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MEMORANDUM

TO: Members, Utah State Board of Education

FROM: Joel Coleman
Interim Chief Executive Officer

DATE: October 10, 2014

INFORMATION: Smart School Technology Program Report

Background:
During the 2012 Legislative Session, S.B. 248 *Smart School Technology Act* was passed. During the 2013 Legislative Session, S.B. 284 (UCA 53A-1-709) *Smart School Technology Program* amended a three-year pilot project known as the Smart School Technology Program, to encourage the deployment of whole-school technology in public schools.

Key Points:

1. The State Board of Education, in collaboration with the education technology provider and the schools participating in the program, shall evaluate the program.
2. The State Board of Education may contract with an independent evaluator to conduct the evaluation.

Anticipated Action:
The Law and Licensing Committee will receive the second program evaluation for the Smart School Technology Program conducted by Southern Utah University under the direction of Dr. Deborah Hill, Dean, Beverley Taylor Sorenson College of Education and Human Development.

Contact: Sydnee Dickson, Interim Deputy Superintendent, 801-538-7515
Diana Suddreth, Interim Director, Teaching and Learning, 801-538-7739
Rick Gaisford, Education and Technology Specialist, 801-538-7988

Utah Smart School Technology Project

Year 2

CHAPTER 1

Executive Summary

The Smart School Technology Project, as defined by legislation initiated during the 2012 Legislative Session in the form of SB 248, the Smart School Technology Act provides funding to develop technology solutions related to economic and workforce development, in this case the use of mobile devices in Utah's public schools. Under the direction of Rick Gaisford in the Utah State Office of Education (USOE), three schools were initially selected to participate in the project through an application for funding process (Gunnison Valley Elementary School, Dixon Middle School and North Sevier High School). In the second year of the project further funding was provided and seven additional schools were selected to participate through an application for funding process (Newman Elementary, Myton Elementary School, North Davis Jr. High School, Beehive Science and Technology Academy, Pinnacle Canyon Academy, Freedom Preparatory Academy, and Utah Career Path High School).

Two overarching research questions have been addressed in the program evaluation undertaken to evaluate the Smart School Technology Project initiative:

1. Do participants use the devices provided by Smart School Technology? Why or why not?
2. To what degree/in what way does the use of the iPad make a difference in:
   a. Learning achievement
   b. Instruction
   c. Engagement

Research Question #1:

Students, school personnel, and parents were surveyed concerning the use of iPads in instruction. Student respondents on one survey indicated that they feel that their handwritten work is being read by the teacher. Those same students also responded that they if given the option, would choose to use digital devices for writing assignments 70% of the time. Most teachers indicated several positive outcomes: that the iPads have enhanced their professional development, expanded/reinforced what they have been able to teach, helped them respond to various student learning styles, and helped them better meet the needs of advanced learners. A majority of the teachers indicated using the iPads at least two to three times a week, for activities as varied as teacher presentation of material, to supporting student research and writing. The benefits to students that parents volunteered most frequently include an increase in student skills with technology, improved student ability to organize school work, an improvement in student learning and creativity, improved communication with teachers, increased sense of pride and responsibility, and improved student access to technology.

"increase in student skills with technology, improved student ability to organize school work, an improvement in student learning and creativity, improved communication with teachers, increased sense of pride and responsibility."

Teachers and students both responded that the use of the iPad was dependent on the knowledge and skills of the teacher in integrating technology into their instruction. Considering this response, if mobile technology is placed in schools it would appear imperative that teachers receive professional development not only in how to navigate about the iPad, but how to integrate mobile technology into their classroom instruction appropriately.

Research Question # 2.a:

USOE's Criterion Referenced Tests (CRT) achievement scores for the first three Smart School Technology Project scores were benchmarked (2010-12) and compared to the SMART implementation year (less than six months of technology) scores. The technology was not in place in the three initial schools for the full year due to infrastructure and implementation matters. When iSchool completed wiring and upgrading the infrastructure mid academic year, the teachers then began learning how to implement the technology into their instruction as the students were learning how to use technology in their classroom activities. Due to these mentioned factors, variance in 2012-13 CRT scores for the three schools could not be directly tied to the implementation of iPads and other technology.

The seven new school's CRT scores were benchmarked using the past four years (2010-13). Beginning spring 2014, Utah students began using a new assessment system, Student Assessment of Growth and Excellence (SAGE). At this time the 2013-14 SAGE scores have not been released by USOE. USOE has cautioned the public that a potential reduced proficiency rate would in this instance, not be a result of decreased instructional excellence or school achievement and that rates will then again be expected to increase as students, parents, and teachers work to implement the new standards and assessment.

Because of these anomalies, the first factor of mid-year implementation, and the second revised testing instrument environment, the academic achievement question cannot be addressed with statistical certainty.

Research Question # 2.b:

When asked what benefits the teacher saw for students, most responded that when students use an iPad it allowed the teacher to respond to a variety of learning styles. Additionally, teachers expressed that the use of an iPad was motivation for students, providing additional practice and increasing digital literacy. One teacher responded, "I would say it decreases distractions for two reasons. First of all, the individual students are so engaged in their own assignments and projects on the iPad that they don't worry about what else is going on in the room that typically would be a distraction. The second reason naturally occurs because of the first: because each students is so engaged, students who typically are the distraction are busy with the task at hand." Another teacher commented, "I think it is also important to note that the iPads are most effective as a complement to the basic instruction, and that we do not become too dependent on technology to teach our students."

Research Question # 2.c:

Students indicated that an increase in ease of completing assignments and being able to communicate with teachers when not in class came with iPad availability. Students also responded that checking on assignments to be graded and their grades was much easier using an iPad. One student responded that a benefit of having an iPad is, "… having the Internet in the palm of your hands" (71).

Teachers and students generally agreed that the use of iPads increase student engagement. Usually, engaged students have higher achievement trajectories than disengaged students. Technology is part of the educational process, but too often it is separate

and not integrated into the learning experience. Only three Smart School Technology schools had a full year of implementation and while the achievement score data is inconclusive, data does support the use of technology in classroom instruction when used by a teacher who has integrated the three knowledge domains: pedagogical knowledge (how to teach), content knowledge (what to teach), and technological knowledge (understands and can use various technologies). For example, a teacher could be very proficient in using a technological tool without knowing how that tool can be used to effectively support learning. Just adding a digital device without designed professional development for teachers may not lead to significant academic improvement. Continued professional development should focus on how to design instruction and assignments that empower and engage students in a learning community with limitless opportunities for learning and not on technical training. With 10 Smart School Technology schools fully implemented the focus should move from the device itself to continued professional development for school personnel on how to integrate all three knowledge domains to support student learning.

"focus on how to design instruction and assignments that empower and engage students in a learning community with limitless opportunities for learning"

Lead Evaluator

Deborah M. Hill, Ph.D., Southern Utah University

Associate Evaluators

Richard West, Ph.D., Brigham Young University

Kristine Manwaring, Doctoral Student, Brigham Young University

Marissa Carlile, M.Ed., Price School District

Clay Rasmussen, Ph.D., Weber State University

iBook Designer

Aaron Fawson, Philosophy Major, Southern Utah University

CHAPTER 2

Year Two: Smart School Technology Project Evaluation

Summary of SB 248 – Smart School Technology Act

Introduced during the 2012 Legislative Session, Senate Bill 248 (Chief Sponsor, Senator Jerry W. Stevenson and House Sponsor, Representative Stephen G. Handy), created the Smart School Technology Act. Utilizing funding provided through the state's general fund, Industrial Assistance Account, the purpose of the Act is to develop technology solutions related to economic and workforce development; in this case the use of mobile devices in Utah's public schools.

Through a request for proposal process that specified various electronic components, operating software components, and professional development opportunities for educators and technological specialists, a private education technology provider was chosen to develop and implement the program. Participating schools were chosen through an application process managed by the State Board of Education. School selection was determined in part by a desire for a diversity of urban and rural schools and locations of the schools across the state. Pursuant to S.B. 248, evaluation of the program was contracted by the State Board of Education to an independent evaluator (reference to bill lines 101-106).

http://le.utah.gov/~2012/bills/sbillint/sb0248s02.pdf

Program Evaluation

Program evaluation is a systematic process for collecting, analyzing and using information to answer questions about projects, policies and programs concerning their effectiveness and efficiency. While program evaluation first focuses around this definition, important considerations often include how the program could be improved, whether the program is worthwhile, whether there are better alternatives, if there are unintended outcomes, and whether the program goals are appropriate and useful. Evaluators help to answer these questions, but the best way to answer the questions is for the evaluation to be a joint project between evaluators and stakeholders. Program evaluation may include both quantitative and qualitative methods of social research.

Overview of Smart School Evaluation Process

The three year evaluation of the Smart School Technology Project utilizes two overarching research questions considering three populations; students, teachers and administrators (Appendix A). The first variable in the evaluation is why, or why not, the participants use mobile technology in their learning/teaching/management and leadership environment. The second variable addresses in what manner does the use of mobile technology make a difference in: (a) learning achievement, (b) instructional strategies, and (c) Engagement.

A useful way to understand variables is to consider them in a cause-and-effect relationship. What variables influence outcomes?

1. What outcomes will this evaluation explain? (Dependent variable: (1) Student Achievement, (2) Student Attendance, and (3) Instructional Strategies)
2. What variables or factors influence the outcomes? (Independent variable: technology)
3. What variables need to be measured (controlled)? (Student achievement and attendance variance)

Year-One data for each participating school benchmarked average student achievement and average student attendance, by teacher, over the past three years (controlled variable). Benchmarks or baseline data for each grade level or secondary content (dependent variable) allow for a comparison of student academic performance after the introduction of one-to-one devices (independent variable). Year-Two data includes student achievement for the current academic year and instructional strategies used by teachers (dependent variables). Year-Three data will include student achievement and attendance, by teacher/site which will be compared against the benchmarked achievement and attendance for that teacher/site. Instructional strategies will be self-reported, by teacher, in collaboration with iSchool Campus and site administrators.

Student Achievement Assessment

The purpose of Utah's Criterion Referenced Tests (CRT) was to measure and assess the knowledge, skills, and abilities of students in the three Core Curriculum areas of English Language Arts, Mathematics, and Science as outlined in the Utah Core Curriculum. These scores are reported first as proficient/not proficient, and then by four proficiency levels to further differentiate students' degree of mastery of the specified concepts. CRTs are grade specific tests in English Language Arts. In Math, the CRT is grade specific for elementary students. For secondary student the CRT is course specific. Example: Students enrolled in pre-algebra are assessed using a pre-algebra CRT. In Science the CRT for 4-6 grade students is also grade specific. For secondary students the CRT is course specific.

Beginning spring 2014, Utah students began using a new assessment system, Student Assessment of Growth and Excellence (SAGE). SAGE measures what students know and can do in relation to the Utah Core Standards. The Utah Core Standards, adopted in 2010, demonstrate the State's commitment to strengthening educational standards and ensuring that all Utah high school students are ready for college, careers, and everyday life when they graduate. "The new standards emphasize deeper analysis and problem-solving skills to meet the demands of the 21st-century global economy" (USOE, 2014). The new assessment system is a computer adaptive test. Every time a student answers a question, the student response determines the next question to be asked. The difficulty of the test is adjusted by each student's answers. It has been noted that student proficiency rates may show a decrease this year as a result of more rigorous standards and rigorous assessment. USOE has cautioned the public that a potential reduced proficiency rate would in this instance, not be a result of decreased instructional excellence or school achievement and that rates will then again be expected to increase as students, parents, and teachers work to implement the new standards and assessment.
(http://www.schools.utah.gov/assessment/Adaptive-Assessment-System/UTEducatorbrochure-Final.aspx)

iSchool Campus

iSchool Campus was awarded the contract for the implementation of the Smart School Technology Project. The mission of iSchool Campus is to provide the most advanced turn-key technology available to empower education's most important resources - the teacher (http://ischoolcampus.com/education/). iSchool Cam-

pus proposes to a holistic 'Smart School', offering a learning environment with mobile devices for each student, high-speed internet access, secure wired and wireless networks, interactive collaborative education software, classroom management and analytical tools, professional development and ongoing technical support.

In order to operate the mobile devices and associated hardware efficiently, iSchool Campus conducted installation of the necessary hardwire and wireless applications at each of the participating school campuses where necessary, working with the district's respective IT departments. In addition, iSchool Campus uploaded curriculum appropriate apps for students, teachers, staff and administration (Appendix B). Selection of apps was based on best practices in instruction and learning, digital learning research and individual site requests (Appendix C). iSchool Campus reviewed online content prior to providing web addresses to participants in the project (Appendix C).

Smart School Technology Schools

The first schools to receive funding included Gunnison Valley Elementary School (Gunnison), Dixon Middle School (Provo), and North Sever High School (Sevier). These schools received 100% funding from the Utah Legislature to implement one-to-one computing in their respective schools. Implementation of one-to-one computing began in school year 2012-13. This report examines the second year of implementation for those schools.

The second round of schools to receive funding from the Utah Legislature include: Myton Elementary School (Public, Duchesne County), Newman Elementary School (Public, Salt Lake City), Pinnacle Canyon Academy (Public Charter, Price), North Davis Jr. High (Public, Davis County), Beehive Science and Technology Academy (Public Charter, Sandy), Freedom Preparatory Academy (Public Charter, Provo), and Utah Career Path High School (Pubic Charter, Kaysville). Second round schools were required to provide matching funds for the cost of implementing the one-to-one computing initiative.

Smart School's Digital Literacy Website

The purpose of this website is to provide research articles and review, and review educational apps appropriate for K-12.

http://onetoworldlearning.weebly.com

CHAPTER 3

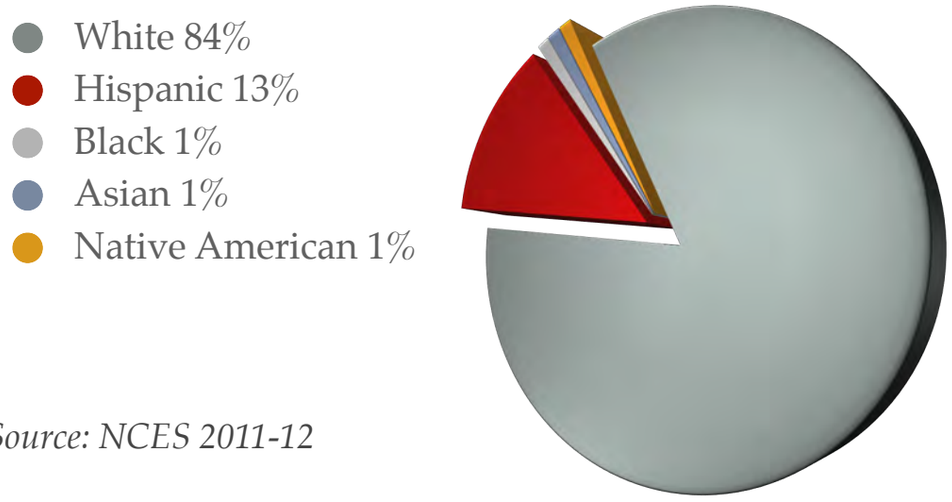
Original Schools Second Year

The second year evaluation for the three original schools: Gunnison Valley Elementary School (South Sanpete), Dixon Middle School (Provo) and North Sevier High School (Sevier). The Smart School Technology Project was implemented in these three schools during the 2012-13 school year.

Gunnison Valley Elementary School (GVES), Gunnison

One of three elementary schools in South Sanpete School District (Manti, UT), GVES serves approximately 563 students in grades PK-5. In 2011, GVES had 23 students for every full-time equivalent teacher, which is higher than the Utah state average ratio of 22:1. Fifty-three percent of the student population is male, 47% is female. Thirty-seven percent of the student population is eligible for free lunches. GVES employs twenty-four classroom teachers and Grant Hanson as Principal. South Sanpete School District includes seven schools serving approximately 3,123 students in grades PK-12.

Figure 3.1.a Gunnison Valley Elementary School Demographics



Source: NCES 2011-12

GVES implemented one-to-one computing in school year 2012-2013. iSchool Campus added two new hardwire runs to each classroom, one line for the supportive Apple iTV and one for a wireless internet access point (AP). Each classroom was provided an Apple iTV attached to an HDTV in addition to two Mac computer labs. The Apple iTV is a device that talks between the iPad and the HDTV for the purposes of presentations. Gigabit switches, to improve multiple computer network connections, and iBoss as a web filter were also installed. In order to allow iSchool Campus the ability to efficiently upgrade all iPads within the school as well as charge batteries, docking cabinets were provided. The docking cabinets house multiple iPads. GVES had previously installed enhanced audio systems throughout the school balancing out the system. In late October, iPads and MacBook Pro laptops were provided to each teacher, staff and administrator. Students were given access to their iPads the week of November 26, 2012. Professional development for faculty, staff and administrators was presented on October 22-25, 2012. Topics ranged from basic navigation on the iPad or MacBook Pro laptop to advanced tips including the use of multi-touch features on the unit.

Student Academic Achievement

The following table presents the CRT scores over the past three school years (2009-2010 to 2011-12). Baselines for grades were calculated using three years of scores. For example, at third grade the baseline benchmark for Language Arts proficiency at GVES was 82%, fourth grade benchmark was 85% and fifth grade at 82%. Benchmarking a baseline proficiency percentage at each grade level provides the ability to compare a cohort of students as they move up in grades to the average CRT proficiency level for

each grade. The green column (2013) is the CRT scores for the year the Smart School Technology project was implemented in the school.

Figure 3.2.a Gunnison Valley Elementary School Academic Achievement (2010-2013)

SCHOOL	SUBJECT	GRADE	2010	2011	2012	3 YR. AVERAGE (2010 - 2012)	2013
GUNNISON VALLEY SCHOOL	LANGUAGE ARTS	2ND	91%				
		3RD	81%	87%	78%	82%	71%
		4TH	86%	78%	91%	85%	80%
		5TH	86%	81%	80%	82.33%	86%
	MATH-EMATICS	2ND	85%				
		3RD	74%	76%	80%	76.67%	73%
		4TH	89%	88%	95%	90.67%	90%
		5TH	91%	82%	83%	85.33%	78%
	SCIENCE	4TH	91%	84%	91%	88.67%	84%
		5TH	89%	88%	86%	87.67%	91%

The 2010 2nd grade cohort highlighted in blue were fifth graders in 2013 (Smart School Technology implementation year). Tracking the second grade cohort's Language Art scores; in second grade 91% were proficient, in third grade 87% were proficient (benchmark = 82%), and in fourth grade 91% (benchmark = 85%) and in fifth grade 86% (benchmark = 82%). Scores for school year 2012-13 (Smart School Implementation), the year those original second grade students were in fifth grade, the Language Art CRT score was 86% proficient. However, this particular cohort of students consistently scored higher than the baseline benchmark Language Art's scores set at each grade level throughout their elementary education.

Tracking the same second grade cohort's math scores: in second grade 85% were proficient, in third grade 87% (benchmark = 77%), fourth 91% (benchmark = 85%) and fifth grade 78% (benchmark = 85%). This same cohort of students scored higher in third and fourth grade. There was a dip in scores in the fifth grade (year of iPad implementation).

Fifth grade science 2013 CRT scores were higher than the three year benchmark (2013 = 91% / Benchmark = 88%). Again this is the cohort of students who were in second grade in 2010 and have consistently scored well throughout their tenure in elementary school.

Overall comparison of the students in specific grade levels compared to the baseline benchmark for the year the iPads were implemented (2012-13) is provided in the following figure and table.

Figure 3.3.a Gunnison Valley Elementary School LA CRT Benchmark vs. 2013 CRT

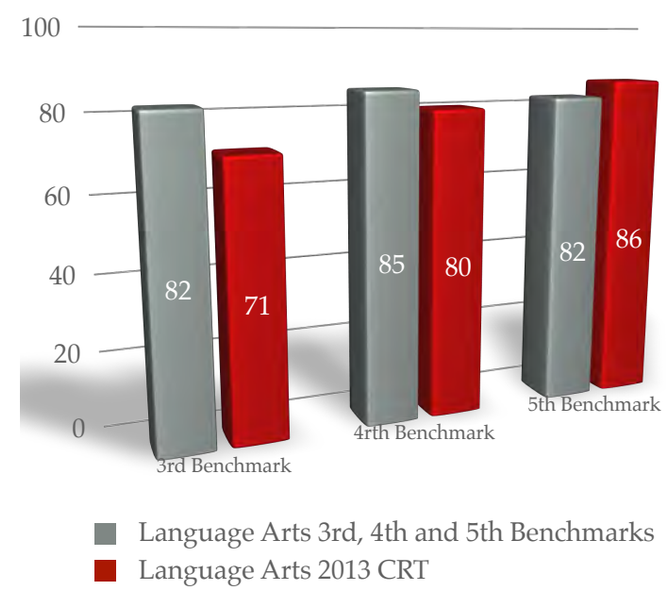


Figure 3.4.a Gunnison Valley Elementary School Math CRT Benchmark vs. 2013 CRT

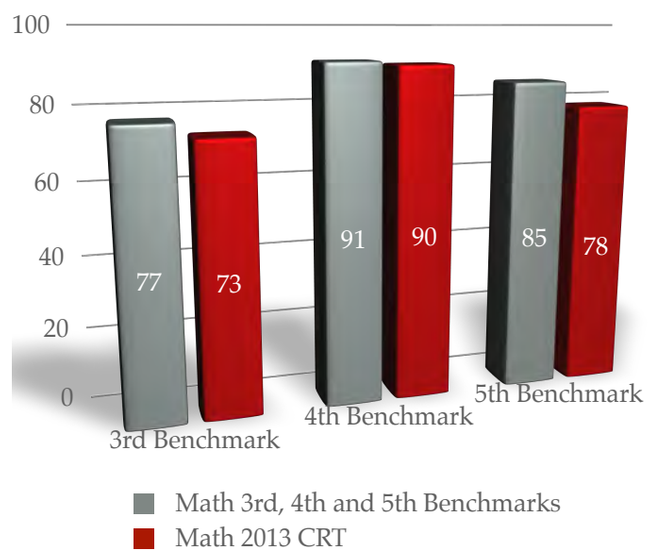


Figure 3.5.a Gunnison Valley Elementary School Science CRT Benchmark vs. 2013 CRT

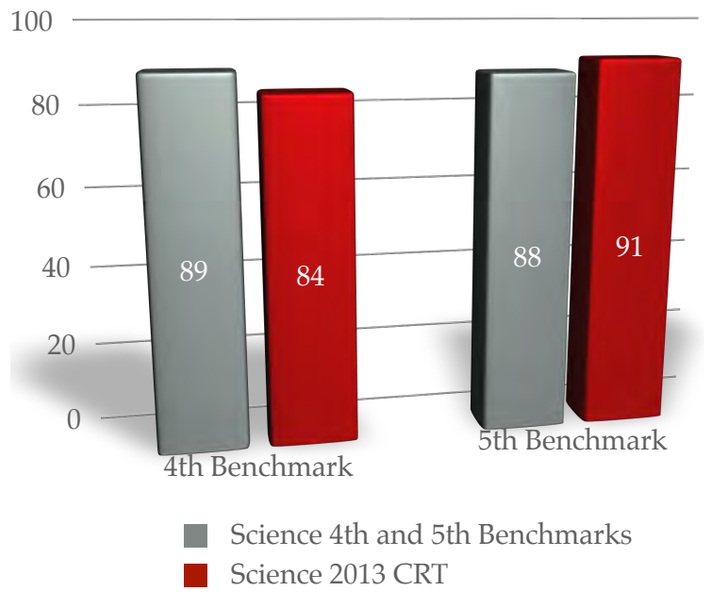


Figure 3.6.a Gunnison Valley Elementary CRT 2013 vs CRT Benchmarks by Grade Level

SUBJECT	CRT 2013	CRT BENCHMARK
LANGUAGE ARTS 3RD	71%	82%
LANGUAGE ARTS 4TH	80%	85%
LANGUAGE ARTS 5TH	86%	82%
MATH 3RD	73%	77%
MATH 4TH	90%	91%
MATH 5TH	78%	85%
SCIENCE 4TH	84%	89%
SCIENCE 5TH	91%	88%

The table presents 2013 CRT proficiency scores compared to benchmark CRT scores. In regards to the scores, the impact of the implementation process itself, relative to the implementation of the Smart School Technology, must be taken into account. From October 2013 to May 2014, GVES teachers spent considerable time learning how to use iPads and integrate and implement one-to-one computing into their instruction. New knowledge and skills were required of the teachers in addition to meeting the State's Core Curriculum. Teachers received their professional development and iPads two months after the school year had begun. CRTs were given in late May, less than a year's worth of instruction at each grade level.

Achievement Scores

At the time of this report the Utah SAGE scores have not been released by the Utah State Office of Education.

iSchool Campus Update Infrastructure and Professional Development

1. Continued Professional Development Opportunities

Full Days of School Visits - iSchool Campus has two ed-tech specialists visit the school during a normal day to spend time in classrooms and answer questions as they arose during the school day. In addition, one full afternoon of Professional Development with specific focus on instructional technology such as productivity and classroom management applications was provided. Per Gunnison Elementary's request, iSchool Campus provided five Professional Training days in 2014 (January, February and April), focusing specifically on Edmodo training, as well as small group sessions.

2. Device Replacements/Repairs

Zero replacements and three iPad Glass repairs during the 2013-–2014 school year.

3. Additional apps

The school manages what apps are installed/removed for each grade/class/student through their individual VPP (Volume Purchase Program) credits with Apple.

The Dynamic Indicators of Basic Early Literacy Skills

(DIBELS) is designed to measure short (one minute) fluency measures. Fluency is the smoothness or flow with which sounds, syllables, and words are decoded. DIBELS is restricted to pupils' ability to decode. Though decoding is important, the ultimate goal of all reading is comprehension: to derive meaning. Without comprehension, reading is simply following words on a page from left to right while sounding them out. The words on the page have no collective meaning. However, high-fluency readers comprehend better, read faster, and read with greater accuracy than low-fluency readers (National Center for Education Statistics {NCES}, 1995). The use of DIBELS to assess and aid reading lessons is important to reading instruction.

GVES, 2013-14 Data:

GRADE	% AT UTAH DIBLES BENCHMARK
Kindergarten	97.4
First	87.6
Second	88.6
Third	91.0
Fourth	89.9
Fifth	92.1
GVES Total	90.9

GVES 2012-13 data: Over 90% of the first, second and third grade students are at "Benchmark" on their grade level reading skills as measured by DIBELS®. This data demonstrates GVES one of the highest performing schools in Utah.

GVES's DIBELS scores for the school (519 student) have 90.9% at "Benchmark" on their grade level reading skills. In Kindergarten, 75 of the 77 students (97.4%) are at Benchmark. This data attests that GVES is one of the highest performing schools in Utah.

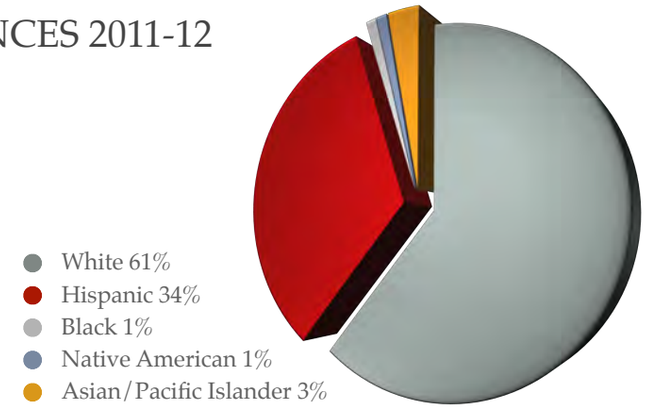
Dixon Middle School, Provo

Dixon Middle School, one of eight middle schools in Provo School District (Provo, UT), serves approximately 862 students in grades 7-8. In 2011, Dixon Middle School had 19 students for every full-time equivalent teacher (UT state average ratio = 22:1). Fifty-two percent of the student population is male, 48% is female. Forty-three percent of the student population is eligible for free lunches (UT average = 31%). Thirteen percent of the students are eligible for reduced price lunches (UT average = 8%). Nine percent of the student population is classified as English Language Learners. Students with disabilities make up 17% of the total student population. Dixon Middle School employs forty-five classroom teachers and Jarod Sites as Principal. The Provo School District includes 24 schools serving 13,769 students in grades PK-12.

Utah state demographic averages: White = 77%, Hispanic = 15%, Hawaiian/ Pacific Islander = 2%, Asian = 2%, Black = 1%, Native American = 1%, and Two or more = 1%.

Figure 3.1.b Dixon Middle School Demographics

Source: NCES 2011-12



Dixon Middle School implemented one-to-one computing school year 2012-13. Provo School District IT completed re-wiring of Dixon Middle School so no new hardwiring was necessary for this project. Each classroom is equipped with two wireless internet access points (APs). iSchool Campus installed a new wireless system and enhanced classroom audio equipment. Apple iTVs attached to HDTVs were installed in addition to the existing multimedia projectors. Docking cabinets in each 'home room' provide iSchool Campus the ability to upgrade each iPad as well as charge batteries. Dixon Middle School was also provided three new Mac and PC computer labs. Teachers, staff and administration received iPads and MacBook Pro laptops in late October 2012. Students received their iPads the week of November 26, 2012. The grant included funding for apps so Dixon Middle School purchased additional apps for specific instructional needs. Dixon Middle School has a teacher committee that reviews app purchase requests and other issues related to the Smart School Technology Project. The school also has a student advisory committee that meets regularly

to assist the administration in addressing hacking and other technology driven student behaviors.

Several teachers have continued to comment on the use of the enhanced audio systems' impact on students' engagement in discussions. The teachers reported that they felt students could clearly hear instruction and were less likely to engage in inappropriate behavior. Teachers also reported less personal voice strain and that the afternoon classes received the same instruction as the morning classes; in the past their voices often 'gave out'.

Student Academic Achievement

The following table presents the CRT scores over the past four school years (2009-2010 to 2012-13). Baselines for grades were calculated using three years of scores. The benchmarked baseline proficiency average for 7th grade Language Art is 82%, the 7th grade Language Art score for school year 2012-13 (implementation) was 86% (an increase). There was also an increase in 8th grade Language Arts (2013 score = 90% / benchmark = 86%). The cohort of students in seventh grade had a Language Art CRT average proficiency score of 82% in 2012 (benchmark baseline = 82%) and in 2013 this cohort's CRT Language Art average proficiency score of 90% (benchmark baseline = 86% (marked increase). Seventh grade math had an increase: 2013 score = 85% / benchmark = 73%. Same with 7th grade science: 2013 score = 77% / benchmark = 66%. Overall comparison of the students in specific grade levels compared to the baseline benchmark for the year the iPads were implemented (2012-13) is provided in the following table and figures.

Figure 3.2.b Dixon Middle School CRT Benchmarks (2010-2012) vs. 2013 CRT by Content and Grade Level

SCHOOL	SUBJECT	GRADE LEVEL	2010	2011	2012	3 YEAR AVERAGE	2013
DIXON MIDDLE SCHOOL	LANGUAGE ARTS	7TH GRADE	79%	84%	82%	81.67%	86%
		8TH GRADE	81%	87%	91%	86.33%	90%
	MATH-EMATICS	7TH GRADE MATH	63%	71%	86%	73.33%	85%
		PRE-ALGEBRA	70%	69%	62%	67.00%	67%
		GEOMETRY	96%	100%	100%	98.67%	98%
		ALGEBRA 1	90%	100%	93%		
		ALGEBRA 2		100%			
		8TH GRADE MATH					70%
	SCIENCE	7TH GRADE	62%	66%	70%	66.00%	71%
		8TH GRADE	67%	64%	68%	66.33%	63%

Figure 3.5.b Dixon Middle School Science CRT Benchmarks vs. 2013 CRT Scores by Grade Level

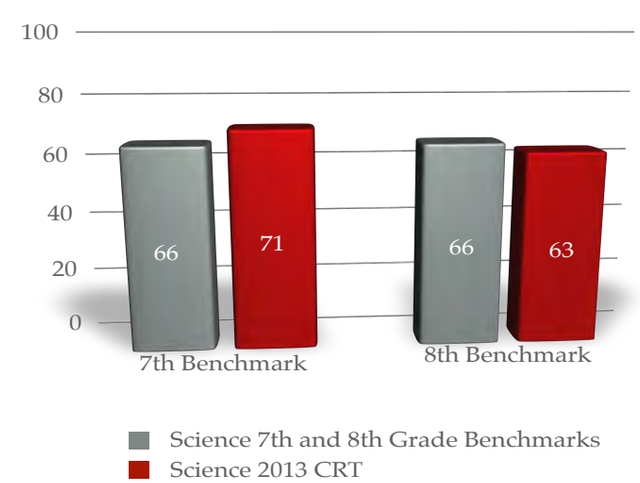


Figure 3.3.b Dixon Middle School LA CRT Benchmarks vs. 2013 CRT Scores by Grade Level

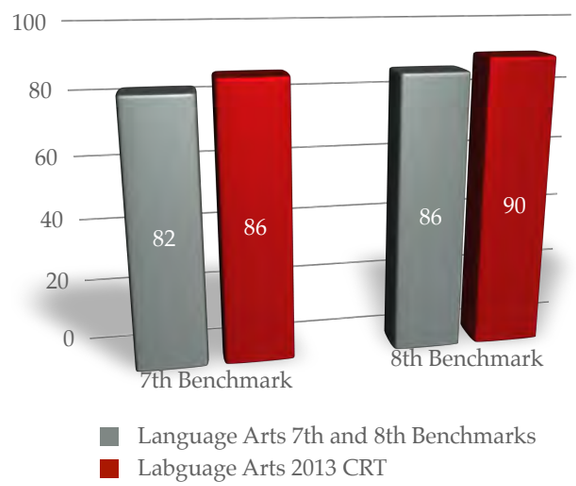
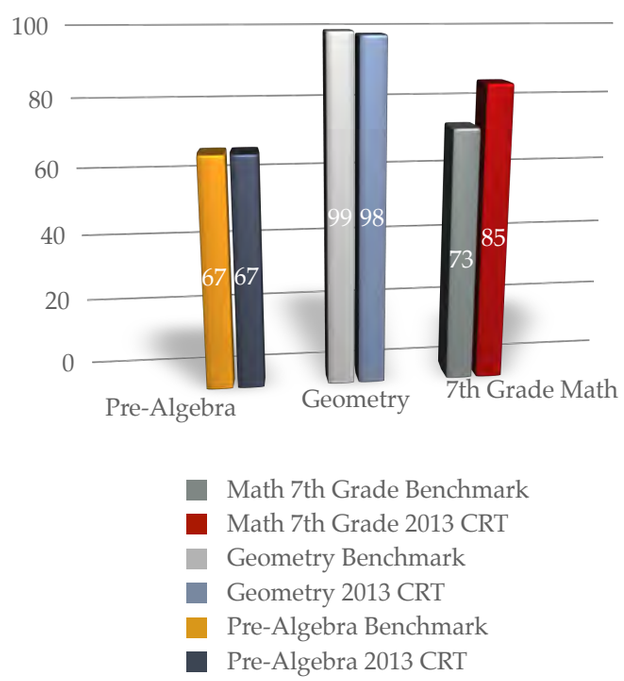


Figure 3.4.b Dixon Middle School Math CRT Benchmarks vs. 2013 CRT Scores by Grade Level



"iPads have enhanced their professional development (78%), expanded/ reinforced what they have been able to teach (94%), helped them respond to various student learning styles (86%), and helped them better meet the needs of advanced learners (86%)."

Additional Research

A formative evaluation of the pilot program and a subset of the full Smart School Technology evaluation study were conducted at Dixon Middle School and Freedom Preparatory Academy by a BYU faculty member and a doctoral student. Two basic questions about the teachers' and parents' perspectives in the iPad initiative were sought. Specifically: (1) What do teachers and parents think are the benefits and challenges of the one-to-one iPad implementation at the school, (2) How are the iPads being used by teachers and students? (Information on the use of iPads for instruction and learning is in Appendix D).

Overall it seems that more teachers and parents feel the iPads have a net positive. Most teachers indicated that the iPads have enhanced their professional development (78%), expanded/ reinforced what they have been able to teach (94%), helped them respond to various student learning styles (86%), and helped them better meet the needs of advanced learners (86%). Most teachers indicated using the iPads at least two to three times a week, and for activities as varied as teacher presentation of material, to supporting student research and writing. It is important to note that the frequency of use was evenly distributed among teachers of different levels of teaching experience. Experienced teachers with more than 10 years of experience were just as likely to report frequent use of the iPad as newer teachers with less than three years of experience.

From the parents, there were more positive than negative comments about the iPad program. The benefits to students that parents volunteered most frequently included an increase in student skills with technology, improved student ability to organize school work, an improvement in student learning and creativity, improved communication with teachers, increased sense of pride and responsibility, and improved student access to technology. The data supports implementation of the iPad program, from the parental point of view.

Achievement Scores

At the time of this report the Utah SAGE scores have not been released by the Utah State Office of Education

iSchool Campus Update Infrastructure and Professional Development

1. Continued Professional Development Opportunities

Dixon Middle School utilized six full days of professional development training from two iSchool Campus ed-tech specialists during the 2012-2013 school year. If additional training is desired, iSchool Campus will provide training on specific apps, or in small-teacher groups, based on the school's overall objectives. Per contract, additional professional development days are billed based on a per-diem fee structure.

2. Device Replacements/Repairs

36 glass repairs during 2013/2014 school year. Zero replacements.

3. Additional apps

The school manages what apps are installed/removed for each grade/class/student through their individual VPP (Volume Purchase Program) credits with Apple.

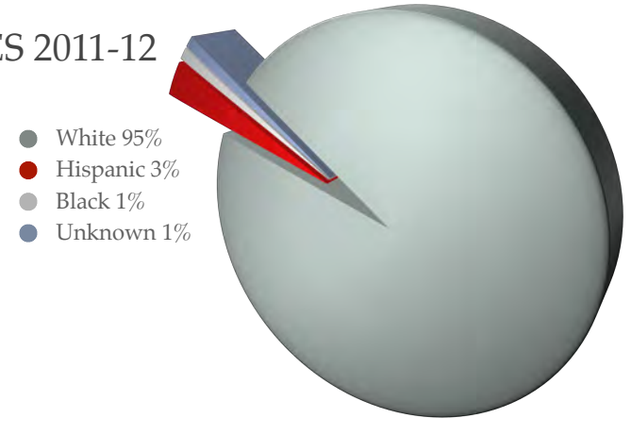
North Sevier High School (NSHS), Sevier

North Sevier High School is one of four high schools in the Sevier School District (Richfield, UT). North Sevier High School serves 264 students in grades 9-12. NSHS has 19 students for every full-time equivalent teacher (UT state average ratio = 22:1). Fifty-four percent of the student population is male, 46% is female. Twenty-nine percent of the student population is eligible for free lunches (UT average = 31%). Thirteen percent of the student population is eligible for reduced price lunches (UT school average = 8%). 2012 graduation rate for NSHS was 94%. NSHS employs 17 classroom teachers and Jill Porter as Principal. The Sevier School District includes 13 schools serving 4,794 students in grades PK-12.

Utah state demographic averages: White = 77%, Hispanic = 15%, Hawaiian/ Pacific Islander = 2%, Asian = 2%, Black = 1%, Native American = 1%, and Two or more = 1%.

Figure 3.1.c North Sevier High School Demographics

Source: NCES 2011-12



North Sevier High School implemented one-to-one computing school year 2012-13. iSmart Campus re-wired the entire school, adding data ports to every classroom and office, including new gigabit switches. Each classroom was provided an Apple iTV attached to an HDTV and enhanced audio equipment. iBoss was installed as the web filter. The school's computer lab was updated with new Mac desktop computers.

In October 2012, teachers, staff and administrators received MacBook Pro laptops as well as an iPad. Students received their iPads mid-December 2012. The school conducted parental meetings regarding the program prior to checking iPads out to students; two students' parents opted out of the program. Students may take home their iPads allowing 24/7 access to the device. iPads are updated when needed by iSchool Campus.

Student Academic Achievement

The following table presents the CRT scores over the past four school years (2009-2010 to 2012-13). Baselines for grades were calculated using three years of scores. The baseline benchmark score for 9th grade Language Arts is 86% and 10th grade is 87%. The 2013 CRT score for 10th grade increased the year the iPads were implemented. Interestingly the same cohort of students' CRT 9th grade Language Arts scores were 88% (benchmark = 86%). In math there was a significant increase in Algebra I CRT scores for 2013: Algebra I 2013 score = 67% proficient / benchmark = 35% proficient. It is noted that the Algebra I CRT scores steadily improved over the three year benchmark period (from 16% proficient to 52% proficient). The Biology 2013 CRT score was also higher than the three year benchmark score: 2013 = 85% / benchmark = 77%.

Figure 3.2.c North Sevier High School Academic Achievement (2010-2013)

SCHOOL	SUBJECT	GRADE/ LEVEL	2010	2011	2012	3 YEAR AVERAGE	2013
NORTH SEVIER HIGH SCHOOL	LANGUAGE ARTS	9TH GRADE	72%	97%	88%	85.67%	75%
		10TH GRADE	85%	79%	97%	87.00%	93%
		11TH GRADE	86%				
	MATH-EMATICS	GEOMETRY	62%	52%	63%	59.00%	
		ALGEBRA 1	16%	36%	52%	34.67%	67%
		ALGEBRA 2	42%				
	SCIENCE	EARTH SYSTEMS SCIENCE	70%	85%	76%	77.00%	73%
		BIOLOGY	72%	73%	87%	77.33%	85%
		CHEMISTRY		46%	59%		27%
		PHYSICS	91%	64%	84%	79.67%	

Figure 3.4.c North Sevier High School Math CRT Benchmarks vs. 2013 CRT Scores

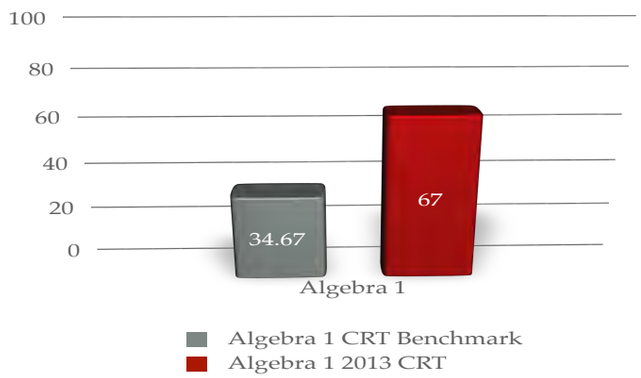


Figure 3.5.c North Sevier High School Science CRT Benchmarks vs. 2013 CRT Scores

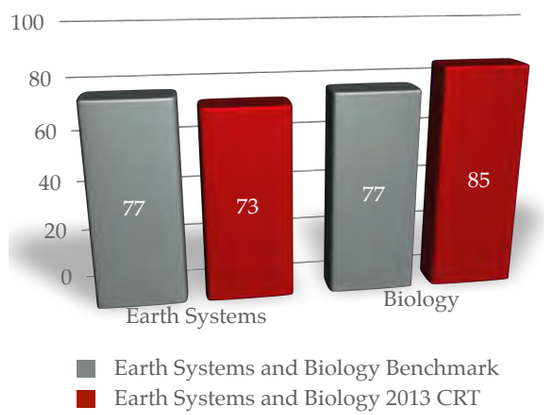
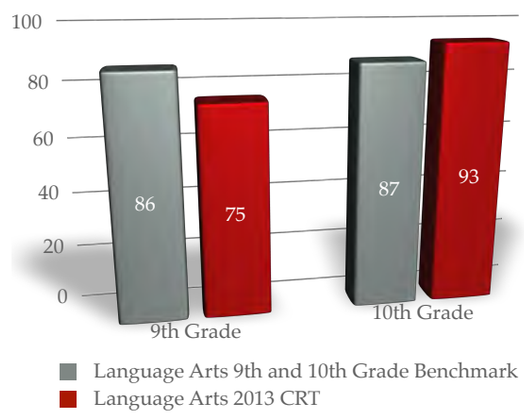


Figure 3.3.c North Sevier High School LA CRT Benchmarks vs. 2013 CRT Scores



The district moved away from using Northwest Evaluation Association (NWEA) after the spring 2013 test and switched to the state SAGE test for 2014.

Achievement Scores

At the time of this report the Utah SAGE scores have not been released by the Utah State Office of Education.

iSchool Campus Update Infrastructure and Professional Development

1. Continued Professional Development Opportunities

North Sevier High School utilized a total of six full days during the 2013-2014 school year (in November of 2013, January/March of 2014). Courses included Intro to Technology, Canvas, and one-on-one teacher training and small group sessions.

2. Device Replacements/Repairs

One device replacement and twelve glass repairs during 2013/2014 school year.

3. Additional apps

The school manages what apps are installed/removed for each grade/class/student through their individual VPP (Volume Purchase Program) credits with Apple.

CHAPTER 4

New Schools First Year

2013-14 Additional School to Smart School Technology Project

In 2013 the Utah State Legislature extended the funding for Smart School Technology Project by allowing additional schools to apply for funding. New applicants applying for Smart School funds needed to match the funding provided by the State. In October 2013, seven schools were added to the study: Newman Elementary School (Public, SLC), Myton Elementary School (Public, Duchense), Pinnacle Canyon Academy (Public Charter, Price), Beehive Science and Technology Academy (Public Charter, Sandy), North Davis Jr. High (Public, Clearfield), Freedom Preparatory Academy (Public Charter, Provo) and Utah Career Path High School (Public Charter, Davis).

Newman Elementary School, Salt Lake School District

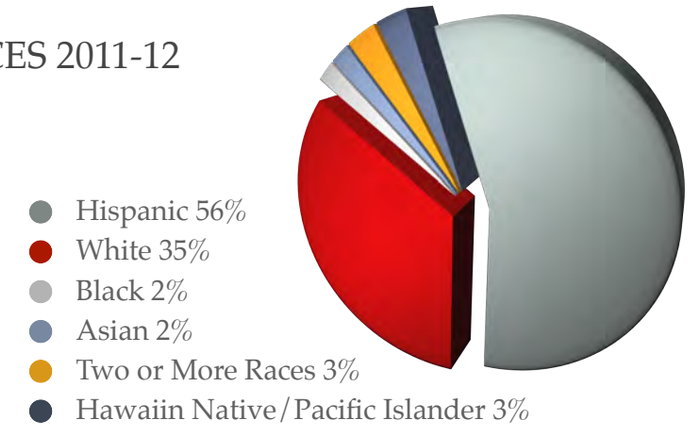
Newman Elementary School's 500 student population reflects the diversity of Salt Lake's Rose Park area. Newman is one of the first schools in Utah to adopt the *Leader in Me Program* to instill leadership characteristics in the students. The school has been recognized as a Utah High-Achieving Title 1 school. Newman offers all full-day kindergarten classes, a gifted and talented program and provides an after-school program for academics and enrichment. The student per teacher ratio is 20:1. Seventy-six percent of the student population is eligible for subsidized lunch. Male students make-up 52% of the student population, 48% female student. Newman Elementary School is one of the 26 elementary schools in the Salt Lake School District. John Erlacher is the Principal and Deborah Candler is Assistant Principal.

iSchool Campus deployment for this school included hanging TV's and a few projectors, configuring Apple TV's on each video source, and configuring all iPads initially while training IT Staff. iSchool Campus configured and a installed new server and iMac computer labs. Deployment began on Nov. 22, 2013 and finished on Nov. 27, 2013.

Utah state demographic averages: White = 77%, Hispanic = 15%, Hawaiian/ Pacific Islander = 2%, Asian = 2%, Black = 1%, Native American = 1%, and Two or more = 1%.

Figure 4.1.a Newman Elementary School Demographics

Source: NCES 2011-12



The following table provides the Newman Elementary School CRT grade level scores for the years 2010 to 2013 for each subject area. The four year average for each grade level is reported.

Figure 4.2.a Newman Elementary School Academic Achievement (2010-2013)

SCHOOL	SUBJECT	GRADE/ LEVEL	2010	2011	2012	2013	4 YEAR AVERAGE
NEWMAN ELEMENTARY SCHOOL	LANGUAGE ARTS	2ND GRADE	83%				
		3RD GRADE	85%	94%	85%	85%	87.25%
		4TH GRADE	75%	84%	91%	73%	80.75%
		5TH GRADE	75%	71%	79%	77%	75.5%
		6TH GRADE	70%	88%	70%	86%	78.5%
	MATH-EMATICS	2ND GRADE	75%				
		3RD GRADE	83%	84%	80%	81%	82%
		4TH GRADE	79%	93%	94%	84%	87.5%
		5TH GRADE	85%	74%	86%	91%	84%
		6TH GRADE	61%	81%	62%	84%	72%
	SCIENCE	4TH GRADE	60%	68%	72%	66%	66.5%
		5TH GRADE	68%	48%	65%	66%	61.75%
		6TH GRADE	54%	59%	55%	69%	59.25%

Additional Research

Students and faculty were surveyed concerning usage. Of the 498 students, 212 responded to the survey. When asked how often they used the iPad to access class content 74% responded using the iPad daily. Additionally, 40% of students responded using the iPad weekly for educational games and 40% responded using iPads to work on projects with classmates weekly. Interestingly, 45% of responding students did not use Google Drive/Docs. When asked what some of the biggest advantages to being able to take an iPad home, 25% responded to do homework. Students were also asked what they thought was the biggest problem with using iPads in the classroom and 14% responded mechanical difficulties and 13% responded that the iPad was a distraction.

Thirteen teachers responded to the teacher survey. Of those responding, all responded that they felt comfortable using the iPad in their teaching. Eleven of the 13 responded they used the iPad daily in their instruction. When asked what benefits the teacher saw for students 92% responded using an iPad allowed them to respond to a variety of learning styles, additionally 85% equally weighted use of an iPad as motivational, providing additional practice and increasing digital literacy. One teacher responded, "I would say it decreases distractions for two reasons. First of all, the individual students are so engaged in their own assignments and projects on the iPad that they don't worry about what else is going on in the room that typically would be a distraction. The second reason naturally occurs because of the first: because each student is so engaged, students who typically are the distraction are busy with the task at hand." Some of the concerns shared by the teachers included more professional development workshops in using digital technology, more funding for apps, and needing more time for implementation. One teacher responded, "Wish we had gotten them before late February… early March. Wish there was some money to buy purchased apps on a classroom level/grade level. Wish there was some interaction with other iSchools to know what would be best choices and uses at each grade level better ear buds for the iPad for each students, more district training."

Achievement Scores

At the time of this report the Utah SAGE scores have not been released by the Utah State Office of Education.

iSchool Update Infrastructure and Professional Development

1. Time line of Professional Development:

Newman Elementary utilized a total of seven (7) professional development training days during the 2013-14 school year (November and December of 2013, and January of 2014), as well as two professional development training days in preparation for the 2014-15 school year (August, 2014). Courses included core subject technol-

ogy training, app workflow courses, and one-on-one teacher/small group training sessions.

2. Device Replacements/Repairs: three iPad glass repairs since beginning of deployment.

3. Apps provided

The school manages what apps are installed/removed for each grade/class/student through their individual VPP (Volume Purchase Program) credits with Apple. They selected apps based on the list of apps provided at the end of this iBook under Apps covered in PD.

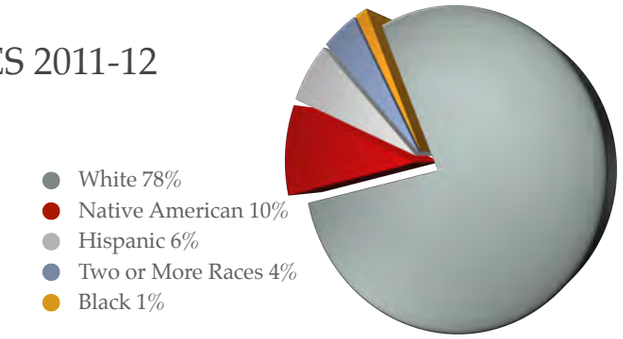
Myton Elementary School, Duchesne School District

Duchesne County School District is a small, rural school district located in scenic Eastern Utah. Duchesne County, gateway to the Uintah Basin, is home to about 4900 students in thirteen schools located in six rural communities. Duchesne County School District has six elementary schools, three high schools, one junior high school, one K-12 school, and two special schools. Myton School is located in Myton, UT and serves 164 students in grades K-5. The ratio of students to teachers is 17:1. The percentage of students eligible for subsidized lunch is 53%. Fifty-two percent of the student population is female 48% male. Jason Young is the Principal of Myton Elementary School.

iSchool Campus deployment included classroom audio in each room, TV's and Apple iTV's in each room, server closet setup and server install, pulling and terminating two CAT6 wires to each classroom. As with every school, it also includes imaging/configuring all iPads for initial hand out and training. Deployment began on Nov. 12, 2013 and finished on Nov. 15, 2013.

Figure 4.1.b Myton Elementary School Demographics

Source: NCES 2011-12



Utah state demographic averages: White = 77%, Hispanic = 15%, Hawaiian/ Pacific Islander = 2%, Asian = 2%, Black = 1%, Native American = 1%, and Two or more = 1%.

Figure 4.2.b Myton Elementary School Academic Achievement (2010-2013)

SCHOOL	SUBJECT	GRADE/ LEVEL	2010	2011	2012	2013	4 YEAR AVERAGE
MYTON ELEMENTARY SCHOOL	LANGUAGE ARTS	2ND GRADE	66%				
		3RD GRADE	63%	54%	71%	91%	69.75%
		4TH GRADE	42%	65%	54%	68%	57.25%
		5TH GRADE	64%	58%	77%	64%	65.75%
	MATH-EMATICS	2ND GRADE	52%				
		3RD GRADE	58%	39%	46%	59%	50.5%
		4TH GRADE	33%	61%	42%	36%	43%
		5TH GRADE	60%	42%	65%	40%	51.75%
	SCIENCE	4TH GRADE	33%	39%	25%	29%	31.5%
		5TH GRADE	36%	42%	62%	48%	47%

The following table provides the Myton Elementary School CRT grade level scores for the years 2010 to 2013 for each subject area. The four year average for each grade level is also reported.

Achievement Scores

At the time of this report the Utah SAGE scores have not been released by the Utah State Office of Education.

iSchool Update Infrastructure and Professional Development

1. Time line of Professional Development

Myton Elementary utilized a total of five professional development training days during the 2013-14 school year (November, of 2013 and January of 2014), as well as one professional development training day in preparation for the 2014-15 school year (August, 2014). Courses included Macbook and iPad basics, core subject technology training, app workflow courses, and one-on-one teacher/small group training sessions.

2. Device Replacement/Repairs: one iPad glass repair.

3. Apps provided

The school manages what apps are installed/removed for each grade/class/student through their individual VPP (Volume Purchase Program) credits with Apple. They selected apps based on the list of apps provided at the end of this iBook under Apps covered in PD.

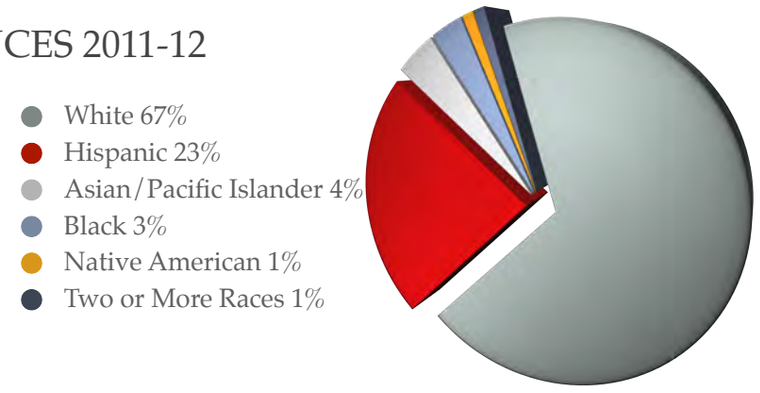
North Davis Jr. High School, Davis County School District

North Davis Junior High School located in Clearfield, UT is one of 100 schools in the Davis District. A public school built in 1939, North Davis Jr. High serves 1033 students grade 7 through 9. Eighty-two percent of NDJHS students are eligible for free or reduced-price lunch program (State average 48%). Ryan Hansen is the Principal of NDJH.

iSchool Campus deployment for this school included complete wireless and wiring access point, installation and upgrade (CAT6) to every classroom/teaching area, and access points installed in every room. Wireless switches were installed and configured in all three data closets, TV and iTVs were installed in all classrooms along with typical program setup and configuration of all iPads, sever, lab computers, teacher computers and iOS Controller. Deployment began on December 16, 2013 and finished on December 20, 2013.

Figure 4.1.c North Davis Jr. High School Demographics

Source: NCES 2011-12



Utah state demographic averages: White = 77%, Hispanic = 15%, Hawaiian/ Pacific Islander = 2%, Asian = 2%, Black = 1%, Native American = 1%, and Two or more = 1%.

Figure 4.2.c North Davis Jr. High Academic Achievement (2010-2013)

SCHOOL	SUBJECT	GRADE/ LEVEL	2010	2011	2012	2013	4 YEAR AVERAGE
NORTH DAVIS JR. HIGH	LANGUAGE ARTS	7TH GRADE	68%	64%	72%	78%	70.5%
		8TH GRADE	76%	78%	80%	85%	79.75%
		9TH GRADE	71%	84%	82%	82%	79.75%
	MATH-EMATICS	7TH GRADE	43%	47%	50%	79%	54.75%
		PRE-ALGEBRA	39%	39%	41%	57%	44%
		GEOMETRY	88%	83%	95%	100%	91.5%
		ALGEBRA 1	57%	67%	40%		
		ALGEBRA 2			66%	92%	
	SCIENCE	7TH GRADE	61%	58%	59%	66%	61%
		8TH GRADE	47%	56%	49%	53%	51.25%
		EARTH SYSTEMS	57%	47%	47%	49%	50%
		BIOLOGY	100%	74%	90%	87%	87.75%

The following table provides the North Davis Jr. High School CRT grade level scores for the years 2010 to 2013 for each subject area. The four year average for each grade level is also reported.

Achievement Scores

At the time of this report the Utah SAGE scores have not been released by the Utah State Office of Education.

iSchool Update Infrastructure and Professional Development

1. Time line of Professional Development

North Davis Junior High School utilized a total of three professional development training days during the 2013-14 school year (October, November and December of 2013), as well as one professional development training day in preparation for the 2014--15 school year (August, 2014). Courses included an introduction to educational technology, assessment tools, app smashing and note ability, a parent orientation session, and one-on-one teacher/small group training sessions.

2. Device replacement/repairs: twelve iPad glass repairs.

3. Apps provided

The school manages what apps are installed/removed for each grade/class/student through their individual VPP (Volume Purchase Program) credits with Apple. They selected apps based on the list of apps provided at the end of this iBook under Apps covered in PD.

Two additional research reports

iPads in Language Arts

With many iPads being sold and the numerous apps that have been developed to run on the iPad, it is little wonder that schools are adopting the technology. The purpose of this study was to examine iPads and their effect on writing in the secondary classroom. Did teacher and student opinions on writing change based upon the iPad? Did students prefer writing with an iPad versus handwriting or writing with a computer? Did teachers assign more writing that was to be handwritten or more writing with the use of an iPad? (iPads in Language Art/ Writing is in Appendix E).

The findings of this research concluded it was not surprising that the lack of training teachers received had them feeling that

they need more help in successfully implementing iPads into their classrooms. Teachers responded that if they were given more training on how to make iPads useful to and exciting for their students, rather than just another method for writing an essay, then perhaps both they and students would have more positive results in favor of the iPad.

Results of the research provided evidence that students felt their work was being read, whether it has been typed or handwritten in its preparation; that teachers are actually reading what students write. This provides validity to the iPad as a writing tool, validity that would be lacking if teachers just let computer-grading programs take over the task of "reading" what students write online.

Overall, the results of this research were somewhat surprising. In an era where technology is valued and with a generation of students that have been exposed to computers since birth, the lack of a preference for iPads was unanticipated. For some of these students, iPads and computers have been around as long as pencils and paper. Using a mobile device as a writing medium is neither novel nor different; yet as it relates to writing, perhaps these students view paper and pencil and iPads as basically the same.

Engaging Technology

We live in a digital rather than analog world and many schools are implementing one-to-one computing initiatives to help accomplish academic goals. In addition to research that examines student achievement other areas may be also be impacted by one-to-one computing initiatives. Impacts can occur in a number of categories, including student engagement, behavior, and motivation as well as in teacher practices. The purpose of the secondary NDJH study was to investigate the usage of iPads in secondary classrooms as perceived by students and teachers. (Engaging Technology is in Appendix F).

Fifty-two percent of the responding teachers, felt somewhat comfortable using the iPad in their classroom. Forty-four percent felt very comfortable or comfortable. Eighty percent of the Level 1 teachers (teachers with less than four years of experience) responded they felt comfortable or very comfortable using the devices. Twenty-eight percent of the Level 2 teachers (teachers with four or more years of experience) felt comfortable or very comfortable using the devices. When responding to how well the professional development (PD) programs provided prepared them for using the devices in their instruction, 61% of the teachers agreed or somewhat agreed that the PD prepared them. Thirty-nine percent of the teachers used the device in their classrooms weekly, 30% of the teachers used the devices at least monthly and 13% responded they used the devices daily. When asked if the use of the devices increased or decreased student distraction in the classroom, 53% indicated the use of the devices increased student distraction. However, 35% of the responding teachers commented that the use of the device increased student motiva-

tion in the classroom, with 30% commenting that the use of the device enabled students to reinforce or expand on the content being taught.

About half of the NDJH student population responded to the student survey. Students responded that the most common use of their iPads were to check grades daily (63%), do Internet research (53%), use Google Drive/Docs (45%), access class content (43%) and take notes in class (39%). Students responded they used their iPads less to read a book (Never 43%) and to communicate with their teacher (48%).

NDJH teachers and students both responded that the use of the iPad was dependent on the knowledge and skills of the teacher in integrating technology into their instruction. Considering this response, if mobile technology is placed in schools it would appear imperative that teachers receive professional development not only in how to navigate the iPad, but how to integrate mobile technology into their classroom instruction appropriately. In addition, considering student responses in the survey, teachers also need support with regard to managing student behaviors relative to using the iPads appropriately in the learning environment.

Beehive Science and Technology Academy, Charter School

Beehive Science & Technology Academy (BSTA) is an open enrollment, tuition-free public charter school which opened on August 29, 2005 in Salt Lake City, Utah. The Academy distinguishes itself among neighboring educational offerings with its college preparatory program that focuses on math, science and technology. The curriculum at BSTA is designed to provide students with a solid foundation in humanities and social science as well as math, science and technology and with the stated aim of preparing them to become responsible and educated members of society. The goal is to prepare students with the skills and understanding necessary to participate and work productively in an increasingly technological, diverse, and multicultural society. Students are placed in classes based on their math skills. Field trips provide additional learning and socializing skills. Each year local, expedition, and out-of-state college trips are offered to students. Every spring, students have the opportunity to go to Europe with faculty and parents. Hanifi Oguz is the Principal of Beehive Science and Technology.
Some of the Beehive Science and Technology Academy achievements include:

Math League Competition

2012

FIRST FTC Robotics Team

2006 - 2007 (2nd place in Montana Regional)

2008 – 2009 (2 teams, 2nd and 3rd place in Denver Regional)

2009-2010 (Best Design Award-Denver Regional)

FIRST Lego League

2005 – 2006 (Programming Award)

2006 – 2007 (3rd place in Montana Regional, Robot Design Award)

2007 – 2008 (2nd place in Montana Regional, Robot Design Award)

2009 – 2010 (3rd place in Idaho Qualifying Tournament, Teamwork Award)

Simcity – Future City Design

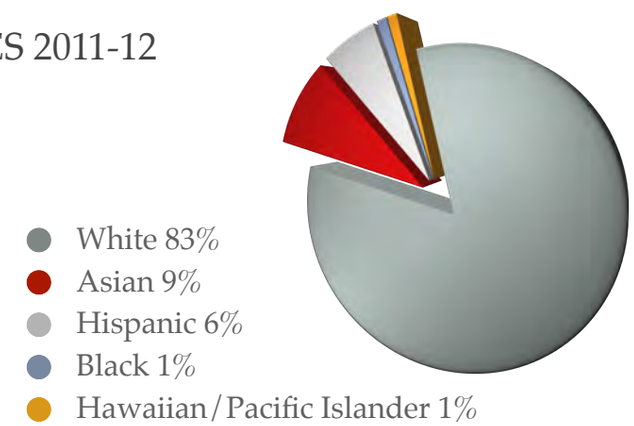
2006–2007(the best futuristic transportation system award in Idaho Regional)

2007–2008(3rd place overall in Idaho Regional)

iSchool Campus deployment included a complete overhaul of all data closets and wiring including Wireless upgrade, installation of classroom audio, projectors in each classroom, one new iMac Lab including desk installation, wiring, configuration and training. As with all other schools, the deployment included all configuration and setup of iPads, laptops, servers, and training staff. Deployment began on Oct. 7, 2013 and finished on Oct. 10, 2013.

Figure 4.1.d Beehive Science & Technology Academy Demographics

Source: NCES 2011-12



Utah state demographic averages: White = 77%, Hispanic = 15%, Hawaiian/ Pacific Islander = 2%, Asian = 2%, Black = 1%, and Native American = 1%.

The following table provides the Beehive Science and Technology CRT grade level scores for the years 2010 to 2013 for each subject area. The four year average for each grade level is also reported.

Figure 4.2.d Beehive Science & Technology Academy Academic Achievement (2010-2013)

SCHOOL	SUBJECT	GRADE/ LEVEL	2010	2011	2012	2013	4 YEAR AVERAGE
BEEHIVE SCIENCE & TECHNOLOGY ACADEMY (BSTA)	LANGUAGE ARTS	7TH GRADE	84%	65%	92%	85%	81.5%
		8TH GRADE	86%	89%	84%	96%	88.75%
		9TH GRADE	95%	91%	87%	90%	90.75%
		10TH GRADE	79%	100%	100%	95%	93.5%
		11TH GRADE	86%	82%	100%	89%	89.25%
	MATH-EMATICS	7TH GRADE	61%	43%	96%	93%	73.25%
		PRE-ALGEBRA	76%	76%	67%	96%	78.75%
		GEOMETRY	73%	38%	97%	85%	73.25%
		ALGEBRA 1	57%	65%	94%	75%	72.75%
		ALGEBRA 2	14%	4%	50%	81%	37.25%
	SCIENCE	7TH GRADE	58%	54%	89%	76%	69.25%
		8TH GRADE	75%	65%	74%	89%	75.75%
		BIOLOGY	70%	72%	78%	76%	74%
		CHEMISTRY	35%	100%	32%	52%	54.75%
		PHYSICS		57%		69%	

Achievement Scores

At the time of this report the Utah SAGE scores have not been released by the Utah State Office of Education.

iSchool Update Infrastructure and Professional Development

1. Time line of Professional Development

Beehive Science and Technology Academy utilized a total of six professional development training days during the 2013-14 school year (September, October and November of 2013 and January of 2014), as well as three professional development training days in preparation for the 2014-15 school year (August, 2014). Courses included Macbook and iPad basics, iPad review, core subject technology training, app workflow courses, and one-on-one teacher/small group training sessions.

2. Device replacement/repairs: fifteen iPad glass repairs. Two iPad replacements.

3. Apps provided

The school manages what apps are installed/removed for each grade/class/student through their individual VPP (Volume Purchase Program) credits with Apple. They selected apps based on the list of apps provided at the end of this iBook under Apps covered in PD.

Additional Research

Of the 316 students at BSTA, 151 responded to the survey. When asked how often they used the iPad for different activities 70% responded they took notes daily using the iPad, 65% checked grades daily, and 60% responded they used the iPad daily to access class content. One student responded, "Please give us more freedom for the iPads. It blocked a lot of sites that are very helpful for research. I found multiple cases of this and the most needed things were blocked. Also there was a thing with iCloud; it would not be able to be fixed unless you were on the school Wi-Fi. Basically they were very helpful for what we could access, but there really wasn't anything unblocked so we couldn't do much, but when we had access to something it was amazing."

When asked what they felt was the biggest advantage 12% responded being able to research. Second to research responding students ranked taking notes followed by more efficient in completing assignments. The biggest problems students identified were distraction (20%), too much restriction for accessing Internet and apps (16%) and games (11%). One student responded, "The reason there was no advantage to learning using these iPads is because they had so many things blocked and restricted. It was too much work to use clean video search and clean image search, and it was terrible that you had to click on more than ten websites until one was actually opened because of the restrictions. At this point, what is stopping me from pulling out my iPhone and finding all the information faster and easier?"

When asked how the iPad was used for schoolwork, 15% responded the iPad was used for in-class assignments, 12% for taking notes and 12% for completing homework. The most often mentioned apps and sites were Edmodo, Google Drive and Khan Academy.

Fifteen teachers responded to the teacher survey. All 15 responded they felt comfortable using an iPad in their teaching. One-third of the responding teachers use the iPad daily in their instruction. Two teachers do not use iPads in their classrooms. Nine of the responding teachers indicated that it takes between one to

three hours weekly to incorporate technology into their teaching. Of the responding teachers 87% indicated the iPad helped them respond to a variety of learning styles while changing the pace of classroom work and helping students be more digitally literate ranked equal at second. Responding teachers marked educational apps as the most beneficial use of iPads in their classrooms.

One teacher stated, "One of the biggest issues that I have seen, is that while the iPad is a great resource, a lot of the apps that are meant to increase ease of making assignments and quizzes, were difficult or had multiple problems when trying to create the assignments or have the students take them. I also felt that a few of the apps developed by Apple, such as pages and keynote, should have been accessible to the students as they would have allowed students to write papers without a need to be connected to the internet. I also think that the iPad has wonderful sharing capabilities that would make turning in assignments much easier if they were to be utilized."

Another teacher shared, "It would be nice to utilize these iPads alongside other great technologies that are missing from our school, such as SMART boards and complementing software. A SMART board gives students the opportunity to express themselves interactively and productively with newer technology in the classroom, and also exposes them to other interface familiarities and programming exposure. I think it is also important to note that the iPads are most effective as a complement to the basic instruction, and that we do not become too dependent on technology to teach our students."

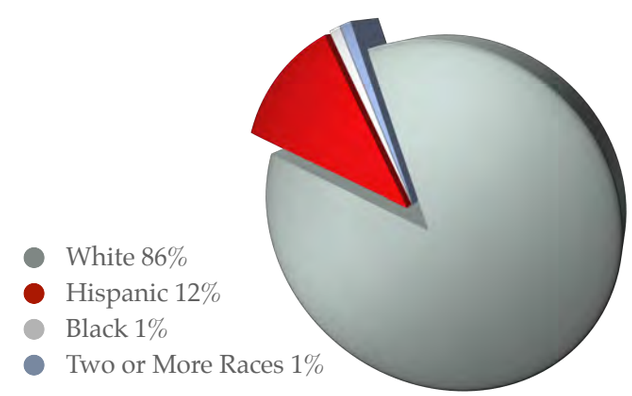
Pinnacle Canyon Academy, Charter School, Price Utah

Pinnacle Canyon Academy opened in 1999 as a charter school serving students in grades K-12. At Pinnacle Canyon Academy, the student body makeup is 53 percent male and 47 percent female, and the total minority enrollment is 14 percent. Students per teacher ratio is 16:1 with 55.6% students eligible for subsidized lunch. The SMART School Technology Evaluation Study evaluates only grades 6-12 for a total of 326 students. Roberta Hardy is the Principal and Founder of Pinnacle Canyon Academy.

iSchool Campus deployment included a complete overhaul of the entire wired and wireless network with CAT6 to every room and lab, new firewall, filter, servers, etc. As with every new school, configuration, setup of all iPads, laptops, computers, and training IT staff was completed. Deployment began on Nov. 25, 2013 and finished on Nov. 29, 2013.

Figure 4.1.e Pinnacle Canyon Academy Demographics

Source: NCES 2011-12



Utah state demographic averages: White = 77%, Hispanic = 15%, Hawaiian/ Pacific Islander = 2%, Asian = 2%, Black = 1%, Native American = 1%, and Two or more = 1%.

The following table provides the Pinnacle Canyon Academy CRT grade level scores for the years 2010 to 2013 for each subject area. The four year average for each grade level is also reported. Highlighted grade/content are baseline data for this study.

Figure 4.2.e Pinnacle Canyon Academy Academic Achievement (2010-2013)

SCHOOL	SUBJECT	GRADE/ LEVEL	2010	2011	2012	2013	4 YEAR AVERAGE
PINNACLE CANYON ACADEMY	LANGUAGE ARTS	6TH GRADE	64%	66%	85%	68%	70.75%
		7TH GRADE	55%	66%	84%	88%	73.25%
		8TH GRADE	45%	83%	88%	93%	77.25%
		9TH GRADE	69%	63%	76%	88%	74%
		10TH GRADE	79%	81%	82%	86%	82%
		11TH GRADE	64%	67%	100%		
	MATH-EMATICS	6TH GRADE	47%	63%	59%	45%	53.5%
		7TH GRADE	66%	66%	80%	67%	69.75%
		PRE-ALGEBRA	14%	56%	69%	75%	53.5%
		GEOMETRY	40%	69%	57%	36%	50.5%
		ALGEBRA 1	53%	38%	37%	43%	42.75%
		ALGEBRA 2	44%	58%			
	SCIENCE	6TH GRADE	53%	54%	66%	39%	53%
		7TH GRADE	34%	51%	81%	50%	54%
		8TH GRADE	31%	35%	59%	56%	45.25%
		EARTH SYSTEMS	31%	45%	40%	66%	45.5%
		BIOLOGY	49%	45%	54%	51%	49.75%
		CHEMISTRY	0%	8%			

Achievement Scores

At the time of this report the Utah SAGE scores have not been released by the Utah State Office of Education.

iSchool Update Infrastructure and Professional Development

1. Time line of Professional Development

Pinnacle Canyon Academy utilized a total of five professional development training days during the 2013-14 school year (January, March and May of 2014), as well as two professional development training days in preparation for the 2014-15 school year (August, 2014). Courses included Macbook and iPad basics, Google apps for education, app smashing and one-on-one teacher/small group training sessions.

2. Device replacement/repairs: 12 iPad Glass Repairs

3. Apps provided

The school manages what apps are installed/removed for each grade/class/student through their individual VPP (Volume Purchase Program) credits with Apple. They selected apps based on the list of apps provided at the end of this iBook under Apps covered in PD.

Additional Research

Use of iPads in instruction and learning (Appendix G). A formative evaluation of the pilot program and a subset of the full Smart School Technology evaluation study was conducted. A Google Form survey collected information from the school's 15 teachers and 176 students. Two basic questions about teachers' and students' perspectives in the iPad initiative were examined. Specifically, (1) what do teachers and students think are the benefits and challenges using iPads in schools and (2) how are the iPads being utilized by teachers and students?

In analyzing the reported data, it is noted that some teachers indicated an increased student engagement, motivation and achievement associated with using iPads in the school. Forty-three

percent of the teachers responded that they had seen measurable improvement in student achievement in their classroom. Fifty-three percent of the teachers responded that one benefit they've seen is for their students to be able to reinforce and expand on the content being taught. The teachers responded that they felt support in learning to use an iPad and how to integrate the use of mobile technology into instruction. Noted as well is that 93% of the teachers felt either comfortable or very comfortable using the iPad for instruction. Only one teacher responded they felt 'neutral' in their comfort level.

Students indicated an increase in ease of completing assignments and communicating with teachers came with iPad availability. Students also responded that checking on assignments to be graded, and their grades was much easier using an iPad. Of the students responding, 67% said they use an iPad daily in their classroom. Seventy-three percent use the iPad daily for Google Doc/Drive and 33% used the iPad to communicate daily with their teachers. One student responded that a benefit of having an iPad is, "… having the Internet in the palm of your hands".

This research briefly highlights a few of the possible results that can be achieved through one-to-one computing. As one-to-one programs move from the experimental stage and become more ingrained in regular practice, research may begin to reveal additional benefits and concerns.

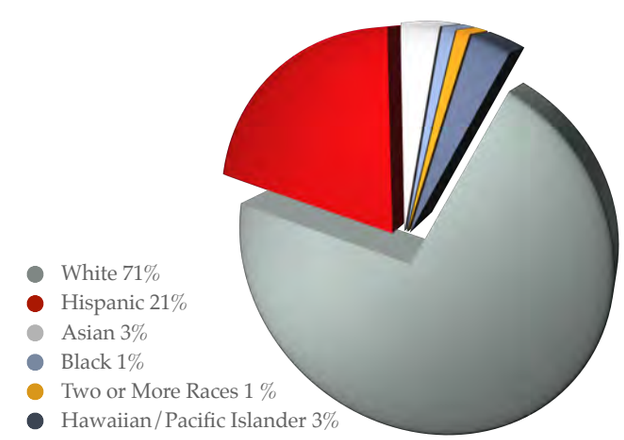
Freedom Preparatory Academy, Charter School

Freedom Preparatory Academy, a newly chartered school, located in Provo, UT serves 672 students in grades K-8. The student teacher ratio is 25:1. Forty-eight percent of the students are eligible for subsidized lunch. Fifty-four percent of the student population is female (46% male). The Smart School Technology Evaluation Study looked only at grades 9-12, for a total of 285 students. Chris Helvey is the Smart School contact for Freedom Preparatory Academy.

iSchool Campus deployment included whole-school wireless installation, wiring to all classrooms and data closets, offices, etc throughout school. iSchool Campus installed TVs, and iTVs, Classroom Audio, servers, switches, computer labs, configured all iPads, server, lab computers and teacher computers. Deployment began on Sept. 2, 2013 and finished on Sept. 6, 2013.

Figure 4.1.f Freedom Preparatory Academy Demographics

Source: NCES 2011-12



Utah state demographic averages: White = 77%, Hispanic = 15%, Hawaiian/ Pacific Islander = 2%, Asian = 2%, Black = 1%, Native American = 1%, and Two or more = 1%.

Achievement Scores

Being a newly chartered school there are no CRT scores for Freedom Preparatory Academy. At the time of this report the Utah SAGE scores have not been released by the Utah State Office of Education.

iSchool Update Infrastructure and Professional Development

1. Time line of Professional Development

Freedom Preparatory Academy utilized a total of three (3) professional development training days during the 2013-14 school year (September of 2013). Courses included Macbook and iPad basics and App Smashing: creating workflow for the classroom.

2. Device replacement/repairs: 4 iPad Glass Repairs

3. Apps provided

The school manages what apps are installed/removed for each grade/class/student through their individual VPP (Volume Purchase Program) credits with Apple. They selected apps based on the list of apps provided at the end of this iBook under Apps covered in PD.

Additional Research

Use and benefits of iPads in classroom instruction and learning (Appendix D). A formative evaluation of the pilot program and a subset of the full Smart School Technology evaluation study was conducted by a BYU faculty member and doctoral student. Two basic questions about the teachers' and parents' perspectives in the iPad initiative were sought. Specifically: (1) What do teachers and parents think are the benefits and challenges to the one-to-one iPad implementation at the school and (2) How are the iPads being used by teachers and students?

The data would indicate that overall it seems that teachers and parents feel that iPad availability has been a net positive. Most teachers indicated that the iPads have enhanced their professional development (78%), expanded/reinforced what they have been able to teach (94%), helped them respond to various student learning styles (86%), and helped them better meet the needs of advanced learners (86%). Most teachers indicated using the iPads at least two to three times a week, and for activities as varied as teacher presentation of material, to supporting student research and writing. It is important to note that the frequency of use was evenly distributed among teachers with different levels of teaching experience. Experienced teachers with more than 10 years of experience were just as likely to report frequent use of the iPad as newer teachers with less than three years of experience.

From the parents there were more positive than negative comments about the iPad program. The benefits to students that parents reported most frequently included an increase in student skills with technology, improved student ability to organize school work,

an improvement in student learning and creativity, improved communication with teachers, increased sense of pride and responsibility, and improved student access to technology. The data seemed to strongly support continued implementation of the iPad program, from the parental point of view.

Utah Career Path High School, Charter, Kaysville

Utah Career Path High School, a newly chartered school, is housed within the walls of the campus of the (DATC) Davis Applied Technology College. The Career Path High is a blended learning flex model. Students are expected to graduate from Career Path High with a high school diploma, a completed industry-based technical certificate, and may additionally and simultaneously earn college credits that matriculate to an Associate of Applied Science degree. The school serves grades 9 – 12 with 175 enrolled students. Judy Clark is the Smart School contact for Utah Career Path High School. No demographic data is available.

iSchool Campus Deployment included wireless installation, wiring to TV's and lab, imaging all computers and server, configuration of filter, firewall, fiber internet installation, installation of TV's, and iTV's. Deployment began on Aug. 19, 2013 and finished on Aug. 21, 2013.

Achievement Scores

At the time of this report the Utah SAGE scores have not been released by the Utah State Office of Education. Being a newly chartered school there are no CRT scores for Utah Career Path High School.

iSchool Update Infrastructure and Professional Development

1. Time line of Professional Development

Utah Career Path High School utilized a total of four (4) professional development training days during the 2013-14 school year (August of 2013). Courses included student orientation bootcamp: iPad basics, repair and replacement.

2. Device replacement/repairs: one computer replacement.

3. Apps provided

Since the students use Macbook Air's, there are no specific Apps that were installed other than Google Drive, Google Chrome and SAGE Testing browser.

APPENDIX A

Study Overview

Study Overview

The study will look at 2 overarching research questions in light of three populations.

Research Questions:

- Q1: Do participants use the iPad? Why or why not?
- Q2: To what degree/in what ways does the use of the iPad make a difference in

  a) learning achievement

  b) instruction

  c) affective characteristics (motivation, efficacy, attitudes)?

Populations:

Students

Teachers

Principals

Study Design

Part A:

- Purpose: Answer Q1.
- Populations: Teachers, and principals in the three participating schools.
- Instruments/Data: Survey, observation (school visit), and/or interviews/focus groups.
- Design: Multiple measures from all participants or a sample of the participants.

Part B:

- Purpose: Answer Q2.
- Populations: Teachers and students using the iPad and their principal.
- General Design: Obtain data from/for the entire populations or a sample.

Figure 5.1 More Detailed Design:

RESEARCH QUESTIONS:	POPULATIONS	INSTRUMENTS/DATA	DESIGN
2A) LEARNING ACHIEVEMENT	Students	End of Year Test Scores, Unit Tests, Reading Inventory, Math Assessment	Pre and Post Test of Non-Equivalent Groups (treatment and control)
2B) INSTRUCTION	Students and Teachers	Surveys, Observations, Interviews/Focus Groups, Tracking of How iPads are Used (if feasible and appropriate)	Multiple Measures of Treatment Group
2C) EFFECTIVE ENGAGEMENT	Students, Teachers and Principals	Survey	Pre and Post Test of Treatment Group

Figure 5.2 Variables of Interest:

RESEARCH QUESTIONS	DEPENDENT VARIABLES	INDEPENDENT/MITIGATING VARIABLES
2A) LEARNING ACHIEVEMENT	Student learning	Use of iPad In Instruction, Affective Characteristics, Background With Technology, Demographics (Individuals and School), Teacher Educational Background
2B) INSTRUCTION	Instruction	Use of iPad, Affective Characteristics, Background with Technology, Demographics (Individuals and School), Teacher Educational Background
2C)EFFECTIVE CHARACTERISTICS	Motivation, Efficacy, Attitude	Use of iPad in Instruction, Demographics (Individuals and Schools), Learning Achievement

APPENDIX B

iPad apps

iPad apps by Content

Science

Body Organs

Inside Nature's Giants

Frog Dissect

NASA

BrainPop

Science 360

The Elements

Meet the Insects

Google Earth

Discovery News

EyeDecide

Journal

iDiary

Day One

Math

Math Bingo

Math Puppy

Math Ninja

Rocket Math

Reading/Literacy

PBS Kids

Brain Quest

Goofy Mad Libs

My Spelling Test

Hooked on Words

Spelling Bug

Chicktionary

Word Search

Books

Morris Lessmore

Gutenberg

Reading Skills 3A

Bookster

Tales2Go

Subtext

Music

MiniPiano

Garage Band

Learn Guitar

Games

The Oregon Trail

Flow

Geography/History

Stack the States

Tiny Countries

Timeline Battle Castles

Civil War Interactive

Ansel and Clair: Paul Revere's Ride

Other

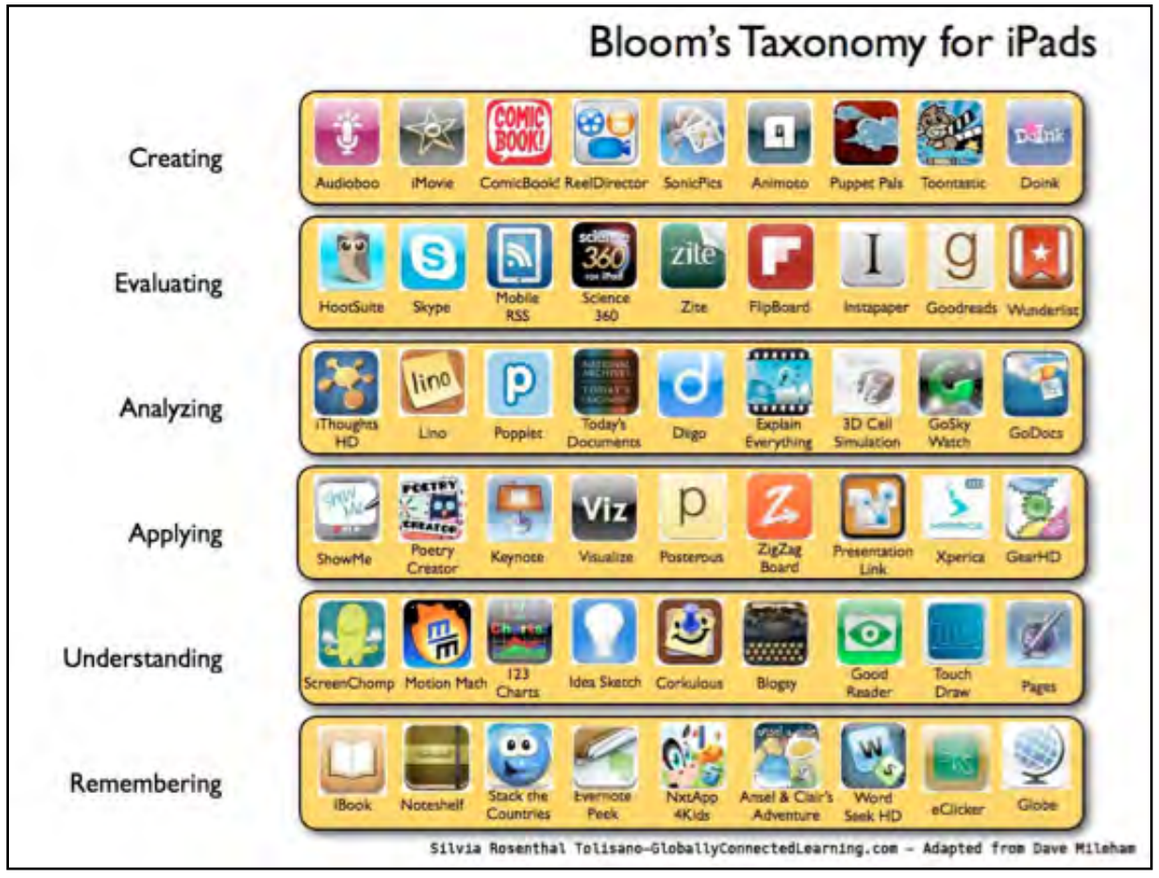
Doodlecast

Pages

iMovie

Penultimate

Bases for Digital Resource Selection



The Digital Learning Farm: Apps for iPads
Curriculum Reviewer
Tutorial Designer
Collaboration Coordinator
Official Scribe
Researcher
Contributor to Society

APPENDIX C

iSchool Reviewed

WEBSITES	DESCRIPTION	GRADE
www.moma.org/explore/mobile/index	moma.org on the go is the mobile version of the New York Museum of Modern Art	All Grades
www.redheads.org/activities/odd_machine/index.html	Grades 2-6, students learn about forces and simple machines	All Grades
www.kidtastic.com/city/city.html	kidtastic is a virtual world of interactive learning for kids	All Grades
www.startinggatepress.com/bytheway.html	free pictures of everyday things from starting gate press. get students thinking, talking, and writing about observations using inferences	All Grades
www.rtpi.org/electronic-naturalist	k-8 interactive, science lesson every two weeks.	All Grades
www.funbrain.com/teachers/index.html	free online games for students to practice curriculum skills.	All Grades
www.eo.ucar.edu/kids/	kids' crossing web site for science learning	All Grades
www.50waystohelp.com/	50 Ways to Help the Planet uses recycling, energy, and conservation to let students pass on their knowledge using the Share This Link.	All Grades
www.knowitall.org/nasa/index.html	NASA Online, math, science, and technology videos	All Grades
www.learningleaders.org/	free reading resources for parents. Includes free, printable, age-appropriate reading games and activities for use at home or school.	All Grades
www.lot.gov/rr/scitech/mysteries/	Everyday Mysteries are fun science facts from the Library of Congress	All Grades
www.twiter4teachers.pbworks.com/w/page/22554534/frontpage	Twitter4Teachers wiki, created to help educators connect with other educators on Twitter.	All Grades

WEBSITE	DESCRIPTION	GRADES
www.wechoosethemoon.org/	We Choose The Moon - Apollo 11 mission to the moon	All Grades
www.mathplayground.com/wp_videos.html	Solve it! Math Word Problems is a video collection of multistep word problems for active minds.	All Grades
www.eo.ucar.edu/educators/KC_guide_intro.html	Kids' Crossing in the Classroom-science	All Grades
www.exploratorium.edu/	Online museum of science, art, and human perception.	All Grades
www.reading.ecb.org/index.html	INTO THE BOOK - focuses on reading comprehension through interactive strategies.	All Grades
www.readwritethink.org	free resources for teachers	All Grades
www.eduweb.com/pintura/	A Pintura Art Adventure	All Grades
www.kidoz.net/plus/buzz.html	kido'z is a safe, easy, fun Internet browser for kids.	All Grades
www.discoveryeducation.com/teachers/free-lesson-plans/virtual-electron-microscope.cfm	Virtual Electron Microscope powered by Discovery education.	All Grades
Khan Academy	With a library of over 2,400 videos covering everything from arithmetic to physics, finance, and history and 125 practice exercises, we're on a mission to help you learn whatever you want, whenever you want, at your own pace.	All Grades
www.mathcounts.org	National math enrichment aligned with the Common Core State Standards to support the classroom math curriculum.	All Grades
www.PBS.org/wgbh/nova/bridge	Build a Bridge, students investigate the role of civil engineers based on different scenarios.	All Grades

WEBSITE	DESCRIPTION	GRADE
www.pbskids.org/whiteboard/	Free interactive whiteboard games for Language Arts, Math, Social Studies, and The Arts	All Grades
www.reading.ecb.org/teacher/	the TEACHER AREA for "INTO THE BOOK"	All Grades
TED Talks	Great website full of new ideas and inspiration. Great for warm up activities.	All Grades
www.new.scholastic.com/math/	Numbers in the News! is a weekly news story involving numbers with a question to solve.	All Grades
www.learning.blogs.nytimes.com/	The New York Times Learning Network is a free online resource for current events and interdisciplinary curriculum. Daily New Quizzes, Word of the Day, On This Day in History, Front Page Podcast, and Lesson Plans.	All Grades
www.carrotsticks.com	Grades 1-5, designed by the Stanford School of Education, math challenge where students compete with their peers around the world.	Grades 1-5
www.isaveatree.com/publicschoolsusa/	Virtual Library 2.0 software and iBook with 15 interactive books and Mac records that can be downloaded and installed on a server so all students and teachers can access the iBook titles.	All Grades
www.nrich.maths.org/public/	Free mathematics enrichment for K-12 graders	All Grades
www.magpo.com/kidspoetry/playonline.cfm	Magnetic Poetry Kids' Kits Online	All Grades
www.schoolimprovement.com	Professional development for teachers.	All Grades
www.quest.bluezones.com/education/blue-zones-challenge/	health/fitness online challenge	All Grades
www.globe.gov	Global Learning and Observations to Benefit the Environment, inquiry-based investigation and innovation-critical thinking and problem solving.	All Grades

WEBSITE	DESCRIPTION	GRADES
www.inventionplay.org/playhouse_tinker.html	Lemelson Center for the Study of Invention and Innovation-critical thinking and problem solving	All Grades
www.water.epa.gov/learn/kids/drinkingwater/wsb_index.cfm	324 activities for K-12 environmental education abut water resources and the water cycle.	All Grades
www.freerice.com	FreeRice, Harvard University and United Nations World Food Program - students take online quizzes and a rice meter keeps track of their answers. For every correct answer, FreeRice will donate 20 grains of rice to the UN World Food Program. It takes about 20,000 grains of rice to feed one person for one day.	All Grades
www.learner.org/interactives/periodic/index.html	Periodic Table Interactives	All Grade
www.pbskids.org/webonauts	PBS KIDS GO! Webonauts learn about citizenship, identity, privacy, and web safety.	2nd Grade
www.arcademicskillbuilders.com/games/grand_prix	Grand Prix Multiplication	3rd Grade
www.historyglobe.com/jamestown/	History - Jamestown Online Adventure	6th Grade
www.discoverengineering.org	Discover Engineering	6th Grade
www.stemcollaborative.org	Middle school interactive learning adventures from STEM Collaborative Project	6th Grade
www.dsc.discovery.com		6th Grade
www.EPA.gov/sow/education/mad.html	Free curriculum resources about “greenscaping”, aCycling, and service learning. Plan an Earth Day event!	

WEBSITE	DESCRIPTION	GRADE
www.nbclearn.com/portal/site/learn	Middle school website	7th Grade
www.media-awareness.ca/english/games/allies_aliens/index.cfm	Allies and Aliens: a Mission in Critical Thinking, helps the students recognize bias, prejudice, and hate propaganda and the Internet and other media.	7th Grade
www.tvschoolhouse.com	Middle school resource	7th Grade
www.brightstorm.com/math	2,000 free homework videos for math (Algebra 1, Geometry, Trig, Precalculus, and Calculus).	8th Grade
www.tryengineering.org/play.php#	Try Engineering to create a virtual design solar car, design and test a bionic arm.	8th Grade
www.knowitall/nasa/simulations/math.html	NASA Connect Math, short videos demonstrating algebra and geometry	8th Grade
www.space.com	Middle school science resource	8th Grade
www.knotebook.com	high school physics lessons, sample lessons from MIT Open Courseware or Stony Brook University	8th Grade
www.puzzling.caret.cam.ac.uk/game.php?game=roller	Roller Coaster Design	8th Grade
www.urbanplanetmobile.com/splash.html	North Carolina businessman and lyric tenor in NC Opera offers recorded vocabulary lessons available via cell phone. SAT/GRE Remix has 300 words that commonly trip up the SAT test taker	8th Grade
www.engineeringsights.org	A Sightseer's Guide to Engineering	8th Grade
www.powerupthegame.com/	PowerUp, created for high school students by IBM, Tyrscience, the New York Hall of Science, National Renewable Energy Laboratory, Connecticut Innovation Academy, Center for 21st Century Skills	8th Grade

WEBSITE	DESCRIPTION	GRADE
www.brightstorm.com/science	2,000 videos on Biology, Chemistry, and Physics	8th Grade
www.online-stopwatch.com	Never be without a stopwatch or timer again! Online Stopwatch can be used full screen online or downloaded to your Mac.	Education
www.cotf.edu/eye/	Explore the Environment, hurricanes, Yellowstone Fires, Mountain Gorillas, Water Quality, and Florida Everglades.	Education
www.tikatok.com/	A Barnes & Noble company, teachers can register for free teacher tools to help kick-start a creative writing project. It is a community for children to write, illustrate, and publish a real book.	Education
www.mathopenref.com/	Perfect for the interactive whiteboard, Math Open Reference is a free interactive resource.	Education
www.wordle.net/	Wordle is a creative tool for generating "word clouds" from any provided text.	Education
www.loc.gov/poetry/180/	Poetry 180 for American High Schools, presents a poem a day for 180 days. Also provides Web casts and related resources.	Education
www.lumosity.com	scientific brain games to improve memory and attention.	Education
www.ncrtec.org/capacity/profile/profess.html	teacher tool used to engage learning.	Education
www.quizinator.com	Quizinator is a free e-learning tool for teachers so that they can create, store, and print worksheets, study sheets, exams, and quizzes online.	Education
www.mathopenref.com/cordblank.html	Print Blank Graph Paper is a tool from the Math Open References Website.	Education
www.lauracandler.com	Graphic organizers, activity sheets, and teacher tools. Register for the newsletter and you will have access to template files, which you can modify.	Education
www.curriculumbits.com/prodimages/details/misc/nv1.swf	Non Verbal Reasoning - Analogies	Education

WEBSITE	DESCRIPTION	GRADE
www.sliderocket.com	Create, manage, and deliver online presentations. Organize a presentation library and share it on the Web.	Education
www.science.vocabulary.com	Specialized science terms can be made into links that can be looked up in a dictionary or reference site.	Education
www.planbookedu.com	PlanBookEdu, make lesson plans available anywhere, anytime. Basic service is free and allows one plan book per year.	Standards
www.COSN.org	Empowering 21st Century Learning K-12 Technology	Technology
www.hitl.washington.edu/artoolkit/	Augmented Reality Technology, overlays digital contention top of real- world surroundings to enhance classroom lessons.	Technology
http://docs.google.com/	Google Docs is a free tool that allows group editing in real time, the document is automatically saved and stored.	Technology
www.teachingdegree.org/2009/06/30/50-awesome-ways-to-use-skype-in-the-classroom/	50 Awesome ways to use Skype in the classroom.	Technology
www.jingproject.com/	JING is free software that lets users snap a photo or record video and share over the Web or Instant Messaging.	Technology
www.thetech.org/exhibits/online/robotics/	Tech Museum of Innovation, the history and workings of robots and robotic cars.	Technology
www.tagxedo.com/	Turn famous speeches, news articles, slogans, and themes, into a visual tag cloud.	Technology
www.architectstudio3d.org/AS3d/home.html	Design a house with Frank Lloyd Wright.	Technology
http://edu.glogster.com/	Glogster EDU is free and allows 50 student management. A multi-sensory collaborative learning platform that allows teachers and students to express their creativity, knowledge, ideas, and skills in a unique way.	

WEBSITE	DESCRIPTION	GRADE
www.polldaddy.com/	Add a student poll to your class Web page survey features Unlimited FREE polls, Polldaddy skins to customize your pictures and video to polls.	Technology
www.pptpalooza.net/	PowerPoint Palooza! 220 educational slides for the geography, social studies, and history. Download the files before using them.	Technology
www.oovoo.com/	ooVoo allows two-way video chat	Technology
www.edmodo.com	Edmodo is a social learning network designed for K-12 educational use. Teachers can create free communication for teachers, students, and administrators on a secure social network for the classroom. Educators can store and share all forms of digital content-blogs, links, pictures, video, documents, and presentations that are accessible online or on Android and iPhone.	Technology
http://wvde.state.wv.us/instructionalguides/	Teach 21 Instructional Guides - project-based assessments with rubrics (K-12)	Technology
www.watchknow.org/	WatchKnow has free educational videos for grades K-12 classroom. Register to upload the videos to your computer. 50,000 educational videos.	Technology
www.bubble.us/	Create mind maps and share them online.	Technology
http://edu.glogster.com/download/glogster-edu-educator-resource-library.pdf	Educator Resource Library available to download as a PDF.	Technology

APPENDIX D

Dixon/Freedom iPad Implementation

Introduction

The Utah State Legislature has made a substantial investment to provide Utah students with 21st century skills and abilities, by funding a three year pilot of one-to-one mobile computing devices in select schools around the state. This report is a formative evaluation of this pilot program, and represents a subset of the evaluation funded as part of the SmartSchools project.

In this report, we describe our evaluation methods and instruments, and then report findings from both a teacher and parent survey we administered to the Dixon and Freedom Academy populations. We then conclude with overall thoughts and conclusions.

For more information, contact us at:
Dr. Richard E. West, rickwest@byu.edu
Kristine Manwaring, kristine.manwaring@byu.net

Evaluation Questions

In this evaluation, we sought to answer two basic, yet important, questions about the teachers' and parents' perspectives in this iPad initiative. Specifically:

1. What do teachers and parents at Dixon Middle School and Freedom Preparatory Academy think are the benefits and challenges to the one-to-one iPad implementation at their school?
2. And how are the iPads being used by teachers and students?

The overarching goal of this evaluation will be to give the funding agency and school administrators, practical, pragmatic findings that will help them understand and improve this pilot program.

Methodology

In order to address the evaluation questions, we employed a mixed methodology design that included surveys with both forced and open-ended responses, interviews, and classroom observations. Only two interviews and classroom observations were completed in time for this report, and thus this report will primarily provide the findings from the survey.

Survey Instrument

We developed the survey items after consulting with administrators at both Freedom Academy, Dixon Middle School, and a survey of the literature on technology adoption practices and models. Administrators at each school suggested questions that we included in the final instrument. The survey questions are included in Appendix A.

The questions on the teacher survey covered four main topics:

1. Sources of support and training
2. The effects of the program on their teaching and preparation
3. The types and frequency of use in the classroom
4. The effects of the program on students

In addition, we asked two broad open-ended questions: "What has gone well with the iPad implementation so far?" and "What are some issues/concerns you have had with the iPad implementation so far?"

1. The survey questions on the parent survey covered three main topics:
   a. The types of observed iPad use in their home
   b. The perceived effects of the iPad program on their child
   c. Concerns or problems with the iPad being in their home

In addition, we asked a broad open-ended question: "Take a moment to write any comments, ideas, thoughts, or suggestions you have about the one-to-one iPad program in your child's school, including what you perceive to be benefits and challenges of using the iPads."

Sampling & Data Collection

We sought the widest net of potential survey participants. We surveyed teachers at both schools during their faculty meetings, and nearly all of the teachers involved in the iPad implementation

participated (n=39 teachers from Dixon and n=17 teachers from Freedom). The teacher survey was taken online through Qualtrics.

The parent survey was also available online through Qualtrics, and each school sent an access link to all parents through email. In addition, we handed out paper copies of the survey to parents at a parent-teacher event at Freedom and at two student music concerts at Dixon. Paper copies of the survey were available in both Spanish and English. Paper copies of the survey were entered into Qualtrics by hand. Surveys completed in Spanish were translated prior to being entered into Qualtrics. In all, 192 parents completed the survey.

We selected two teachers to observe and interview. The observations allowed us to see how both teachers and students use and manage the devices during their instruction. The interviews explored teachers' overall impressions of the program, unique uses they have incorporated, and how they overcame challenges in implementing the iPads in their instruction.

Data Analysis

Survey data was cleaned and organized in Excel and entered into SPSS for analysis. Frequencies and cross-tabulations were completed to look for patterns that would enrich understanding of the program. The open-ended responses were analyzed by parsing the comments into individual thoughts to facilitate coding, and then categorized by comparing comments with each other to determine those comments that reflected similar thoughts. Between the two surveys, over 300 individual thoughts were coded. Frequencies were created for each coding category, and then we looked for themes across the categories that represented meaningful understandings of the teachers' and parents' perspectives.

Findings

We will report the findings for each of the surveys according to the questions that the results helped to answer.

Teacher Survey

How do teachers learn to use the iPads, and how well do they feel supported?

Teachers reported that their biggest source of support for learning how to use and integrate iPads into their classroom management and pedagogy were other teachers. This was true for learning technical skills, classroom management strategies while using the devices, and curriculum/pedagogy approaches. Professional development within their schools was the second most selected source of support and training. Several Dixon teachers said they had received great support from their school and district technology staff. One person said the initial training by iSchool Campus had been very effective, but 12 teachers expressed dissatisfaction with the level of support and training offered by iSchool Campus. A quarter of the teachers indicated mostly learning from the Internet about curriculum and pedagogical strategies for using the iPads.

Table 1.

What has been most helpful in developing your technical, classroom management, and pedagogical skills with the iPads?

	TECHNICAL SKILLS	CLASSROOM MANAGEMENT	CURRICULUM & PEDAGOGY
HELP FROM OTHER TEACHERS	40%	49%	34%
PROFESSIONAL DEVELOPMENT IN YOUR SCHOOL	19%	26%	19%
TRAINING FROM ISCHOOL CAMPUS	17%	4%	4%
PROFESSIONAL DEVELOPMENT FROM DISTRICT STAFF	6%	0%	4%
RESOURCES AVAILABLE ON THE INTERNET	11%	8%	26%
OTHER	8%	13%	13%

In addition to where teachers learned about using the iPads in their teaching, we also wanted to know how well supported the teachers felt in this pedagogical change. We asked teachers to rate how supported they felt in the same three areas of technical skills, classroom management and curriculum and pedagogy. The majority of teachers reported that that they felt supported in these three areas. However, up to a third of the teachers reported that they disagreed to some extent with their level of support in each of the three areas.

Table 2.

To what extent do you agree with the following statements?

	STRONGLY DISAGREE	DISAGREE	SOMEWHAT DISAGREE	SOMEWHAT AGREE	AGREE	STRONGLY AGREE
I FEEL SUPPORTED IN LEARNING IPAD SKILLS	4% (2)	9% (5)	15% (8)	33% (18)	30% (16)	9% (5)
I FEEL SUPPORTED IN LEARNING HOW TO INTEGRATE IPADS INTO MY CLASSROOM	6% (3)	7% (4)	21% (11)	36% (19)	26% (14)	4% (2)
I FEEL SUPPORTED IN LEARNING HOW TO INTEGRATE IPADS INTO MY CURRICULUM AND PEDAGOGY	4% (2)	9% (5)	15% (8)	37% (20)	30% (16)	5% (3)

Recommendations

Two teachers suggested that the iPad training at the beginning of the year would be more effective if the teachers were broken into smaller groups based on ability level. That way the inexperienced teachers would have more time to cover the basics, and the more advanced teachers could work on actual lesson plans and learning activities.

Since teachers reported that they learned the most from other teachers, we recommend more time for teachers to collaborate with and learn from each other. One teacher said that she and another teacher sometimes went to school on Saturday mornings to collaborate on lesson ideas for using the iPads. Rather than expecting teachers to do this collaboration on the weekend, finding ways that teachers can collaborate at school, especially when they could benefit from the input of more of their colleagues, could be useful. In addition, while some teachers indicated the iSchool Campus training was useful for technical skills, most did not find it useful for learning classroom management or pedagogical uses for the iPads, thus, it could be useful to dedicate resources and time to other opportunities for teachers to learn these critical skills.

How does the iPad program affect teaching and preparation?

We asked teachers about the effect of the iPad pilot on their teaching and preparation. In terms of how much time teachers

need in order to implement iPads into their instruction, 70% of teachers said it takes them an extra 1-3 hours per week and 9% said it takes 4-7 hours of extra effort each week. Only 19% said it does not take any extra time during the week to implement iPads into their instruction. Teachers spending 1-3 hours extra each week equates to 36 to 108 extra hours of preparation over the course of a school year. This preparation time seems to have been effective, though, as two thirds of the teachers indicated they agreed or strongly agreed that they were comfortable using an iPad in their teaching practice.

The majority of teachers also agreed that iPads help them better meet the needs of advanced and struggling learners, reinforce and expand on the content they are teaching, respond to a variety of learning styles and change the pace of classroom work. However, they also reported that iPads make classroom management more difficult.

Table 3.

To what extent do you agree with the following statements?

	STRONGLY DISAGREE	DISAGREE	SOMEWHAT DISAGREE	SOMEWHAT AGREE	AGREE	STRONGLY AGREE
I FEEL COMFORTABLE USING AN IPAD IN MY TEACHING PRACTICE	4%	4%	1%	24%	39%	28%
USING IPADS IN MY CLASSROOM ENHANCES MY PROFESSIONAL DEVELOPMENT	2%	7%	13%	34%	36%	8%
USING IPADS HELPS ME REINFORCE AND EXPAND ON THE CONTENT BEING TAUGHT	2%	2%	2%	38%	36%	21%
USING IPADS HELPS ME RESPOND TO A VARIETY OF LEARNING STYLES	0%	2%	11%	28%	47%	11%
USING AN IPAD HELPS ME BETTER MEET THE NEEDS OF ADVANCED LEARNERS	1%	4%	9%	41%	30%	15%
USING IPADS HELPS ME TO CHANGE THE PACE OF THE CLASSROOM WORK	2%	5%	15%	30%	35%	13%

Teacher comments concerning the positive changes the iPad program has brought to their classroom instruction included:

"I am able to offer more educational options."

"Creative work can be easily applied to various assignments."

"It allows more high order thinking tasks such as synthesis and analysis."

"I am able to re-teach more effectively."

"I can implement very fun ways to teach/learn/interact/plan."

[I can give] "more explicit modeling of research strategies."

"Allowing students to do research projects in class or at home without having to reserve a library."

"Having handouts on line."

"Students are emailing me their assignments daily, and my feedback is much more timely."

"It is very convenient to have my presentations on the iPad and be able to play them in any room of the school."

The survey results, however, did reveal challenges teachers faced with incorporating the one-to-one iPad program into their classrooms. The majority of teachers agreed, "iPads make classroom management more difficult" as well as "it makes students more distracted and harder to teach."

Common teacher comments concerning the challenges of using iPads in their classroom included:

"There are many distractions with the iPads that add to my work of monitoring students for inappropriate use."

"The students are very easily distracted by playing on iPad, and it looks like they are taking notes."

"The students that aren't motivated with regular classroom instruction often times are just distracted by the iPad"

"It can be easy for students to distract themselves with other things such as games and websites instead of getting work done."

Even high use teachers agreed that student distraction is a problem. However, we interviewed and observed two teachers, and found that they used many techniques for managing distraction successfully. In addition, one teacher volunteered in the survey, "Setting strict, clear expectations about their use in the classroom makes implementing iPads so much better and smoother." These included establishing protocols for when the iPads were kept in backpacks or placed, screen down, on the desk. One teacher had the students practice these procedures many times at the beginning of the school year. Both teachers interviewed also said that when the students were doing individual or group work, teachers needed to walk around the room and monitor use, but they said they would be doing that anyway. These two teachers felt like the advantages of the iPads outweighed the extra effort required to deal with distraction.

A second source of tension for teachers in implementing iPads in their classrooms was uncertainty with students being responsible with the devices, school procedures that interfered with using the iPads, and technological challenges. First, since students take their iPads home, there is the chance they will not bring them to class, or that they might not be charged, ready to support their learning. One teacher commented: "When the kids bring their iPasd to school, we can do assignments. I have one scheduled for today, but I don't know if they all will show up with one so they can do it." This uncertainty requires teachers to always have backup plans, such as printed work for students, which can add to the planning burden.

In addition to worrying about students bringing their iPads, a few teachers at Dixon mentioned that all of the iPads were taken for updating during the winter, and that they were surprised by how long it took for them to be returned to students. One teacher explained, "Updating iPads was very inhibitive to instruction. It was very difficult to [have] the iPads away from them for a couple weeks. It made it really hard to be consistent in lesson planning, etc. At the beginning of the new semester, with new students, it made it difficult to get them set up in Edmodo groups and other technologies that are needed."

Some teachers also experienced uncertainty about whether or not the technology would work for them. Teachers at Freedom mentioned that they were having problems with Airplay not work-

ing. Once teachers lost confidence in the technology, they were less likely to use the iPads in their instruction. One teacher explained, "Technical problems with connecting to the Internet can absolutely sabotage my lessons. On any given day, 10 percent of my students can't join us in doing the lesson because of some technical issue. Trying to fix these issues in class robs instructional time."

Finally, one teacher expressed uncertainty about what will happen when the iPad pilot is completed. Will they be able to continue with the lessons they have developed? This long-term uncertainty might discourage teachers from fully committing to making significant changes to their pedagogy.

Recommendation

We will explore the extent of student distraction and how teachers manage it more fully in next year's evaluation. In the meantime, we recommend teachers receive direct training on managing distraction and have the opportunity to collaborate with other teachers and come up with successful techniques and solutions that can be applied throughout the schools.

We recommend that teachers be made aware of when iPads will be taken from students for updates and that the updates be performed as quickly as possible. In addition, technical problems need to be solved quickly so that teachers develop the confidence in the technology they need to plan lessons with the iPads.

How are the iPads used in the classrooms?

We asked how often teachers used the iPads and what types of applications were most important and used most frequently. According to the survey data, 72% of teachers used the iPads at least two or three times a week. For teachers who are in their second year of this program, 43% said they were using iPads more than their first year, 40% said the same, and 17% said their usage was less the second year than the first. It is important to note that the frequency of use is evenly distributed among teachers of different levels of teaching experience. In other words, experienced teachers with more than 10 years experience were just as likely to report frequent use of the iPad as newer teachers with less than three years of experience.

Table 4.

This year I have used iPads for classroom instruction:

Daily	**28% (15)**
2-3 times a week	43% (23)
Once a week	11% (6)
Once a month	4% (2)
Less than once a month	6% (3)

We asked teachers to rate how important various potential applications of iPads in their classrooms were to their actual teaching. The following items are listed in the order of importance, based on a 1 (don't use) to 5 (very important) scale. Mean scores are given in parenthesis after each item. Of note, "student research, writing and presenting," was rated as Very Important by the most teachers (18), even though it is ranked fourth overall. The diversity of items

on the list indicate a wide variety of student-focused iPad applications in these classrooms.

- Teacher presentation of instructional materials (3.74)
- Access to educational websites (3.62)
- Access to educational apps (3.58)
- Student research, writing and presenting (3.53)
- Cloud storage access (3.53)
- Student group exercises and assignments (3.49)
- Camera for taking pictures and/or video (3.45)
- Student created multimedia projects (3.40)
- Modifications and accommodations for students with IEPs (3.28)
- Homework options (3.26)
- E-books and e-textbooks (3.17)
- Classroom management such as quizzes and communicating with students (3.06)

In addition to these patterns of common uses, we found several examples of new practices and innovative uses of iPads that are worth mentioning, as follows:

1. A science class worked with a local lighting company to design a light fixture. Using the app Whitegoods Light Meter, the students were able to measure the light and heat radiating from different types of light.
2. A science teacher sent her students on "webquests," or digital scavenger hunts. She gave students the QR codes for websites she preselected and had them gather specific pieces of information from each site.
3. A computer programming teacher had the students use the iPads as a second monitor by displaying the programming instruction on the iPad while using the more powerful desktop computer systems to do programming. This saved a lot of student time by removing the need to switch back and forth between windows on the computers.
4. A teacher said she was able to have her students present their work more often by broadcasting their work to the Apple TV as they sat at their desks. She said students who ordinarily felt very uncomfortable standing in front of the class were much more comfortable sharing their work.
5. Several teachers established email check-in times each evening when they would check their email and answer student questions about homework. One teacher estimated that between 50-70% of her students reached out to her for help or clarification with homework over the course of the year.
6. Many teachers expressed enthusiasm for Edmodo, a social learning platform: "Students can access Edmodo, an online educational website, that has revolutionized my teaching. I'm excited about Edmodo."
7. A Digital media class has been using the iPads to Facetime with middle school students in Poland. They have been using iPad and Adobe tools to collaborate on projects with the Polish stu-

dents. These students have found they share a common passion for Imagine Dragons and Studio C.

How has the iPad program affected students?

We asked teachers to report on the effects on students of using iPads in the classroom. Teachers most strongly agreed that the iPad program led to students being more technologically literate. They also agreed that it increased student motivation to learn, be engaged, and collaborate with each other on schoolwork.

One aspect that we did not ask teachers about, but that came out strongly in both the teacher and parent survey comments, is that having an iPad to take home gives students greater ability to manage their grades, homework, and assignments. In fact, one teacher we interviewed said that she has noticed a definite improvement in students' abilities to manage their classwork. She said some of the teachers have told students they will check their email each evening at 7 p.m. Many students emailed their teachers for clarification or help with homework after school. Before they had their own iPad to take home, this rarely happened. In addition, she said that more students are emailing her when they are absent instead of waiting to get their assignment when they return to school. She is then able to email them instructions and document attachments so they are not behind when they return to school. She, as well as other teachers and parents who took the survey, said that students check their grades more often and are less likely to get as far behind in classwork. We conclude that an important effect of the one-to-one program, and the emphasis on letting students take the devices home, has enabled an increase in student ability and willingness to manage their grades and assignments.

The following are a representative sampling of the teachers' comments about the positive effects of the iPad program for students:

"Students are engaged in their learning."

"Students with poor hand writing can more clearly express their ideas."

"They can do research right from their seats and we can do word processing without having to go to a lab."

"It allows each student to be engaged and involved without having to 'take their computer turn.''

"Students are more engaged in note taking."

"Many are more motivated to be involved in activities that are technologically organized."

"Students are becoming more literate with the iPad."

"Many [students] are using the photo feature to take a picture of the notes on our whiteboard too. This is helpful for students that have IEP accommodations for notetaking."

What are teachers' overall impressions of the iPad program?

We asked teachers how they felt about the iPad program when it was first announced in their school and how they now felt after implementing the program. While 49% reported strongly approving of the program when it was first announced, only 30% strongly agreed with it when the surveys were completed, which was one year post-implementation for Freedom Academy and two

years post-implementation for Dixon. This underscores the difficulty of integrating new technology and teaching practices for teachers. However, based on the high usage, the teachers seem to be adjusting well as they are finding effective ways to use the iPads in their teaching.

Table 5.

Difference in approval rating of iPad program from first announcement to current year.

Parent Survey

We surveyed parents of students at both Dixon and Freedom Academy. We feel that parents are an important stakeholder in this program and a valuable source of information.

	WHEN IPAD INITIATIVE WAS FIRST ANNOUNCED FOR YOUR SCHOOL	NOW THAT IPADS HAVE BEEN IMPLEMENTED AT YOUR SCHOOL
STRONGLY DISAPPROVE	4% (2)	2% (1)
SOMEWHAT DISAPPROVE	4% (2)	8% (4)
NEUTRAL	9% (5)	15% (8)
SOMEWHAT APPROVE	34% (18)	45% (24)
STRONGLY APPROVE	49% (26)	30% (16)

What do parents perceive the effect of using the iPads to be on student engagement?

Parents were asked about the impact of the program on their child's interest, effort, and performance in school. In all three categories, approximately 60% of parents indicated that they felt the iPad program had improved their children's engagement in school.

Table 6.

Since receiving an iPad for learning, I feel my child's (interest, effort, performance) in school has:

What have been the strengths and weaknesses of using iPads in the schools, according to parents?

	IMPROVED	STAYED THE SAME	DECREASED
INTEREST IN SCHOOL	62%	33%	5%
EFFORT IN SCHOOL	60%	32%	8%
PERFORMANCE IN SCHOOL	60%	31%	9%

Parents were also asked about potential concerns they might have experienced. While 38% reported not experiencing any problems, 29% reported their children were distracted, 28% reported technical challenges or not being able to access the Internet, and 20% reported that their child was not able to use the iPad effectively. Complaints about the filtering being too restrictive were the most common complaint listed in the open-ended "other" response, accounting for 6 out of the 19 comments.

Table 7.

Which of the following concerns have you experienced or noticed?

Loss or theft of device:	7% (11)
Damage to the device:	7% (10)
Child not able to use the iPad effectively:	20% (29)
Distracted by the technology and not on task:	29% (43)
Used for socialization instead of doing school work:	15% (22)
Not able to access the Internet or other technical challenges:	28% (41)
Teacher uncertainty about how to integrate and use the iPad effectively:	18% (27)
Instances of cyberbullying:	4% (6)
No concerns experienced or noticed:	38% (56)
Other:	13% (19)

The open-ended question in the parent survey provided parents an opportunity to provide feedback about their perceptions of the iPad implementation. The final question of the parent survey asked parents to "Take a moment to write any comments, ideas, thoughts, or suggestions you have about the one-to-one iPad program in your child's school, including what you perceive to be benefits and challenges of using the iPads." These comments provide a more complete understanding of the effects of the program on students and their families and revealed some surprising insights.

Overall, there were more positive than negative comments from parents about the iPad program. The benefits to students that parents volunteered most frequently included an increase in student skills with technology, improved student ability to organize school work, an improvement in student learning and creativity, improved communication with teachers, increased sense of pride and responsibility, and improved student access to technology. The following are benefits and challenges with the iPad program, as expressed by parents. All of these parent comments were taken directly from the surveys.

Perceived benefits of the iPad Program

Increase in student skills with technology

- "I like my student being taught the programs on the iPad and I want him to be tech savvy and be competitive with new technology."

- "Technology is such a big part of life. I appreciate what he is learning and how he is learning it at school."
- "I like the idea of children using technology. The opportunity to have so much information at their fingertips will give them a greater educational edge than any previous generation."
- "I think the iPad has been a useful addition to my child's scholastic sequence. In particular, their comfort level with using online resources is significantly raised "

Improved student ability to organize schoolwork

- "It makes it so easy for my son to complete homework and projects on time as well as communicate with his teachers. He used to have a difficult time staying on top of assignments and turning them in on time. Now, he almost always gets things in on time, and they are high quality."
- "My son loves to check his grades. He knows immediately if something is missing or if a teacher received an assignment."
- "The ease at which the child can get assignments and turn items in has significantly improved with use of iPad."
- "The iPad has helped our child stay updated from teachers and makes it more convenient for us to have the homework completed on time."
- "We are glad to use it to keep track of assignments due and grades. It is very handy to have all school related things in one place."
- "I love how the iPad has helped my son to be more organized,"
- "Benefit—less assignments get lost."
- "I think my son has enjoyed being able to organize his assignments to figure out what he still needs to work on. My son has major organizational issues, and this has helped him immensely!"

Improved learning and creativity

- "I feel that the iPad is a great learning tool and lets the students have that easy, hands-on experience and ease of doing work with access to what they need."
- [My child] is writing her own books daily. Instead of watching TV programs, she has become much more creative, spending hours writing, and using the iPad for creative photography and art projects.
- [More] ability to keep pace with global education standards.
- "It motivates them to get their homework done and keep on task."
- "It is good to have students working on school assignments at home. iPad is definitely a plus"
- "It has been easier for my student to complete presentations and do research for projects/assignments. Overall, the iPads have been a great benefit for my student."
- "I feel like the iPads are a great tool for research on school projects and they give the opportunity for some fun and engaging educational games."

Improved communication with teachers

- "I think it improves communication with teachers."
- "The biggest benefit is being connected to teachers to communicate questions about class or homework. Teachers answer quickly."
- "I really like that they have direct contact with teachers and pages where they complete homework and submit it right then."
- "The iPad has only enhanced my child's learning by giving her more access to teachers and other students and the ability to keep things organized well."
- "The iPad has helped our child stay updated from teachers and makes it more convenient for us to have the homework completed on time."

Increased sense of pride and responsibility

- "I know with my child, it has given her a sense of pride that she has access to and can use such a great device. She is excited to show me her homework and what she has done during the day on her iPad."
- "I think that my student has learned to be more responsible with the iPad while he has had it."
- "Our child has loved having the iPad and has been very responsible with it."
- "It's a great idea and helps the student have tools to get work done and puts them in charge of their education."
- Improved access for those without technology in their homes
- "It is wonderful to have this opportunity to experience technology. It is definitely not something my family can afford, so I feel blessed to be given this opportunity."
- "The person that thought of this had a great idea to give them or loan them iPads because there are many parents that don't have the money to buy them for our children. Thank you to the schools!"
- "I think the iPad has helped children whose parents don't have access to these sorts of electronic devices."

In addition to these most frequently mentioned benefits, parents also mentioned the benefit of saving paper, not having to carry so many books in their backpack, and having learning be more fun and enjoyable.

Perceived challenges of the iPad Program

The most frequently mentioned challenge of the program was that students were more distracted or spending too much time playing games, emailing friends, or watching videos. In addition, several parents expressed frustration with the Internet filtering. Several parents also said that they would like more homework sent home on the iPads. Finally, several parents said that they did not see any benefit to the iPad program at all.

Students are more distracted

- "For my daughter, who is easily distracted, it was one more thing for me to monitor, and I know she used it for non-school things during school and as much as she could get away with at

home. I see the value of making sure kids understand how to use technology, but mostly it was a distraction for our daughter."

- "There are just too many distractions that take students away."
- "The iPad has been great for learning but has been also an obsession and distraction at times."
- "I think it could be used a great resource, but many children use it as a distraction in the classrooms and at home. And what happens when they go to high school and don't have an iPad to take notes, take pics of notes in class etc. . . . It doesn't teach them to pay attention and learn."
- "It was more of a distraction and time waster than anything to have it in my home."
- "Sometimes technology can be a distraction. It is a challenge to learn how to manage it successfully."
- "My child has been distracted (it seems mostly by emailing friends) and fallen behind on homework and chores at times because of the iPad. But, I feel learning to balance our interests is part of life and a struggle I think a lot of us adults have! We could say we eliminate it altogether or we can be happy (& hopeful) that learning to balance it now will be a beneficial habit for the future.

The filtering is too restrictive

- "The kids are asked to research on the Internet but most websites are blocked."
- "Open social networks like Facetime for homework help . . . students often did homework together and helped each other . . . particularly math or getting assignment clarification if absent."
- "Please, please, please open them up and let the kids really use them. My daughter would love to use the iPad to read, create projects, do homework and research, etc., but the paranoia that has resulted in locking down the tablets has made them almost unusable. If we're going to have them, let us use them! Otherwise, don't waste the money. I really want this to be successful, but the system for managing them has to change."
- "The filtering system is too discriminating, making the device almost worthless at home."
- Sometimes the tools used to lock down the iPad from misuse (gaming, restricted sites) also limit access to useful educational sites or tools.

No benefits to the program

- "I don't think I have seen her do anything she couldn't have done without one, but we have home computers available to her."
- "I'm really not sure what the benefits of each child having an iPad are. The only possibly benefit I see is the child learning the technology if they do not already have access to it. Does it help the child to do homework better? No. Does it organize the child better? No. His backpack is still a mess and he still turns in an occasional late assignment. The things he uses the iPad the most for is playing iTunes radio, playing the apps, and taking pictures and videos."

- The iPad thus far is best at being a music device and an alarm clock in the home. At school it is best as a broken way to type and great way to chitchat with friends in class.
- "From my point of view, almost everything done on the iPad could be done on paper."
- "Seems to have a very limited benefit. Reading and writing are the most important things kids do in school, in my opinion, and the iPad hasn't really helped with either."

Recommendations

Parents provided several suggestions for improving the one-to-one iPad program. The most important of these is to provide training and on-going communication with parents. One parent said she had a hard time helping her child at home because she did not know how to use an iPad herself. Another parent said he was unsure about what types of activities his child should be doing on the iPad at home such as whether or not the child could pursue non-school related interests. Another parent wanted more information about how they are being used in each class.

A second suggestion from parents was to provide some sort of insurance plan for the iPads. These parents expressed concern about being financially responsible for such an expensive piece of technology that they would not have the means to replace if necessary. They said a small insurance plan would reduce their worry.

Overall, the data seems strong to recommend continued implementation of the iPad program, from the parent point of view, with additional care given to teaching and helping students to not be distracted on the devices, while also removing reasonable limits to using the devices for educational purposes. We recognize these two issues sometimes contradict, but finding the right balance seems to be one of the critical issues for parents.

General Conclusions and Recommendations

Overall, the responses from teachers and parents indicated honest appraisals of the strengths and weaknesses of the iPad Implementation. In general, it seems that more teachers and parents feel the iPads have been a net positive. Most teachers indicated that the iPads have enhanced their professional development (78%), expanded/reinforced what they have been able to teach (94%), helped them respond to various student learning styles (86%), and helped them better meet the needs of advanced learners (86%). Most teachers (71%) indicated using the iPads at least 2-3 times a week, and for activities as varied as teacher presentation of material, to supporting student research and writing. While teacher perception of the iPad initiative has regressed since the initial rollout, most teachers remain positive about the experience.

These findings were largely corroborated by most parents, where about 60% of parents indicated that the iPads improved their student's interest, effort, and performance in school. Many reported their student developing technological competencies, improving their ability to self-regulate and organize their schoolwork, and improving their creativity and communication with teachers.

Despite these benefits, teachers reported technological challenges that created trepidation about implementing the iPads. In addition, teachers reported increased workloads from implementing the iPads due to increased preparation time, the need of prepar-

ing backup lesson materials for students who forget their devices, and because of increased time answering student emails in the evenings about homework. Teachers and parents also noticed increased distraction challenges with the students, although teachers are learning classroom management techniques to minimize this challenge in the classroom. Parents also feel concern over the responsibility of caring for the devices in their homes, and frustration over the strict filtering and content control on the iPads, which limits students' abilities to use the devices as true personalized learning tools.

Based on this feedback, we recommend continued support of the iPad initiative and consideration of future expansion to other schools. In order to improve the iPad implementation efforts, we also recommend:

- Increasing the time and opportunities for teachers to collaborate with and learn from each other, as this has proven to be a powerful way to develop pedagogical strategies for using the iPads.
- Providing teachers direct training, perhaps from skilled teachers in the schools who already have mastered this skill, on managing student distraction with the devices.
- Greater coordination and communication of the schedule for iPad updating and maintenance, and quick return of the devices, to minimize the disruption in the teaching with the devices.
- Increased technical support to the schools so technical problems can be solved quickly, providing teachers confidence in the technology.

In addition, we have observed that Dixon Middle School has invested considerable time and resources in updating the technology infrastructure needed to make the iPads functional at their school. Because this was unexpected, we recommend that in future implementations, that sufficient funds be provided for the technological updating needed to existing infrastructures to support the devices.

Future Evaluation Efforts

There are several things we would like to explore in the next stage of the evaluation. In addition to repeating the parent and teacher surveys we plan to add a student survey and student interviews. We also plan to do more classroom observations and teacher interviews. In addition, we think it will be important to include interviews with the technical staff at each school to better understand how much technical support the program has required of school and district staff.

There were a few issues that arose from survey comments that we would like to explore more deeply. These include the issue of student distraction and best practices to limit this at school and in the home, reducing barriers to teachers changing their teaching practices to include iPads, including uncertainty in the technology, the practice of students being able to contact teaches after school hours for help with homework and how to facilitate this without burdening teachers, and strategies for involving parents more in the implementation.

Parent Survey

iPad Project

IPAD USE INFORMATION

At HOME, for a **SCHOOL RELATED** purpose, how often has your child used the iPad to do each of the following?

School Related Activity	Almost Every Day	1-2 times a Week	1-2 times a Month	Rarely or Never	Don't Know
Access Class Material					
Use Calculator					
Word Processing					
Do Research on the Internet					
Read Books					
Take Notes on Homework					
Do Homework Assignments					
Communicate with Teachers					
Organize Schoolwork					
Work on Projects Individually					

School Related Activity	Almost Every Day	1-2 times a Week	1-2 times a Month	Rarely or Never	Don't Know
Work on Projects with classmates					
Communicate with classmates					
Play Educational Games					
Check Grades					
Create a Presentation					
Take Photos and/or Video					
Access Social Media (eg Facebook or Twitter)					

Please list any other school related activities you have observed.

At HOME, for a **NON- SCHOOL RELATED** purpose, how often has your child used the iPad to do each of the following?

Non-school Related Activities	Almost Every Day	1-2 times a Week	1-2 times a Month	Rarely or Never	Don't know
Listen to Music					
Watch Videos					
Explore Personal Interests					
Look up things on the Internet					
Read Books					
Complete Personal Projects					
Take Photo and/or Video					
Communicate with Friends					
Play Non-educational Games					
Access Social Media (eg Facebook or Twitter)					

Please list any other school related activities you have observed.

WHAT OTHER TYPES OF TECHNOLOGY DO YOU HAVE IN YOUR HOME? PLEASE CHECK ALL THAT APPLY.		DO YOU HAVE INTERNET ACCESS AT HOME THAT YOUR CHILD CAN USE FOR THE IPAD?	
	Desktop or Laptop Computer		Yes
	Tablet, like the iPad or Kindle Fire		No
	Smart phone		Not Sure
	other_____	DO FAMILY MEMBERS OTHER THAN YOUR CHILD USE YOUR CHILD'S IPAD WHEN IT IS AT HOME?	
	None of the above		Yes
			No
			Not Sure
WHICH IF ANY OF THE FOLLOWING CONCERNS HAVE YOU EXPERIENCED OR NOTICED? PLEASE CHECK ALL THAT APPLY.			
	Loss or theft of the device		Teacher uncertainty about how to integrate and use the iPad effectively
	Damage to the device		Instances of cyberbullying
	Child not able to use the iPad effectively		Used for socialization instead of doing schoolwork
	Distracted by the technology and not on task		Other_____
	Not able to access the Internet or other technical challenges		No concerns experienced or noticed

ATTITUDE TOWARDS AND PERFORMANCE IN SCHOOL			
Please indicate how having an iPad has affected your child's attitude and achievement.			
Since receiving an iPad my child's **interest in school** has?			Stayed about the Same
	Greatly Improved		Slightly Decreased
	Improved		Decreased
	Slightly Improved		Greatly Decreased
Since receiving an iPad for learning I feel my child's **effort in school** has?		Since receiving an iPad for learning I feel my child's **Performance in school** has?	
	Greatly Improved		Greatly Improved
	Improved		Improved
	Slightly Improved		Slightly Improved
	Stayed about the Same		Stayed about the Same
	Slightly Decreased		Slightly Decreased
	Decreased		Decreased
	Greatly Decreased		Greatly Decreased

DEMOGRAPHIC INFORMATION			
In order to understand how iPads benefit a wide variety of families we would like ask a few questions about your household.			
Which of the following best describes your household's **annual income**:			$50,100 to $75,000
	$25,000 or Less		$75,100 to $100,000
	$25,100 to $50,000		Over $100,000
Please select the educational category that best describes the **education** of parents or guardians in your household.			
Parent/Guardian 1:_____		Parent/Guardian 2:_____	
	Less than High School		Less than High School
	High School / GED		High School / GED
	Some College		Some College
	2-Year College Degree		2-year College Degree
	4-year College Degree		4-year College Degree
	More than 4-year College Degree (e.g. M.S., J.D., M.D., PhD)		More than 4-year College Degree (e.g. M.S., J.D., M.D., PhD)

Additional Comments

Please take a moment to write any comments, ideas, thoughts or suggestions you have about the one-to-one iPad program in your child's school, including what you perceive to be benefits and challenges of using the iPads.

Teacher iPad Evaluation Survey Questions

- At which school do you teach? (Dixon, Freedom Preparatory Academy)

Support Questions:

- Which of the following has been most helpful to you with developing **technical skills** for working with an iPad? (Options: Professional development from iSchool Campus, professional development from district staff, professional development within your school, help from other teachers in your school, resources available on the internet)
- Which of the following has been most helpful with integrating iPads into your **class room management**? (same options as #2)
- Which of the following has been most helpful integrating iPads into your **curriculum and pedagogy**? (same options as #2)

To what extent do you agree with the following statements? (1-6 Likert scale)

- I feel comfortable using an iPad in my teaching practice.
- I feel supported in learning iPad skills.
- I feel supported in learning how to integrate iPads into my curriculum and pedagogy.
- Using iPads for instruction is too costly in terms of resources, time and effort.
- Using iPads in my classroom enhances my professional development.
- iPads make classroom management more difficult.
- iPads help me better meet the needs of struggling learners.
- iPads help me better meet the needs of advanced learners.
- Using iPads helps me reinforce and expand on the content being taught.
- Using iPads helps me respond to a variety of learning styles.
- iPads help me to change the pace of classroom work.
- Please rate the following uses of iPads in terms of how important they are to your classroom practice (1-5, do not use to very important)
  - Educational apps
  - Educational websites
  - E-books/textbooks
  - Individual research and writing/presenting activities
  - Student created multi-media projects
  - Group exercises and assignments
  - Modification and accommodations for students with IEPs
  - Cloud storage access (Google Docs, Dropbox, etc.)
  - Support for motor-impaired or language impaired students
  - Camera/taking pictures

- Homework options
- Teacher presentation of content
- Teacher lesson plan development
- Classroom management (attendance, quizzes, communicating with students)

- This year I have used iPads for classroom instruction: (daily, 1-2 times/week, once a week, 2-3 times/month, once a month, less than once a month, never)
- Is this your first or second year of implementing iPads into your classroom?
- If this is your second year, are you using iPads for instruction more, about the same or less than last year? (more, same, less)
- Think back to when the iPad initiative was first announced for your school. Did you approve or disapprove of implementing iPads into your own classroom? (1-5 Likert scale)
- Now that iPads have been implemented in your school, do you now approve or disapprove of the idea of implementing iPads in your own classroom? (1-5 Likert scale)
- Please indicate how frequently iPads are integrated into your teaching activities for each of the uses listed below: (instructional, communicative, organizational, analytical, recreational, expansive, creative, expressive, evaluative)
- Please indicate how frequently iPads are integrated into your teaching activities in the following ways: (substitution, augmentation, modification, redefinition)
- On average, how much extra time does incorporating an iPad into your classroom require? (no extra time, 1-3 hours, 4-7 hours, 7-10 hours, more than 10 hours per week)

To what extent do you agree with the following statements about the effects of iPads on students of using iPads in your classroom? (1-6 Likert scale)

- It promotes student collaboration
- It increases student motivation to learn
- It results in students neglecting important traditional learning resources (like library books)
- It increases student achievement
- It makes students more distracted and harder to teach
- It makes students more technologically literate
- It increases student engagement
- What has gone well with the iPad implementation so far? (open response)
- What are some issues/concerns you have had with the iPad implementation so far? (open response)
- What is your gender?

- How many years have you been teaching in a school?
- What subject do you teach?
- On average, how many hours per week do you spend using a computer or tablet for personal use outside of teaching activities?
- Which of the following descriptions of computer technology proficiency levels best describes your level of proficiency? (Newcomer, Beginner, Average, Advanced, Expert)

APPENDIX F

iPads, Student and Writing

Introduction

The Utah State Legislature made a substantial investment to provide Utah students with 21st century technology skills and knowledge, by funding a three year pilot of one-to-one mobile computing devices in select schools around the state. This formative evaluation of the pilot program at North Davis Junior High School, Davis School District, Utah represents a subset of the evaluation funded as part of the Smart Schools project.

Purpose

With so many iPads being sold and the numerous apps that have been developed to run on the iPad, it is no wonder that schools are beginning to adopt the technology. The purpose of this study was to examine iPads and their effect on writing in the secondary classroom. Did teacher and student opinions on writing change based upon the iPad? Did students prefer writing with an iPad versus handwriting or with a computer? Did teachers assign more writing that was to be handwritten or more writing with the use of an iPad?

Methodology

The data was collected from the Google Document surveys administered April 11-17, 2014 by North Davis Junior High Language Arts teachers who teach grades seven and/or eight. In total data was collected from 486 seventh and eighth grade Language Arts students and six Language Arts teachers.

The data was collected using two different Google Document surveys. Students were given twenty six multiple choice questions asking a variety of questions to solicit student opinions (Appendix A). The survey covered topics that ranged from student preference on handwriting versus writing with an iPad to whether or not students texted daily. Language Arts teachers were given a survey that had seventeen multiple choice questions and eight short answer questions (Appendix B). These questions were designed to gather information such as teacher use of the iPad in their classroom and whether or not they felt they had been given enough training in order to properly integrate iPad use into their classroom.

Results

The following summarizes the findings.

- 100% of the responding teachers agree that they read what students have written.
- 77% of students feel that their handwritten work is being read.
- 75% of students feel that the work they do on the computer is being read.
- 50% of responding teachers felt they had been given enough training on iPads while the other half felt they have not.
- 100% of the responding teachers disagree they have been given training on the use of iPads in their classroom.
- 100% of the responding teachers felt that they had not received enough training.
- Five of the six responding teachers said that more instruction would help both them and students use the iPad more successfully.
- Over half of responding students expressed a preference for handwriting while the other half did not.
- Half of the responding students reported that they would write with their iPad if given a choice.
- Half of the teachers felt that they have not been given enough training.

- 100% feel that they have not been given enough training on how to implement iPads into their classroom.
- 31% of the responding students would write with a pencil if given a choice, 40% would write with a computer and 30% would choose to write with an iPad.
- Four of the six responding teachers agree that writing on an iPad is beneficial to students while two disagree.
- Four of the six responding teachers feel that iPads are useful for students and learning.
- Seventeen percent of the responding teachers felt that students had better quality of writing with iPads.
- Thirty-three percent of the responding teachers felt that the iPad was beneficial to students.
- Thirty-three percent of the responding teachers felt that the iPad was not beneficial to students.
- 9% of the responding students reported that they handwrite 1 day a week, 12% reported 2 days a week, 22% reported 3 days, 21% reported 4 days and 36% reported 5 days a week.
- 30% of the responding students reported that they write using an iPad 1 day a week, 28% reported 2 days a week, 23% reported 3 days, 10% reported 4 days and 9% reported 5 days a week.
- Two of the responding teachers reported using iPads once a week, two reported using the iPad twice a week, one reported three times weekly and one reported using the iPads 4 times a week. No teacher reported using the iPad daily.
- One responding teacher reported handwriting twice a week, two reported three times weekly, one reported handwriting four times a week, and two reported handwriting daily. No teacher reported giving handwritten assignments only one day per week.
- 75% of students text daily.
- 78% of responding students use social networking sites daily.
- 59% of the responding students believe that sharing what they write is easier with an iPad.
- 51% of responding students disagree that they write better with an iPad.
- Half of responding students reported that it is harder to write with an iPad than to handwrite.
- Half of students believe that it is easier to write with an iPad.
- 58% of responding students view writing on an iPad as more fun than handwriting.

Conclusions

When looking at the results of the teachers' survey answers, it is not surprising that a lack of training has them feeling that they need more help in implementing iPads in their classrooms. If they were given more training on how to make iPads useful to students as well as exciting, rather than just another way to write an essay,

then perhaps both they and students would have more positive results in favor of the iPad.

It is motivating that students feel their work is being read, whether it has been typed or handwritten, and that teachers are actually reading what students write. This data provides validity to the iPad that would be lacking if teachers just let computer-grading programs take over the task of "reading" what students write online.

Overall, the results of this research were surprising. In a generation where technology is valued and students have been exposed to computers since birth, the lack of a preference for iPads was unanticipated. For some of these students, iPads and computers have been around as long as pencils and paper. Using a mobile device as a writing medium is not novel or different. For the sake of writing, perhaps these students view paper and pencil and iPads as the same.

Further research

Further research is necessary in this area to come to definite conclusions. Students and teachers need to be asked subsequent questions to clarify questions previously asked. One avenue that could be further researched is what types of writing assignments are being given? Would student preference for the iPad change if they were asked what they preferred for different types of writing assignments versus just asking them what they preferred for writing?

Another area of research could be to ask teachers what their experience with technology and iPads is. The students could then be surveyed and categorized according to which teacher they have. This would allow the researcher to see if the teacher's attitude and experience with technology affected how their students viewed and used it as well.

Finally, it would be helpful to conduct the same survey in a different demographic. The school surveyed is located in an urban setting. It would be useful to ask students in a rural or lower socio-economic school the same questions to see if their lack of the same resources would cause differing opinions on the effectiveness, preference for, and use of iPads for writing.

STUDENT SURVEY GIVEN THROUGH GOOGLE DRIVE			
Writing in Language Arts-Student Survey			
What Grade are you in?*			I Write more with my iPad than pencil.*
	7th		Strongly Agree
	8th		Agree
I like to write. *			Disagree
	Strongly Agree		Strongly Disagree
	Agree	I write more with my iPad than computer.*	
	Disagree		Strongly Agree
	Strongly Disagree		Agree
I write daily in Language Arts. *			Disagree
	Strongly Agree		Strongly Disagree
	Agree	When I handwrite, I know someone reads it. *	
	Disagree		Strongly Agree
	Strongly Disagree		Agree
When I write on a computer, I know someone reads it. *			Disagree
	Strongly Agree		Strongly Disagree
	Agree		
	Disagree		
	Strongly Disagree	* Required	

I text daily. *		I think more clearly when I type. *	
	Strongly Agree		Strongly Agree
	Agree		Agree
	Disagree		Disagree
	Strongly Disagree		Strongly Disagree
I use social media networking sites daily. *		Writing is boring. *	
	Strongly Agree		Strongly Agree
	Agree		Agree
	Disagree		Disagree
	Strongly Disagree		Strongly Disagree
I write better using the iPad. *		I find it easier to write on my iPad. *	
	Strongly Agree		Strongly Agree
	Agree		Agree
	Disagree		Disagree
	Strongly Disagree		Strongly Disagree
I think more clearly when I handwrite. *		I have more fun writing on my iPad than handwriting. *	
	Strongly Agree		Strongly Agree
	Agree		Agree
	Disagree		Disagree
	Strongly Disagree		Strongly Disagree

* Required

	If I had a choice, I would handwrite. *		How many days a week do you write in Language Arts? *
	Strongly Agree		1
	Agree		2
	Disagree		3
	Strongly Disagree		4
	If I had a choice, I would write with my iPad. *		5
	Strongly Agree		How many days do you handwrite in Language Arts? *
	Agree		1
	Disagree		2
	Strongly Disagree		3
	I find it harder to write with my iPad than handwriting. *		4
	Strongly Agree		5
	Agree		How many days a week do you write on your iPad in Language Arts?*
	Disagree		1
	Strongly Disagree		2
	I handwrite in class. * (check all that apply)		3
	Journals		4
	Essays		5
	I type... * (check all that apply)		
	Journals		
	Essays		* Required

	My last quarter's grade in Language Arts was? *
	A
	B
	C
	D
	F
	If I had a choice, I would write with _____ *
	Pencil
	Computer
	iPad

* Required

LANGUAGE ARTS TEACHER SURVEY GRADES 7-8 GIVEN THROUGH A GOOGLE DRIVE SURVEY	
Writing in Language Arts-Teacher Survey	
My students like to write. *	
	Strongly Agree
	Agree
	Disagree
	Strongly Disagree
Writing on iPads is beneficial to students. *	
	Strongly Agree
	Agree
	Disagree
	Strongly Disagree
I write more with my iPad than pencil. *	
	Strongly Agree
	Agree
	Disagree
	Strongly Disagree

* Required

I write more with my iPad than computer. *		I have been trained on iPads. *	
	Strongly Agree		Strongly Agree
	Agree		Agree
	Disagree		Disagree
	Strongly Disagree		Strongly Disagree
When I handwrite, I know someone reads it. *		I have been given training on implementing iPads in my classroom. *	
	Strongly Agree		Strongly Agree
	Agree		Agree
	Disagree		Disagree
	Strongly Disagree		Strongly Disagree
When students write on a computer, I read it. *		iPads are useful for students and learning. *	
	Strongly Agree		Strongly Agree
	Agree		Agree
	Disagree		Disagree
	Strongly Disagree		Strongly Disagree
I have time to read all that students write. *		Students know how to write using iPads. *	
	Strongly Agree		Strongly Agree
	Agree		Agree
	Disagree		Disagree
	Strongly Disagree		Strongly Disagree

* Required

How many days a week do you write in Language Arts? *		What do students handwrite? * (check all that apply)	
	1		Journals
	2		Essays
	3		Other:
	4	What do students type? * (check all that apply)	
	5		Journals
How many days a week do you handwrite in Language Arts? *			Essays
	1		Other:
	2	Which online types of writing do you use in your classroom? * (check all that apply)	
	3		Journals
	4		Essays
	5		Other:
How many days a week do you write on an iPad in Language Arts? *			
	1		
	2		
	3		
	4		
	5		

* Required

From your observations, do students write better quality (fewer errors, address the topic better) with iPads or handwritten? Why?*

Do you believe writing on the iPad is beneficial to students? Why?*

What do you use the iPads most with-reading or writing? Why?*

Do you feel that you've been given enough training to use iPads as part of the curriculum? Why?*

Would more instruction using iPads help you and/or your students use them more successfully?

7th Grade Language Arts Only-For second quarter of the 2013-2014 what were the grades of your students in Language Arts? Fill out all grades that apply to what you teach.

How many A's, B's, C's, D's, and F's did you give?

8th Grade Language Arts Only-For second quarter of the 2013-2014 what were the grades of your students in Language Arts? Fill out all grades that apply to what you teach.*

How many A's, B's, C's, D's, and F's did you give?

APPENDIX G

Use of One-to-One Computing in a Junior High School

Introduction

The Utah State Legislature made a substantial investment to provide Utah students with 21st century technology skills and knowledge, by funding a three year pilot program of one-to-one mobile computing devices in select schools around the state. This formative evaluation of the pilot program at North Davis Junior High School, Davis School District, Utah represents a subset of the evaluation funded as part of the Smart Schools project.

Purpose

We live in a digital rather than analog world and many schools are implementing one-to-one computing initiatives to help accomplish academic goals. In addition to research that examines student achievement, other areas may also be impacted by implementation of one-to-one computing initiatives. Impacts upon student engagement, behavior, and motivation as well as on teacher practices, might all be found to occur. The purpose of this study is to investigate the usage of iPads for instruction and learning in secondary classrooms and as perceived by students and teachers.

Methodology

The data was collected from the Google Document surveys administered May 2014 by North Davis Junior High teachers. Data was collected from 516 students and 23 teachers.

Teachers responded to 13 items concerning how comfortable they felt using the device, the extent to which they felt prepared to use the device, challenges and benefits of using the device in their instruction to planning instruction using the devices.

Students responded to 21 items. Student items included how often they used the device, for what purpose they used the device, advantages they think in using the device and challenges in using the device.

Results

Teachers: Twenty-three teachers responded to the survey, representing just under one half of the 48 teachers in the school. Of those teachers responding, 52% felt somewhat comfortable using the iPad in their classroom. Forty-four percent felt very comfortable or comfortable. Eighty percent of the Level 1 teachers (teachers with less than four years of experience) responded they felt comfortable or very comfortable using the devices. Twenty-eight percent of the Level 2 (teachers with four or more years of experience) felt comfortable or very comfortable using the devices. In response to how the professional development (PD) provided prepared them for using the devices in their instruction, 61% agreed or somewhat agreed the PD prepared them. Fifty percent of the responding teachers used their colleagues as a resource in learning how to use the device.

Thirty-nine percent of the teachers use the device in their classrooms weekly, 30% of the teachers used the devices at least monthly and 13% responded they use the devices daily. Fifty-two percent of the teachers responded that it takes an additional 1-3 hours in planning to implement the devices into their instruction. When asked if the use of the devices increased or decreased student distraction in the classroom, 53% indicated the use of the devices increased student distraction. However, 35% of the responding teachers commented that the use of the device increased student motivation in the classroom, with 30% commenting that the use of the device enabled students to reinforce or expand on the content being taught. Twenty-two percent of the teachers commented that the device benefited in meeting a variety of learning needs in the classroom. Comments included:

Increase because students won't stay on task with what they are supposed to be doing and play games.

- Both; Helps keep them stay engaged but it also causes a temptation to play games or watch movies instead of working.
- Able to increase student motivation to learn, Able to respond to a variety of learning styles, Able to make students more technology-literate, Able to provide additional practice to struggling learners/students (differentiate instruction)
- Able to increase student motivation to learn, Able to demonstrate something I can't show any other way, Able to make students more technology-literate.

Teachers ranked the use of educational websites and the ability for students to complete at-desk individual research as the top beneficial uses of the devices in their classrooms.

Students. Of the 1033 students enrolled at NDJH, 516 responded to the survey. Students were asked how often they used the iPad to:

- Access Class Content
- Use Calculator
- Use Google Drive/Docs
- Do Internet Research
- Read a Book
- Take Notes in Class
- Do Homework Assignments
- Communicate With Teachers
- Check Grades

The most commonly cited use of the iPads were to check grades daily (63%), do Internet research (53%), use Google Drive/Docs (45%), access class content (43%) and take notes in class (39%). Students responded they did not use iPads to read a book (Never 43%) and communicate with their teacher (48%). Students were asked what were the three biggest advantages to using iPads in the classroom. Theme of responses included: Internet access and research, texting, checking grades, Google Drive, taking notes, and doing homework. When asked the three biggest problems to using iPads in the classroom, common response themes included: distractions, teachers who don't know how to use them, slow WiFi, texting and blocked apps. Not all NDJH students were allowed to take the iPad home. Of those who could take the iPad home theme responses to, "What are the three biggest advantages to being able to take the iPad home" were; doing homework, emailing teachers and checking grades.

Conclusion

Of the participating teachers in this study 96% felt somewhat comfortable or comfortable using an iPad in their classroom. Eighty percent of the new teachers (Level 1) felt comfortable using an iPad. This percentage was larger than the Level 2 teachers (more than four years of experience) who responded they felt comfortable. This may be due to the more recent use of mobile technology in teacher preparation programs and/or a generation of teachers who have used mobile technology in their personal lives. Sixty-nine percent of the teachers use an iPad either weekly or daily in their classroom. Participating NDJH teachers indicated

they felt the use of iPads increased student distraction, however 35% responded that using an iPad increased student motivation.

NDJH participating students responded that they use their iPads to access the Internet, use Google Drive/ Docs and check their grades. iPads were used less to read a book and communicate with their teachers (which may be the responses from students who were not allowed to take their iPads home).

NDJH teachers and students both responded that the use of the iPad was dependent on the knowledge and skills of the teacher in integrating technology into their instruction. Considering this response, if mobile technology is placed in schools it is imperative that teachers receive professional development not only in how to navigate about the iPad, but how to integrate mobile technology into their classroom instruction appropriately. In addition, considering student responses to the survey, it would appear beneficial for teachers to be provided support in ways to manage student behaviors with regard to using iPads most appropriately for successful learning outcomes.

APPENDIX H

One-to-One Mobile Technology

Introduction

The Utah State Legislature made a substantial investment to provide Utah students with 21st century technology skills and knowledge, by funding a three year pilot program of one-to-one mobile computing devices in select schools around the state. This formative evaluation of the pilot program at Pinnacle Canyon Academy, Charter School Price, Utah, represents a subset of the evaluation funded as part of the Smart Schools project.

Purpose

Mobile technologies are beginning to be considered as potential teaching and learning tools in the classroom. Given the popularity, affordability, portability and flexibility of such devices, it is not surprising that educators harness the devices within and beyond the classroom for educational purposes. The potential for learning with mobile technology has been equated with 21st century learning skills. However, there are concerns regarding the practicality of introducing these devices in educational environments. Currently, there is limited research examining how learners and educators actually use mobile technologies. The purpose of this study was to examine how teachers and students use mobile technology in their instruction and learning.

Methodology

Pinnacle Canyon Academy opened in 1999 as a charter school serving students in grades K-12. For the purpose of the SMART School Technology Evaluation Study, grades 6-12 are evaluated. Surveys were administered by7th and 8th grade Language Arts teachers to their students in April 2014. The teacher survey asked teachers to respond to their level of comfort using iPads in their classrooms, how they [the teacher] perceived student engagement and achievement (Appendix A). Teachers also responded to the amount of time iPads were used for instruction in their classrooms and the planning for instruction. Student surveys asked students to respond on their use of iPads in their classroom, including both educational and non-educational uses (Appendix B).

Results

Summary of Teacher Survey (N=15). Data was analyzed holistically and as subsets determined by level of teaching license. Utah Level 1 teachers have a professional educator license issued upon completion of an approved teacher preparation program or an alternative preparation program and have less than four years teaching experience. Utah Level 2 teachers have met the requirements for a Level 1 license as well as completed the Utah Early Year Experience (EYE) requirements, are recommended by a district/charter school and have more than three years teaching experience.

Ninety-three of the responding teachers felt very comfortable or comfortable using mobile technology (iPad) in their classroom. Of the Level 1 (teachers only one (PE teacher) did not use the iPad in instruction. One hundred percent of the Level 2 teachers felt comfortable using an iPad in instruction. A majority of the teachers felt support in learning how to use and integrate an iPad in instruction. Both Level 1 and Level 2 teachers reported that the use of iPads increased student engagement in the classroom. Forty-three percent of the teachers responded that they had seen measureable improvement in student achievement in their classroom. One teacher commented that, “The students are excited to learn and use the iPads to enhance the learning”. Another stated, “I like not wasting so much paper”. Fifty-three percent of the teachers responded one benefit they’ve seen for their students is the ability to reinforce and expand on the content taught. Additionally, 33% reported that students were motivated to learn. Half of the Level 1 teachers use iPads daily in their classrooms. Three of the five Level 2 teachers use iPads daily in instruction. All Level 1 teachers reported that

planning for the integration of iPads in instruction took less than three additional hours, with four teachers responding no extra time for planning was used. Four of the Level 2 also responded that planning for the integration of iPads in instruction took less than three additional hours.

Summary of Student Survey (N=176). Sixty-seven percent of the students responded that they use an iPad daily in their classrooms with 22% responded they use an iPad weekly. Students respond on the use of the iPad in classroom assignments.

- 26% used daily as calculator
- 73% used daily for Google Doc/Drive
- 63% used daily for Internet research
- 20% used daily for reading
- 28% used daily for educational games
- 25% used daily to play non-education games
- 33% used daily to communicate with teacher and 33% weekly to communicate with teacher

When asked what they thought were advantages to using an iPad, student responses included: not having to use paper, never losing assignments, faster and easier to complete assignments and "having the Internet in the palm of your hands". A common theme was the ease of completing assignments, turning in assignments and then checking for grades on assignments. Students were asked what they thought were some problems with iPads in the classroom. A common theme in responses was that some students used the iPad for non-classroom activities which was distracting.

Conclusion

When examining the data, it was clear that the implementation of one-to-one iPads produced a wide range of results. Some teachers indicated an increased student engagement, motivation and achievement. The teachers responded that they felt support in learning to use an iPad and how to integrate the use of mobile technology into instruction. Noted is that 93% of the teachers felt either comfortable or very comfortable using the iPad for instruction. Only one teacher responded they felt 'neutral' in their comfort level.

Students indicated an increase in ease of completing assignments and communicating with teachers. Students also responded that checking on assignments to be graded, and on their grades themselves was much easier using an iPad.

This research briefly highlights some of the possible positive results that can be achieved through implementation of a one-to-one computing strategy. As one-to-one programs move from the experimental stage and become more ingrained into regular practice, research may begin to reveal additional benefits and concerns.

APPENDIX I

iSchool Campus Report

Training courses and Apps

Initial Training

- iPad Hardware Training: 8 Hours
- MacBook Training: 8 Hours
- Apps and other Training: 8 Hours (First Visit)
- Ongoing Training: (Schools Have Chosen a Variety of These Options On-–Going and for Different Amounts of Time and Courses)

Key Course Offerings:

Digital Citizenship

This course covers a range of digital citizenship topics that you can cover with your classrooms. Topics Include: Nine Elements of Digital Citizenship, REP's, Responsibilities in Web Filtering, Copyright Law, Cyber Bullying, Digital Etiquette, How to Deal with iPad Breaks, iPad Classroom Rules, Social Networks Parents Guide, Sexting, Digital Dosier, Keeping Families Safe.

iTunes U

iTunes University is a great platform for digital content and course organization. This course focuses on learning how to create iTunes University courses and share them out to students using 1-1 iPads in the classroom. Topics Include: Creating an Apple ID, Basics of iTunes U, Overview of Interface, Taking Notes, Login to the Interface, Creating an Instructor Profile, Creating a New Course, Planning Your Course, Adding Content to your Course, Supported File Formats, Student Enrollment, App Smashing and Workflow.

Google Drive

Google Drive allows students and teachers to keep files safe and easy to reach from anywhere, on a tablet, computer and smartphone. It also allows for file sharing between student and teacher, group collaboration and automatic saving of all files and documents.

Edmodo

Edmodo is an educational website that takes the ideas of a social network and refines them and makes it appropriate for a classroom. Using Edmodo, students and teachers can reach out to one another and connect by sharing ideas, problems, and helpful tips.

Schoology (Where Applicable)

Schoology is an online learning, classroom management, and social networking platform that improves learning through better communication, collaboration, and increased access to curriculum and supplemental content.

Canvas (Where Applicable)

Canvas K-12, is an open-source LMS platform designed for the specific needs of elementary and secondary schools. The LMS enrolls parents with their students to provide greater visibility into their children's learning experience and provides actionable analytics to teachers and administrators.

Assessment Tools

This course covers the range of assessment tools that can be used in the 1-1 classroom environment. Topics include types of assessments, Edmodo for Assessments, Socrative, Google Forms, Geddit, Kahoot, Nearpod.

App Smashing

This course covers the modern technology workflow, and has been one the most popular/effective sessions for teachers. Topics include: Introduction to the Distribution Chain, How to Use QR Codes, iTunes University for Distribution, Ways to Distribute Work to Students, How to Smash Apps, Collecting Digital Work, Posting to Google Drive, Posting to Edmodo, and Posting to Schoology.

Teaching Computer Coding

This course covers the fundamentals of using Hopscotch in your classroom. Topics Include: Coming up with a HopScotch Action Plan, Teaching Coding to Young Kids, What Most Schools Don't Teach, Sample Projects and Hopscotch Challenges.

3D Printing

This course covers emerging topics in 3D printing, updated when new ideas in this field come to light. Topics Include: What 3D Printing Is, History of 3D Printing, Curriculum Options, Getting Started Creating Models, Using Sketch Up, Autodesk 123D, Makerbot Replicator, Blender, AutoDesk 123, Tinkercad, 123d Creature and Sculp for iPad, 3D Crafters, 3D Tin, Art of Illusion.

Digital Whiteboard

This course covers the creation of digital whiteboards and their use in the classroom. Topics Include: Using Educreations, Capturing Workspaces, Annotating Documents, Using Airplay, Sharing Completed Work

ISTE Standards

The ISTE Standards set the bar for excellence and best practices in learning, teaching and leading with technology in education. The benefits of using the ISTE Standards include: Improving higher-order thinking skills, such as problem solving, critical thinking and creativity, Preparing students for their future in a competitive global job market, Designing student-centered, project-based and online learning environments, Guiding systemic change in our schools to create digital places of learning, Inspiring digital age professional models for working, collaborating and decision making.

Video Creation and Distribution

This course covers the basics of iMovie, and assists teachers in developing sample trailers and video projects to be developed into coursework and assignments for teachers. The latest version of iMovie allows teachers and student incorporate video or stills currently in their library, or to shoot real-time footage as part of their project.

Apps we have covered and provided information regarding during professional development sessions:

123D Catch

3DTin

3D Cell

3D Brain

1st Grade Math

6th Grade Math Common Core

ABC Reading Magic

ABC Alphabet Phonics

ABC Alphabet

Aesop's Quest

Animation Creator HD

Adobe Voice

Audioboo

Auryn Ink

Art Studio for iPad

Art Rage

Artist3D

Adobe Ideas

Baby Plants Flowers - 2

BaiBoard

Book Writer

Book Creator for iPad

Baby Plants Fruits

Baby Plants Vegetables

Bamboo Paper

Building Serial Circuits

Building Atoms, Ions and Isotopes HD Lite

Britannica Kids: Solar System

Brushes 3

Cargo-Bot

Cato's Hike

Cubify Draw

Counting 123

Common Core Number Operations in Base Ten

Chicken Coop Fraction Games

Clever Keyboard

Creative Book Builder

Discovery Ed

Digital Storytelling on iPad

Diversity of Animals and Plants

Diversity of Animals and Plants

Da Vinci HD

Draw and Show

Doodlecast Pro

Doceri Interactive

Documents 5

Elevated Math

eClicker

ExoPlanet

easyLearn Simple Machines

Earth Observer

Exploriments: Electricity - Voltage Measurements

EasyLearn Adaptations in Animals

Ecosystems HD

Ear Trainer

Educreations

Evernote

Free Graphing Calculator

Frog Disection

Figure

Flipboard

FlipBook HD

Flowboard: Presentation App

Google Docs

Geometry Pad

Grammar Jammers

Geometry

Go SkyWatch

Geology POI

Google Maps

Google Earth

Groupboard Collaborative Whiteboard

GarageBand

GeoDash

Hangouts

Haiku Deck

Hakitzu Elite

Healthy Food Monsters

Hudson Alpha iCell

Hopscotch

iMindMap HD

Instapaper

iBooks

iSource APA

iMovie

iMathematics

iTooch Middle School

iCircuit

ImproVox

i-Logo

Jot! Whiteboard Free

Kodable

Khan Academy

Kid Science: Worm Dissection

Kid Science: Frog Dissection

Kids Reading Comprehension Level 1

Keynote

Layers

Language Central for Science Physical Science

Leafsnap for iPad

Langauage Central for Science Earth Science

Long Multiplication

Language Central for Science Life Science

Let's Create! Pottery HD

Lightbot

Nearpod

Math Drills

MathBoard

Math Evolve

MultiFlow

Mythology - Norse

Meet the Vowels

My Math Flash Cards App

Measurement HD

Magnetism

Moon

Mobile Podcaster

Molecules

MadPad HD

MindNode - Delightful Mind Mapping

Noteshelf - Write, Sketch, Annotate

Notability

Nasa App

Nature Human Genome Special Edition

Nova Elements

Notion

NotateMe

Overdrive

Operation Math

Phonics Genius

Popplet

Picturebook: School Edition

Paper by FiftyThree

Penultimate

Prezi

Puppet Pals HD

Particle Zoo

Pizza Fractions 1

Planets

Papers

Phonics Rhyming Bee Free

ProCreate

Real Piano

Rainbow Sentences

Recorder Plus + HD

Reading Comprehension

Rhyme N Time

SketchUp

ScorecerGreen Planet

Silent History

Sight Reading HD

Science Learning Hub

Science Glossary

Science 360 for iPad

Sushi Monster

Simple Machines by Kids Discover

Star Walk

Solar Walk

SyncSpace: Collaborative Zoomable White-board

ShowMe Interactive

Story Creator

Scribble My Story

StoryBuddy 2

StoryBuilder for iPad

Sentence Builder

Smoovie - The Stop Motion Animation App

Story Patch

StoryKit

Stack the Countries

States of Matter

Seasons and Weather

Symmetry

SketchBook

Sketch Club

Sonja

SoundCloud

Socrative Teacher/Student

Spore

States of Matter

Symphony Pro

Tap Typing

Tenuto

The Human Body

Tellagami

Ti-Nspire

TinkerCad

Thinking Blocks Ratios

ThinkMusic

Type Racer

Whiteboard HD

Wolfram Algebra Assistant

Zen Brush

Zite