into high quality lessons plans. For teachers in the Humboldt, Pershing and Lander Counties, a SMART certified technician provided the SMART technology training for teachers. This reduced the traveling for teachers in those counties. Teachers then participate in the integration of the technology into the high quality lesson plans through the SMART certified instructor from Churchill.

Summary of progress to date based on project goals and objectives including impact on student achievement. List activities/objectives/milestones accomplished during this period (attach supporting data charts, tables, graphs, etc.).

Goal I:

Teachers will receive interactive white board technology systems during the 2009-2010 school year with support and professional development during 2009-2011 in order to increase their knowledge of and use of student centered instruction.

Objective (marking progress toward Goal I):

To improve student 21st Century skills by focusing on student centered instruction using integrated technology by 100% of the teachers as evidenced in lesson plan design and implementation.

The list of classes for the 2009-2010 school year included: getting started with technology, preparing students for 21st Century Learning, SMART Board Level 1, Designing an integrated lesson, Inquiry based learning and think sheets, SMART board level 2, Exploring the web in the classroom, Finding and organizing internet resources, classroom communication, productivity tools and inquiry based learning, collaborative learning, spreadsheets as tools, creating multimedia projects, using presentations in an IT classroom.

Goal 2 :

Students will increase their 21st Century skills by receiving **student centered instruction** using integrated technology (ISTE National Educational Technology Standards for students)

Objective (marking progress toward Goal I):

To improve students 21st Century Skills in 7 rural school districts as evidenced in teacher lesson plans using integrated technology

Project Examples:

- Blogs & Wikis
- Google Docs
- Online File Storage
- Interactive Whiteboard Lesson
- Podcasts
- Inquiry-based learning
- Multimedia
- Surveys
- Websites
- Spreadsheets
- Online Presentations
- Web Evaluations
- Internet Search Guides
- WebQuests

List scheduled activities/objectives/milestones not accomplished during this period. Define problems and solutions.

Attendance for the required session was an issue, which was anticipated. Unfortunately, the high quality outcomes using the interactive technology are not realized without full participation in the professional development. Additional technology was provided to those teachers that completed the training and submitted their required work in the first year.

In the second year, due to lack of participation and responsibility for turning in the required assignment in the first year, there is funding available to send those teachers who have fully participated to the ISTE conference in June 2011.

In addition there may be enough funding to bring a SMART technician trainer to Churchill County and pull one person from each district to participate in this training. This would support the technical issues that district's incur and the need for trained personnel.

Districts faced budget cuts at the end of the first year of the grant and teachers with the least seniority received reduction in force notices. The questions arose around what

happened to the SMART systems, whether they could be moved to another school if a teacher transferred, and if the teacher moving into the room with the SMART system wasn't willing to participate in the training, could the board be moved. Directives were decided that the board could be moved to a room where the teacher resided that was trained if they stayed in the district. If the teacher was rif'd, the board would follow a teacher who was willing to participate in the training. The teacher equipment protocol is enclosed.

As a result the instructor was required to do some make up first year lessons in the second year.

Number of students who have directly benefited from the project to date; specify by public and nonpublic schools.

Twenty five classroom teachers have participated in the first year of the grant with an average of 25 students per classroom for over 625 students. In the second year of the grant, this number doubles to 1250.

Number of staff who have directly benefited from the project to date; specify by public and nonpublic schools.

Public schools. There were no private schools in these counties that indicated a request to be included in a technology project.

Churchill	Storey	Lander	Nye	Humboldt	Pershing	Mineral
Heck	Burton	Averett	Farinella	Lucas	Fecht	Gemelke
Boone	VanVoorst	Spence	Tsu-Jones	Barton	Shirley	Keuhey
Meihack		Olsen	Metscher	Conn	Montes	
Weikel			Windholz	Parks		
Allyn			Baltutat			
Purrell						

Project evaluation results to date.

The external evaluator indicated in the first year evaluation that Goal #1 was met by providing exceptional instruction as outlined by the management plan and the professional development plan. 100% of the teachers participated throughout the project and completed the year as participants, providing integrated technology instruction in their lessons and were utilizing the IWB lesson designs as asked.

All of the requirements of Goal #2 were met by the participants and are reported in this document. The non completion of turning the required information in at the end of the year considering the events in all schools districts at the end of the year with RIF and staff reductions can be understood. Some participants did not know their assignments for the next year let alone if they would be returning to employment at all. The recommendation of the evaluator was to give the participants the summer to finalize all their assignments and get them turned in the beginning of the second school year of the project.

The evaluator assessed the use of the Webinar as an effective use for professional development in the rural areas. The evaluator sat in on the web sessions, and the Saturday live sessions to evaluate the effectiveness of the technology and the effectiveness of the professional development. He also used surveys to gather perception data from the participants on the effectiveness of the technology as a professional development tool. The surveys were very positive showing the tools useful and productive.

It was reported that the knowledge of technology and 21st Century Skills was improved in those participants and that they acquired new knowledge. The participants developed new skills and

could identify those new skills. A change in behavior was evidenced by the administrator surveys, the year end reflections and by reviewing digital video lessons submitted as part of the evaluation process. Principals rated the increase in integrated technology for these classrooms as 2 to a 4.1, interactively engaging students at 4.1, use of inquiry bsed lessons as a 3.6, integration technology lessons 4.4, student achievement has increased as a 3.6. The reflection is that the involvement in the class and use of technology in the classroom has impacted the participants behavior.

Budget considerations: Due to the fact that not all teachers received the additional technology, and there will be funds remaining in the budget, a revision will be made to provide for a regional tech conference, pay for stipends to submit interactive lessons to NDE statewide green energy project, funding to attend the ISTE conference, funding to send a person from each district to SMART tech training.

Enhancing Education Through Technology (EETT) Program

Progress Report Form

District_____Churchill County _____ Grantee Contact___Sue Chambers, Federal Programs Facilitator_

Grant Number/Amount ___10-765-01000_ $___211.006.19__ Grant Name____EETT Consortium_____

Grant Period __07/01/09___ to ___06/30/10____ NDE Contact___Kim Vidoni/Christie Borino_

Mo Day Yr Mo Day Yr

Please address the following components in your project update. Attach additional sheets as necessary.

Summary of grant intent.

Through a consortium of seven rural school districts, teachers will receive interactive white board technology systems during the 2009-2010 school year in order to increase their knowledge of and use of student centered instruction. Students will increase their 21st century skills by receiving student centered instruction using integrated technology based on the ISTE National Educational Technology Standards.

- Summary of progress to date based on project goals and objectives including impact on student achievement. List activities/objectives/milestones accomplished during this period (attach supporting data charts, tables, graphs, etc.). **All seven districts selected the teachers to participate at the grade level of their choice. SMART or Promethian interactive white board systems were ordered for the districts as per their request. Professional development over Ellumiate, an interactive online communication system, teachers have participated in scheduled after school training, and come together four times during the school year for a face to face, hands on training. Trainers were available in Pershing, Humboldt and the primary trainer is in Churchill County. Teachers receive the system plus the training, inservice credit, books and rewards for completing the trainings. Trainers in Pershing and Humboldt receive stipends.**

- List scheduled activities/objectives/milestones not accomplished during this period. Define problems and solutions. **To date 90% of the training activity has taken place with 80% of the budget expended (salary, stipends, evaluation yet to be expended fully). Teachres still need to submit their video as their final project. The evaluation has yet to be completed by the outside evaluator.**

- **N**umber of staff who have directly benefited from the project to date; specify by public and nonpublic schools.
  There are 25 teachers in seven public rural school districts that have benefited from this project. These districts cover 50% of the square miles in the state and 40% of the school districts.

- Number of students who have directly benefited from the project to date; specify by public and nonpublic schools.
  This is assuming that the average class size is 25 students and 25 teachers, the number is 625 students. The dream is that these teachers become mentors for technology in their own districts with the second year of training. Already they are sharing strategies in their schools which can have an exponential effect.

- Services/resources received by nonpublic schools being served by the grant. **None**

- Project evaluation results to date. **All equipment for the SMART system has been purchased and installed. Some districts continue to have technology issues with access to internet, band width,**

- Budget narrative detailing spending to date. Were grant funds spent according to grant projections? If not, please explain. **All grant funds have been spent according to the grant budget codes. No amendments have been needed. Districts have been very supportive of the installation costs. A final review of the budget will be made and funds expended appropriately.**

- Will 100% of grant funds be spent by the end of the grant period? **Yes** Extensions and carryover for each fiscal year will not be granted.

EETT Consortium Grant

Teacher Equipment Protocol for 2010-2011

Due to the possibility of teacher reassignments and RIFs going on throughout the state, this has also impacted the progress of our technology project. We have met with our state leaders and have discussed the best possible solution for the technology equipment for students, teachers, and the schools where the equipment is placed.

Here is the priority for technology distribution:

1. The technology will remain with the teacher in our project who is trained in using it IF they are planning to attend all of the training for the second year.

2. The technology will transfer (as it is feasible by each district) with the teacher who is participating in the project in order for them to complete the second year of training.

3. If the teacher who is currently using the technology is no longer employed by the school district, then the technology stays in the classroom where it was initially installed provided that the teacher taking over that room will complete the remainder of the training and attend additional make-up sessions in order to fulfill the requirements of the grant.

4. If the teacher in the room with the technology is not willing to participate in the project, then the equipment may be moved to a classroom with a teacher who will complete the remainder of the training and attend make-up sessions to fulfill the requirements of the grant.

5. The incentive equipment (document or video camera) is the property of the district, yet should remain with the teacher who has completed the first year of training. If that teacher is gone, the equipment should remain with the SMART or Promethean system already in place with the new teacher who will participate in our project for 2010-2011.

Thank you for your attention to this matter. Please feel free to contact me or Sue Chambers with any questions.

Michelle Richardson

(775) 423.6955

richardsonm@churchill.k12.nv.us

Sue Chambers

(775) 423.6955

chamberss@churchill.k12.nv.us

Teacher Comments:

- I think the most useful tool I have learned is the communication class. I feel that I could better communicate with the parents through blogs, websites, etc.... Parents today are very technological. I personally have even text my son's teacher to let her know that he was sick, so I know technology is a great way to communicate. We all know that if teachers and parents are communicating it helps the children to succeed. I'm comfortable with technology and I know the parents of my students are comfortable, then why waste a valuable too.
  ~Jennifer

- I cannot convey to you the difference the SMART Board has made in the learning that has occurred in my first grade classroom. I can give you many examples that occur on a daily basis. All of my students can count coins so quickly. In the past, (prior to my SMART board) only about 60% of the students could count quarters at this same time in the school year. Spelling has improved greatly with the use of the SMART board. Each day the students us the magnetic letter program to spell their weekly spelling words. In the past I have used the actual magnetic letters on the side of the cabinets…but for some reason using the program on the white board makes all of the difference. Their math facts have improved too. I have always been an effective teacher but with the SMART board in my classroom, my effectiveness has truly improved. I see many improvements in my students' engagement and learning. None of these improvements would have occurred without the SMART board grant and the training that came with it. As a result of the technology training I also started to use more technology in my classroom....not just my SMART board but we did our first Podcast. The students loved it and it was a great learning experience for all of us.
  ~Crystal and the first grade students

- Understanding how to create separate folders with the sites students are using for a particular subject were of great help to me. By doing this I know the students won't be "surfing into uncharted territory." I know the sites in the folder are appropriate and what they need. That has been great! I feel more comfortable letting them navigate the sites and using the computer without me over their shoulder the entire time. I am able to attend to other students while they work on the computer. Before, I never would have let students use the computer without me "right there" for fear of them finding something they should not be seeing.
  ~Dana

- The most important thing that I have learned from this class is kind of a overarching appreciation for technology rather than one single thing. The resources that I use from the Internet have doubled as we have shared websites and different uses of technology. I also have more of a drive to use technology as a form of communication among my students and others that are not in the same place as us. Creating and using podcasts, PowerPoint presentations,

and blogs were never an option before. Now I have the knowledge to have my students use and create these things so that our learning is spread to other places.

The technology (Smart Board) has made the learning so much more engaging

and fun! My students love that they can learn material through games,

movies, songs, pictures, interactive lessons, and so much more. It is

not the same thing every day now that I can pull in information or ideas

from so many different places. ~Dawn

- My kids and I have enjoyed they different stuff we have been able to do by having the SMART Board in our health classroom. Just recently I had to be gone from my class on two days, I had a little trouble convincing the sub to use what I already had done and ready for the class. On the second day he was more willing to try it and my students were very happy to see me stop by and get it set up for him. It only took a few minutes to get logged in and have it pulled up. My class was able to help the sub learn how to move pages, reveal hidden things, do the activities, and save it all so I could see what they had come up with when I got back. Much better than a note to and from a sub. this way I know what was accomplished and they stayed on target without getting busy work. ~Barb

Clark County School District

Overview of the Project

Clark County School District applied for funding to support three sub-projects for an umbrella project for *Enhancing Education Through Technology*. The three sub-projects are based on the needs for teacher pedagogical knowledge, teacher content knowledge, and standards-based curricula within the District. The project is using the funding to (a) increase the use of technology-driven formative assessment in classrooms by supplying teachers with classroom response systems and professional development on the use of formative assessments; (b) expand the online professional development program piloted during 2008-09 to provide online content coursework for teachers; and (c) align revised technology standards and activities with standards-based curriculum documents, producing technology suggestions and integration strategies for content areas.

Specifically, these three sub-projects were defined by the development of a hierarchy of Goals, Objectives, Strategies, and Activities. The Goal for each sub-project is broadly stated in terms of appropriate and measurable student outcome data. Each goal is supported by a set of implementation Objectives, which help clarify or define the means for achieving each Goal. Each Goal is further defined operationally by a set of Strategies. These Strategies are then supplemented by a clearly defined set of Activities to be achieved along the timeline of the project.

1. Formative Assessment Sub-project (Goal 1)

Goal 1: The percentage of students at proficient or above will increase to meet AYP requirements.
Objectives: 1. 100% of participating teachers will increase their knowledge of formative assessment by at least 25% as measured by pre- and post-tests. 2. The frequency of formative assessment in participating teachers' classrooms will double, as measured by self-report, pre- and post-professional development. 3. The test scores for students of participating teachers will be at least 10% above students of non-participating teachers, as measured by District common interim assessments.
Strategy I (supporting Goal I): Professional development will be provided by the Curriculum and Professional Development Division (CPDD) staff and Educational Computing Strategists (ECSs). ECSs are licensed teachers with technology expertise, available at each school as instructional coaches. Because of the size of our District and this project, it is most cost effective to train the ECSs and then support

them in training classroom teachers.

Strategy II (supporting Goal 1):

Each ECS in this project will be working with 6 – 10 teachers, allowing time for coaching, modeling, and mentoring during the school day, thus making the professional development ongoing. We have chosen to use classroom responders because they are easy to use and engaging for students . It can be reasonably expected that teachers will use these formative assessment tools, increasing the number of formative assessments, because they are so simple to set up and use.

Strategy III (supporting Goal 1):

Secondary math teachers will be provided with TI Navigator systems, response systems which are unique to mathematics instruction. These systems are more complicated than typical response systems, but also have features that allow students to collaborate, visualize math concepts, and work through problem solving. The training for math teachers will be done by vendor trainers and then followed up by CPDD staff and ECSs.

Strategy IV (supporting Goal 1):

Monthly podcasts about how to solve problems related to the concepts in pre-algebra and algebra will be provided to students, teachers, and parents. These will be based on the pacing calendars for these classes, providing just-in-time supports for students. Students (and their parents and teachers) will be able to subscribe to these podcasts, so that as each is posted, it is immediately available for use. Practice tests for core content areas, based on the CRT and proficiency exam matrices, will be posted for students to use online. Teachers will have access to the data from these practice tests. During Year 1, the core content focus was science.

Activities:

A set of 12 specific activities with additional sub-activities support the set of four Strategies under Goal 1.

2. Online Professional Development Sub-project (Goal 2)

Goal 2:

Over time, student achievement will increase as a result of increased teacher content knowledge.

Objectives:

1. 50 sections of courses developed during 2008-09 will be taught.

2. 20 new courses, focused on subject matter, will be developed and piloted.

3. The test scores for students of participating teachers will be at least 10% above students of non-participating teachers, as measured by District common interim assessments.

Strategy I (supporting Goal 2):

Over the course of the year, previously trained instructors will provide online PDE courses to teachers. Participants will each pay a nominal $10 fee and the grant will pay the instructors.

Strategy II (supporting Goal 2):

Content teachers and curriculum specialists will collaborate to develop 20 content courses for teachers. They will be assisted and mentored by the previously trained cadre of online instructors.

Activities:

A set of 4 specific activities with additional sub-activities support the set of two Strategies under Goal 2.

3. Standards-based Curriculum (Goal 3)

Goal 3:

The graduation rate will increase and the drop-out rate will decrease as students become more engaged and motivated.

Objectives:

1. Appropriate subject areas and grade levels will be identified for each technology standard.

2. Engaging technology integration activities will be identified or developed for each standard, across content areas.

3. Teachers will have access to technology integration ideas and supports.

Strategy I (supporting Goal 3):

A matrix for the revised technology standards will be developed. This will document the most

appropriate content areas and grade levels for addressing each standard. **Strategy II (supporting Goal 3):** Classroom activities and technology suggestions for each standard will be identified or developed. These will be posted for teacher and curriculum specialist access. This strategy is planned for implementation in Year 2 of the project.
Activities: A set of 5 specific activities with additional sub-activities support the set of two Strategies under Goal 3.

The following sections outline each sub-project (Goal) using Activities as an organizational element. This format provides, in most cases, a chronological aspect to the ordering of information. Each Activity is associated with the Strategy that it supports, and includes any SubActivities, which further describe the work undertaken. Target dates and dates completed for each SubActivity are noted, along with a clarifying narrative provided by the principal project team member responsible for that Strategy.

GOAL 1

FORMATIVE ASSESSMENT

ACTIVITY 1 (supporting Strategy I of Goal 1)

Strategy I Description	Activity	Target Mo/Yr	Completed Mo/Yr
Project ECSs trained as trainers	***SubActivity 1:*** Materials developed for ECS use	9/2009	10/2009
	SubActivity 2: Training on response systems	9/2009	1/2010
	SubActivity 3: Direct instruction on Formative Assessment (FA)	9/2009	12/2009

Narrative Documentation:

Materials were collected, organized and created during August, September, and October of 2009. Direct instruction was provided for Educational Computing Strategists (ECSs) in November and December of 2009. Response system training was held at each school site during December 2009 or January 2010.

ACTIVITY 2 (supporting Strategy II of Goal 1)

Strategy II Description	Activity	Target Mo/Yr	Completed Mo/Yr
Project workshops led by ECSs	***SubActivity 1:*** Pretest teacher knowledge of FA	10/2009	11/2009
	SubActivity 2: Gauge frequency of FA use in classrooms	10/2009	10/2009, 2/2010, 5/2010
	SubActivity 3: Direct instruction on FA	10/2009	12/2009
	SubActivity 4: Teachers select FAs to	10/2009	12/2009

	use in workshops		
	SubActivity 5: Instruction on response systems	10/2009	1/2010

Narrative Documentation:

The first professional development (PD) session was held on November 6, 2009, with all participants in attendance at the CPDD facility, and the session was delivered by project staff. The second PD session was delivered at the school sites by the ECSs during November or December, 2009. The pre-project survey to test teacher knowledge of formative assessment (FA) was completed the first week of November, 2009. Three observations were made to gauge the frequency of FA use in classrooms (more than 40 teachers involved in all three observations). One observation was conducted pre-project PD, one mid-year, and a final observation near the end of the school year. Response systems were distributed and participants trained during December, 2009 and January, 2010.

ACTIVITY 3 (supporting Strategy II of Goal 1)

Strategy II Description	Activity	Target Mo/Yr	Completed Mo/Yr
Project workshops led by ECSs	***SubActivity 1:*** Group problem solving of obstacles	12/2009	1/2010
	SubActivity 2: Additional direct instruction on FA	12/2009	1/2010
	SubActivity 3: Group planning for FA implementation	12/2009	1/2010

Narrative Documentation:

The third PD session, the second led by the ECSs, was conducted at each school site during January of 2010.

ACTIVITY 4 (supporting Strategy II of Goal 1)

Strategy II Description	Activity	Target Mo/Yr	Completed Mo/Yr
Project workshops led by ECSs	***SubActivity 1:*** Group problem solving of obstacles	01/2010	3/2010
	SubActivity 2: More direct instruction on FA	01/2010	3/2010
	SubActivity 3: Group planning for FA implementation	01/2010	3/2010

Narrative Documentation:

The fourth PD session, the third led by the ECSs, was conducted at each school site during March of 2010.

ACTIVITY 5 (supporting Strategy II of Goal 1)

Strategy II Description	Activity	Target Mo/Yr	Completed Mo/Yr
Project workshops led by ECSs	***SubActivity 1:*** Group problem solving of obstacles	03/2010	5/2010
	SubActivity 2: More direct instruction on FA	03/2010	5/2010
	SubActivity 3: Group planning for FA implementation	03/2010	5/2010
	SubActivity 4: Post-test of teacher knowledge of FA	03/2010	5/2010
	SubActivity 5: Teacher self-report of FA implementation	03/2010	5/2010

Narrative Documentation:

The fifth and final PD sessions was held at the CPDD facility in May of 2010 for all participants, and was conducted by project staff.

ACTIVITY 6 (supporting Strategy II of Goal 1)

Strategy II Description	Activity	Target Mo/Yr	Completed Mo/Yr
Project workshops led by ECSs	***SubActivity 1:*** Online forum created & moderated to support ECS-led workshops	No date	10/2009

Narrative Documentation:

A conference was created on InterAct, the District's communication system, in October of 2009. The conference included a discussion sub-conference, calendar, directory, and area for sharing resources.

ACTIVITY 7 (supporting Strategy III of Goal 1)

Strategy III Description	Activity	Target Mo/Yr	Completed Mo/Yr
Project workshops for math teachers	***SubActivity 1:*** Direct instruction on how to configure the math navigator response systems	10/2009	10/2009

Narrative Documentation:

TI Regional Instructor provided hands-on training to two teachers at each site in using the TI Navigator with students. Some schools also sent a technology representative (ECS) to the part of training session dealing with basic set up. Additional support was provided via email and InterAct Forum. TI Navigators were deployed by CPD staff. Basic setup was completed at that time.

ACTIVITY 8 (supporting Strategy III of Goal 1)

Strategy III Description	Activity	Target Mo/Yr	Completed Mo/Yr
Project workshops for math teachers	***SubActivity 1:*** Group problem solving workshop	02/2010	5/2010
	SubActivity 2: Group planning for FA implementation	02/2010	5/2010

ACTIVITY 9 (supporting Strategy III of Goal 1)

Strategy III Description	Activity	Target Mo/Yr	Completed Mo/Yr
Project workshops for math teachers	***SubActivity 1:*** Online forum created & moderated	No date	Ongoing through 06/2010

Narrative Documentation:

An InterAct Forum was created and moderated during the 2009-2010 school year. The forum offered a help request link, tutorial support, and a place for teachers to share lesson plans and best practices.

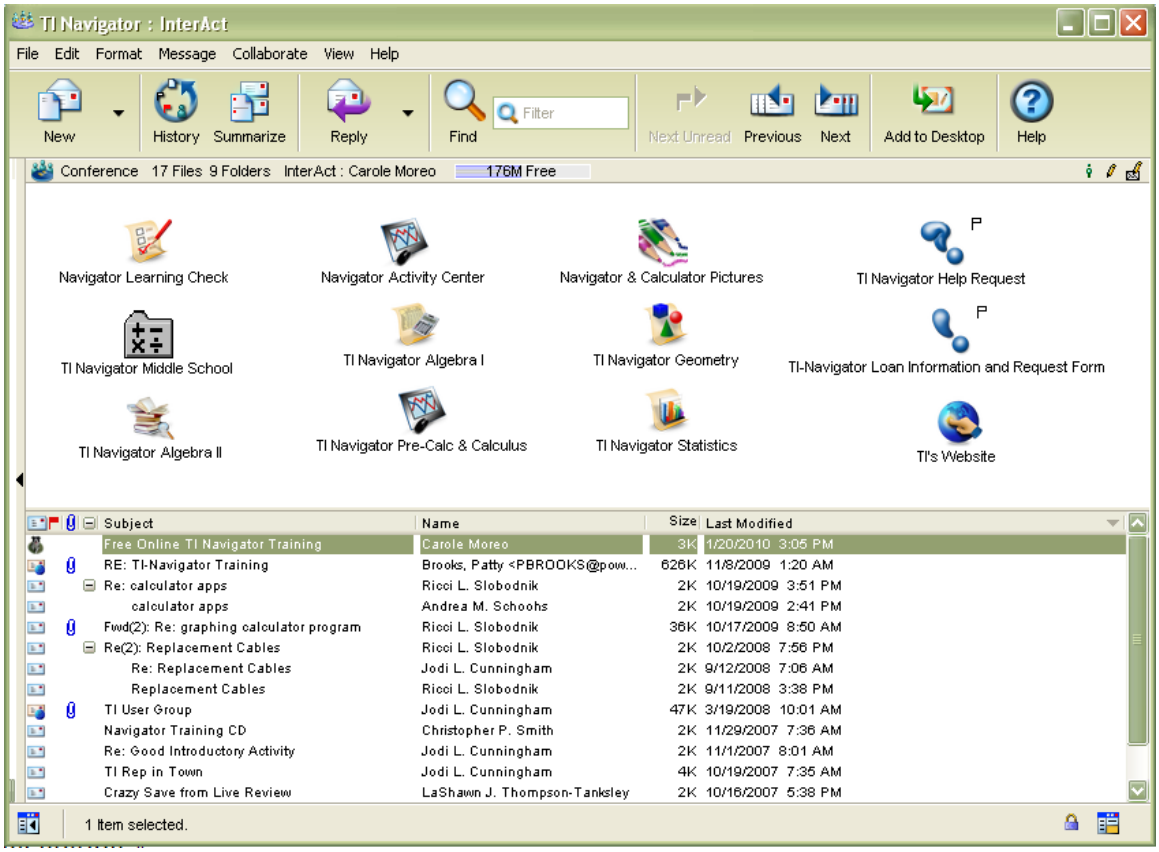


Figure 1. Screen view of the online forum created for the math workshops.

ACTIVITY 10 (supporting Strategy IV of Goal 1)

Strategy 4 Description	Activity	Target Mo/Yr	Completed Mo/Yr
Monthly content area instructional podcasts	***SubActivity 1:*** Pre-algebra podcasts created monthly	No date	Dec 2009 June 2010

Narrative Documentation:

See below under *Activity 11* for specific information.

ACTIVITY 11 (supporting Strategy IV of Goal 1)

Strategy IV Description	Activity	Target Mo/Yr	Completed Mo/Yr
Monthly content area instructional podcasts	***SubActivity 1:*** Algebra concepts podcasts created monthly	No date	Dec 2009 June 2010
	SubActivity 2: Algebra practice tests are created and posted online		Dec 2009 June 2010

Narrative Documentation:

A total of five (5) pre-algebra instructional videos, ten (10) algebra I instructional videos, one (1) pre-algebra practice tests and two (2) algebra practice tests were created and posted online at: http://ccsd.net.mathvideos. During the initial semester (Fall 2009) the Website was accessed 278 times. Since January 13, 2010, the Website has been access an additional 810 times. However, these numbers do not present a complete picture of the number of times the math videos may have been downloaded by students, as they are also available via an iTunes educational portal, from which it is impossible to retrieve data relating to access.

ACTIVITY 12a (supporting Strategy IV of Goal 1)

Strategy 4 Description	Activity	Target Mo/Yr	Completed Mo/Yr

Monthly content area instructional podcasts	***SubActivity 1:*** Science practice tests for 8th & 9th grade content posted online	Year 1	9th-12/2010 8th- no

Narrative Documentation:

The second practice HSPE was completed and made available to high school science teachers in December 2010. A practice test designed for 8th grade was not accomplished. The need for Spring 2010 continued to be focused on high school science teachers whose students were planning to take the upcoming March HSPE. Reports (as of early January), indicated that only 1/3 of the available accounts were being used. Therefore, the focus continued to be recruiting new teachers who had not taken advantage of the resource, and to continue to support existing users. For those existing active users, we needed to continue to support their efforts and make them aware that an additional test was now available.

This aggressive campaign to increase users and usage began in January. Information was communicated at science DC meetings as well as e-mail correspondence. Between January and June, the number of active teacher accounts increased from 35 accounts to 59. The archived training resources were also made available for the new teachers involved in the project. Project facilitator supported teachers as requested.

Student outcome data were not systematically collected during this implementation phase (Year 1). Due to budgeting issues and time constraints centered on the beginning of the first project year in August 2009, project staff utilized temporary, trial software accounts in order to get the project moving on time. The trial software did not support data collection from individual students. However, as the project begins Year 2, the fully licensed software accounts will be able to provide the project personnel with the opportunity for student outcomes data collection.

Goal 1 Objectives

	Description	Met
Objective 1	100% of participating teachers will increase their knowledge of formative assessment by at least 25% as measured by pre and post-tests.	yes

Objective 2	The frequency of formative assessment in participating teachers' classrooms will double, as measured by self-report, pre and post professional development.	33%
Objective 3	The test scores for students of participating teachers will be at least 10% above students of non-participating teachers, as measure by District common interim assessments.	*See below

***Narrative Documentation:** Due to the late acquisitions of technology materials, verified by reported timelines, students did not receive the intended interventions for a sufficient period to appropriately use CRT/Interim Assessment data to determine effectiveness. Therefore, this objective/milestone is not being measured for the 2009-2010 school year.

Goal 1 Milestones

	Date Expected	Description	Met
Milestone 1	End of September 2009	Equipment delivered and set up	yes
Milestone 2	End of September 2009	Trainers (ECSs) trained	yes
Milestone 3	End of December 2009	ECSs will report classroom response system (CRS) use	yes
Milestone 4	End of December 2009	Math DCS will report Navigator (CRS) use	yes
Milestone 5	End of January 2010	Postings and correspondence in forums will be summarized for planning purposes	yes
Milestone 6	End of May 2010	Final evaluation (data) will be compiled. Evaluation data collected during the project year was forwarded to the external evaluator in May of 2010.	yes
Milestone 7	*Fall semester 2010*	*CRT scores for students of participating teachers will be examined for patterns.*	*No**

Data

The following data sets are extant for the Formative Assessment (Goal 1) sub-project.

1. Self-report survey data of classroom teacher/participants regarding knowledge of and confidence with using formative assessment in the classroom. Pre and Post data were collected.

2. An interval-collection method behavioral observation instrument was used to collect classroom data across observations with more than 50 teachers/participants.

*The preliminary but limited data are currently under initial analysis by project staff and the external evaluator with a focus on providing formative research data to inform the project for Year 2 implementation.

GOAL 2

ONLINE PROFESSIONAL DEVELOPMENT

ACTIVITY 1 (supporting Strategy I of Goal 2)

Strategy I Description	Activity	Target Mo/Yr	Completed Mo/Yr
Over the course of the year, previously trained instructors will provide online PDE courses to teachers. Participants will each pay a nominal $10 fee and the grant will pay the instructors.	***SubActivity 1:*** Previously developed courses will be scheduled and taught.	No date	12/2009

Narrative Documentation:

Offered online technology-related professional development that had been created during 2008-2009. Seventeen (17) online courses were taught.

ACTIVITY 2 (supporting Strategy II of Goal 2)

Strategy II Description	Activity	Target Mo/Yr	Completed Mo/Yr
Content teachers and curriculum specialists will collaborate to develop 20 content courses for teachers. They will be assisted and mentored by the previously trained cadre of online instructors.	***SubActivity 1:*** Content teachers and curriculum specialists will decide on 20 courses to be developed	09/2009	09/2009

	SubActivity 2: Working in pairs they will meet regularly online to develop the coursework.	No date	12/2009 02/2010 03/2010

Narrative Documentation:

•New staff person was sent to Moodle training.

•An overview of the online tools, Centra and Moodle, was presented to the cadre for the Fall Social Studies Literacy professional development.

• Met with each department within CPD to identify professional development course needs.

• Contacted new PDE online instructors for training on Moodle. Coordinate with Moodle trainer on PDE course

• Attended webinar to review the Moodle CMS program.

• Provided training for Literacy personnel to incorporate Moodle into the Writing Academy PDE. Aug 2009

ACTIVITY 3 (supporting Strategy II of Goal 2)

Strategy II Description	**Activity**	**Target Mo/Yr**	**Completed Mo/Yr**
Project workshops for math teachers	***SubActivity 1:*** Content teachers, especially long-term subs, will take the new courses and provide feedback.	05/2010	05/2010 and continuing in Year 2

Narrative Documentation:

Twenty-five (25) separate courses were taught over the course of Year 1.

ACTIVITY 4 (supporting Strategy II of Goal 2)

Strategy II Description	**Activity**	**Target Mo/Yr**	**Completed Mo/Yr**

Project workshops for math teachers	***SubActivity 1:*** Quarterly trainings will be conducted for all online instructors: *group problem-solving for obstacles encountered.*	No date	01/2010 02/2010 03/2010
	SubActivity 2: Quarterly trainings will be conducted for all online instructors: *further direct instruction on using online environments*	No date	02/2010 03/2010
	SubActivity 3: Quarterly trainings will be conducted for all online instructors: *group discussions and planning*	No date	04/2010 05/2010

Narrative Documentation:

- Centra trainings held for OPD instructors.
- Moodle collaboration and development workshops held.
- Camtasia training provided to math teachers.
- PDE online instructors spring training was held.
- Two back-to-back Moodle trainings were held.
- A refresher course for the Centra system was held.
- Online courses were revised and updated. A course development workshop was held for online teachers.
- Training and support for CCSD departments for using online teaching tools was held.

Goal 2 Objectives

	Description	Met
Objective 1	Fifty (50) sections of courses developed during 2008-2009 will be taught.	no*
Objective 2	Twenty (20) new courses, focused on subject matter, will be developed and piloted.	no*
Objective 3	The test scores for students of participating teachers will be at least 10% above students of non-participating teachers, as measure by District common interim assessments.	**see below

Narrative Documentation:

***Funding was not awarded for the full implementation, so the scope of this project was scaled back. Seventeen (17) online courses were taught.**

**Interim testing was done before this project was finished, so the data from interim testing would not apply.

Goal 2 Milestones

	Date Expected	Description	Met
Milestone 1	End of September 2009	Previously developed courses calendared	yes
Milestone 2	End of November 2009	Content teachers and curriculum specialists trained to use online tools.	yes
Milestone 3	End of December 2009	Outline for each new course will be finished.	yes
Milestone 4	End of January 2010	Postings and correspondence in forums will be summarized for planning purposes.	yes
Milestone 5	End of March 2010	New courses submitted for PDE approval.	yes
Milestone 6	End of May 2010	Courses evaluated by participants.	yes
Milestone 7	*Fall semester 2010*	*CRT scores for students of participating teachers will be examined for patterns*	**see below*

***Narrative Documentation:**

Interim testing was done before this project was finished, so the data from interim testing would not apply.

GOAL 3

STANDARDS-BASED CURRICULUM

ACTIVITY 1 (supporting Strategy I of Goal 3)

Strategy I Description	Activity	Target Mo/Yr	Completed Mo/Yr
A matrix for the revised technology standards will be developed. This will document the most appropriate content areas and grade levels for addressing each standard.	***SubActivity 1:*** Task force will meet to develop matrix.	12/2009	6/2010

Narrative Documentation:

ACTIVITY 2 (supporting Strategy I of Goal 3)

Strategy I Description	Activity	Target Mo/Yr	Completed Mo/Yr
A matrix for the revised technology standards will be developed. This will document the most appropriate content areas and grade levels for addressing each standard.	***SubActivity 1:*** Matrix will be posted for input from Nevada's teachers.	No date	

Narrative Documentation: In the process of being proofread. Will be provided to Dr. Vidoni and state technology committee in September, 2010

ACTIVITY 3 (supporting Strategy II of Goal 3)

Strategy II Description	Activity	Target Mo/Yr	Completed Mo/Yr
Classroom activities and technology suggestions for each standard will be identified or developed. These will be posted for teacher and curriculum specialist access.	***SubActivity 1:*** A content area will be chosen and activities and suggestions identified or developed.	05/2010	05/2010

Narrative Documentation: Lesson plans were completed and inserted into the CCSD wiki site. A catalog of those will be created during 2010 – 2011. This part of the project was started, but was planned to be done during Year 2.

ACTIVITY 4 (supporting Strategy II of Goal 3)

Strategy II Description	Activity	Target Mo/Yr	Completed Mo/Yr
Classroom activities and technology suggestions for each standard will be identified or developed. These will be posted for teacher and curriculum specialist access.	***SubActivity 1:*** A [second] content area will be chosen and activities and suggestions identified or developed.	08/2010	Will continue into Year 2

Narrative Documentation: This part of the project was planned to be done during Year 2.

ACTIVITY 5 (supporting Strategy II of Goal 3)

Strategy II Description	Activity	Target Mo/Yr	Completed Mo/Yr

Classroom activities and technology suggestions for each standard will be identified or developed. These will be posted for teacher and curriculum specialist access.	***SubActivity 1:*** Suggestions and activities will be posted for Nevada's teachers.	08/2010	Set for Fall 2010 semester

Narrative Documentation: This will be done after review by Dr. Vidoni and the state technology committee.

Goal 3 Objectives

	Description	Met
Objective 1	Appropriate subject areas and grade levels will be identified for each technology standard.	yes
Objective 2	Engaging technology integration activities will be identified or developed for each standard, across content areas.	yes
Objective 3	Teachers will have access to technology integration ideas and supports.	yes

Goal 3 Milestones

	Date Expected	Description	Met
Milestone 1	End of December 2009	Matrix	yes
Milestone 2	End of March 2010	Fifty percent (50%) of content area finished.	yes
Milestone 3	Year 2, if funded	One hundred percent (100%) of first content area finished.	no
Milestone 4	End of July 2010	Fifty percent (50%) of [second] content area finished.	no
Milestone 5	End of August 2010	One hundred percent (100%) of [second] content area finished.	no

Summary

Project evaluation refers to an evaluation of project implementation, as measured against the project's scope of work, deliverables, personnel requirements, and so forth.

Project evaluations may also include an assessment of project effectiveness, but do not include a valid control group and thus cannot be used to attribute outcomes or impacts to project operations. Project evaluations, nonetheless, can produce useful findings on project operations, and if designed and timed appropriately, can be used to guide management decision-making.

A specific type of project evaluation is the *process evaluation*, which assesses whether the project was implemented--including the procedures undertaken, the decisions made, and the services delivered--as intended. By documenting the project's development and operation, the process evaluation uncovers reasons for successful or unsuccessful performance, and provides information for potential replication.

(USAID Microlinks Wiki [2010, August 15]. Monitoring and Evaluation. Retrieved from http://apps.develebridge.net/amap/index.php/Monitoring_and_Evaluation)

Project evaluation for Year One of this project has involved primarily the process evaluation method, as the preponderance of the activities indicated by the project goals, objectives, and strategies dealt mainly with implementation of new technologies, new assessment plans, and new instructional delivery systems, often in combination. For this reason, this Year One summative report necessarily focuses on the (a) *outputs* and (b) *outcomes* from those activities. Data to support an assessment of impact, that is, whether the project has been successful in its overall objectives of measurable outcomes is not yet extant in sufficient amount or kind.

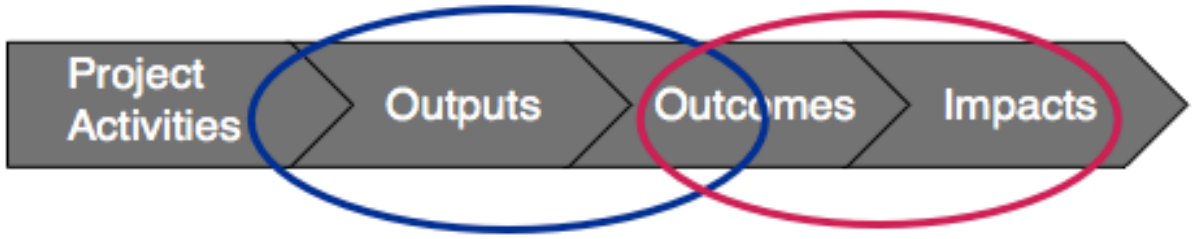


Figure 2. Year 2 focus will be on outcomes and impacts leading to meeting the goals of each subproject.

It is expected, then, that during Year Two of the project, a focus on improvement of design and delivery of project activities (based on formative evaluation feedback) will to some degree refocus the project from outputs and outcomes (implementation) to outcomes and impacts, as is illustrated in the figure above. This is clearly stated in the Narrative Documentation sections of the Activity Recap Tables used extensively in this report. And while some outcomes data has led to preliminary impact results for

specific project objectives (e.g., Goal 1, Objectives 1 & 2), these results may be considered premature, but nonetheless positive indicators of the success thus far in the project.

Activities Have Been Completed

For all intents and purposes, all activities set out in this project with implementation dates that fell within the calendar of Year One have been successfully completed. Many other activities that did not have implementation dates have also been completed or are partially completed in a reasonable relationship to the overall timeline of the 2-year project. Project activities that have not been fully completed or were scheduled for Year 2 will be reviewed by project staff during the initial weeks of Year Two and plans for the dispensation of those activities will be developed and articulated. Formative evaluation data will drive the decisions.

Randall Boone, PhD, is the outside evaluator for this project. He can be reached:

Email: randyboone@me.com

Phone: 702-379-6212

Mail:

2159 Falcon Pointe Lane

Henderson, NV 89074

Washoe County School District Enhancing Education Through Technology 2009-2010

Talbot Bielefeldt (talbot@iste.org)

Clare Strawn, PhD (cstrawn@iste.org)
International Society for Technology in Education
September 7, 2010

Introduction

Washoe County School District (WCSD) has been implementing white boards with assistance from Enhancing Education Through Technology (EETT) grants through the Nevada Department of Education (NDE) since 2007-8. In addition to serving its own classrooms, WCSD has involved neighboring districts in its initiatives—Pershing County in 2008-9 and Douglas County in 2008-9 and 2009-10. As part of the evaluation of the 2009 WCSD EETT grant, the International Society for Technology in Education (ISTE) conducted teacher observations and surveys in WCSD classrooms in the spring of 2010. Observations were conducted April 19 through 22, 2010, and surveys were conducted between May 28 and June 8, 2010. All of the teachers involved were learning to integrate interactive white boards into instruction. The central questions for the evaluation were whether teachers had progressed in technology integration over time and been able to establish collaborative student-centered learning environments.

Teachers who were being introduced to the interactive white boards were designated as an ActivBoard (AB) Cadre. Those who are working on more advanced levels of integration and who could serve as a resource for other teachers were designated as the ActivClassroom (AC) Cadre[1]. Expectations were different for the two groups; AB members were expected to improve, but it was recognized that teachers at this level would still be using to use the features of the interactive boards. AC members were expected to moving to higher levels of integration.

[1] ActivBoard and ActivClassroom are Promethean's names for, respectively, its interactive white board and its suite of software and accessories to use with the board.

Teacher Survey

Although conducted after the observations, it is useful to consider the teacher survey first, as it helps establish the context for the classroom visits. (The logistics of visiting a large number of classrooms in one week—some of which were in remote rural communities—precluded conducting extensive teacher interviews as part of the observations.) The survey, made available online, asked:

- Which cadres the teachers belonged to
- How long the teachers had been teaching with interactive whiteboards
- What grades the teachers worked in
- What changes teachers had noted in their
- Instructional strategies
    - Classroom management
    - Role as a teacher
    - Students' behavior
    - Student outcomes
    - Needs for support from the school or district.

Fourteen teachers responded to the survey. Nine were members of the AB cadre, and four were members of the AC cadre. One did not specify a cadre, although with only one year of whiteboard experience, they probably were part of the AB cadre. Two of the teachers were in their first year of using whiteboards, five were in their second year, five in their third, and two had used whiteboards since before the WCSD initiative started in 2007. Cadre membership was not necessarily determined by experience with whiteboards. One AC cadre member had two years of experience and one AB cadre member had four. Two teachers taught primary grades (2), eight worked in upper elementary (3-5), one was a middle school teacher, and three worked in high schools. Comments are summarized below, with representative quotations.

Changes in instructional techniques (18 comments from 13 respondents)

The most common change noted (4 responses) was the use of the whiteboards by elementary teachers across all subject areas. Other changes referred to increased use of particular resources: Visuals (3) and the Internet (3). Some teachers also felt their teaching was more creative (2) and the

materials more closely aligned with curriculum (2). Individual changes included better lesson planning, improved assessment, and more interaction with and participation by students.

I teach all subjects using the Activboard. I took the overhead out of the classroom . . . . I incorporate the use of the Activboard into almost every lesson. (Teacher #6, elementary)
I am constantly evaluating the students because the data is right in front of me. I can then change my instruction or regroup and restructure the lessons. (Teacher #7, elementary)

Changes in classroom management (15 comments from 13 respondents)

More than half the teachers (7) cited increased student engagement as an important change. One commented that students "like the board." Two teachers felt that they were able to be more responsive to student needs. Improved teacher organization and student participation were cited again, but by different teachers than responded to the instructional technique prompt. Another teacher commented that teaching appropriate use of digital tools is important. Three teachers said that classroom management was not a problem or had improved, but without specifying the nature of the change.

. . . By using the ActivBoard, I can keep my students engaged and on task. (Teacher #2, primary)
. . . Students tend to listen better and follow directions because they want to use the ActivExpressions[2] *(Teacher #13, primary)*

Role as a teacher (14 comments from 12 respondents)

The one recurring comment (5 responses) was that teachers were better able to assume a facilitation role in the classroom. Two felt their teaching was more student-centered. Other comments included that instruction was more relevant and the teacher more available, credible (because of technology skill), and more global in thinking (because of internet use). A teacher felt

[2] ActivExpression is Promethean's name for its digital response system.

forced by the whiteboard to keep up with technology, and another noted that the required planning is difficult. One teacher said that teaching was now "more fun."

I am more available while using the ActivSlate while roaming the room. It doesn't tie me to the whiteboard and allows me to see the room from the students' perspective.(Teacher #1, elementary)
Facilitator, tools provider for curricula standards. I provide the materials that [are] kinesthetic, visual and tactile for all students' diverse learning styles.(Teacher #8, elementary)

Changes in student behavior (14 comments from 13 respondents)

Student engagement was the most important change, noted by 10 teachers. One teacher noted no changes; one noted an increase in technology skills. One teacher each reported fewer discipline problems and more discipline problems.

I used to use boards all around the class, so I walk around less, which has increased discipline problems.(Teacher #5, secondary)
Students seem much more motivated by lessons and activities that involve the board. The tools allow all students, even non-English speakers, to be involved in some capacity. Students who usually don't participate in activities will participate for a chance to come to the board. (Teacher #12, elementary)

1. Changes in student outcomes (19 comments from 14 respondents)

Several teachers reiterated comments made earlier: Instruction was more student-centered, assessment of students was improved, and students were more engaged or confident. One noted that students accessed online academic resources out of school. Most (10) cited increased academic achievement. Three of these specified that the increase was in reading and/or math. One teacher felt that student outcomes had not changed, and one said they were improved, but without specifying the change.

I have noticed an increase in vocabulary scores. Also, using the board for math makes the not-so-sure student more confident. (Teacher #1, elementary)

Students really enjoy creating and sharing their flipcharts. They also access the website we visit at home. (Teacher #10, elementary)

Changes in support needs. (16 comments from 12 respondents)

Five teachers applauded the support they have received to date. Four urged continuation of training and support. Time was noted as an issue in solving technical problems by two teachers. Two said they personally were comfortable with fixing technology problems, but urged more support for colleagues. Other concerns included more advanced training, more ideas for using the whiteboards in upper grades, and the need for additional support staff.

I need little support I can fix most problems. I think my colleagues would benefit from the use of the ActivBoards and the expressions. . . . thus the district and school would need to support these tools more readily. (Teacher #7, elementary)

Personally, the support I have received has been exceptional. I think overall the team . . . is in need of more support as they do not get to help each individual when needed. (Teacher #8, elementary)

I think the school district as a whole needs more than one [support] person. (Teacher #13, primary)

Classroom Observations

Classroom observations conducted in 2010 were a continuation of observations conducted by ISTE for WCSD in 2008-2009 (Hayden & Sampson-Gruener, 2009). Forty teachers were observed over two school years, Twenty-five teachers were observed in 2008-2009 (38 class periods) in Washoe, Pershing, and Douglas Counties. Twenty classrooms (23 class periods) were observed in April 2010 in Washoe and Douglas Counties. Six of these teachers were observed in both years. Almost half of the teacher (19) taught in grades 3-5. Nine teachers taught in grades 6-8. There were six teachers each at the primary (K-2) and high school (9-12) levels.

In 2010, 14 observed teachers were current or past members of the AC cadre and seven were past AB cadre members. The content covered in the lessons included all the core subject areas: Math (9), Language Arts (6), Social Studies (3), and Science (2). One lesson integrated Math and Social Studies.

ISTE Classroom Observation Tool

The instrument used was the ISTE Classroom Observation Tool (ICOT) (ISTE, 2008a), which records details of classroom setting, technology use, and teacher and student roles. The instrument also addresses the NETS Standards for Teachers, First Edition. Because those standards have been replaced by revised NETS (adopted in 2009 by the Nevada Department of Education), that portion of the instrument is not discussed here.

Median class sizes were 17 for primary, 20 for elementary, 24 for middle grade, and 23 for high schools. Observations averaged around 50 minutes, with a range from 15 to 85 minutes. Each observation was recorded by one observer, with the exception of two observations used to calibrate the protocol between observers. Three observers visited the district two at a time in 2008-2009. One of these also participated in the 2010 observations.

Technology Use Duration

ICOT observers note every three minutes whether students are using technology, and whether that use is related to learning (as opposed to recreational use, or fixing problems with the technology itself.) In most cases, teacher use exceeded student use (Figure 1). The median proportion of class time during which teachers used technology was 73%, versus 40% for students. The median percentage of time students used technology in a period was 27%, all of which was spent in academic learning. That is, although technology was used by students in only part of most periods observed, when it was in use, no time was lost to technical issues and the technology was not employed for non-instructional uses such as administration or recreation.

Note that in Figure 1, the first five observations are of teachers new to the ActivBoard Cadre. The rest are of teachers who were past or current members of the ActivClassroom Cadre. There is a difference in the proportions of technology use by students across the two groups. The more experienced teachers were more likely to have students using technology at least 50% of the class period ($\chi_2[1] = 4.4079$, $p<.05$). The mean proportions of student use were .35 for ActivBoard

members and .53 for ActivClassroom members. (The mean proportions of teacher use were similar, approximately 50% of class time for each group.) This tendency for student use of technology to increase with teacher experience was noted in 2008-2009, during which there was an increase in the proportion of student use from fall to spring observations.

Student Groupings and Teacher Roles

All classrooms used whole class instruction, and in approximately a quarter of observations (6) that was the only student grouping. The rest of the classrooms (17) added small groups of 3 or 4, pairs, or individual work (Figure 2). All of these categories increased their presence in observations over time. That is, in 2010, an observer was more likely to see two or more student groupings in a classroom. The mean and median number of groupings increased from 1.5 to 2.

Figure 1. Percentage of Class Time in which Student and Teachers Use Technology, by Observation (2010, N=17)

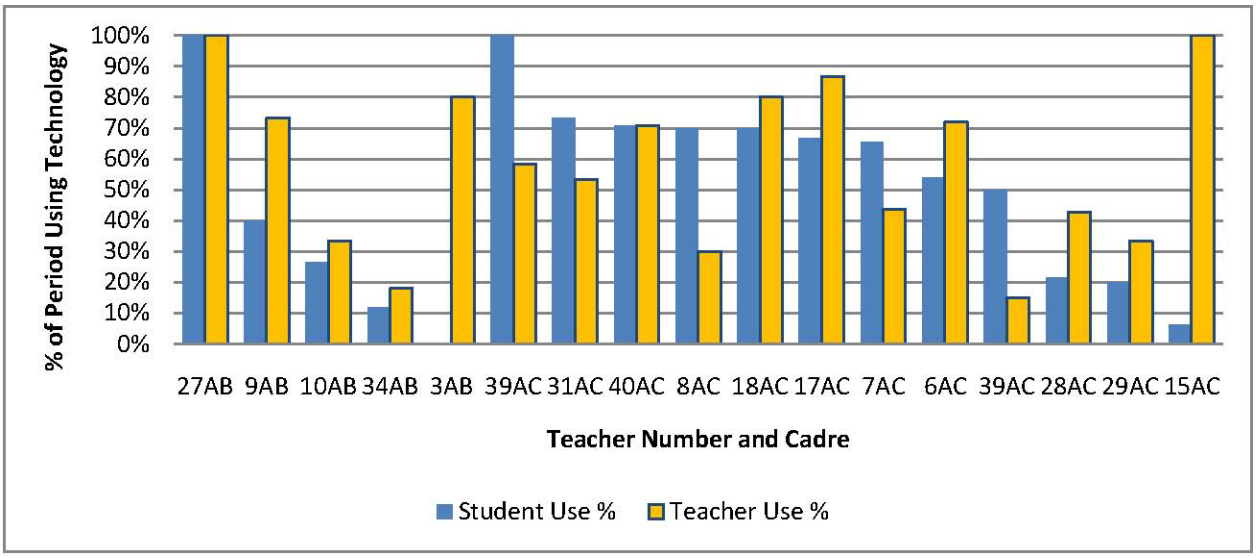
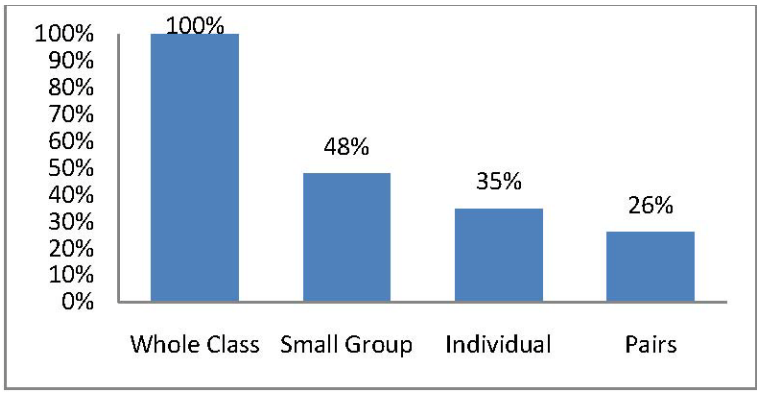


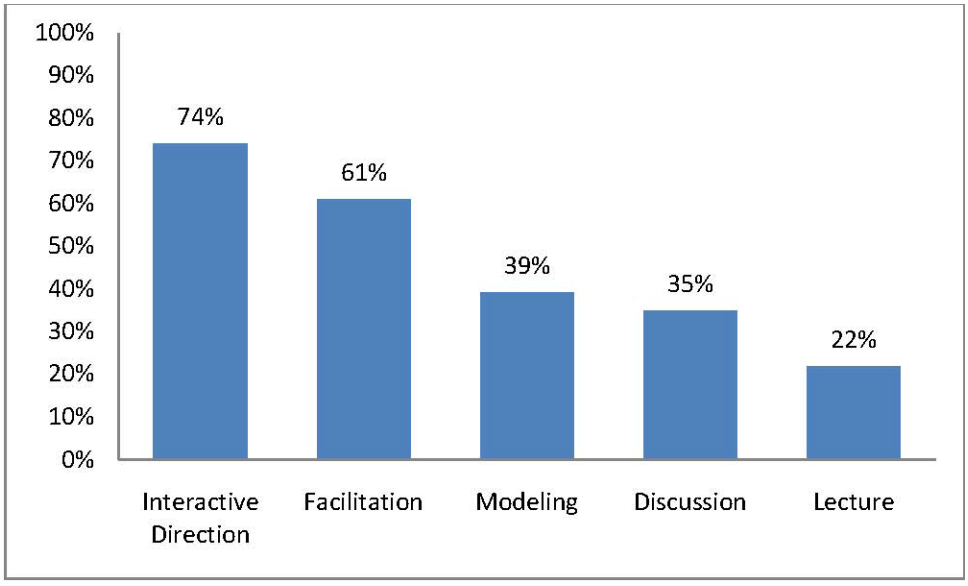
Figure 2. Percentage of Classrooms Employing Various Student Groupings (N=23).



Although whole class instruction was the most common classroom grouping, lectures were not the most common instructional strategy. It was in fact the least frequent approach (Figure 3). Most instruction involved "interactive direction," another teacher-led approach in which the teacher presents new material while frequently asking students to respond to questions. The next most common activity was facilitation, in which the teacher provides advice to students engaged in individual or small group work. "Modeling," seen in 39% of classrooms, involves the teacher

Figure 3. Percentage of Teachers Employing Various Instructional Strategies

demonstrating a procedure. "Discussion," in terms of the ICOT, refers to dialog undertaken by students, as opposed to the teacher-led interactive direction. The discussion may be elicited by the teacher, but is between students.



There were some differences in approach related to experience: ActivClassroom cadre members were more likely to us interactive direction and facilitation, and less likely to use lecturing and modeling. However, the differences were not significant.

Learning Activities

The most frequently observed learning activity was drill and practice (Figure 4). This generally was not traditional computer-aided instruction, in which a student answers questions presented by a computer program, but whole-class response to teacher-created exercises on the white board. Student response systems allow rapid feedback to the individual student as to whether an answer is correct, and rapid feedback to the teacher as to which questions present the most difficulties. The second most common activity was viewing teacher presentations, followed by analysis of information (e.g., working with geometric figures or considering literary structure). The relative frequencies of activities were similar to those observed in earlier years.[3]

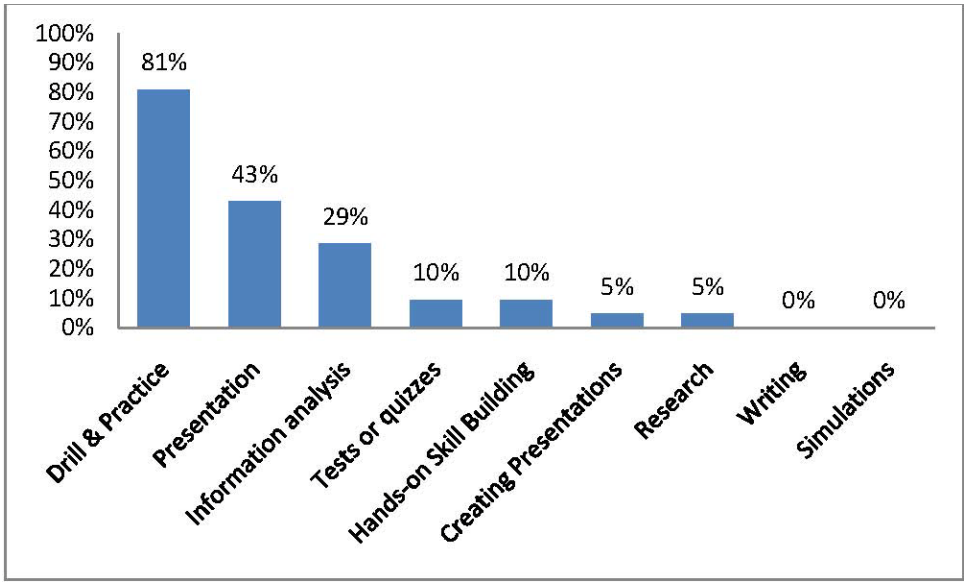


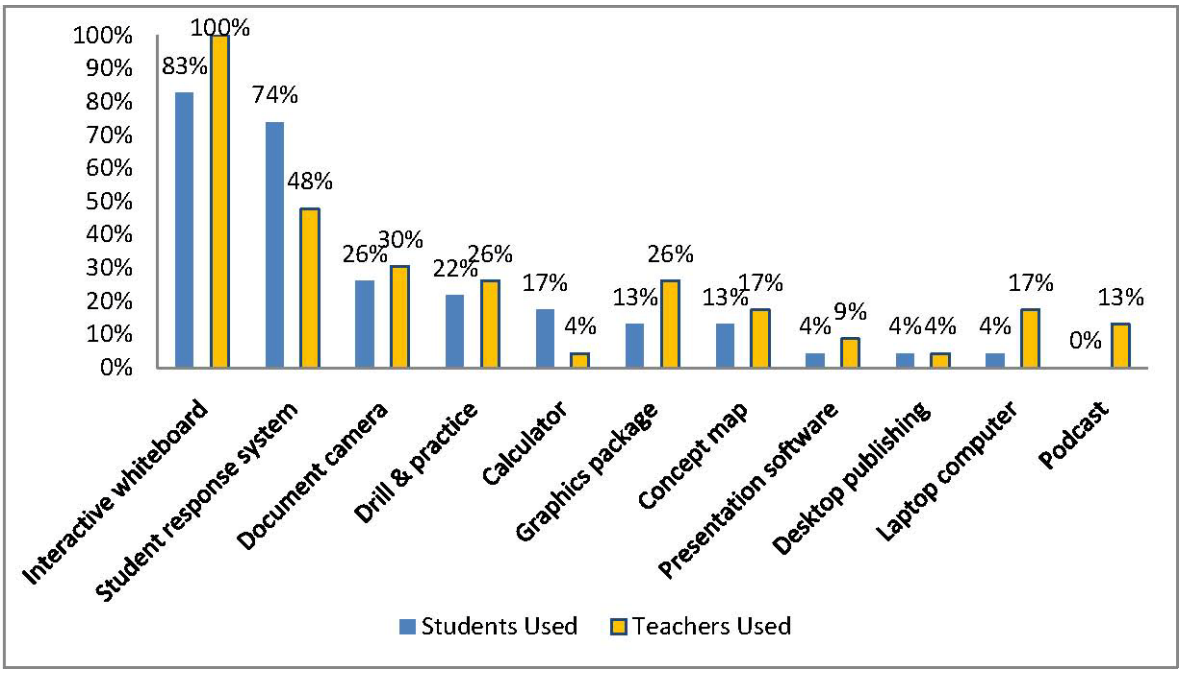
Figure 4. Percentages of Classrooms Engaging in Various Learning Activities (N=21).

Technologies Used

A variety of technologies were observed during the observations. As might be expected from the activity profiles, the whiteboard, student response system, and drill/practice software were the

[3] In 2009, one observer recorded several instances of using "simulations." However, later examination of the observer's narrative notes suggests that this was a coding error.

most common. In addition, the document camera was used in more than a quarter of classrooms by both students and teachers (Figure 5). The frequency of observed teacher use was somewhat greater than the observed student use for most technologies. The configuration observed in 2010 was somewhat different than in 2008-2009. The document camera was not observed in the first



year and student response systems were only seen in a few classrooms. A wider variety of technologies were observed in use by one or two teachers, including databases, spreadsheets, calculators, and simulations.

Figure 5. Percentages of Classrooms Employing Various Technologies (N=23)

Student Engagement and Need for Technology

The ICOT asks observers to make summary estimates about each lesson:

- To what extent were students engaged?
- Did the technology integrated into the lesson provide an advantage?

The evaluation of engagement is subjective, but for the purposes of the WCSD observations, the following criteria were used: “Non-engaged” behavior was any lack of attention or disruption

that persisted over two ICOT timekeeping periods. That might include dozing, playing, joking with friends, arguing, or anything that pulled a student away from participating in the class activities. The proportion of students identified as not engaged was subtracted from the total to obtain the percent engaged. (For example, one student out of 20 distracted for three or more minutes would be recorded as an engagement level of 95 %.) The percent represents the lowest level of engagement observed during the period at any one time.

By these criteria, the median level of classroom engagement was 100%. That is, more than half of all observed classrooms had no students who were more than briefly or intermittently off task. The lowest level was 50% in an unusually disruptive class in which the teacher was trying to present a formative quiz on the whiteboard in a darkened room. The setting and the fact that the students were having difficulty with the content may have provided both the opportunity and the cause for off-task behavior. The other low-engagement class (75%) had a group of four girls who dealt with their cosmetics in the back of the room without engaging in the lesson or attracting the teachers' attention. In this case, the issue seemed to be related to a particular clique; other students were engaged in the class. The level of engagement was slightly better than in the previous year, when observers rated the classes at a median level of 95% (mean=94%). To put these percentages in perspective, 95% engagement typically represents one or two students not attending in two consecutive three-minute periods. If the figure seems high, it may be because "disruption" is not necessarily coded as "disengagement." Overly gregarious or hyperactive students might be fully engaged in the content, even if a teacher might feel their behavior needs to be corrected.

The need for technology integration is rated in terms of alternatives: Would there have been a way to conduct the lesson without the technology tools? Observers can give one of four responses regarding the technology:

1. Not needed; other approaches would be better.

2. Somewhat useful; other approaches would be as effective.

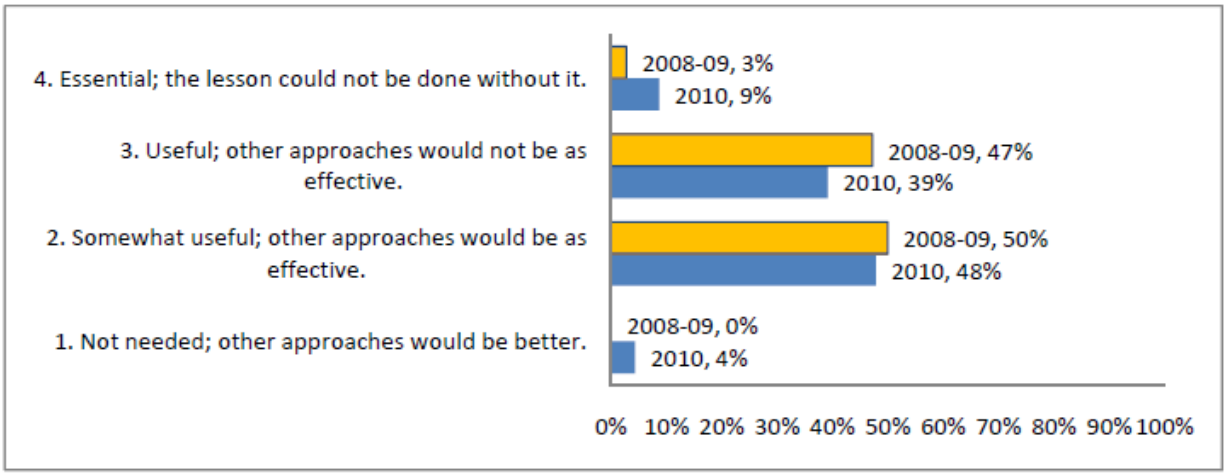
3. Useful; other approaches would not be as effective.

4. Essential; the lesson could not be done without it.

Ratings were given in 23 cases. In 48% of cases, observers rated technology as useful or essential (Figure 6). Either the activity could not have been done (e.g. as when on online geometry

site is used to provide interactive simulations of geometry constructions); or else the activity could not have been done in the same time (e.g., as when whiteboard-administered quizzes provide immediate feedback to inform instruction or stimulate discussion.). “Somewhat useful” ratings were assigned to activities where the technology effectively duplicated a traditional activity (e.g., a student going to the board to present the solution to a math problem), without taking advantage of the technology to make the presentation more interactive, creative, metacognitive, collaborative, or substantial. In the case mentioned above where students became frustrated and restive during a review quiz, the observer rated the technology use as less effective than a conventional review with face-to-face interaction. As indicated in Figure 6, there were minor differences in the pattern of ratings between 2008-9 and 2010, but they were not significant.

Figure 6. Need for Technology, Proportions by Level for 2008-9 (N=35) and 2010 (N=23) Observations.



Cross-Program Comparisons

Because of the difficulty in obtaining consistent ratings across reviewers, the ICOT is not recommended for comparisons across different reviewer groups. However, since the ICOT was introduced in 2008, ISTE has accumulated 181 observations across four Nevada EETT programs and two National Science Foundation grants. Most of these were conducted by four individuals who trained on the ICOT. Three of the individuals were involved in some stage of ICOT development and had previously demonstrated well-aligned interpretation of elements in the ICOT or its predecessors (Hayden, et al., 2005). For that reason, ISTE felt that it was reasonable to compare observations within ISTE-evaluated programs.

Some of the programs besides WCSD made extensive use of interactive whiteboards. Others focused on hands-on science, the use of online simulations and visualization tools, and a comprehensive technology integration approach (eMINTS). The observations in other programs tended to be in secondary schools (71% in grades 6-12), while WCSD observations were mostly (59%) in grades 1-5. Table 1 shows the proportions of observations by subject for both groups.

Table 1. Content addressed in observations.

Subject	WSCD (N=60)	Other (N=113)
Math	45%	12%
Language Arts	25%	12%
Science	15%	61%
Social Studies	10%	7%
Social Studies / Math	3%	0%
Social Studies / Language Arts/ Science	2%	0%
Science / Math	0%	1%
Social Studies / Science	0%	2%
Elective (student portfolios)	0%	4%
Technology	0%	1%

Observation times, class sizes, and high levels of student engagement were similar across programs. Because of differences in context, the ICOT archive in no way establishes what is "normal" for technology integration. However, it does display alternative configurations of technology use, teacher roles, and student groupings.

Table 2 shows the proportions of student and teacher use in WCSD and other observed classrooms. In WCSD, teacher use exceeded student use; the relationship was reversed in other programs. The median proportion of student use devoted to academic learning was the same in both groups: 100%.

	Number of Observations		Median % of Observation Period	
Variable	WCSD N	Other N	WCSD	Other
Teacher use of technology	48	102	74%	13%
Student use of technology	48	102	39%	65%

Table 2. Duration of technology use as proportion of observation period

Table 3 compares the proportions observed of different student groupings, teacher roles, and learning activities. Overall, WCSD teachers used more whole-class instruction and less individual work than teachers in other programs. The combined proportions of pairs and small groups were similar. The proportions of teacher roles were roughly similar, although WCSD teachers did somewhat less facilitation and formal lecturing and somewhat more interactive direction. The greatest differences were in the types of learning activities. Drill/practice and student presentations were uncommon in most classrooms outside of WCSD, but observed frequently in WCSD. Writing and research were the most common activities observed in "other" classrooms, but hardly every observed in WCSD. This was surprising, given the higher proportion of observations in language arts and social studies classrooms in WCSD.

Table 3. Proportions of observed student groupings, teacher roles, and learning activities

		Number of Observations		Proportion of Observations in which Variable was Observed*	
ICOT Section	Variable	WCSD N	Other N	WCSD	Other
Student Groupings	Individual	62	120	26%	51%
	Pairs	62	120	21%	28%
	Small Groups	62	120	41%	23%
	Whole Class	62	120	84%	68%
Teacher Roles	Interactive Direction	57	106	52%	43%
	Lecture	57	106	45%	58%
	Discussion	57	106	23%	19%
	Modeling	57	106	29%	32%
	Facilitation	57	106	64%	71%
Learning Activities	Information Analysis	53	106	28%	42%
	Testing	53	106	9%	8%
	Writing	53	106	4%	46%
	Drill & Practice	53	106	57%	13%
	Hands-on Skill Training	53	106	4%	20%
	Creating Presentations	53	106	4%	16%
	Presenting	53	106	42%	13%
	Simulations	53	106	8%	15%
	Research	53	106	4%	35%

*Percentages may sum to more than 100 because of multiple groupings, roles and activities within classrooms.

Table 4 displays the technologies observed in 167 ICOT observations since 2008. Fourteen of the 27 technologies are observed less than 10% of the time in either WCSD or other programs. Some (e.g., science probes) are present because they are a featured technology in one or another grant. Other technologies (laptops, graphics) were present in at least 15% of observations in WCSD and other programs. That leaves 11 technologies that were used at least 10% in WCSD or other programs, but not to the same extent in both groups. Interactive whiteboards were obviously the most common technology in WCSD, but they were also the most common teacher technology across all programs, even if they were only observed in a third of classrooms outside of WCSD. Related to the whiteboard use, student response systems are much more common in WCSD observations than elsewhere, as is use of drill and practice programs, document cameras, and student calculators. (Note that calculators are an on-screen tool available with the whiteboard software.)

On the other hand, common productivity tools—general presentation software, desktop publishing software, web browsers, databases, and word processors—were rarely observed in WCSD, although they are common elsewhere. The greater use of simulations outside of WCSD may

be related to the goals of particular grants that feature computer modeling as a tool for learning science.

Table 4. Proportions of observations using various technologies (WCSD N=58, Other N=109).

	Teacher Use*		Student Use*	
Variable	WCSD	Other	WCSD	Other
Interactive whiteboard	93%	33%	71%	11%
Student response system	22%	5%	36%	3%
Laptop computer	21%	23%	16%	29%
Graphics	19%	13%	10%	15%
Presentation software	14%	24%	3%	13%
Desktop publishing	12%	17%	5%	21%
Document camera	12%	3%	10%	0%
Drill & practice	12%	1%	10%	6%
Concept mapping software	7%	1%	5%	1%
Podcast	5%	0%	2%	2%
Web browser	3%	32%	2%	45%
Tablet computer	3%	0%	0%	0%
Calculator	3%	0%	17%	2%
Simulation	2%	12%	3%	15%
Databases	2%	10%	0%	12%
Word processing	0%	16%	0%	16%
Wiki	0%	4%	0%	5%
Science probe	0%	4%	0%	7%
Spreadsheets	0%	2%	2%	3%
Videoconferencing	0%	2%	0%	0%
Video camera	0%	2%	0%	0%
Digital camera	0%	1%	0%	1%
Handheld computer	0%	1%	0%	6%
Video production	0%	1%	0%	1%
Blog	0%	1%	0%	2%
Web authoring tools	0%	1%	0%	3%
Email	0%	0%	0%	1%

*Percentages may sum to more than 100 because of multiple technologies used within classrooms.

Summary and Discussion

Classrooms that make extensive use of interactive whiteboards have a distinctive feel. The rhythm of an instructional period is determined by cycles of teachers presenting information on the board, students bringing their work to show to the class, and assessments of learning in public forum.

A look at the duration patterns for technology use show that whiteboards are first of all a teacher tool. They facilitate presentation of material to the class and whole-class interaction with the display. Looking at patterns of use across teachers of different experience levels, it appears that

more veteran whiteboard users (or those with more advanced professional development) tend to turn over more control of the technology to students. Students use the board to share their work with others, and student presentations at the board are a common feature of the classes observed.

There are, however, certain physical and financial limitations inherent in centering much of instruction on the board. As one teacher pointed out in the survey, the board may anchor the teacher and student attention in one part of the room. (Boards are in theory movable, but alignment of interactive boards is difficult, and most classrooms have boards firmly mounted to the wall.) In most classes observed, whoever is using the board has to leave his or her seat to manipulate either the touch-sensitive surface of the board itself or the computer that is driving the display. Interactive slates are available to allow users to manipulate the board from afar, but they were just coming into use, and were rarely observed.

The interactive whiteboard is clearly situated as a premier presentation medium for the teacher. (No teacher in any program evaluated by ISTE has expressed regret at having a whiteboard, and some have commented that they "don't know how we did without it.") Its efficacy at providing an engaging classroom experience is supported by ISTE's observations across a range of technology environments.

ISTE observers did question, however, where the whiteboard fits in the context of essential skills and the concern of WCSD to establish a student-centered learning environment. That is, what is the "opportunity cost" of this approach to instruction? Note the relatively low incidence of writing activity, online research, and the use of basic productivity tools in the WCSD observations. It is true that program evaluation observations are somewhat artificial events, in which outsiders drop in to watch a particular kind of activity that has been paid for with a particular source of funding. They are generally not valid assessments of a districts instructional program. Writing, research, and information literacy may be amply addressed by other components of the WCSD program. And yet, those same limitations apply to all ICOT observations ISTE has conducted, and the profiles of observed technology use were different in different districts

In summary, then, ISTE has the following findings and recommendations for WCSD's EETT-funded implementation of interactive whiteboards.

1. Interactive whiteboards are a popular and engaging aspect of modern classrooms. Students and teachers say they make the instructional activities more interesting. While ISTE has noted exceptions, overall, this finding is uncontested.
2. Professional development or equivalent experience changes teachers' use of whiteboards and appears to lead to more involvement of students. This is a correlational finding, so it may be that the relationship works in reverse (i.e., more student-centered teachers sign up for more advanced whiteboard training). Either way, the training program is an important part of the implementation and will need to be continued in some form to sustain and expand whiteboard use.
3. The effect of the whiteboard on the range of technology skills and tools that students are exposed to should be clarified for teachers and students. WCSD's program may be optimal as is in some aspects. WCSD students do not spend much time learning specialized presentation software.. Yet they readily give technology-enhanced presentations when called to the board to discuss their answer to a math problem. ISTE would be hard pressed to say that this is inferior in terms of technology use to meet the current NETS Standards (ISTE, 2008b) or Nevada's concern for workplace readiness (Nevada Commission on Educational Technology, 2009, p. 1). However, given evidence that other programs have more frequently integrated fundamental skills as writing and online research into other subjects (particularly science), the question remains whether the whiteboard program is (a) doing all it can to encourage hands-on student use of

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Nevada EETT 2009-2010

White Pine and Lincoln County Public Schools

Talbot Bielefeldt (talbot@iste.org)
International Society for Technology in Education

A partnership of White Pine and Lincoln Counties was awarded Enhancing Education Through Technology funds for the 2009-2010 school year by the Nevada State Department of Education. The two adjacent counties cover a large rural area in the basin and range country on Nevada's eastern border. The application for the EETT funds listed the main problems to be addressed as:

- Lack of technology integration in classroom instruction
- Lack of teacher development, not just conventional training, but also in terms of establishing a culture of professional collaboration.
- Lack of stakeholder involvement, particularly by parents.

The proposed solution was to provide technology and professional development to a cadre of teachers who would serve as resources for the rest of their districts. The EETT grant was intended to be the start of a five-year initiative. Table 1 outlines the original project proposal.

Figure 1. White Pine / Lincoln EETT Project Outline

Goal: Provide all teachers with germinal experience with technology in education

- Every teacher will create and teach a unit of study that integrates technology.
    - Strategy: Professional development
        - Identify teacher mentors
        - Orient teacher mentors
        - Attend the 2009 Clark County School District Educational Technology Conference
        - Fund webinars, online classes, and continuing education for teachers
        - Fund travel for inter-district collaboration
        - Facilitate a strategic planning meeting at the ISTE 2010 Conference
        - Purchase a library of resources on technology integration
    - Strategy: Administrative support
        - Principals work with mentor teachers to systematize technology integration and communicate with staff.
        - Participate in state-sponsored administrator training.
        - Provide time for lesson and unit development
        - Conduct regular classroom observations of technology-integrated units.
    - Strategy: Support hardware, software, and infrastructure
        - Schools develop maintenance plans for hardware and software.

Goal: Assessing progress toward technology integration

- Students demonstrate technology competency
    - Strategy: Staff develop assessments of technology literacy
        - Each participating school develops components and assessments of technology literacy
        - Administrators ask staff to identify students who struggle with technology literacy
        - Teachers remediate struggling students
        - Teachers assess 8th grade technology literacy against state standards.
- Students and teachers develop improved attitudes toward classroom technology use
        - Teachers implement the grant activities
        - Students and teachers take attitude surveys at the beginning and end of each year.

Goal: Increase parent involvement in school

- Parent participation in school events increases
    - Schools conduct parent communication activities
        - Technology summits twice a year.
        - Quarterly parent nights with informal classes on technology
        - Schools seek parent classroom participation
        - Schools survey parents twice a year on parent communication

Overall Progress

The implementation of the project was delayed first by a need to reduce budget. With the EETT budget cut more than 60%, the number of mentor teachers in the two districts was reduced

from 12 to 4. Fall activities were curtailed, although some staff members were able to attend the technology conference in Clark County.

A joint kickoff meeting was held on January 13. The districts discussed teacher requirements and the connections among 21st-century skills, student-centered pedagogy, and technology integration.

On February 2, White Pine received its laptops, and the teachers started digital portfolio class the next week. iPod were delivered on March 1, and wireless access points were installed three weeks later.

Lincoln County's equipment arrived January 26, and it took most of February to complete configuration of the computers and to begin using them in instruction. The pre-implementation professional development activities did not take place in either district.

Program Evaluation

The counties contracted with the International Society for Technology in Education (ISTE) to evaluate the EETT grant. ISTE's original evaluation proposal envisioned mainly technical role in the identification of survey instruments and the evaluation of survey data. With the dramatic changes in the EETT program and the elimination of fall activities, the evaluation changed to focus on how the systems integrated technology in the absence of key program supports. An ISTE evaluator made two visits to the region in April and May 2010. The first visit was devoted to observing teaching and technology use in classrooms directly affected by the grant. The second visit emphasized the role of technology in the overall educational system, and involved interviews with superintendants and visits to additional schools not directly involved in the grant.

The evaluator was concerned with the following questions:

- Given the delayed, mid-year implementation without professional development, where do the mentor teachers start from in terms of technology integration skills?
- What supports are present or absent for pursuing the program goals and sustaining progress?

White Pine County

The EETT program was implemented in White Pine Middle School in Ely. The school, which dates from 1913, is in an urban setting in the old center of town across from a large park. WPMS serves about 320 students in grades 6-8.

Classroom Observations

Two teachers were directly involved in the White Pine portion of the grant. One was a science teacher; the other was a language arts teacher. The two teachers shared the grant-provided equipment, which included laptops and iPod Touches. Observations took place in teachers' classrooms, a science lab, and the school library. The mobile technology followed the teachers, although the transitions were made somewhat awkward by the fact that the cart to hold and charge the laptops had not arrived. Teachers, with the help of students, would have to carry the machines and power supply cables between classrooms.

The rubric used for recording data was the ISTE Classroom Observation Tool, or ICOT (http://www.iste.org/icot), an Adobe AIR application that allows observers to take structured notes on a tablet computer. The ICOT asks observers to code categories of student groupings, and teacher roles, as well as noting technology applications used, and National Educational Technology Standards addressed. The rubric also allows recording the time and sequence of technology use during the class period, and asks the observer to make judgments about student engagement and the contribution of educational technology to the lesson.

The April observations over two days involved watching the same teachers work with several different classes each. The observer remained in each classroom for a full period, watching the introduction, conduct, and wrap-up of each lesson. In May, the observations consisted of attending student presentations and of tours to other schools in the district.

Learning activities and technologies used

The two middle school teachers were engaged with three activities during the observations: The language arts teacher had students researching and creating a project on poetry. In an elective class, looked up designs for paper airplanes, which they then built and tested. The science teacher was working on understanding the relationship between distance, speed, and time. Both were also involved with advising eighth-grade students on the preparation of a

required reflective portfolio. Those students who had been nominated a students-of-the-week during the year were allowed to use the laptops to create digital portfolios. On the second observation, the evaluator attended the presentations of the poetry and portfolio projects to classes and parents.

The iPods were used for web research and for doing calculations. The laptops were used for research, for accessing a public wiki site for creating web pages, and for creating presentations. The ICOT protocol asks observers to note every three minutes whether technology is in use and whether it is being used for teaching and learning. Observations lasted and average of 50 minutes, Technology was used an average of 41% of that time by students, and average of 17% by teachers. Because the technology was new, some classes were devoted to hands-on training with the tools rather than to their application in the curriculum. Overall, the average proportion of student use-time devoted to curriculum was 80%.

Student groupings and teacher roles

Early observations usually involved teacher introductions to the technology and the topic, followed by individual work, or, in about half the observations, pairs or small groups. In later observations, students were more likely to independently start up and use the technology. Along with this pattern of classroom management, teachers' most common roles were lecturing and then facilitating subsequent work. There was one case where lecture dominated the class, and in about half the classes, there was no formal lecture. (This included the student presentations, where the teachers functions as masters of ceremonies for the attending students and parents.)

Student engagement

For the most part, students were highly engaged in the lessons and with the technology. The ICOT defaults to reporting 100% engagement (all students engaged in class all the time.) Using the 3-minute intervals as a guide, the observer noted any student who was distracted, off-task, or disruptive during two consecutive intervals. (Occasional joking or horseplay is ignored.) The engagement percentage is reduced in proportion to the number of students who meet the "two-consecutive-periods" standard (i.e., one student out of a 20 student class would reduce the engagement to 95%). In six of the 11 observations, engagement was 100%. In three, only one student in each class was off-task to a significant extent. One group of students, observed on two

occasions, had more serious problems with attention. These were exacerbated by issues with new technology that resulted in some gaps in pacing while the issues were resolved.

Contribution of technology

The ICOT asks observers to make a judgment of the unique contribution of technology in comparison to alternatives. The lowest rating (1) reflects an opinion that the lesson would have been better without the technology component. The highest rating (4) indicates that the lesson could not have been conducted without the digital tools. A "2" suggests that the technology-based approaches were no better than alternatives, and a "3" indicates that while alternatives exist, the technology were superior. By this standard, the observer rated five the lessons as "2," five at "3," and one at "4." The "4" involved the use of an online web-site creation tool that allowed students to create their own poetry sites. The essential part of the lesson was the introduction of students to the online tool (the technology was the content). Subsequent observations of the same project were rated "3," in that the creation of a poetry book is a common language arts activity, but the online venue allowed more authentic publication of the work. Ratings of "2" were given to activities where the technology replaced other available resources (e.g., books of paper airplane designs) without taking advantage of the unique capabilities of computers or online resources.

The EETT Context: Interviews and Survey

To better understand how the EETT grant fits into the district program, ISTE interviewed the grant teachers, the coordinator of the grant, the middle school principal, and district administrators. The Assistant Superintendent described how the district decided it needed to make preparing students with 21st-century skills a goal, whether or not it had the technology to do so. The superintendent explained that he was concerned with communicating this vision to the community. The EETT teachers made a start at a Parent Night where they demonstrated how to access Pearson PowerSchool, the student information system, from home. (In one class polled, 11 of 15 students—73%—had home internet access. But he feels the case still needs to be made to the public for the classroom use of technology.

The coordinator reiterated that the technology was implemented without professional development. Teachers echoed this concern. "We don't know what we don't know," was how

the language arts teacher expressed it. She had worked previously at a newer school with more technology, but still felt that she did not know enough about integrating the laptops and iPods. The district decided to continue working with the same two teachers in order to capitalize on their experience and to provide them with the training they were promised when they were recruited. The district is planning a number of activities to prepare for the next school year:

- Both teachers will attend the ISTE Conference in Denver in June 2010.
- The district will purchase additional applications for the iPods in Spring 2010.
- The teachers will participate in professional development on classroom use of social networking applications and on the use of interactive white boards in fall 2010.

The district technology specialist escorted the evaluator to several other schools in the district that were within easy driving distance of the district headquarters in Ely. These included two elementary schools and White Pine High School. The technology infrastructure at all included computer labs plus some classroom computers. With the exception of newer laptops, and interactive white boards, most of the technology is several years old and approaching the end of its useful life. Long term technical support is a major concern. The district's technical support specialist was present at the middle school during the initial observations, and provided assistance in helping students and the teacher solve technical issues. However, he is shared among the several schools, and is not always available to solve immediate problems that might interfere with delivery of a lesson.

Another issue is the age of the school buildings themselves, a factor that makes it difficult to retrofit some areas for networking. (An exception is a 2002 K-12 facility at Lund in the southern part of the county from which the WPMS language arts teacher transferred.) The middle school had new access points installed in 2009-2010 to facilitate the use of the laptops, and additional drops are planned. Currently, internet access is also limited by bandwidth, but the district hopes to resolve that issue by the next school year.

The transition to a more extensively networked environment is an ongoing process. For instance, the lack of central saving and retrieval means that students need to always work on the same machines or store their work on thumb drives both for use in school and to take work home. Even that work around was not always effective because of differences in software on

home and school computers. A policy of not allowing laptops to go home was waived for four 8th-graders who needed to complete their portfolios on EETT-provided equipment.

Teacher Survey

Because the EETT observations concentrated on only two teachers, ISTE asked the district to advertise a web-based survey to all teachers in the district to help assess the districts' needs in moving forward. The survey form appears as Figure 2.

Figure 2. Teacher Survey

White Pine / Lincoln Enhancing Education Through Technology

- White Pine and Lincoln County school districts have stated that they want to provide students with 21st-Century skills that reflect the demands of the world outside of school. In your opinion, what would be the most important thing the school could do to meet those demands?
- In your experience, what have been the most effective uses of technology in the classroom?
- What would you most like to learn about using technology in teaching and learning?
- What are the major barriers to using technology in the classroom in your school?
- How do you prefer to learn in your job? Please rate the following approaches:

	1=Not useful for me	2=Can be useful, but I learn more with other approaches	3=Useful, one of several good ways for me to learn	4=The best way for me to learn
Taking a college class District-provided workshop Professional conference 1-on-1 mentoring Small study group Independent study Distance learning				

- How familiar are you with Nevada's 2009 Educational Technology Plan?

Never heard of it.	Heard of it, but never read it.	Aware of it's contents, but never read it.	Have read the plan.

- The National Educational Technology Standards talk about essential conditions for using technology in schools. Where do you think your school is in terms of meeting these conditions?

	We don't meet this condition and have not worked on it.	We're just starting to address this issue.	We have been working on this issue for a while.	We mostly meet this condition
Shared vision for educational technology among all stakeholders.				
Stakeholders empowered to be leaders in effecting change.				
A systemic plan for the infusion of technology.				
Ongoing funding to support technology and staff development.				
Reliable and equitable access to current and emerging technologies.				
Educators skilled in the selection and effective use of appropriate technology resources.				
Technology-related professional development with time to practice and share ideas.				
Consistent and reliable technical support.				
Content standards and curriculum resources that support digital-age learning.				
Teaching and assessment centered around the				

needs and abilities of students.				
Continuous assessment of teaching, learning, leadership, and the use of digital resources.				
Partnerships and collaboration within the community to support technology use.				
Policies and incentive structures to support technology use.				

Fifteen White Pine teachers responded to the survey. The open-ended responses to the first four questions are summarized below. Teachers expressed general agreement about the need for improved infrastructure and a particular interest in learning about interactive white boards.

Table 1. White Pine and Lincoln County school districts have stated that they want to provide students with 21st-Century skills that reflect the demands of the world outside of school. In your opinion, what would be the most important thing the school could do to meet those demands? (14 responses)

Improve infrastructure (increased access to updated computers and peripherals such as interactive white boards)	79%
Provide professional development	14%
Improve student technology skills	14%
Provide access to more student material on the web	7%
"Require all classes to teach and use technology."	7%

Table 2. In your experience, what have been the most effective uses of technology in the classroom? (15 responses)

Interactive white boards	60%
Specific content software (e.g., Read 180, virtual labs)	33%
Presentation software (e.g., PowerPoint)	20%
Publishing software for students	13%
Class web sites	13%
Projects	7%

Table 3. What would you most like to learn about using technology in teaching and learning? (11 responses)

Interactive white boards	55%
General technology integration	36%
Access needed more than training	9%

Table 4. What are the major barriers to using technology in the classroom in your school? (14 responses.)

Infrastructure	93%
Professional development	21%
Student skills	7%

In terms of the vehicles for professional development, the most-desired format was one-on-one training, with several types of face-to-face training in groups a second choice. Independent study and distance education were the least-favored approaches.

Table 5. Professional development preferences (15 responses.)

Type of Professional Development	Mean	StDev	Median
Taking a college class	2.81	0.66	3
District-provided workshop	2.63	0.81	3
Professional conference	2.60	0.91	3
Small study group	3.13	1.09	3.5
1-on-1 mentoring	2.81	0.83	3
Independent study	2.38	0.81	2
Distance learning	2.15	0.80	2

B.

The Nevada state technology plan, which was developed in 2009 in part with EETT funds, was largely unknown to the White Pine teachers. Only one individual had read the plan, and one other was aware of its contents. Five of the teachers did not know the plan existed.

The last question asked teachers to rate where they thought their schools were in relation to meeting the essential conditions for technology integration set out in the National Educational Technology Standards, upon which Nevada's state technology plan is based. For every one of the conditions, most responses said that the school did not meet the condition and was not working on it, or was just starting to work on it (Table 6).

Table 6. Teacher estimates of meeting NETS Essential Conditions (15 responses.)

NETS Essential Condition	Mean	StDev	Median
Shared vision for educational technology among all stakeholders.	1.63	0.62	2
Stakeholders empowered to be leaders in effecting change.	2.13	0.96	2
A systemic plan for the infusion of technology.	1.75	0.77	2
Ongoing funding to support technology and staff development.	1.67	0.72	2
Reliable and equitable access to current and emerging technologies.	1.75	0.58	2
Educators skilled in the selection and use of technology resources.	1.69	0.60	2
Technology-related professional development.	1.44	0.81	1
Consistent and reliable technical support.	2.25	0.86	2
Content standards and curriculum that support digital-age learning.	1.75	0.68	2
Teaching and assessment centered around student needs and abilities.	2.44	0.89	2
Assessment of teaching, learning, leadership, use of digital resources.	1.93	0.80	2
Partnerships and collaboration within the community.	1.56	0.63	1.5
Policies and incentive structures to support technology use.	1.50	0.63	1

Lincoln County

Lincoln County implemented its part of the EETT grant in Caliente Elementary School and nearby Lincoln County High School in Panaca. Caliente lies roughly halfway between Ely to the north and Las Vegas to the south. The elementary school has about 136 students in grades PK-6. The high school has about 190 students in grades 9-12. Overall, the district has four elementary schools, two middle schools, and three high schools.

Classroom Observations

Observations were conducted in Lincoln County immediately following the White Pine observations in the same weeks. As in White Pine County, the first visit concentrated on observation of lessons and the second visit emphasized placing the EETT project in the context of the district's overall capacity.

Learning activities and technologies used

The most common learning activities recorded (five of 14 observations for each activity) were research, writing, and drill. Research and writing were often part of the same lesson. Research was conducted on web sites, although in one case, difficulties in logging on to sites forced many students to return to their textbooks and other printed references. Writing used the

Open Office word processor on laptops. Drill used a mix of web-based activities and teacher created quizzes in Moodle. In the classes of the EETT teachers, most students had some introduction to the technology prior to the observation. On the second visit, some other teachers were observed who were implementing new activities. In these cases, more time was spent in hands-on learning about the technology itself. One teacher, working on a multimedia project, commented that she would have students record the audio portion in the open-source software Audacity, a program she expected to learn "over the weekend."

Student groupings and teacher roles

In 10 of 14 observations, students worked as individuals. Groupings of two to five students occurred in only five cases. Teachers sometimes gave whole-class presentations to introduce units, but in many cases, students in the middle of a project would enter class, pick up laptops, and begin to work independently. In all but one case, teachers mainly assumed the role of facilitator while students carried out assignments. Teacher-led activities included the quizzes and interactive direction (teacher presentations with frequent questioning of the class).

Student engagement

Student engagement was quite high. The occasions where engagement was less than 100% appeared to be a combination of random class differences (i.e., the presence of one or more disruptive students) and technology use. A video shown in one class was an opportunity for a couple of students to "check out." In another case, a teacher trying a web-based unit ran into bandwidth issues. Not all students could access the required web site. In addition, some student had difficulty navigating the web and entering web addresses. This resulted in idle time during which several students went off-task.

Contribution of technology

The observer rated three of the lessons as "2" (non-technology approaches would have been as effective), six of the lessons as "3" (technology offered an advantage), and four of the lessons as "4" (technology was essential). Essential uses included cases where the topic itself was technology, as when students helped a teacher close down a mobile lab for the summer, or when students learned how to create a business letter on a word processor. Another example was research that accessed a larger number and wider range of resources than would otherwise be possible in a class period. Non-essential uses included practice sessions in which the drill did not take advantage of computer-assisted-instruction features that distinguish integrated technology

from conventional worksheets. In another case, technology was used only to present images that could as well have been viewed in a book or as a poster. The intermediate ratings described situations where students were assigned or chose to use a mix of digital and conventional resources, where some resources were under-utilized, or where the really essential components would appear later (e.g., using conventional information sources that would eventually be published as a podcast.).

The EETT Context

The evaluator met with principals, the district superintendent, and the technology coordinator. Perhaps the greatest difference in context between the schools observed White Pine and Lincoln was the pre-existing emphasis on classroom-based technology in Lincoln County. There are no computer labs. Classrooms have several desktop computers each, supplemented by the mobile labs. At the elementary school, a tally of available student computers revealed that the student-to-computer ratio is less than 1:1. However, many of the desktop computers are old and near the end of their useful life. The superintendent is very supportive of technology and of teachers and building administrators who want to integrate it into learning. The district has sought to upgrade computers a few at a time as resources allow. However, even that effort is threatened by continued budget issues.

One of the EETT teachers in Lincoln County came out of the technology industry and serves as a de facto technology coordinator. Another teacher has that title, and is the coordinator of the EETT grant. Both have regular teaching duties on top of technology support responsibilities. The district also has an information technology specialist who provides technical support.

The district has been successful in grant writing, and looks to grants to sustain its program. There is some "pressure from below," in that parents are willing to contribute to technology support if they see that the resources are used. A parent night at which students demonstrated what they were doing with computers appeared to be very successful.

Barriers the district faces include "last-mile" bandwidth issues. The district has 10Mb access, but the functional bandwidth in classrooms is much less. As in most districts, time is an issue for both professional development and technical support.

Discussion and Recommendations

Looking at the White Pine / Lincoln EETT program from the standpoint of strengths, weaknesses, opportunities, and threats, it is apparent that the districts have several conditions in their favor. The district technology and administrative leadership have identified the need to provide students with digital skills and have taken the initiative to increase capacity. Teachers have skills in instructional practices that align well with educational technology use. Some of the teachers have substantial technology skills brought from other job postings.

The most obvious weakness is the inadequate and aging technology infrastructure. Another issue is the lack of technical support, which relies in one district on a single technical support specialist and in the other on a skilled teacher with other assignments. Although these individuals are able to cope with the present minimal level of technology use, any successful technology initiative that increased the amount of equipment and the number of users would most likely overwhelm the present system.

An even larger concern is the low level of essential conditions perceived by teachers who completed survey. Lincoln County did not disseminate the teacher survey because of its proximity to the end of the year and other surveys that the teachers had taken. However, one of the Lincoln EETT teachers responded, and that individual's responses on all items were similar to the ratings given by the teachers in White Pine. While a single teacher is not representative, an EETT-supported teacher would be in a good position to know the capacity of the district, having participated in planning for the project.

ISTE regularly conducts similar Essential Conditions surveys of teachers enrolled in its technology professional development programs. According to ISTE Professional Development staff, ratings that are all in the lower half of the scale are very unusual. Self-report ratings are not standardized, so the teachers' perceptions may or may not reflect actual capacity, but it is still meaningful that teachers express these concerns across all the conditions.

The opportunity presented by the White Pine / Lincoln initiative is that present in any low-capacity situation: The chance to "do it new and do it right." With examples of several approaches across the two districts (mobile labs, conventional labs, handhelds, interactive white boards, etc.) but no large commitment to any, the district is in a position to study and implement the latest practices without a large legacy of outdated infrastructure.

The main threat is that the funding picture will only get worse in the near-to-medium term. In theory, the Internet should make rural counties as viable for information-based jobs as a city, particularly when combined with natural beauty and recreational opportunities. (The Caliente area is already a retirement destination for some Las Vegas residents.) However, it takes more than a wireless connection to provide a range of services in a community. At this point, Lincoln County does not have any large income base. According to district staff, most of their families are employed in various services for the railroad, the county government, or the school district itself. The population available to support the schools is very limited in a county with less than 5,000 residents in an area of more than 10,600 square miles.

White Pine County has more population (about 9,000 people in about 8,900 square miles), and income. However, its largest private employer, a mining operation northwest of Ely, is dependent on markets an on a supply of ore that will eventually play out. The largest public employer, a state prison, has seen staff cuts since the onset of the current recession.

Going forward, White Pine and Lincoln Counties might build on their strengths in the following ways:

- Communicate the shared vision of 21st century skills that led to the successful EETT grant. Target the various stakeholders, including parents, business, and the school staff. Make teachers aware of the state technology plan and the fact that innovation has support beyond the district.
- Draw on the successful grant partnership to seek additional grants, in particular those that may target rural communities.
- Aggressively seek information on best practices in technology integration from outside the districts. The teachers mentioned the need for instructional examples, but the same recommendation applies to policy issues. For instance, network security and filtering are issues for all schools, large and small. Policies in these areas should be based on successful solutions in districts that have found ways to give students access to online resources.
- Share information and resources across districts. For instance, instructional practice in White Pine placed more emphasis on small-group work, while Lincoln is more experienced in integrating one-to-one computing in the classroom. Sharing expertise could improve the

technology integration in both districts. Distance is obviously a factor (the counties are adjacent, but their district offices in Ely and Panaca are 120 miles apart, with no population centers in between). The districts might investigate ways to use distance learning to bridge that gap.

- Develop a plan for leveraging the experience of the EETT teachers. In ISTE's experience, model classrooms in themselves do not result in disseminating practices. It requires administrative support and rewards for innovation, and some form of cadre of early adopters to introduce other teachers to new practices and help them overcome a steep learning curve.
- In terms of evaluating progress, ISTE recommends revisiting EETT classrooms in 2010-2011 after professional development plans have been implemented, resurveying teachers in both districts after the first of the year, sending a survey to district parents about their needs and expectations, and documenting administrative action such as grant applications and changes in policy that support 21st century teaching and learning.

EETT 2010 Formula Funding

Program Description

The Mathematics and Instructional Technology Department in the Curriculum and Professional Development Division received funding available through the Enhancing Education Through Technology Program, through the Nevada Department of Education, as provided by Title II, Part D of "No Child Left Behind," for the purpose of providing professional development to administrators and teachers to ensure the integration of technology into instructional practices and all curricula. These funds were utilized to evaluate technology integration in classroom instruction to ensure that effective technology strategies and methodologies are implemented.

The primary goals of this project were to increase student achievement focusing on technology integration by providing high quality professional development to teachers and administrators and to develop best practices and models of technology implementation.

The project provided funding for salaries and benefits, technical and consultant services, out-of-district travel, instructional supplies, books and periodicals, technology related supplies, items of value, and indirect costs. Success of the grant is being reported in the following areas: ECS Support, Technology Conference, FASST Math implementation and professional development, Whiteboard Training, and Equipment to Support Technology Projects.

ECS Support

ECSs, district wide, were provided professional development that focused on technology integration, working with adult learners, and current technologies for 21st century learners. Funds were used for teachers participating in professional development led by ECSs. Mentors were provided to new ECSs, and ECS Advisory Committee members continued to serve as liaisons between their service areas,

schools, and CPDD staff. CPDD staff attended and presented at national conferences, bringing back ideas for best practices and forming collaborations that assist CCSD in professional development efforts.

Technology Conference

A yearly technology conference was provided for teachers, ECSs, and administrators in October 2009. Participants from across the state joined, funded by their respective districts. Keynote speakers and presenters were paid stipends, as well as staff (including custodians) for the weekend conference. Participants not earning credit received a stipend for full participation (112 CCSD attendees). Funds also provided for custodial, presenter, and keynote speaker compensation as appropriate. Following are frequency tables with survey question results.

Frequency Tables

October 23, 2009

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	1	1.2	1.4	1.4
	Yes	68	82.9	98.6	100.0
	Total	69	84.1	100.0	
Missing	System	13	15.9		
Total		82	100.0		

October 24, 2009

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	69	84.1	100.0	100.0
Missing	System	13	15.9		
Total		82	100.0		

The presentations were well organized.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	23	28.0	41.8	41.8
	Agree	25	30.5	45.5	87.3
	Disagree	6	7.3	10.9	98.2
	Strongly Disagree	1	1.2	1.8	100.0
	Total	55	67.1	100.0	
Missing	System	27	32.9		
Total		82	100.0		

The information was presented clearly.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	19	23.2	34.5	34.5

	Agree	29	35.4	52.7	87.3
	Disagree	6	7.3	10.9	98.2
	Strongly Disagree	1	1.2	1.8	100.0
	Total	55	67.1	100.0	
Missing	System	27	32.9		
Total		82	100.0		

The information provided has increased my knowledge of technology and of the topics I attended.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	20	24.4	36.4	36.4
	Agree	30	36.6	54.5	90.9
	Disagree	2	2.4	3.6	94.5
	Strongly Disagree	3	3.7	5.5	100.0
	Total	55	67.1	100.0	
Missing	System	27	32.9		
Total		82	100.0		

I will be able to implement/apply the ideas presented.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	20	24.4	36.4	36.4
	Agree	29	35.4	52.7	89.1
	Disagree	2	2.4	3.6	92.7
	Strongly Disagree	3	3.7	5.5	98.2
	Not Applicable	1	1.2	1.8	100.0
	Total	55	67.1	100.0	
Missing	System	27	32.9		
Total		82	100.0		

The information from the presentations reinforced or enhanced my professional competence.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	18	22.0	32.7	32.7
	Agree	32	39.0	58.2	90.9
	Disagree	3	3.7	5.5	96.4
	Strongly Disagree	2	2.4	3.6	100.0
	Total	55	67.1	100.0	
Missing	System	27	32.9		
Total		82	100.0		

The information provided has increased my knowledge of instruction or improved my ability to provide instruction.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	19	23.2	34.5	34.5
	Agree	28	34.1	50.9	85.5
	Disagree	4	4.9	7.3	92.7
	Strongly Disagree	3	3.7	5.5	98.2
	Not Applicable	1	1.2	1.8	100.0
	Total	55	67.1	100.0	
Missing	System	27	32.9		
Total		82	100.0		

Technology impacts student achievement positively.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	38	46.3	69.1	69.1
	Agree	17	20.7	30.9	100.0
	Total	55	67.1	100.0	
Missing	System	27	32.9		
Total		82	100.0		

I would recommend these topics be offered again.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	16	19.5	29.1	29.1
	Agree	31	37.8	56.4	85.5
	Disagree	5	6.1	9.1	94.5
	Strongly Disagree	2	2.4	3.6	98.2
	Not Applicable	1	1.2	1.8	100.0
	Total	55	67.1	100.0	
Missing	System	27	32.9		
Total		82	100.0		

I would like to be kept informed about next year's conference.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	50	61.0	90.9	90.9
	No	5	6.1	9.1	100.0
	Total	55	67.1	100.0	
Missing	System	27	32.9		
Total		82	100.0		

Certification:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	K-12	8	9.8	14.8	14.8
	Elementary	23	28.0	42.6	57.4
	Secondary	15	18.3	27.8	85.2
	Counselor	1	1.2	1.9	87.0
	Administrative	4	4.9	7.4	94.4
	Other	3	3.7	5.6	100.0
	Total	54	65.9	100.0	
Missing	System	28	34.1		
Total		82	100.0		

Position held:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Teacher	33	40.2	61.1	61.1
	Administrator	4	4.9	7.4	68.5
	Counselor	1	1.2	1.9	70.4
	Other	15	18.3	27.8	98.1
	Choose not to answer	1	1.2	1.9	100.0
	Total	54	65.9	100.0	
Missing	System	28	34.1		
Total		82	100.0		

Current level:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Elementary	25	30.5	46.3	46.3
	Middle/JHS	14	17.1	25.9	72.2
	Secondary	13	15.9	24.1	96.3
	K-12	1	1.2	1.9	98.1
	Other	1	1.2	1.9	100.0
	Total	54	65.9	100.0	
Missing	System	28	34.1		
Total		82	100.0		

Gender:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	14	17.1	25.9	25.9
	Female	40	48.8	74.1	100.0
	Total	54	65.9	100.0	
Missing	System	28	34.1		
Total		82	100.0		

Ethnic group:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	White	34	41.5	63.0	63.0
	Black	4	4.9	7.4	70.4
	Hispanic	5	6.1	9.3	79.6
	Asian/Pacific Islander	3	3.7	5.6	85.2
	Other	1	1.2	1.9	87.0
	Choose not to answer	7	8.5	13.0	100.0
	Total	54	65.9	100.0	
Missing	System	28	34.1		
Total		82	100.0		

The keynote speaker was:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Outstanding	30	36.6	54.5	54.5
	Good	16	19.5	29.1	83.6
	Average	9	11.0	16.4	100.0
	Total	55	67.1	100.0	
Missing	System	27	32.9		
Total		82	100.0		

It would be beneficial to preregister for sessions at the conference.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	45	54.9	81.8	81.8
	Disagree	10	12.2	18.2	100.0
	Total	55	67.1	100.0	
Missing	System	27	32.9		
Total		82	100.0		

How did you hear about the conference?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Interact	10	12.2	18.5	18.5
	ECS	19	23.2	35.2	53.7
	Administration	5	6.1	9.3	63.0
	Teacher	3	3.7	5.6	68.5
	Past attendee	12	14.6	22.2	90.7
	Flyer	3	3.7	5.6	96.3
	Other	2	2.4	3.7	100.0
	Total	54	65.9	100.0	
Missing	System	28	34.1		
Total		82	100.0		

I attended the following session on Oct 23 at 6:10pm:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Friday 1 6:10 p.m. - 7:00 p.m. Printed Booklets, Podcasts, and Digital Stories Room 165A	2	2.4	3.4	3.4
	Friday 2 6:10 p.m. - 7:00 p.m. Using Pedometers Across the Curriculum Rodeo Room	3	3.7	5.1	8.5
	Friday 3 6:10 p.m. - 7:00 p.m. Photo Editing : Easy to Use With Free Software Room 226	7	8.5	11.9	20.3
	Friday 4 6:10 p.m. - 7:00 p.m. Lights! Computer! Action! Room 227	5	6.1	8.5	28.8
	Friday 5 6:10 p.m. - 7:00 p.m. Finding & Securing Grant Money for School Projects Room 207	5	6.1	8.5	37.3
	Friday 7 6:10 p.m. - 7:00 p.m. Data Connection: Never Have to Grade Another Test Room 233	3	3.7	5.1	42.4
	Friday 8 6:10 p.m. - 7:00 p.m. vrLibrary: THE Way to Connect with Your Curriculum Room 136	1	1.2	1.7	44.1
	Friday 9 6:10 p.m. - 7:00 p.m. "Reel" Results: Digital Video in the Classroom Room 117	6	7.3	10.2	54.2
	Friday 10 6:10 p.m. - 7:00 p.m. Listen Up: How Music Can Transform Your Lessons Library	6	7.3	10.2	64.4

	Friday 11 6:10 p.m. - 7:00 p.m. What ECSs Need to Know About ParentLink Room 114	2	2.4	3.4	67.8
	Friday 12 6:10 p.m. - 7:00 p.m. What Ails Your Computer? Viruses, Spyware & More Room 135	5	6.1	8.5	76.3
	Friday 13 6:10 p.m. - 7:00 p.m. Online Pedagogies, Moodle, and 21st Century Learning Room 201	3	3.7	5.1	81.4
	Friday 14 6:10 p.m. - 7:00 p.m. Using Technology to Integrate ELA and Social Studies Room 209	1	1.2	1.7	83.1
	Friday 15 6:10 p.m. - 7:00 p.m. CUE-SN's Tool Shed CUE Room	1	1.2	1.7	84.7
	Friday 16 6:10 p.m. - 7:00 p.m. Vendor Booths Cafeteria	8	9.8	13.6	98.3
	Did not attend a session during this time	1	1.2	1.7	100.0
	Total	59	72.0	100.0	
Missing	System	23	28.0		
Total		82	100.0		

I attended the following session on Oct. 23 at 7:10pm:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Friday 17 7:10 p.m. - 8:00 p.m. Accomplish Amazing Animations in the Classroom Room 165A	5	6.1	8.8	8.8
	Friday 18 7:10 p.m. - 8:00 p.m. Using Wikis to Build WebQuests Rodeo Room	6	7.3	10.5	19.3
	Friday 19 7:10 p.m. - 8:00 p.m. Photo Editing : Easy to Use With Free Software Room 226	1	1.2	1.8	21.1
	Friday 20 7:10 p.m. - 8:00 p.m. 50 Ways to Use Discovery Education Streaming Room 227	7	8.5	12.3	33.3
	Friday 21 7:10 p.m. - 8:00 p.m. Differentiation & Project-Based Learning in CCSD Room 225	7	8.5	12.3	45.6
	Friday 22 7:10 p.m. - 8:00 p.m. Three-Level System to Identify Teacher Technology Use Room 233	3	3.7	5.3	50.9
	Friday 23 7:10 p.m. - 8:00 p.m. Engaging Students: Let the Games Begin Room 136	5	6.1	8.8	59.6
	Friday 24 7:10 p.m. - 8:00 p.m. Mac and Windows - Two Operating Systems on One Computer Room 117	1	1.2	1.8	61.4

	Friday 25 - 8:00 p.m. Listen Up: How Music Can Transform Your Lessons	7:10 p.m. Library	1	1.2	1.8	63.2
	Friday 26 - 8:00 p.m. What ECSs Need to Know About ParentLink	7:10 p.m. Room 114	2	2.4	3.5	66.7
	Friday 27 - 8:00 p.m. Explore Learn360: The NEW Choice for Steaming Media	7:10 p.m. Room 135	4	4.9	7.0	73.7
	Friday 28 - 8:00 p.m. Building your Professional Learning Network (PLN)	7:10 p.m. Room 201	4	4.9	7.0	80.7
	Friday 29 - 8:00 p.m. Using Technology to Integrate ELA and Social Studies	7:10 p.m. Room 209	4	4.9	7.0	87.7
	Friday 31 - 8:00 p.m. Vendor Booths *	7:10 p.m. Cafeteria	3	3.7	5.3	93.0
	Did not attend a session during this time		4	4.9	7.0	100.0
	Total		57	69.5	100.0	
Missing	System		25	30.5		
Total			82	100.0		

I attended the following session on Oct 23 at 8:10pm:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Friday 32 8:10 p.m. - 9:00 p.m. Multimedia, and Video, and Paint, Oh My! Room 165A	11	13.4	19.6	19.6
	Friday 33 8:10 p.m. - 9:00 p.m. Using Wikis to Build WebQuests Rodeo Room	2	2.4	3.6	23.2
	Friday 35 8:10 p.m. - 9:00 p.m. I Can Do That With PowerPoint? Room 227	7	8.5	12.5	35.7
	Friday 36 8:10 p.m. - 9:00 p.m. Cutting-Edge Totally Online Keyboarding Room 225	1	1.2	1.8	37.5
	Friday 37 8:10 p.m. - 9:00 p.m. Three-Level System to Identify Teacher Technology Use Room 233	1	1.2	1.8	39.3
	Friday 38 8:10 p.m. - 9:00 p.m. More Writing, Less PaperRoom 136	4	4.9	7.1	46.4
	Friday 39 8:10 p.m. - 9:00 p.m. Mac and Windows - Two Operating Systems on One Computer Room 117	1	1.2	1.8	48.2
	Friday 40 8:10 p.m. - 9:00 p.m. Using Your Document Camera to the Fullest Library	6	7.3	10.7	58.9

	Friday 41 - 9:00 p.m. 8:10 p.m. Student Response Systems: Formative/Summative Room 114	2	2.4	3.6	62.5
	Friday 42 - 9:00 p.m. 8:10 p.m. Explore Learn360: The NEW Choice for Steaming MediaRoom 135	1	1.2	1.8	64.3
	Friday 43 - 9:00 p.m. 8:10 p.m. Classroom Blogging: Taking It To The Next StepRoom 201	5	6.1	8.9	73.2
	Friday 45 - 9:00 p.m. 8:10 p.m. CUE-SN's Tool Shed CUE Room	6	7.3	10.7	83.9
	Friday 46 - 9:00 p.m. 8:10 p.m. Vendor Booths * Cafeteria	6	7.3	10.7	94.6
	Did not attend a session during this time	3	3.7	5.4	100.0
	Total	56	68.3	100.0	
Missing	System	26	31.7		
Total		82	100.0		

I attended the following session on Oct 24 at 10:10am:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Saturday 47 10:10 a.m. - 11:00 a.m SFMOMA's ArtThink: Curriculum for Visual Arts, Language Arts, & Social Studies Room 1	4	4.9	7.3	7.3
	Saturday 48 10:10 a.m. - 11:00 a.m Basic Navigation of IDMS for Elementary Teachers Rodeo Room	1	1.2	1.8	9.1
	Saturday 49 10:10 a.m. - 11:00 a.m Create Your Own Webpage: Simple and Free Room 227	10	12.2	18.2	27.3
	Saturday 50 10:10 a.m. - 11:00 a.m Managing & Assessing Student Blogs Room 226	2	2.4	3.6	30.9
	Saturday 51 10:10 a.m. - 11:00 a.m Schools.ccsd.net: School Site Web Templates Room 229	3	3.7	5.5	36.4
	Saturday 52 10:10 a.m. - 11:00 a.m InterAct™ Beginning Basics Room 225	2	2.4	3.6	40.0
	Saturday 54 10:10 a.m. - 11:00 a.m Your DESTINY: Searching State Standards via the Library Online Catalog Library	2	2.4	3.6	43.6
	Saturday 55 10:10 a.m. - 11:00 a.m Using Telecommunication in the Classroom Room	3	3.7	5.5	49.1

	Saturday 56 a.m. - 11:00 a.m for K-12 Education 114	10:10 iTunes U Room	14	17.1	25.5	74.5
	Saturday 57 a.m. - 11:00 a.m	10:10 iREAD! Room 117	4	4.9	7.3	81.8
	Saturday 58 a.m. - 11:00 a.m Lessons…Instant Assessment...SMART Classroom! 201	10:10 SMART Room	6	7.3	10.9	92.7
	Saturday 59 a.m. - 11:00 a.m Assessment with Student Responders 135	10:10 Formative Room	3	3.7	5.5	98.2
	Saturday 61 a.m. - 11:00 a.m Booths * Cafeteria	10:10 Vendor	1	1.2	1.8	100.0
	Total		55	67.1	100.0	
Missing	System		27	32.9		
Total			82	100.0		

I attended the following session on Oct 24 at 11:10am:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Saturday 63 11:10 a.m. - 12:00 p.m Basic Navigation of IDMS for Secondary Teachers Rodeo Room	1	1.2	1.8	1.8
	Saturday 64 11:10 a.m. - 12:00 p.m CCSD's Wiki-Teacher Room 227	6	7.3	10.9	12.7
	Saturday 65 11:10 a.m. - 12:00 p.m Tech Story: Digital Storytelling for Students Room 226	9	11.0	16.4	29.1
	Saturday 66 11:10 a.m. - 12:00 p.m Schools.ccsd.net: School Site Web Templates Room 229	4	4.9	7.3	36.4
	Saturday 67 11:10 a.m. - 12:00 p.m InterAct™ Beginning Basics Room 225	1	1.2	1.8	38.2
	Saturday 68 11:10 a.m. - 12:00 p.m Assistive Technology Resources Room 231	1	1.2	1.8	40.0
	Saturday 69 11:10 a.m. - 12:00 p.m Placemats: They're Not Just for Dinner Library	3	3.7	5.5	45.5
	Saturday 70 11:10 a.m. - 12:00 p.m Real Life Professional Development in Second Life Room 114	7	8.5	12.7	58.2

	Saturday 71 a.m. - 12:00 p.m Project-Based Learning with Brain Research 11:10 Room 117	6	7.3	10.9	69.1
	Saturday 72 a.m. - 12:00 p.m Lessons…Instant Assessment...SMART Classroom! 11:10 SMART Room 201	6	7.3	10.9	80.0
	Saturday 73 a.m. - 12:00 p.m Engaging Interactive Curriculum Ideas! 11:10 Cool, Room 135	5	6.1	9.1	89.1
	Saturday 74 a.m. - 12:00 p.m SN's Tool Shed 11:10 CUE-CUE Room	2	2.4	3.6	92.7
	Saturday 75 a.m. - 12:00 p.m Booths * Cafeteria 11:10 Vendor	3	3.7	5.5	98.2
	Did not attend a session during this time	1	1.2	1.8	100.0
	Total	55	67.1	100.0	
Missing	System	27	32.9		
Total		82	100.0		

I attended the following session on Oct 24 at 1:10pm:

			Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Saturday 76 p.m. - 2:00 p.m Blended Classrooms using Moodle	1:10 Room 165A	3	3.7	5.5	5.5
	Saturday 77 p.m. - 2:00 p.m Overview of the K-5 Elementary Standards-Based Report Card	1:10 Rodeo Room	2	2.4	3.6	9.1
	Saturday 78 p.m. - 2:00 p.m Wiki-Teacher 227	1:10 CCSD's Room	1	1.2	1.8	10.9
	Saturday 79 p.m. - 2:00 p.m Tech Story: Digital Storytelling for Students 226	1:10 Room	4	4.9	7.3	18.2
	Saturday 80 p.m. - 2:00 p.m CCSD Web Applications: my.ccsd.net and ccsdtv.net	1:10 Room 229	6	7.3	10.9	29.1
	Saturday 81 p.m. - 2:00 p.m InterAct™ Advanced Tips & Tools	1:10 Room 225	5	6.1	9.1	38.2
	Saturday 82 p.m. - 2:00 p.m CultureGrams	1:10 Room 231	2	2.4	3.6	41.8
	Saturday 83 p.m. - 2:00 p.m Chat with the CTO	1:10 Library	3	3.7	5.5	47.3

	Saturday 84 1:10 p.m. - 2:00 p.m Document Cameras: Not Just for Clean Hands! Room 116	5	6.1	9.1	56.4
	Saturday 85 1:10 p.m. - 2:00 p.m RTI, Special Ed., and How to Engage CCSD Students! Room 114	1	1.2	1.8	58.2
	Saturday 86 1:10 p.m. - 2:00 p.m Project Based Learning with Brain Research Room 117	6	7.3	10.9	69.1
	Saturday 87 1:10 p.m. - 2:00 p.m Formative Assessment with Student Response Systems Room 201	6	7.3	10.9	80.0
	Saturday 88 1:10 p.m. - 2:00 p.m Cool, Engaging Interactive Curriculum Ideas! Room 135	3	3.7	5.5	85.5
	Saturday 89 1:10 p.m. - 2:00 p.m CUE-SN's Tool Shed CUE Room	4	4.9	7.3	92.7
	Saturday 90 1:10 p.m. - 2:00 p.m Vendor Booths * Cafeteria	3	3.7	5.5	98.2
	Did not attend a session during this time	1	1.2	1.8	100.0
	Total	55	67.1	100.0	
Missing	System	27	32.9		
Total		82	100.0		

I attended the following session on Oct 24 at 2:10pm:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Saturday 91 2:10 p.m. - 3:00 p.m Enhance Student Learning Using Student-Produced Videos Room 165A	7	8.5	12.7	12.7
	Saturday 92 2:10 p.m. - 3:00 p.m Building your Professional Learning Network (PLN) Rodeo Room	1	1.2	1.8	14.5
	Saturday 93 2:10 p.m. - 3:00 p.m Using Online Discussion Forums in the Classroom Room 227	4	4.9	7.3	21.8
	Saturday 94 2:10 p.m. - 3:00 p.m Voicethreads: A Picture is Worth a Thousand Words Room 226	3	3.7	5.5	27.3
	Saturday 95 2:10 p.m. - 3:00 p.m CCSD Web Applications: my.ccsd.net and ccsdtv.net Room 229	4	4.9	7.3	34.5
	Saturday 96 2:10 p.m. - 3:00 p.m SOLIA: Students Online with InterAct™ Room 225	3	3.7	5.5	40.0
	Saturday 97 2:10 p.m. - 3:00 p.m Video Streaming & Other Free Teacher Resources from Vegas PBS Room 231	4	4.9	7.3	47.3
	Saturday 98 2:10 p.m. - 3:00 p.m Using Digital Storytelling Projects in the Classroom Library	11	13.4	20.0	67.3
	Saturday 99 2:10 p.m. - 3:00 p.m Capture Their Thoughts with the Interactive Classroom using TI-	1	1.2	1.8	69.1

	Navigator? Room 116					
	Saturday 3:00 p.m	100 2:10 p.m. - ParentLink as an Effective Tool for Teachers Room 114	3	3.7	5.5	74.5
	Saturday 3:00 p.m	101 2:10 p.m. - A Fluency Solution: Read Naturally's SE Version Room 117	2	2.4	3.6	78.2
	Saturday 3:00 p.m	102 2:10 p.m. - Technology in the Music Classroom Room 201	1	1.2	1.8	80.0
	Saturday 3:00 p.m	103 2:10 p.m. - Express Yourself! (Student Response System) Room 135	3	3.7	5.5	85.5
	Saturday 3:00 p.m	104 2:10 p.m. - CUE-SN's Tool Shed CUE Room	3	3.7	5.5	90.9
	Saturday 3:00 p.m	105 2:10 p.m. - Vendor Booths * Cafeteria	4	4.9	7.3	98.2
	Did not attend a session during this time		1	1.2	1.8	100.0
	Total		55	67.1	100.0	
Missing	System		27	32.9		
Total			82	100.0		

I attended the following session on Oct 24 at 3:10pm:

			Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Saturday 4:00 p.m Punch!	106 3:10 p.m. - Photo Story with a Room 165A	14	17.1	25.5	25.5
	Saturday 4:00 p.m Taking It	107 3:10 p.m. - Classroom Blogging: To The Next Step Rodeo Room	6	7.3	10.9	36.4
	Saturday 4:00 p.m Discussion Forums in the Classroom	108 3:10 p.m. - Using Online Room 227	1	1.2	1.8	38.2
	Saturday 4:00 p.m and Community with Blogging	109 3:10 p.m. - Promoting Creativity Room 226	1	1.2	1.8	40.0
	Saturday 4:00 p.m LessonLink for Geometer's Sketchpad	110 3:10 p.m. - Sketchpad Room 229	1	1.2	1.8	41.8
	Saturday 4:00 p.m Webpage: Simple and Free	111 3:10 p.m. - Create Your Own Room 225	5	6.1	9.1	50.9
	Saturday 4:00 p.m Other Free Teacher Resources from Vegas PBS	112 3:10 p.m. - Video Streaming & Room 231	4	4.9	7.3	58.2
	Saturday 4:00 p.m Databases in the Library – Includes Science Resource Center and Opposi	113 3:10 p.m. - Resource Center	2	2.4	3.6	61.8
	Saturday 4:00 p.m Thoughts with the Interactive Classroom using TI-Navigator?	114 3:10 p.m. - Capture Their Room 116	1	1.2	1.8	63.6

	Saturday 4:00 p.m	115 3:10 p.m. - ParentLink as an Effective Tool for Teachers Room 114	5	6.1	9.1	72.7
	Saturday 4:00 p.m	116 3:10 p.m. - A Fluency Solution: Read Naturally's SE Version Room 117	2	2.4	3.6	76.4
	Saturday 4:00 p.m	117 3:10 p.m. - Technology in the Music Classroom Room 201	3	3.7	5.5	81.8
	Saturday 4:00 p.m	118 3:10 p.m. - Express Yourself! (Student Response System) Room 135	3	3.7	5.5	87.3
	Saturday 4:00 p.m	120 3:10 p.m. - Vendor Booths * Cafeteria	5	6.1	9.1	96.4
	Did not attend a session during this time		2	2.4	3.6	100.0
	Total		55	67.1	100.0	
Missing	System		27	32.9		
Total			82	100.0		

FASTT Math

The FASTT Math project was expanded to another 10 schools, with the software and workstations provided through other grant funding. Teachers received professional development from FASTT Math and follow-up professional development offered by ECSs and CPDD staff. A new server was purchased and put in service to handle the increased capacity needs of having more schools utilizing the program.

FASTT Math Year One Lessons Learned

Spring 2010

1. To efficiently provide access to the software and database for record-keeping, CPDD purchased (through alternative funding) a Mac server.

   The new server version is web-based, allowing for easier deployment at school sites and possible access for students from off-campus locations.

2. In the fall of 2009, elementary schools were recruited for participation. By the end of January, schools had responded and been given the software (through other grant funding).
   - Professional development and support will start at the beginning of the school year for the schools identified to participate.
   - More frequent training for ECSs, teachers, and administrators will be scheduled using an online webinar format.
3. It was time consuming to obtain rosters for participating schools. These were requested through ECSs.
   - Rostering will be done with the help of technicians at TISS.
   - Rostering will be done by count day.
   - A rostering scheme that will allow for smooth implementation at the middle school level, where students may be enrolled in multiple math classes, will be discuss with the FasttMath technician.

4. Implementation at sites was low. Only 36% of the students enrolled used the program for recommended weekly frequency, three times or more per week. An additional 48% of students used the program, but with less frequency. This group is made up of student who may have only completed the initial assessment or students who used the program regularly, but fewer than three times per week.
    - Beginning of the year implementation may help.
    - Monthly reports will be shared with the site administrators.
5. Both Taylor and Cortez Elementary Schools had a significant number of students participate three or more times per week (65% and 53% respectively).
    - Of the students using the software at Taylor ES, nine students are fluent (97% or greater Fast Facts), 24 students are near fluent (between 80% and 97% Fast Facts), and 78 students are developing (between 50% and 80% Fast Facts). At Taylor ES 182 students used the program three or more times per week.

Of the students using the software at Cortez ES, five students are fluent (97% or greater Fast Facts), 13 students are near fluent (between 80% and 97% Fast Facts), and 91 students are developing (between 50% and 80% Fast Facts). At Cortez ES 196 students used the program three or more times per week. Please note that the Formula grant provided funding for the professional development and teacher support. Equipment and software were purchased through other funding sources.

Whiteboard Training

Five professional development workshops were provided for district teachers using electronic whiteboards. These were facilitated by district staff who have been certified as trainers by the whiteboard vendors. Two of our instructors have begun or scheduled PDE classes (since the start of 2010) that consist of three face-to-face meetings and time outside of class (total time: 15+ hours). At least one other trainer will be scheduling a PDE class.

- We conducted training in the fall semester for teachers at two sites on both 11/7 and 11/21. A total of 278 participants received training.
- Also, completed spring semester trainings for March 6th and 20th. Two sites were used for both days, and spaces available for 240 teachers. These trainings focused on advanced skills and student response systems.
    - 156 responses have been received from training surveys.
    - Survey responses show majority rating favorable agreement or meeting of objectives for the trainings.

Smartboard and Notebook Beginning training results

1. Objective 1: Participants will understand the basic set-up of their board/components and how to configure their board for use.		
Objective not met	2	2%
Objective met	69	63%
Objective exceeded	38	35%
Total	109	100%

2. Objective 2: Participants will be able to describe and use the components of the side tab bar (page sorter, gallery, attachments, properties tabs).		
Objective not met	3	3%
Objective met	71	65%
Objective exceeded	35	32%
Total	109	100%

3. Objective 3: Participants will be able to describe, use, and modify the tools associated with the main tool bar.		
Objective not met	3	3%
Objective met	73	67%
Objective exceeded	33	30%
Total	109	100%

4. Objective 4: Participants will be able to describe and modify an object's properties.		
Objective not met	6	6%
Objective met	76	70%
Objective exceeded	27	25%
Total	109	100%

5. Objective 5: Participants will be able to describe and use the items located in the resource gallery and locate resources online.		
Objective not met	2	2%
Objective met	74	68%

Objective exceeded	33	30%
Total	109	100%

6. I will be able to use information or skills from this professional development within the next month		
Yes	97	90%
No	11	10%
Total	108	100%

7. Multicultural resources and strategies were integrated into this professional development session.		
Yes	70	65%
No	37	35%
Total	107	100%

8. Reading and writing instructional strategies were integrated into this professional development session.		
Yes	103	95%
No	5	5%
Total	108	100%

9. Mathematics instructional strategies were integrated into this professional development session.		
Yes	101	94%
No	7	6%

Total	108	100%

10. I would appreciate additional training on...
27 Responses

Smartboard and Notebook Intermediate Results

1. Objective 1: Participants will be able to describe and modify an objects properties (order, linking, animation).		
Objective not met	3	6%
Objective met	29	59%
Objective exceeded	17	35%
Total	49	100%

2. Objective 2: Participants will be able to describe and model ten ways to add interactivity to their SMART lessons.		
Objective not met	6	12%
Objective met	26	53%
Objective exceeded	17	35%
Total	49	100%

3. Objective 3: Participants will be able to describe and use SMART Notebook's ink aware tool with Microsoft Word, Excel, and PowerPoint.		
Objective not met	10	20%
Objective met	30	61%

Objective exceeded	9	18%
Total	49	100%

4. Objective 4: Participants will be able to add items to the resource gallery and locate resources in the lesson activity toolkit.		
Objective not met	4	8%
Objective met	29	59%
Objective exceeded	16	33%
Total	49	100%

5. I will be able to use information or skills from this professional development within the next month		
Yes	46	94%
No	3	6%
Total	49	100%

6. Multicultural resources and strategies were integrated into this professional development session.		
Yes	31	66%
No	16	34%
Total	47	100%

7. Reading and writing instructional strategies were integrated into this professional development session.		
Yes	45	94%

No	3	6%
Total	48	100%

8. Mathematics instructional strategies were integrated into this professional development session.		
Yes	46	94%
No	3	6%
Total	49	100%

9. I would appreciate additional training on...
19 Responses

Promethean board and ActivInspire beginning training

1. I understand the basic setup of my Promethean board and how to calibrate it.		
Strongly Agree	15	65%
Agree	7	30%
Disagree	1	4%
Strongly Disagree	0	0%
Not Sure	0	0%

2. I understand how to locate and download online resources.		
Strongly Agree	11	48%
Agree	11	48%
Disagree	1	4%
Strongly Disagree	0	0%
Not Sure	0	0%

3. I am able to use the ActivInspire Dashboard comfortably.		
Strongly Agree	6	26%
Agree	11	48%
Disagree	5	22%
Strongly Disagree	0	0%
Note Sure	1	4%

4. I can describe to someone the use of the tools located on the main tool bar.		
Strongly Agree	6	26%
Agree	12	52%
Disagree	2	9%
Strongly Disagree	0	0%
Not Sure	3	13%

5. I am able to use the tools located on the main tool bar comfortably.

Strongly Agree	7	30%
Agree	11	48%
Disagree	3	13%
Strongly Disagree	0	0%
Not Sure	2	9%

6. I am able to customize the tools associated with the main tool bar.

Strongly Agree	3	13%
Agree	12	52%
Disagree	5	22%
Strongly Disagree	1	4%
Not Sure	2	9%

7. I am able to edit an object's properties using the editing tools and/or the editing menu.

Strongly Agree	5	22%
Agree	9	39%
Disagree	4	17%
Strongly Disagree	2	9%
Not Sure	3	13%

8. I can describe and use the Page Browser and the Notes Browser.		
Strongly Agree	4	17%
Agree	10	43%
Disagree	5	22%
Strongly Disagree	1	4%
Not Sure	3	13%

9. I am able to describe the items located in the resource library.		
Strongly Agree	5	22%
Agree	8	35%
Disagree	6	26%
Strongly Disagree	1	4%
Not Sure	3	13%

10. I am able to use the items located in the resource library.		
Strongly Agree	5	22%
Agree	9	39%
Disagree	5	22%
Strongly Disagree	1	4%
Not Sure	3	13%

11. I am confident in my ability to create a Promethean Flipchart using the skills listed above.		
Strongly Agree	5	22%
Agree	9	39%
Disagree	3	13%
Strongly Disagree	3	13%
Not Sure	3	13%

Equipment to Support Technology Projects

- Pathlore upgrade
    - In September 2009, the upgrade was done for the Pathlore System. During the project, some outstanding issues were resolved but they did not affect the implementation and use during the first part of the school year.
- Moodle server for online PD
    - All systems are 'Go' on the Moodle server. We were able to successfully install, test and migrate our Moodle instance onto the new server in May, complete with an offsite backup system. It currently houses all the online professional development courses for CCSD and the Nevada Pathway Project as well as provides a web presence for the Pathway Project, with news/updates and article features from most administrators and teachers involved. The server handles traffic of around 25-35,000 hits a week on the Moodle site and up to 1,300 hits/week on the Pathway website.