Access Learning

Presentation to the Senate and House
Education Committees — February 28, 2014

Schools in the Pilot

Keaau Elementary
- 857 students, 79% economically disadvantaged

Mililani Mauka Elementary
- 893 students, 16% disadvantaged

Mililani Waena Elementary
- 744 students, 32% economically disadvantaged

Moanalua Middle
- 839 students, 70% economically disadvantaged

Nanaikapono Elementary
- 929 students, 91% economically disadvantaged

Nanakuli Elementary
- 451 students, 87% economically disadvantaged

Nanakuli High and Intermediate
- 970 students, 81% economically disadvantaged

Pahoa Elementary
- 449 students, 92% economically disadvantaged

More Than Laptops

More Than Laptops

Professional Development for all administrators, teachers, and technology coordinators.

School safety resources and partnerships, digital device usage policy, and change management guide.

Teachers leveraging technology.

Students engaging in learning beyond the four walls of the classroom.

Breakdown of Funds

The legislature appropriated $8,219,659 to fully implement a 1:1 pilot program in School Year 2013-2014.

$7,998,940.00 Funds directly to schools to help offset **curriculum** costs, **devices** for every teacher and student, **software**, and a 6% **spare pool** at each school; **warranties**; **vouchers** to purchase educational **apps** and **cases** for iPads; **carts** for storage and charging; a portion of the **professional development**; and **technical support**.

$182,209.75 Funds directly to schools to purchase **substitute teachers**, overall **project management** and **evaluation**.

$38,509.29 Funds directly to schools to purchase **asset tags** for devices, classroom management **applications**, and an **evaluation tool**.

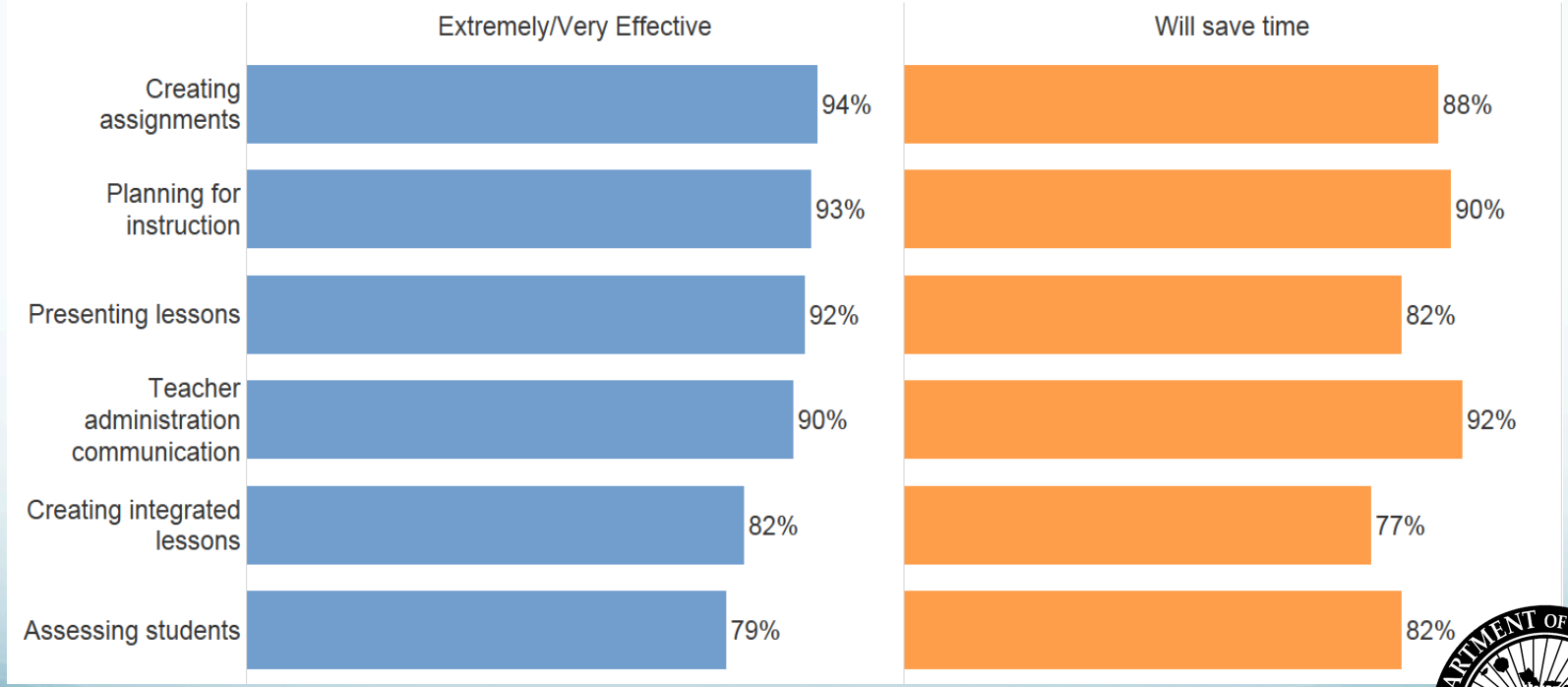
Some of what we're seeing...

- Students at Keaau Elementary going on a virtual field trip to the Honolulu Zoo with students from UH Lab School.
- Students at Pahoa Elementary creating classroom rules for using the devices responsibly (in addition to the Digital Device Usage Policy).
- Students at Moanalua Middle using devices during band to connect more deeply with music by learning about composers and their context.
- Teachers in Nanakuli working with students on how to "hug and hold" their devices to prevent damage.

Baseline Evaluation Results

"We do more sharing of documents – now more than ever before. Google Docs will let us post a document and then other members of my [grade-level] team can examine and make changes."
— Teacher interview, Fall 2013

Figure 8: Percent of Teachers who believe Laptops help save time



Baseline Evaluation Results

Giving the right tools, and teaching students how to use these tools will increase student participation at a greater level — increase critical thinking, and give the students life skills needed in the world around them. (Teacher survey, Fall 2013)

- 83-84% of teachers believe the **computers will help them improve the quality of student work** for traditional students, high achieving students, and at-risk/SPED/ELL students.
- 84% of teachers believe the **devices will improve student preparation for class** for high achieving and at-risk/SPED/ELL students.

Baseline Evaluation Results

More planning time for schools in advance of professional development.

- In order to fully implement by the end of school year 2013-2014, the Department accelerated its timeline. Schools were notified of participation in July 2013, with devices going to teachers in October 2013.

More time for targeted professional development before deploying the student devices.

- In order to fully implement by the end of school year 2013-2014, the Department accelerated its professional development timeline. All schools received professional development during the Fall semester and deployed the student devices by the end of February 2014.

Additional resources are required.

- This was a significant impact on technology staff at the school and state levels.
- Additional costs related to facility security.
- Ongoing costs associated with purchasing devices.

What's Next?

- Targeted professional development, at each school, for teachers and technology coordinators, building upon the foundation provided in the first semester.
- Ongoing evaluation to build on the baseline data collected in early Fall 2013.
  - Surveys of administrators, teachers, technology coordinators, students, and parents.
  - Final report of findings in May 2014.

Some Closing Thoughts

“ Aloha all,

I just wanted to share what an amazing day I had today! I was fortunate enough to join Principal Higa and her team, as they continued deployment of their devices. We visited kindergarten, first, second, and third grade classes where Principal Higa had the teachers unlock their computer cart to reveal the devices to the class. Each student then cleaned their hands, pulled out his/her device from the cart, and placed it carefully on his/her desk. Principal Higa demonstrated how to lift the cover, turn the computer on and log in, as well as how to turn it off, close the cover and return it back to the cart.

The kids were so excited to receive their devices! Besides the oohs and ahhs, as well as the cheering, **kids commented on how they were getting the same kind of computer their teacher has.** Some students commented on how **this was their first computer**. One boy actually brought me to tears when he said**, "This is the best day of my life!”**

From the moment I heard that the Nanakuli complex was going to be in the pilot, I was so thrilled! **This is bigger than just using a digital curriculum;** this is about **social justice for our kids.** Many of our kids on the coast **don't have the luxury of having a computer at home**. At school, they have always had to share the computers in the classroom. Now, with their own device, they'll be able to do so much more**. This pilot provides the opportunity to raise digital citizens, develop 21st century teaching & learning skills, and level the playing field between our kids and kids from more affluent communities.**

Mahalo for this amazing opportunity!”

Some Closing Thoughts

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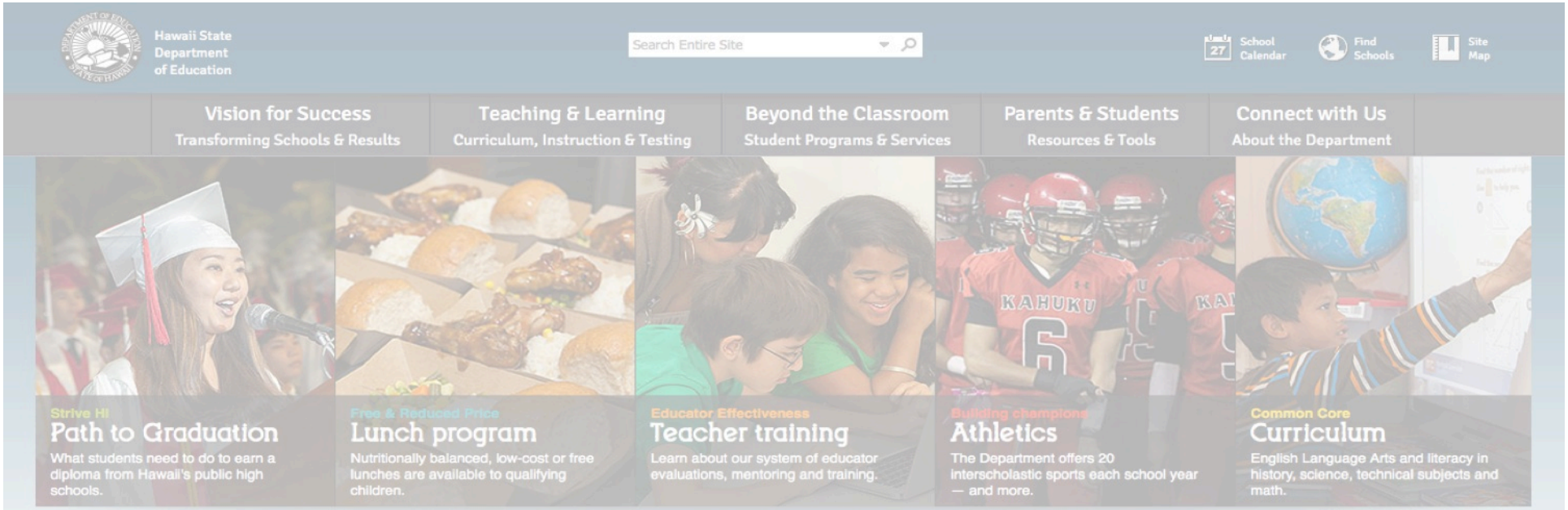

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The Impact of the Access Learning Pilot Program

Phase 1 Summary Evidence: Mid-Year Research Report

Prepared by Dr. Jonathan Schwartz

University of Hawaii West Oahu

The evaluation team consisted of one part-time researcher.

Dr. Jonathan Schwartz is an Associate Professor in the Division of Education at the University of Hawaii West Oahu.

Dr. Schwartz was hired to be the external evaluator on the Access Learning (formerly CCDC) Pilot Program.

This report has been written by Dr. Schwartz who also collected and compiled all evaluation evidence.

Overview of Research

The initial phase of the Access Learning pilot program (September 2013 to December 2013) provided all teachers in eight schools on two islands with laptop computers, and provided schools and teachers technical assistance. All schools received professional development for integrating laptop technology into their curriculum and instruction. Evaluation evidence collected and analyzed during this initial phase indicates:

Summary of Initial Findings

How are the computers being used, what impacts have they had on teachers and students, and what obstacles do teachers, schools encounter?

This report provides an overview of the baseline data collected during the beginning of first semester, 2013. These data include teacher perceptions of the potential impact of technology as well as lessons learned to date. A final report with administrator, teacher, technology coordinator, parent, and student data will be released in May 2014. The final report will also include any identified outcomes.

The evaluation evidence collected over the first 4 months of the program, and presented in this summary report indicates that computers are used widely by teachers and in a variety of activities to improve job performance and teaching. Three factors were identified that determine computer usage and acceptance: technology skill level, prior computer experience and usage, and participation in professional development activities.

Teachers and Principals see positive potential from the implementation of the one-to-one computer program. They believe that computers will help them improve performance and efficiency so that they can accomplish more in less time. They also believe that computers will make them better organized and prepared. They think that all students will benefit through greater access to educational opportunities and more individualized instruction. Teachers also think the new digital curriculum in English language arts will benefit teachers and students.

Some obstacles, however, have been reported in this initial phase of implementing the Pilot program. Teachers, Principals, and technology coordinators believe that there was a lack of a customized/localized implementation program by school and that numerous infrastructure issues that exist such as providing a sustained commitment of resources, device management questions and what for personnel additions are required to support the program. Many teachers also report that the lack of sufficient professional development activities, and the lack of time to explore and learn more about the uses of the laptops, hinders them in further integrating the technology into their teaching and learning.

In summary, more data needs to be collected to determine the success of this pilot program. Best practices are emerging and are being documented so that lessons can be learned. There is substantial self-reported evidence that student learning has the potential to improve. In the coming months and years, this perceived impact on student learning needs additional attention and study. This sustained and systematic analysis will require new types of assessments, along

with traditional ones, to capture the potentially new and more varied way of learning that are occurring through the implementation of Hawaii's innovative one-to-one laptop technology program.

Presently, a level of performance for the overall program must be determined in order to determine if the program will be considered successful. The key to answering this question is to work with individual schools to help them conduct their own evaluations. In that way, the school can determine benefits in a way that is consistent with their own goals and approaches to teaching, learning and data collection. This remains consistent with the Legislature's intent to empower each school to be directly accountable for student achievement.

There are a number of key questions to address as we move forward. These questions align with the key questions guiding the evaluation.

RQ1: How are laptops being used?

- How do we gauge commitment level?
- What levels of usage will be considered acceptable?

RQ2: What are the impacts of laptops on teachers and students?

- What measures will be used to evaluate student achievement?

RQ3: What obstacles have schools and teachers encountered using a computer in the classroom?

- How will the lessons learned be used to improve project effectiveness?

The Impact of Hawaii's Access Learning Program on

Teachers in Eight Public Schools: **Phase One Summary Evidence**

In school year 2013-2014, the Hawaii State Department of Education began implementation of the Access Learning Pilot Program, with the goal of providing teachers and students in participating schools with the opportunity to leverage technology to transform teaching and learning. For the purposes of data collection for the evaluation study, the pilot project has been divided into two phases: Phase One which took place during the Fall 2013 semester and Phase Two which will take place during the Spring 2014 semester. Phase One of the Pilot provided teachers in eight schools with laptop computers, funds to offset the costs of a new digital curriculum, and support for teachers and school leaders on integrating technology into teaching.

Phase Two will involve deployment of laptops to the students (it is noted that two schools -- Keaau and Pahoa Elementary Schools -- deployed both teacher and student laptops in the Fall 2013 semester). This report provides some evidence, from the Phase One, on teacher use and the anticipated impacts on teachers and students. Additional evidence will come in the report on Phase Two, to be issued in May 2014.

Background

The Department of Education seeks to investigate the impact that technology can have on supporting innovative and effective teaching, engaging students in learning by providing interactive and quality content, and the potential for technology to alleviate burden on educators. Based on the results of the Access Learning Pilot Program, the Department will further explore expanding access to digital learning opportunities across the state.

In 2012, the Department approached the Legislature with an ambitious ask for $42 million over two years for the first phase of a three phased rollout to ultimately provide all teachers and students with a digital device. This program was proposed to begin with focused professional development and the leasing of computer devices over a 4-year period. The legislature approved a smaller scale pilot and appropriated $8.2 million for the purchase and implementation of digital devices within one school year. According to DOE representative Stephanie Shipton, the shift to a one-year purchase and rollout as opposed to a multi-year rollout required the DOE to adjust their program. Adjustments included compressing the professional development schedule and revising a budget that was originally based on costs estimated from a multi-state request for proposal with devices leased as opposed to purchased and services/supports from the vendor included as part of the proposal.

In June 2013, 12 schools applied for the pilot program and 8 were selected. Schools were selected based on technology infrastructure and commitment to participate in key aspects of the program (professional development, program evaluation, and implementation of a digital curriculum). Complex Area Superintendents and school principals worked together to complete the application and review project requirements. In addition to the application, selected schools

completed a project agreement. Each school's project agreement included enrollment and teacher counts (to inform device purchase), the number of classrooms in the school (to inform device cart and other peripheral purchases), the resources the Department was able to provide, the school responsibilities, and the school points of contact/project team.

The DOE purchased devices for all teachers and students, charging and storage carts for each classroom, software (academic and security), and professional development, as well as provided funds to schools to offset costs associated with curriculum, asset tags, and substitute teacher days.

In the fall of 2013, the first implementation phase began. Schools completed professional development with three vendors: Apple Computers; the Curriculum, Research, and Development Group (CRDG) from the University of Hawaii at Manoa; and McGraw Hill or College Board. Apple Computers provided training that focused on fundamentals of using a Macbook or iPad, integrating computers into curriculum, language development in literacy, and creativity. CRDG provided training on Google Apps for Education in support of the Common Core, supported design and development of resources for schools to manage the transition to technology, and provided support to technology coordinators. McGraw Hill and College Board provided training on their digital English language arts curriculum. The Office of Curriculum, Instruction and Student Support (OCISS) provided on demand wiki wiki training sessions, scheduled and customized to meet each school's individual needs. Different vendors offered different professional development designs, mostly catered to the individual schedules and needs of each school.

By December 2013, 7 of the 8 schools had completed all scheduled professional development with CRDG and the one remaining school was scheduled to complete training in early January. Nearly all schools completed professional development with Apple Computers and all schools completed professional development with McGraw Hill or College Board.

Evaluation Design

In May 2013, a team of staff from the Office of Curriculum, Instruction and Student Support (OCISS), Office of Information Technology Systems (OITS), Office of Strategic Reform (OSR), and the Systems Accountability Office (SAO) met to discuss the key goals, research questions and data points that would drive implementation of the Pilot project. The group decided on goals for the Pilot project to include:

- Support student mastery of the Common Core State Standards;
- Improve and increase the use of technology to support student learning; and
- Identify best practices and lessons learned to inform work across the state, in non-pilot schools.

In June 2013, the DOE created a team to construct a research design for the evaluation of the Pilot project. Taking into account research on existing 1:1 pilot projects in other states and districts, project staff and developers identified three core areas to examine: (1) Teachers and Teacher Training; (2) Student Learning; and (3) Schools and Community. Based on these areas, research questions were developed.

The evaluator and the DOE recognize that policymakers and others require evidence to inform their assessment of the program. Thus, the evaluation focused on answering three questions:

- How are laptops being used by teachers?
- What are the impacts of the laptops on students and teachers?
- What obstacles have school and teachers encountered?

A mixed methods approach was used to collect and analyze evidence. A mixed methods approach integrates both qualitative and quantitative data collection techniques. For this research, the researcher started with the collection and analysis of quantitative data (surveys) to determine a relationship between variables. The researcher then used the information to inform the collection of qualitative data (interviews and observations). Using multiple evaluations and sources of evidence provided a triangulation of evaluation evidence, and increased the validity and reliability of findings. Evaluation was collected using the following tools:

1. Online surveys: Web-based surveys were used as the primary means of gathering data from all teachers, technology coordinators, and principals during the first phase.

2. Interviews: Focus group and individual interviews took place at all sites. During site visits, the evaluator met with teachers, team leaders, technology coordinators, vice principals, and principals. Interviews took place with individuals as well as small groups. In some cases, the evaluator attended team meetings and was granted time at the beginning or end to speak with the group.

3. Observations: A limited number of observations of classrooms were conducted during site visits.

4. The researcher also reviewed evaluations collected as part of professional development courses.

5. Case studies: The evaluator met with officials from public and private schools with one-to-one computer programs in the state of Hawaii. These schools included: Kalani, Ben Parker, Hale Kula, MidPac, Iolani, and Punahou. The review and analysis of these one-to-one computing programs helped inform the evaluation.

Evaluation Data

Teachers, technology coordinators, and principals in the Pilot program were surveyed during the first phase of data collection to develop a baseline. Table 1 reports the number of participants surveyed and returned, and the response rates.

Response rates varied by school. Almost 450 teachers were surveyed. Surveys from 161 teachers were returned and analyzed. Eight technology coordinators were surveyed, and all eight responded. Eight principals were surveyed, and all eight responded. In addition 13 site visits were conducted at pilot schools from October to December 2013. During those site visits, 94 teachers were interviewed at 8 schools. A limited number of observations took place at the two schools where students had already received computers (Pahoa Elementary and Keaau Elementary).

Table 1: Survey responses

Groups	Number Surveyed	Number Returned	Response Rate
Teachers	448	161	36%
Technology Coordinators	8	8	100%
Principals	8	8	100%

Table 2: Total number of site visits, observations and interviews.

Site Visits	Teachers Interviewed	Technology Coordinators Interviewed	Principals/Vice Principals Interviewed	Classrooms Observed
13	94	3	7	10

All teachers in the 8 schools in the pilot program were contacted and asked to participate in this evaluation study. Out of the 448 who were contacted, 161 or 36%, returned questionnaires. It is important to note that the results of this evaluation represent only the teachers who returned questionnaires, not all of the teachers in the 8 of schools. Findings are not and will not be valid enough to generalize.

Phase two of data collection will consist of the following:

- Teacher surveys
- Principals surveys
- Technology Coordinator surveys
- Student Surveys – pre and post
- Parent surveys
- Classroom observations
- Interviews with teachers, students, principals, technology coordinators
- Analysis of student work samples

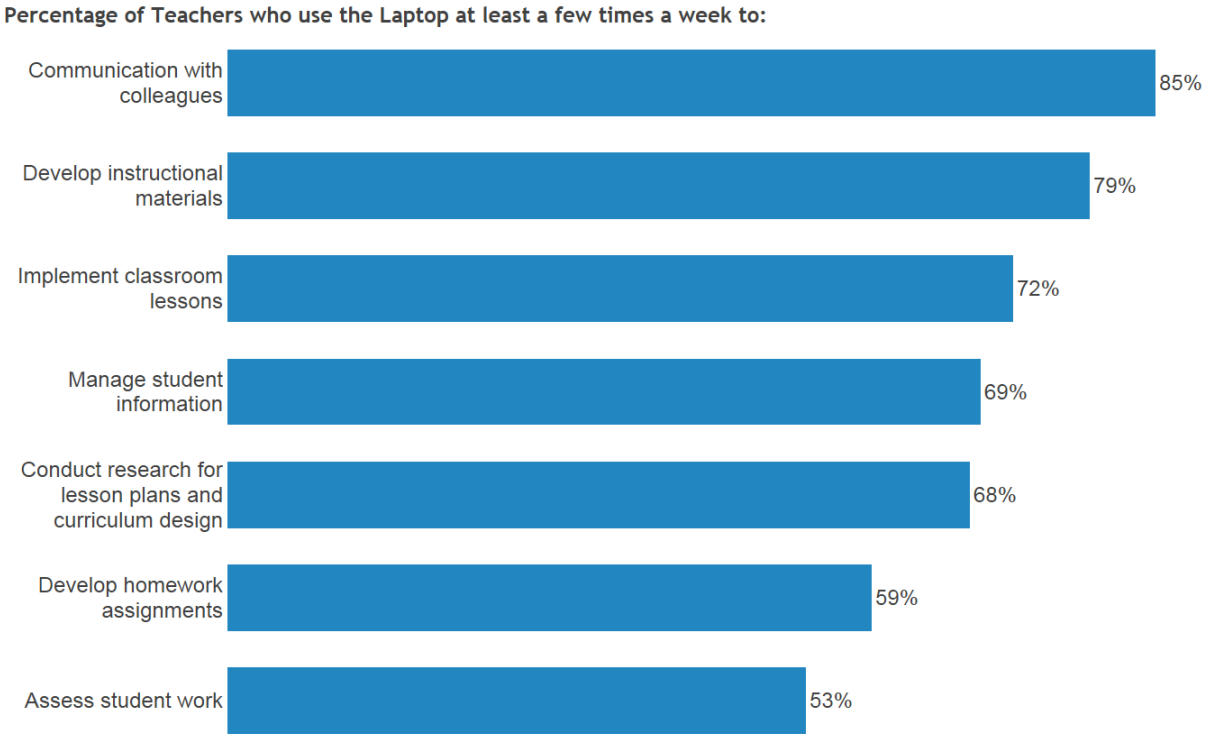
Findings

RQ1: How are laptops being used?

1. Prior to the introduction of the pilot, there was extensive usage of computers by teachers in the public schools.

- Prior to this year, 93% of teachers surveyed reported using a computer.

2. Computers are rapidly becoming critical to the way that teachers do their jobs. The teachers surveyed use computers in the following ways.



Some of the comments:

> *We do more sharing of documents – now more than ever before. Google docs will let us post a document and then other members of my [grade-level] team can examine and make changes.* (Teacher interview, Fall 2013)

> *One of the best things about using a computer is that it allows me to create and maintain library of materials. Over the last few years, I've collected lesson plans, presentations, assignments, and assessments that I've been able to use again and again.* (Teacher Interview, Fall 2013)

> *I am able to do research quickly when classroom discussion leads to a question I don't have the correct answer.* (Teacher Survey, Fall 2013)

Teachers repeatedly note that they use computers to augment teaching in various ways.

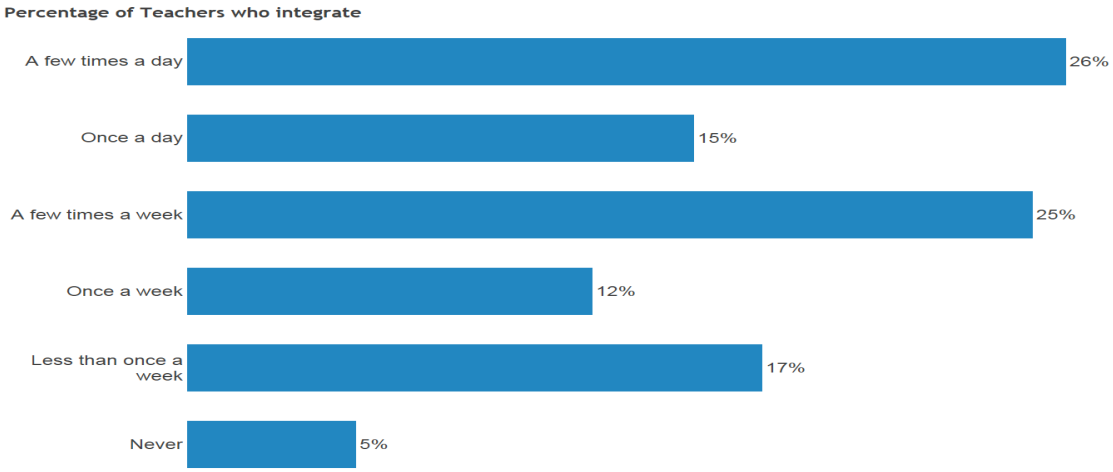
> *Students watch video clips on historical events we are studying. It gives them visuals of what they are reading and learning about.* (Teacher Survey, Fall 2013)

> *Videos, songs, games allow me to build prior knowledge in a way that is fun and interesting.* (Teacher Interview, Fall 2013)

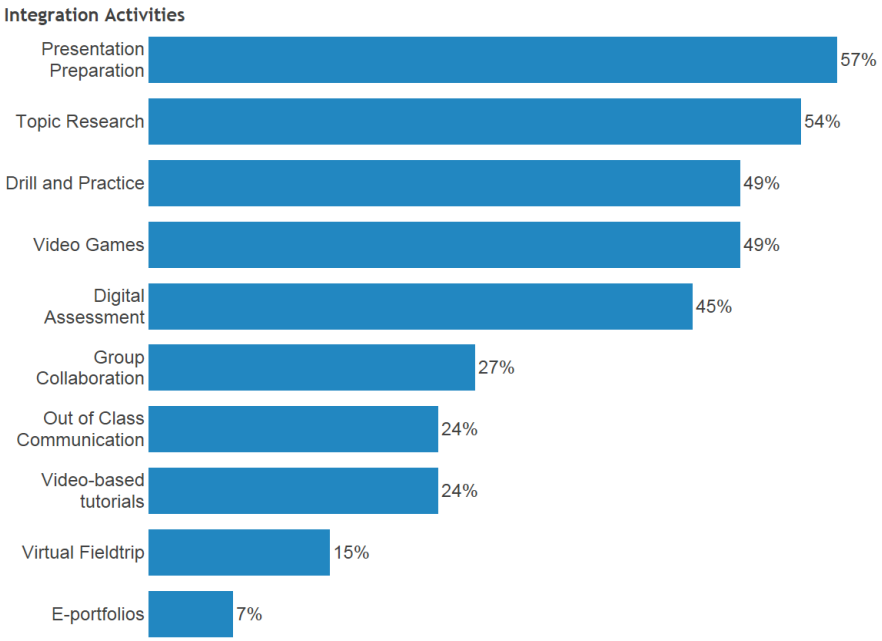
> *I have been able to develop schema in students by introducing videos and pictures. Also, students remember better when lessons are interactive such as keynote or powerpoint. Data is also easier to be analyzed when it is on a database where many can access.* (Teacher Survey, Fall 2013)

> *As a review, we play Jeopardy using PowerPoint. I also show clips to learn poetry or debate.* (Teacher Survey, Fall 2013)

3. With two of the eight schools deploying student devices in the first phase, 41 percent of the teachers surveyed integrate computers into their classroom instruction on a daily basis.



4. Integration consists of a broad variety of teaching activities.



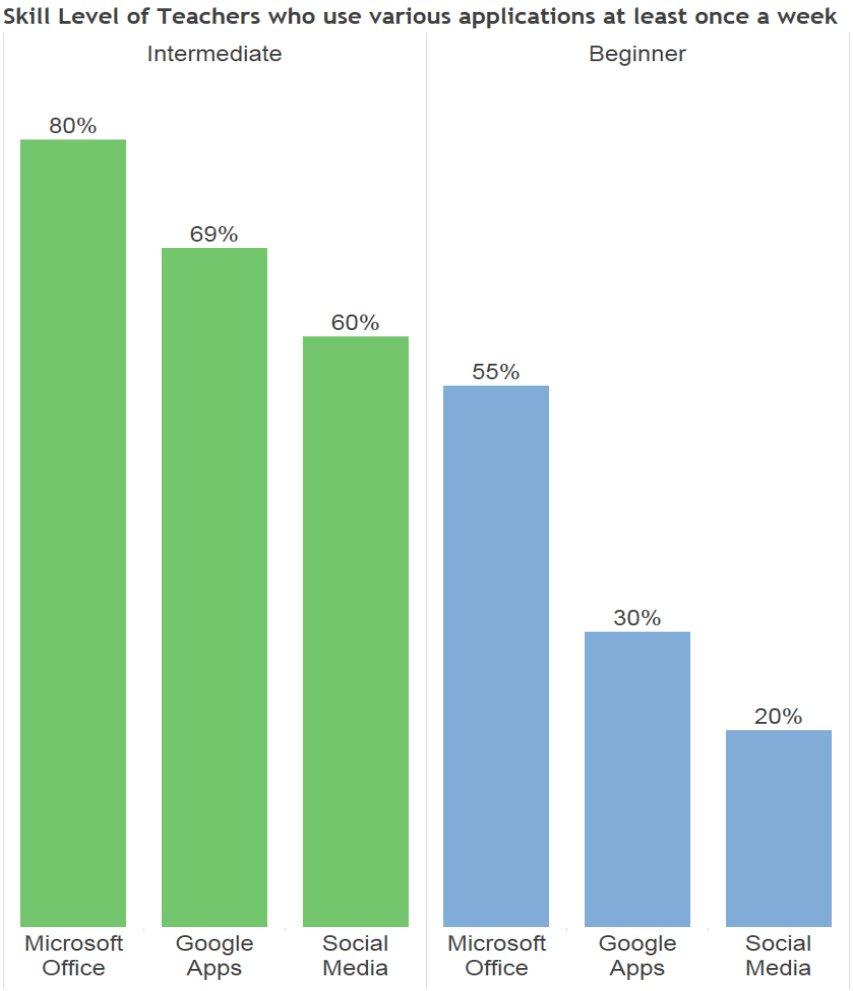
Google Applications for Education was a major part of the professional development provided as part of this pilot project. It is interesting to note that very few teachers who previously used Google Applications for Education for personal use are using these applications with their students. With professional development provided during the Fall 2013 semester to the Access Learning schools and the deployment of student devices in the Spring 2014 semester, teacher use of Google Applications for Education with students may have been lower.

Google Apps for Education	Using for personal use	Using with students
Calendar	47%	1%
Drive	51%	9%
Docs	53%	13%
Spreadsheets	38%	3%
Gmail	60%	8%
Presentations	19%	7%
Forms	23%	2%

5. Three key factors determine teacher computer acceptance and usage: technology skill level, prior computer experience and usage, and participation in professional development activities. The greater their technology skill level, the more computer experience they have and the more teachers participate in professional development, the more likely they are to accept and use computers in the classroom.

Technology Skill Level

Teachers who consider themselves intermediately skilled are almost twice as likely to use social media and have 50 percent higher usage rates of Google Applications as teachers who consider themselves beginners. This finding supports one of the lessons learned from schools with existing one-to-one programs. Interviewed officials from these schools emphasized that successful implementation includes having teachers use devices and applications for at least one year prior to the start of the program.



Comments from intermediate users of technology are typical of the following.

> *I'm familiar with Google Apps for Education. I've been using for over a year now with my students and with other teachers at my school. I would have preferred PD on more sophisticated applications like* [inaudible]. *I'm ready to start using the computers with my students.* (Teacher Interview, Fall 2013)

I can't wait to start this pilot with my students. It will certainly help remove the stress of where my students will get a laptop in order to participate. (Teacher Survey, Fall 2013)

Computer Experience

Less experienced teachers had a greater likelihood of using social media.

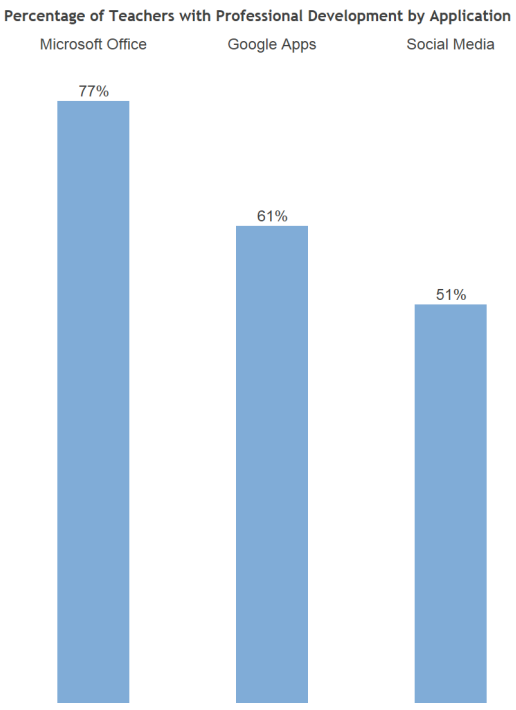
Years of computer experience	Use Social Media	Do Not Use Social Media
First Year	9%	1%
1-5	23%	12%
6-10	26%	13%
11-15	16%	12%
16-20	2%	9%

This data was consistent with comments about various computer applications. Comments from two teachers are fairly typical of comments from many others.

The more I use Google, the more comfortable I become with the apps. [Teacher Interview, Fall 2013]

...I will feel more comfortable about what I am able to provide for my students. Right now I'm feeling a bit outdated as far as my comp tech skills, as I haven't had time to explore, learn, and do. [Teacher Survey, Fall 2013]

Professional Development



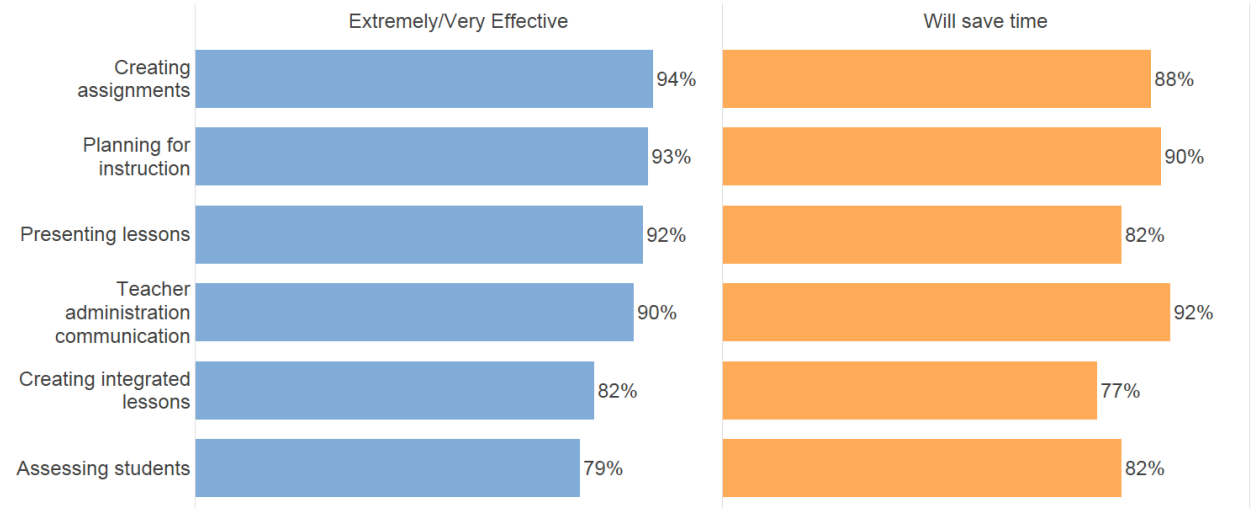
Teachers who responded that that they have not participated in professional development workshops related to integrating technology into the classroom showed lower usage of popular applications and social media.

Use of computers will be measured again in the spring. Changes in usage will be documented at that time and presented in the final report to be completed in May 2014.

RQ2: What are the impacts of laptops on teachers and students?

1. Most teachers are very positive about the potential of computers in the classroom. Teachers think that computers will help them improve performance and improve their efficiency so that they can accomplish more in less time.

Figure 8: Percent of Teachers who believe Laptops help save time



Technology coordinators and Principals surveyed as part of this evaluation also describe teachers' attitudes as positive.

Principals see the one-to-one computer program as an opportunity to support and provide opportunities for innovative teaching and learning.

> *Golden opportunity to support students and our Department!* (Principal Survey, Fall 2013)

> *The program provides a wonderful opportunity for 21st century leaning at its best!* (Principal Survey, Fall 2013)

> *This is the perfect opportunity for kids. Teaching practices have grown to include 21st century skills and student performance has increased tremendously.* (Principal Survey, Fall 2013)

2. Improving efficiency is a critical benefit. More than half of teachers surveyed believe that a computer saves them a significant amount of time when planning for instruction, creating assignments and communicating with administrators and other teachers. Almost half believe that computers help them save a lot of time when it comes to presenting lessons (49%), creating integrated lessons (42%) and assessing students (45%).

> *Self-correcting assignments and data collection is instantaneous. I can then provide immediate feedback.* (Teacher Survey, Fall 2013)

…have been able to develop schema in students by introducing videos and pictures using the computers. (Teacher Survey, Fall 2013)

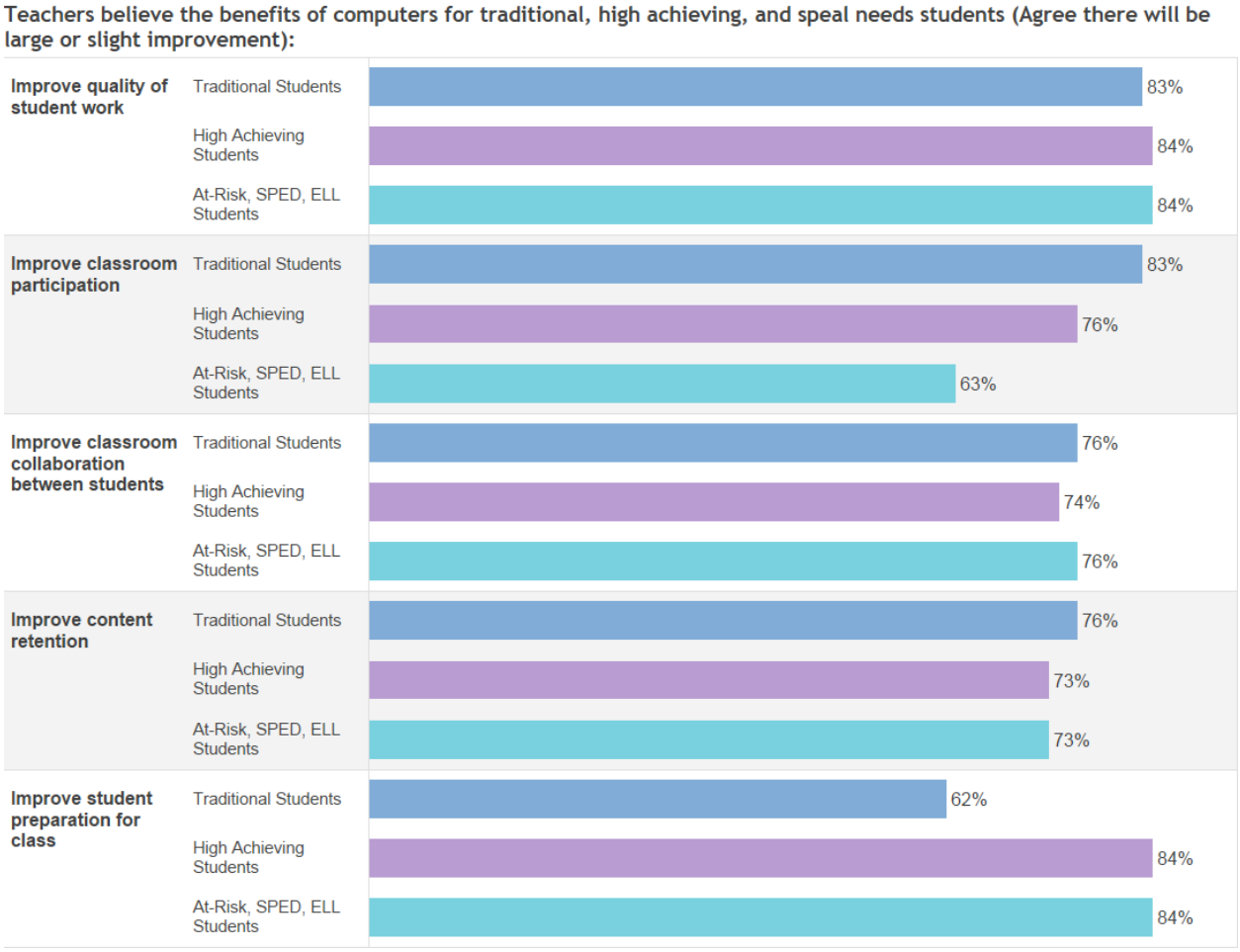
3. Better organization and preparedness is another benefit cited by teachers.

> *One of the best things about using a computer is that it allows me to create and maintain a library of materials. Over the last few years, I've collected lesson plans, presentations, assignments, and assessments that I've been able to use again and again.* (Teacher Interview, Fall 2013)

> *It allows me to create better records for parent teacher conferences including recording my students when they read and playing it back when we meet. Overall though, everything is better organized.* (Teacher interview, Fall 2013)

It helps with record keeping and details what each student needs to work on – in an organized and efficient way. (Teacher Interview, Fall 2013)

4. Teachers feel strongly about the benefits of computers for not only traditional, high achieving students but also students who may have special needs.



For example, comments from two teachers are fairly typical of comments from many others:

> *Having the technology assessable to students will not only enhance student learning, but allow students to move into the 21st century efficiently and successfully.* (Teacher Survey, Fall 2013)

> *Given the right tools, and teaching students how to use these tools will increase student participation at a greater level--increase critical thinking, and give the students life skills needed in the world around them.* (Teacher Survey, Fall 2013)

5. Teachers and Principals believe that computers will provide greater access to learning opportunities for students.

> *The teachers at [school name removed] want to even out the playground for our students. When students graduate and go on to KS* [Kamehameha Schools]*, we want students to be able to say that they have used a Mac Air computer, just like everyone else.* (Principal Interview, Fall 2013)

> *Students are excited about the opportunity to have computer access. I think that having a computer will make students more independent and organized.* (Teacher Interview, Fall 2013)

> *This will make a huge difference in student participation and access to resources.* (Teacher Survey, Fall 2013)

> *…some students do not have access to computers. I strongly feel that computers can enhance student learning especially because this generation of students are tech savvy.* (Teacher Survey, Fall 2013)

> *I'm excited for my* [special needs] *students. More opportunity to learn.* (Teacher Interviews, Fall 2013)

> *I feel that it is very valuable to students because it will allow those who don't normally shine to have a chance to highlight their strengths.* (Teacher Survey, Fall 2013)

6. Teachers believe that computers will help them to differentiate instruction. The computers will enable teachers to target different learning styles so that students are able to advance at their own pace and levels.

> *I have students watch videos, listen to songs, and do hands-on activities. There are really great programs also, like Achieve 3000.* (Teacher Interview, Fall 2013)

> *Jason never used to be engaged when we would do reading. He was one of my lower level readers, he was behind his classmates. He really likes to read now, and it shows.*

> *You can see. And his reading is improved. He reads faster and does a better job of understanding what he reads. He reads passages at his own rate, pace.* (Teacher Interview, Fall 2013)

> *I have found that technology allows students to express their learning in many different ways. It also allows me to differentiate my instruction for students depending on their specific needs.* (Teacher Survey, Fall 2013)

In the schools where students already have their devices, observations of students using computers reveal how students progress through content at their own pace while the teacher works with individual students.

> *There are 24 students in this class. 20 students sit at their desks looking at the screen of their laptop computer. The screen shows a reading passage alongside a video and several comprehension questions. Students use the track pad to highlight sentences in the passage to provide evidence for questions they had answered. Each student completes the task at their own pace – some finishing quicker than others. Once finished, students move on to the next passage/video. During this time, the teacher sits with a group of four students on the carpet in the back of the room. This group takes turns reading aloud to the teacher.* (Classroom Observation, Fall 2013)

Software programs currently used at many schools (IXL, iReady, Achieve3000) allow for differentiated instruction as well. One concern expressed by Principals is the ability to extend the school day and find more time for students to work on these programs.

> *We are looking to have extended learning time by next year, this will help. One way might be to have the students in A+ use computers. We might get a second bus to take kids home at a later time. Those who are really struggling, maybe taxi company will help to take the students home after they are done working on the computer.* (Principal Interview, Fall 2013)

> *We want students to practice beyond the school day. We are looking for extended learning time. We want more access to English language arts software, more practice for students.* (Principal Interview, Fall 2013)

7. When asked specifically about the new digital ELA curriculum (Wonders by McGraw Hill or Springboard by College Board), teachers agree that the new curriculum will be beneficial.

Benefit of Using Computers to implement the digital curriculum	Agree or strongly agree
It will enhance my pedagogical practices.	70%
It will enhance my students' learning.	71%
It will help me to align my teaching to the Common Core Standards.	74%
It will improve my capability to include technology in my pedagogical practice.	80%

Interviews and open-ended survey responses suggest that at the time of the survey few teachers had received professional development on the digital curriculum. This is due in part to the timing of the survey (beginning of first semester). At the writing of this report, all schools have completed their curriculum professional development.

RQ3: What obstacles have schools and teachers encountered using a computer in the classroom?

Based in this initial phase interviews, there are four obstacles to be addressed in order to effectively implement 1:1 computing.

1. Lack of a customized/localized implementation program by school.

There is a need to recognize the vast differences that exist between each of schools in Hawaii, and to tailor programs to the specific needs of each school. The table on the following page illustrates some of those differences.

	School Description	Reported Usage as of 10/2013[1]	Progress of the rollout as of 12/31/2013
Keaau Elementary	Enrollment: 857 % Economically Disadvantaged: 79 % Native Hawaiian: 36	High	Teachers and students have received devices
Pahoa Elementary School	Enrollment: 449 % Economically Disadvantaged: 92 % Native Hawaiian: 44	Low	Teachers and students have received devices
Nanakuli Elementary School	Enrollment: 451 % Economically Disadvantaged: 87 % Native Hawaiian: 92	Low	Teachers have received devices
Nanikapono Elementary School	Enrollment: 929 % Economically Disadvantaged: 91 % Native Hawaiian: 56	Low	Teachers have received devices
Moanalua Middle School	Enrollment: 837 % Economically Disadvantaged: 31 % Native Hawaiian: 9	High	Teachers have received devices
Mililani Mauka Elementary School	Enrollment: 893 % Economically Disadvantaged: 16 % Native Hawaiian: 13	High	Teachers and students have received devices
Mililani Waena Elementary School	Enrollment: 744 % Economically Disadvantaged: 32 % Native Hawaiian: 20	Medium	Teachers have received devices
Nanakuli Intermediate/High School	Enrollment: 970 % Economically Disadvantaged: 81 % Native Hawaiian: 71	N/A	Teachers have received devices

These differences are important as they impact the decisions made at the schools related to roll out of the one-to-one program at the schools. These differences suggest that there is no single approach to implementing a one-to-one program in the schools in Hawaii. This was recognized by both teachers and principals.

[1] High = 86% or more of the teachers surveyed at the school reported using a personal computer for work related tasks once a week or more.
Medium = 85% to 75% of the teachers surveyed at the school reported using a personal computer for work related tasks once a week or more.
Low = 75% or fewer of the teachers surveyed at the school reported using a personal computer for work related tasks once a week or more.

For example, two schools have already given computers to students and other schools are taking a more measured approach to device distribution.

As of December 2013, three schools had conducted informational sessions for parents, one school had scheduled an informational session for parents, and three schools plan to schedule informational sessions for parents in the near future.

Whereas two schools are currently allowing students to take computers home, two schools have decided that computers will not go home with students, and two schools have a plan to allow students to take computers home at a later time.

> *Our community out here is unique. We face very different challenges than other schools. The idea of sending computers home is something that may not work. We have families with 3 kids in* [name removed] *high school, and 4 kids in* [name removed] *elementary school. That's 7 computers in one home and turns a home into a target.* (Administrator Interview, Fall 2013)

Some schools need more professional development and some schools need less professional development. Some schools needs more advanced professional development and some schools need more basic professional development. Some schools can rely on their own faculty to provide professional development.

Some schools need more computers and more software licenses based on the number of transient students.

In addition, the bell schedule causes more complexity for some schools. However, schools are finding innovative strategies for addressing this challenge. In one instance, the school changed the bell schedule in order to provide students with passing time to check the devices back in at their homeroom (to accommodate device going with the student).

2. Insufficient time given to teachers for the planning and implementation process.

This was the teachers' and principals' number one complaint: that they were not given enough time to plan for the initiative. Most teachers want more time to prepare before students receive computers. Time as an obstacle is most dramatic for those less proficient teachers who are not comfortable with computers or for those who are not familiar with the Macintosh operating system. The following comments reflect numerous statements by teachers:

> *I think that just having the computers in teachers' hands will get them excited about preparing their lessons in different ways, but I don't know if there is enough time for teachers to experiment enough to implement with fidelity this year.* (Teacher Survey, Fall 2013)

It's difficult and problematic to begin a new program mid year. I wish that we had more time to plan for implementation. Feel overwhelmed because we have great things planned and now have to plan again with new reading program on devices. Not against it... just wanted more time to plan! (Teacher Survey, Fall 2013)

Classroom teachers have not had time to be effectively trained much less have time to practice with, explore and effectively utilize the tools given us. We were already more that 30 instructional days into the school year before my students and I had access to the devices. Evaluating the program at this time is therefore, in my opinion, premature. (Teacher Survey, Fall 2013)

Teachers need TIME not only to learn the tech-based curriculum, but time is also needed to collaborate, plan, and familiarize ourselves with the programs. (Teacher Survey, Fall 2013)

When asked if teachers would prefer this initiative had not been rolled out – if the pilot was giving them additional burden - teachers repeatedly stated that they would still feel overwhelmed by the amount of work not directly related to teaching students. According to teachers, it's not this specific initiative but it is all the initiatives.

It's like giving students five words every week - they learn the words. You increase the number of words to twenty each week - how many words are they truly retaining? There are too many initiatives added to the plate and nothing is being taken off. (Teacher Interview, Fall 2013)

It's like this, when you get all your work done, there is just more to do the next day. So you get a computer and can be more efficient, yes, I get my work done quicker. But then there is just more work to do. It just never ends. (Teacher Interview, Fall 2013)

I think I'm overwhelmed. The curriculum is rushed. The new curriculum and add in computer use and it becomes a lot to do at one time. We are glad we are learning about Springboard now, but it will be next year when it goes well. Teachers are now only learning to collect homework online, access students' assignments online, provide assistance to those students who need assistance. (Teacher Interview, Fall 2013)

The need for more time stems from the amount of learning involved, the vast number of initiatives rolling out in schools across the state, and the need for a clear message. Classroom teachers, especially those who are beginning computer users, are faced with an enormous learning curve. Not only must they learn how to use a computer, but they must now also learn to integrate computers into the classroom. This is most problematic for less proficient users. For example, comments from these teachers are fairly typical of comments from many others less proficient users:

> *I am a beginner/novice user of the technology and equipment in the classroom so I may not know how to use the equipment to further enhance my lessons.* (Teacher Survey, Fall 2013)

> *In addition, the state (in terms of public education) has been a PC state for so long that more professional development with Macs should have been provided before allowing students to use them. One day of professional development is not enough for someone who has never used a Mac. It's like giving car keys to a toddler and saying "now you can compete in a Nascar race*. (Teacher Survey, Fall 2013)

> *…this is an amazing shift in how we teach and how students will learn. A shift in thinking of this magnitude is not something that takes place overnight. We need time to digest this new way of doing things, we need time to think about how we will teach differently, we need to plan and prepare. Where is the time?* (Teacher Interview, Fall 2013)

> *We learned about using Google Apps – Forms, I think. But I haven't used them yet on my computer yet. They seem to be useful. Everything has always been so traditional – paper and pencil. This is such a shift.* (Teacher Interview, Fall 2013)

An administrator made similar comments, noting a major concern as,

> *Paradigm shift for teachers in regards to using technology for instruction, collaboration, and communication (teacher to teacher; teacher to student; student to student; teacher to parent; school to community)*. (Administrator Reflection, Fall 2013)

But even teachers who are experienced with technology face a vast number of responsibilities. One administrator summarized concerns writing

> *Balancing all of the deliverables for the STATEWIDE initiatives (e.g., Implementation of Common Core State Standards, ART, Data Teams, CSSS/RTI, EES, EOC, ACT) as well as rest of things that we are required to do (e.g., 1:1, complex initiatives, school initiatives, Academic/Financial Plan, bell schedule, etc) thus lack of time to get all that we need to get done, done!--PROBLEM: Tyranny of the Urgent.* (Administrator Reflection, Fall 2013)

This issue of feeling overwhelmed, unprepared, and anxious seems to stem from an inability to properly plan for the one-to-one initiative. Many teachers, school level staff, and administrators repeatedly note that a clear and coherent message from the Department of Education has been lacking as part of this project. They are unsure of the objectives.

> *Teacher's don't know what to teach or how they are expected to use computers.* (Teacher Survey, Fall 2013)

Some Principals agree that more up front planning should have taken place.

> …better planned upfront with all parties involved. Calendar of events and a research-based timeline (regarding pilots) [should have been] established. (Principal Survey, Fall 2013)

> *1. Pre-planned coordinated schedule 2. Longer lead time to schedule training 3. Allow more time to accomplish tasks* (Principal Survey, Fall 2013)

Communication also involves setting of clear expectations. Based on discussions with schools that have existing one-to-one programs, many mistakes will be made. There will be glitches, problems with receiving devices, and problems with a new curriculum.

3. Not enough individualized professional development specifically devoted to the program. Teachers expressed concerns about professional development. Two specific concerns included the need for professional development aimed at the ability level of the user and the need for a sustained professional development program.

> [professional development] *needs to be differentiated. For more experienced users, there was too much downtime. More experienced users wanted faster pace, less experience users wanted slower pace.* (Teacher Interview, Fall 2013)

> *I hope that training on "HOW" to integrate technology into the curriculum is given the top priority in this program. And I hope that the training takes into account the different levels of competency of the teachers so that teachers can receive training that will be helpful and not overwhelming.* (Teacher Survey, Fall 2013)

> *Not enough support and focus on PD that best practices for blended instruction.* (Principal Survey, Fall 2013)

> *I think if I had more professional development this would be phenomenal. I think right now, my limited knowledge of all the available educational programs is what's holding the class back. I only utilize the programs such as a3000, brainpop, class dojo, ixl, and reading wonders but I know there are sooooo many more other programs available that I could do if I knew how.* (Teacher Survey, Fall 2013)

> *Professional development will allow me to see how one-to-one devices can be best utilized for student achievement. As I learn more about programs or sites that I can use for instruction, the more I can help students navigate their devices and to utilize them to address their needs.* (Teacher Survey, Fall 2013)

Teachers also ask for professional development in which they are allowed the time to visit schools and see teachers use computers as part of their teaching and utilize applications.

I really want to see what other teachers are doing with computers in their classrooms. I think this would be a good way to learn more about integration. (Teacher Interview, Fall 2013)

Teachers and Principals ask for professional development that would be deployed over an extended amount of time. Teachers overwhelming suggest a full year of professional development and time in order to become more familiar and comfortable with devices.

Professional development was rushed. I need more time. A full year would have been good, and then I could have spent the summer becoming familiar with the computer, different websites, and planning lessons. (Teacher Interview, Fall 2013)

Customized PD throughout the year with follow up training support from the state project team (Principal Reflection, Fall 2013)

It was difficult cramming all of the training into one semester. It didn't give teachers a chance to try it out before they moved on to the next training. (Principal Survey, Fall 2013)

Two days of computer training for Reading Wonders was not sufficient enough for teachers to begin to grasp the program. No instruction on students working independently on computers was shown for this program. No examples of doing a complete lesson with a varied level of students in a classroom was presented. Teachers are learning independently as they teach lessons about the program and this causes inconsistency of how the program is suppose to be taught. (Teacher Survey, Fall 2013)

4. Infrastructure issues, a sustained commitment of resources, device management questions and personnel additions are required to support the program.

Many teacher expressed concerns similar to the following:

How long is the commitment of resources available so this can be implemented and sustained for following School years? (Teacher Survey, Fall 2013)

Will we be able to hire additional personnel to manage the devices? (Teacher Survey, Fall 2013)

5% overage of devices not enough for a high transient complex area, and More equipment needed (ear buds, hard cover cases for protection, etc. (Teacher Survey, Fall 2013)

All Principals agree that more funding is needed. This includes additional funding for professional development, training, additional personnel, educational programs, and equipment such as headphones and cases.

One Principal suggested

The next level of support needs to come at the budget level. Whether through legislation or administrative rule their needs to be a way to change fiscal requirements so that WSF monies can be saved and used in a three or four year cycle to allow for multi year leasing of hardware. I believe attention to this matter will allow for statewide implementation. There will still need to be some legislative help but we won't have to rely on total funding. (Principal Survey, Fall 2013)

DOE Response

DOE officials acknowledge the problems encountered by teachers and principals as part of the pilot program. Interviews with officials suggest the need for balancing standardizing expectations and allowing innovation through the pilot process. The DOE has taken steps to address these communication issues. A regular meeting schedule was recently created to hear and address problems encountered at schools. A mid point check in meeting was held to address group concerns. A chain of command is being used to ensure greater participation in evaluation. The DOE has also significantly increased the project team's time in schools, troubleshooting and collecting feedback. The project team created and manages two online learning communities and a resource site to provide schools with access to archived updates, documents, and FAQs. In addition, project staff are embedded at schools to provide real-time support to teachers.

The DOE has remained surprisingly agile in their ability to be responsive to problems faced at the schools and provide fixes directly related to this project. In most cases, departments were happy to work with the evaluator as part of this project.

Attachment A: Literature Review of Existing 1:1 Programs in Hawaii

Meetings were conducted with seven schools on the island of Oahu that currently have one-to-one computing programs. Administrators, principals, teachers, technology coordinators and curriculum specialists took part. In all cases, schools were very receptive to meetings and happy to discuss the one-to-one programs at their schools. The researcher took notes during each of the meetings and summaries were then written. Each summary adhered to a simple structure: background, things that have gone well, and important lessons learned. In all cases, summaries were sent to schools to ensure accuracy. Schools included: Punahou School, Mid Pac Institute, ʻIolani School, Kalani High School, University Lab School, Hale Kula Elementary, and Ben Parker Elementary School. Based on meetings and summaries, themes were generated. Themes as listed below as are consistent with themes that emerged from research data generated as part of this evaluation.

1. One-to-one programs at all schools are unique. Roll out was different at different schools and computers are used differently at different schools.

2. Teachers will differ in their ability. Teachers initially go through a progression of implementation and fall on a continuum in terms of the extent of usage.

3. It is important to provide support for teachers and students. There are many different support models.

4. There is a need to carefully consider and estimate the total costs for infrastructure, maintenance, and professional support.

5. Teachers need time to become comfortable with operating systems, hardware, software and online resources.

6. There will be problems with any one-to-one program.

7. Many schools do not collect data on their one-to-one programs.

8. Teacher buy-in is important.

9. Extensive planning and communication is critical for a successful one-to-one program.

10. Different schools see different benefits to a one-to-one program.

11. New ways of assessment are needed to assess 21st Century skills.

12. School leadership support is important.

Attachment A: Literature Review of Existing 1:1 Programs in Hawaii

Punahou School

Punahou School has had a one-to-one computer program for the past ten years. The program was built in phases and started with the deployment of devices in a single, fourth grade classroom. Today, all students in grades four to eight have laptop computers. According to officials at Punahou School, teachers initially go through a progression of implementation and fall on a continuum in terms of the extent of usage. Officials emphasize the importance of providing support for teachers and students and advise careful consideration and estimation of the total costs to include infrastructure, maintenance, and professional support. When implemented successfully, one important result can be more personalized instruction.

Implementation Time: Unavailable

Attachment A: Literature Review of Existing 1:1 Programs in Hawaii

Mid-Pacific Institute

Overview

Mid-Pacific Institute currently has a one-to-one computing program for approximately 1550 students and 160 teachers in grades 3 through 12. The program was rolled out in 2012. In Kindergarten thru 2nd Grade, students leave the iPad at school. Grades 1 and 2 have one-to-one iPads and Kindergarten shares 1 iPad for 2 students. With the advent of the iPad, administration made the decision that costs were no longer prohibitive and mapped out a plan for device deployment. For almost two years, teachers prepared for the one-to-one computing program at Mid-Pacific Institute familiarizing themselves first with the Mac operating system, hardware, software and online resources. Expectations were made clear to teacher that iPads would be used campus wide. A staff of 7 individuals support this program.

What's gone well

Officials believe that student and teacher creativity has been enhanced and that students are more engaged and excited about school. Devices are used as part of projects that reflect a more project-based curriculum where iPads are used to collect research and solve real world problems. Teachers report that students are more responsible as they care for devices both on campus and at home. Classrooms have changed measurably in terms of the amount of time individuals contribute to classroom conversations. There is more participation by students and more collaboration with community members. Parents have expressed interest and the school has recognized and encouraged this interest by providing professional development classes and promoting conversations in the home around a number of topics such as the appropriate use of technology and computer literacy. In addition, Mid-Pacific Institute now sponsors the Schools of the Future Project where representatives from different schools and the community come to visit the Mid-Pacific Institute campus to learn about technology innovations.

Principals have worked hard to support technology use by teachers. They have developed a professional development model where content is peer taught. As a result, experts are readily available and provide assistance when needed. Principals also recognize the need to create time for teachers to learn to use technology and take part in learning communities in order to collaborate with peers and other professionals. It is important to recognize that all teachers are unique and all classrooms are unique; thus, implementation and the extent of usage differs from class to class.

Important lessons were learned

According to officials at Mid-Pacific Institute, there was no way to identify all the possible issues prior to the start of the one-to-one program. Some specific issues faced by Mid-Pacific Institute included managing updates to the iPad operating system, changes in applications, and an increased ability of individuals to penetrate networks. This resulted in major revisions to the overall program in first year and the Acceptable Use Policy

(AUP) was revised. Digital citizenship and breakage were also recognized as major issues. Despite these issues, administration maintained an attitude that "things are going to happen" as part of any one-to-one program and worked hard to improve the program. In recent years, there have been more conversations, more collaboration and more communication. Digital citizenship is more integrated into classrooms and assemblies. Social media conversations are had regularly and the school has brought in experts to discuss issues such as bullying. Teachers have become more involved in conversations about computers and helped revise the AUP.

Teachers have taken to the technology at their own pace. Early adopters raced ahead and experimented with different ideas. Other teachers have needed more time to adopt devices in their classrooms. Teachers span wide in terms of how they use devices and how much they use devices. Regardless, the teachers take time to reflect and seem to seek out resources and technology coordinators for assistance. There are those who simply substitute the computers in the classroom and there are other teachers who think out of the box.

Implementation Time:
2011-12 School Year: All teachers received laptops
Spring 2012: Teachers received iPads and professional development
Fall 2012: Students received iPads

Attachment A: Literature Review of Existing 1:1 Programs in Hawaii

‘Iolani School

Overview

‘Iolani School currently has a one-to-one computing program for nearly 1900 students and over 300 faculty and staff serving grades K through 12. The program was inspired by students and initially rolled out iPads to fourth grade students in 2011. This expanded to include fourth and fifth grade students in 2012-2013, and spread to Upper School in January of 2013 to put iPads in the hands of all teachers and the Junior class students.

The program was developed based on the idea that iPads are not meant to replace teachers; instead, computer devices are a tool to improve teaching and make teachers and students more efficient. Teachers are under no obligation to use iPads in their classrooms nor are teachers obligated to attend professional development sessions.

Extensive time and planning went into the development of the one-to-one computing program. A consultant was hired and a support system was built. The infrastructure was enhanced to include state of the art equipment and facilities. There are currently a total of seven Information Technology Services (ITS) and 4 Education Innovation Lab (EIL) staff providing support to help teachers integrate computers into the classroom and manage devices.

What's gone well

Officials at 'Iolani School note that students are more organized, efficient and connected as a result of the one-to-one program. Less than one year ago, students on campus could be seen toting 15 to 20 pound backpacks to class. Today, students carry much smaller cases with as little as a single electronic device. Students use devices for such tasks as note taking, accessing web-based texts, collecting data, writing and presenting reports, and communicating. There is more collaboration between students and between students and teachers. Officials believe that 'Iolani School is more open than ever before to collaboration between students and teachers thanks to the opportunities that technology provides. Classroom teaching incorporates real world events and involves parents and other local stakeholders more than ever before.

Teachers at 'Iolani were involved in the development of the one-to-one program and all steps as part of the implementation were transparent. Input was collected using surveys and focus group meetings. Teachers took part in all regular meetings and were kept informed throughout the process regarding issues such as professional development, device distribution, and device maintenance. This resulted in a strong sense of buy-in from teachers. Administration believes that good communication and transparency generated enough good will such that when problems arose, teacher support did not wane. According to officials at 'Iolani, "The faculty knew what was coming so the roll out was smooth."

Extensive administrative support was crucial to the success of the program. This included adequate funding for infrastructure, professional development, and support for students and teachers.

The success of the program has resulted in wide recognition. It is not uncommon for teachers and administrators from DoE schools to visit 'Iolani to learn about the program and see how devices are being used.

Important lessons were learned

In 2012, 'Iolani School hired a consultant to provide direction and focus for the one-to-one program. As a result, there were very few unanticipated occurrences. Costs have been in line with expectations and infrastructure has been fully developed.

Administration and faculty have had to deal with issues related to ordering online textbooks, mobile device management, and game playing. But, for the most part, the program has had very few problems. Ongoing review and refinement of policy is a requirement.

Officials at 'Iolani School have worked hard to marry the responsibilities of educational technology experts and specialists in instructional technology. These individuals now work together closely and have adopted a customer service mentality highlighted by the phrase "how may we help you?".

Implementation Time:
2011-2012 School Year: Tests of lower school iPad deployment using cart-based model
Fall 2012: Deployment of iPads to teachers and staff
Spring 2013: Deployment of iPads to Junior Class as take-home devices. Professional development for teachers.
2013-14 School Year: Full deployment to all students in all grades on the first day of school.

Attachment A: Literature Review of Existing 1:1 Programs in Hawaii

Kalani High School

Overview

Kalani High School first deployed a one-to-one computing program during the 2009-2010 school year. During that school year, the principal contracted professional development for teachers in the fall, then deployed 600 computers to students in grades 9 and 10 in the spring. By the 2011-2012 school year, all students in all grades had computers - 1100 students and 90 teachers. Kalani employes a staff of two full time individuals plus Network 2000 representative to maintain the one-to-one program at Kalani. One staff member is a classroom teacher and curriculum and instruction specialist. The other staff member is full time technical assistant. Network 2000 representatives provide additional support including deploying, imaging, and collecting devices.

What has gone well

Since the initial roll out of laptop computers, school officials have seen increased usage by students and teachers. This has resulted in improved computer literacy skills, more collaboration, and more engagement by students. A library of software and websites has been developed to benefit teaching and learning. At Kalani, there is daily computer usage by both most teachers and students who using a variety of programs/software in many different ways. Students complete tasks in school and at home. Project-based tasks include the creation of presentations, short videos, and web quests. Students create and administer surveys to collect and analyze data. HSA testing is also conducted on computers.

Teachers who use computers love their devices and cannot do without. Administration reports that teachers who use devices are more productive and work more efficiently. of the success at Kalani is based on a culture that has developed where teachers and staff are more than willing to help others in need. This collaboration has made those less experienced users more willing to take risks.

Important lessons were learned

Kalani Principal Mitch Otani states that computers are a great tool, but present many challenges. He stresses the importance of anticipating the costs as part of a one-to-one program and notes that unforeseen problems will arise. For example, when the school bought more computers, devices did not arrive on time, imaging took longer than expected, and computers were could not be immediately deployed. Updating drivers was time consuming and took substantial man power. The staff has worked hard to prohibit student access to inappropriate websites and deny unauthorized users on the system.

Not all students have devices for various reasons. The nature of the program at Kalani has led to a decrease in usage by students. Because students take advanced classes at other schools, fewer seniors are in class on the Kalani comps and those families do not see a

need to invest in a device. This has led to fewer teachers being interested in using computers and professional development has tailed off.

One of the goals of the one-to-one program at Kalani it to enhance 21st Century skills including communication, team work, problem solving. To that end, the school is working with a research consultant to examine the impact of the one-to-one program on student learning. Measuring achievement proves difficult in that it is hard to isolate achievement/success while separating out other school factors (e.g., new bell schedule, extra study hall, make up exams).

Getting teachers to by in to the one-to-one program has proven difficult when there are many initiatives out of the Department of Education. Teachers have difficulty finding time to advance their computer learning and explore different ways to integrate given the various initiatives in the district.

Implementation Time:
Fall 2009: Students in 9th grade received devices
Summer 2010: A group of teachers (10+) received 60 hours of professional development
Summer and Fall 2010: Students in 9th and 10th grade received devices
2011-2012 School Year: All students received devices, full implementation
Professional Development ongoing as needed

Attachment A: Literature Review of Existing 1:1 Programs in Hawaii

The University Lab School

Overview

The University Laboratory School (ULS) is in its second year of a 1:1 computing program. Prior to the program's conception, the idea of 1:1 computing had been debated by the ULS community for over a year. The administration and technology committee discussed numerous concerns about undertaking such an initiative. Concerns included costs for both the school and families, access for students, training and support for teachers, students, and parents, and the effective uses of the technology as part of the curriculum. In 2012, the decision was made to pilot the 1:1 computer initiative with 56 seventh-grade students and 9 teachers for the 2012-2013 school year. The program was deemed a success and expanded in its second year to involve 168 students in grades 6-8 and 25 teachers.

What went well

The ULS 1:1 pilot program coordinators collected data over the course of the year to address the main concerns regarding cost, access, and training. Students, parents, and teachers completed surveys that included many of the key concerns. Survey results showed increases in access to technology at school and home, and in time spent on schoolwork. Students reported improved quality of work and seemed more interested in school.

In addition, students participated in 21st Century Skills assessments to gauge what impact having anytime access to a computer might have on 21st century skill development. Results showed increases in creativity and innovation, communication and collaboration, research and information fluency, and digital citizenship. In some instances, gains were substantial.

The student and parent training programs were compulsory and deemed mostly successful. Students were trained and tested by ULS teachers in the areas of the Acceptable Use Policy and the ULS Laptop Contract; parents attended a meeting run by the ULS administration to go over the specifics of the program. Both students and parents were trained by an Internet Safety specialist at separate meetings.

It is important to note that prior to the 1:1 pilot program, the entire ULS faculty and staff, not just teachers involved in the 1:1 program, participated in a year-long technology professional development that focused on the use of Google Apps for Education, Mac OS, classroom hardware, and PowerSchool (the school's student information system). ULS administration focused all professional development time on technology with a goal of basic fluency for all teachers. ULS administration went virtually paperless, sharing folders, calendars, documents, and forms with teachers. This forced teachers to learn to use these applications and promoted an understanding and expectation of usage throughout the school. As a result, teachers at ULS are committed to integrating

technology into their classes, and are immersed in technology as part of their everyday lives at the school.

Because the student 1:1 computer would be different from the teacher computer, teachers in the 1:1 program were given the student computer to use for 6 months prior to the 1:1 program beginning. This was to help teachers determine what apps would be useful for their students and so that teachers would be able to help students troubleshoot computer issues. It resulted in teachers in the 1:1 program feeling comfortable and prepared to integrate more technology into their teaching.

Important lessons were learned

In the first semester of the pilot program, 30% of the computers were damaged, and most were a complete loss. This was a result of many factors, including a fragile device, as well as student use and abuse. This substantial hardware loss led to the inclusion of community incentives such as the work rewards program (student homepages open to a screen that reads "X days since last computer incident") to increase the feeling of community responsibility. In the second semester of the pilot program, damages were much less than the first semester. Most importantly, the overall damage to the laptops resulted in the program administrators selecting a more rugged, and less costly, machine for year 2. Currently, in the first semester of year 2, there has been damage to less than 2% of the machines.

Another cost item that changed from the pilot was the approach to filtering the Internet at home. In the pilot year, ULS provided families with a $60 router, but most parents reported that they didn't install the school-issued router. In the second year of the program, ULS installed Securly, a web filter that protects students wherever they use the computer, at a cost of $10/user/year.

In the second year of the 1:1 program, because more teachers and students were involved in the one-to-one program, ULS administration committed 1½ duty periods for a Technology Integration Coordinator. This person is in charge of coordinating all the student and parent trainings, as well as supporting teachers with technology integration. Also, based on teacher feedback, ULS invested in Hapara, a management platform that works with Google Apps. Teachers were assigning, and grading, more work on Google Docs, and the management was cumbersome.

Implementation Time:
2011-12 School Year: All teachers participated in technology-based professional development
Spring 2012 School Year: 7th grade teachers received devices and supplemental training
2012-2013 School Year: Implementation for 7th grade teachers and students
2013-2014 School Year: All middle school students and teachers entered the 1:1 environment with continued professional development

Attachment A: Literature Review of Existing 1:1 Programs in Hawaii

Hale Kula Elementary School

Overview

Hale Kula Elementary School has a one-to-one computing program for 21 students in two classrooms: one 4th grade classroom and one 5th grade classroom. The program was developed in 2011 as part of a Department of Defense grant. Each week students spend 2½ days at home and 2½ days in school. Students in the one-to-one computing program take part in all school-related activities including field trips, student council, and physical education. Through the DoDEA grant, Hale Kula has a grant manager who works to gather data from the school as well as Wheeler Middle School regarding academic information about the students in the program. The manager also monitors spending and is the point of contact for any communication with DoDEA.

The one-to-one computer program was initiated by a Blended Learning Team with support from the Tech Coordinator, the librarian, and the curriculum coordinator at the time. Teachers were provided with funding from Hawaii Virtual Learning Network so they could create their curriculum that was then placed on the learning platform, Blackboard. Throughout the two years of this program, it was a team effort to work through the challenges and celebrate the successes.

Teachers took part in an intensive training course and spent considerable time developing a curriculum based on Common Core Standards and identifying resources. There were many information meetings between teachers and parents in an effort to ensure that everyone was well informed about the program.

What went well

There is strong support for the program at Hale Kula. The teachers who designed the program are motivated to carry out a successful program. Students are interested in a program that is new and exciting, and parents are encouraged about the promising benefits.

There have been many benefits for students. Those involved with the program at Hale Kula report that students are more self-reliant. Students demonstrate improved organizational and time management skills. There are higher levels of engagement as well. Students are more confident than ever before. Statewide assessment data has been good; last year, all students met or exceeded proficiency.

There have been benefits for teachers as well. Teachers have expanded their repertoire of teaching strategies and are now utilizing a more student centered curriculum that is project based and allows for more student choice. Instruction is more personalized and computers allow teachers to differentiate instruction.

Administration at Hale Kula believes that the one-to-one program has resulted in increased collaboration and provided a means to share with the community. This has

included presentations at the Schools of the Future Conference by 11 and 9 year old students. The Blended Learning Team has presented at a Kamehameha Tech Conference, a Schools of the Future Conference, and a Librarians' Association Conference. They have also done a presentation for the Joint Venture Education Forum. Administration is quick to point out that test scores do not characterize the program and notes that not everything can be measured.

Important lessons were learned

Many lessons have been learned as a result of the one-to-one program at Hale Kula. Over the last few years, the program has evolved and administrators, teachers and parents have learned that one-to-one computing is not for everyone. All students are different in that there are those who have need more assistance and others who are more self-directed.

The Blended Learning program model will be difficult to sustain due to the fact that elementary school parents are reluctant to enroll their children in this program. Having a child at home for 2½ days can be restrictive for parents who have other commitments during the day. Parents were appreciative of this opportunity for their children and were effusive in their praise.

Computers are only a tool that can be added to a teacher's repertoire. When used properly, a computer can be very effective. But a computer is not a curriculum nor is it a replacement for a teacher. Using computers as a tool in the classroom requires time-intensive planning and preparation. One factor that helped this program to be successful was that teachers at the school had been using Google Apps for three years before the implementation of this program. If teachers do not have this prior experience with devices or applications, more learning time is required. Teachers find it difficult to find time given demands by Department of Education initiatives and other school responsibilities.

It is important to consider the costs involved with a one-to-one program. At Hale Kula, professional development has fallen off because money was allocated primarily for devices. Administrators and teachers continue to work on a plan to make the program sustainable. Funding for infrastructure is critical. A strong network must be able to handle the number of computers as part of a one-to-one program. Additionally, maintaining the laptops can be challenging; constant updates to devices need to be made. If a one-to-one program is implemented in any school, it may require additional personnel.

Test scores won't necessarily go up as a result of a one-to-one program. As a result, assessments need to be rethought to reflect 21st Century skills.

Finally, administrators and teachers believe that in any classroom, students need the opportunity to apply skills they have learned. The one-to-one program focused on application of skills and choice to collaborate, communicate, think critically, and create. These are essential 21st Century skills. These are skills all students need in order to be

successful in the future.

Implementation Time:
Spring and Summer 2011 - Teaches take part in professional development
Fall 2011 - Students receive devices, full implementation

Attachment A: Literature Review of Existing 1:1 Programs in Hawaii

Ben Parker Elementary School

Overview

During the 2007/2008 school year, Benjamin Parker Elementary began planning and implementing a one-to-one computing pilot program. During that year, computers were ordered and sent home with students for a limited amount of specific projects. At the same time, the school installed access to a wireless network throughout the campus. The following year, educators and staff at the school began an outreach program to educate the community about the program. Parent meetings were held and computers were issued to students and parents. In subsequent school years, the program was expanded to include all students with full implementation complete in 2010/2011. During the 2010/2011 school year, all students in grades 1-6 had a computer to use in school. Students also took these devices home to complete assignments. Laptop centers were installed for students in kindergarten.

What went well

Professional development efforts were strong. Teachers were able to go to Punahou School to see the use of devices in a classroom setting. Many teachers sought out their own professional development.

There is a strong commitment by teachers. The pilot started with teachers who wanted the computers.

The pilot took three years to fully implement. In the third year, there was a jump in test scores. Regular completion of online programs such as KidBiz helped this jump.

Community was kept informed and was very involved. Relationships with local business proved useful. For example, these stakeholders helped with repairs.

Important Lessons Learned

Educators and staff at Benjamin Parker Elementary learned many lessons from the implementation of the one-to-one computing program at their school. Most importantly, they learned that an infrastructure needs to be in place in order for a successful program to be carried out. At Benjamin Parker Elementary, a physical infrastructure included a wireless system, extra laptop computers, electrical capacity in all buildings, charging stations and appropriate furniture. An organizational infrastructure included trouble-shooting teams in place with flexible schedules, form, procedures, professional development time and money, and a computer expert on staff.

Based on the implementation, faculty and staff also learned the importance of teacher training. Teachers need to be familiar and comfortable with the computer program in order to best make use of the technology.

Parent involvement was deemed essential for the success of the program. Training sessions were held for parents and professional development vendors included parent sessions in with the training of teachers.

Changing attitudes and perceptions was targeted. Many faculty and staff were worried that students would not properly care for laptop computers. Many teachers were forced to shift their thinking regarding how in-class assignments and homework would be completed and submitted.

There are numerous software programs available to school. No one program is best for any specific school.

Consistent monitoring and support is needed to gauge the continued professional development, technology support and training, time. At time, staff needed to force the issue when necessary.

Aligning resources can be costly but is necessary. For example, purchases on textbooks needed to stop and money needed to be put into technology. Support positions needed to be able to work with technology and provide support. Training time needs to take place.

There were many problems initially including insufficient network infrastructure, poor battery life, lack of available training, and costs associated with training.

Implementation Time:
2007-2008 School Year - Some teachers and some students received devices for specific projects
2008 to 2010 - More teachers and students received devices, Professional development for teachers
2010- 2011 School Year - All teachers and students had received devices, full implementation

Digital Materials and Devices

States
States are moving rapidly toward classrooms that are more technology rich and curricular materials that are delivered digitally. For example:

- Maine deploys a 1:1 device strategy in middle and high schools.
- Alabama just signed a law required computing devices and digital textbooks for all high school students.
- Idaho law requires that all high school students have devices by 2015-2016.
- Laws in New Mexico and West Virginia require publishers to provide materials in electronic and print formats.
- North Caroline requires that textbook funding transition to fund digital materials.
- Florida is transitioning to digital materials and technology by 2015-2016.
- Pennsylvania and Missouri are placing a heavy emphasis on pushing technology into the classroom via 1:1 and other strategies.

The map provided at the end of this document, highlights recent changes to state laws to implement either a digital materials initiative, device strategy, or both.

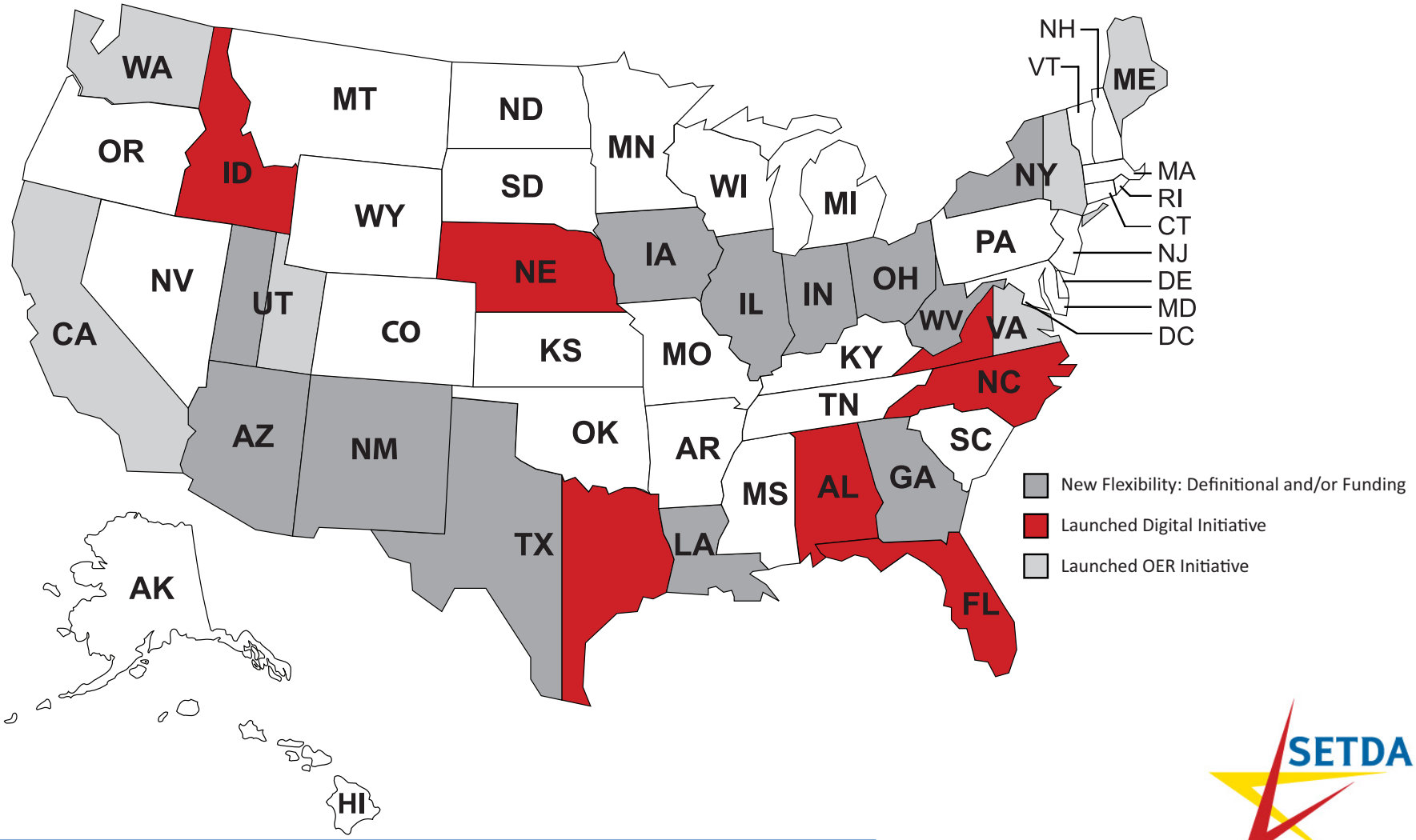
Districts
In many cases, school districts are moving faster than their states. Hundreds of school districts are already deploying 1:1 device strategies. According to US News and World Report, *over 600 school districts are implementing 1:1 iPad deployments*. A sampling of 126 districts in 27 states with some kind of 1:1 device deployment (laptop, tablet, hybrid) is below.

- Mooresville Graded School District, NC
- Floydada, TX
- Spartanburg School District 3, SC
- Henrico County, WV
- Auburn City Schools, AL
- Charleston County School District, SC
- Greene County School District, NC
- Baldwin County Public Schools, AL
- Guilford County Schools, NC
- Kansas City Public Schools, KS
- Glidden-Ralston School District, IA
- Omaha Public Schools, NE
- Huntsville, AL
- Byron Independent School District, TX
- Winterboro, AL
- Irving Independent School District, TX
- Coleman Independent School District, TX
- McAllen Independent School District, TX
- Stillwater Central Schools, NY
- Shoreline School District, WA
- North Kansas City 74 School District, MO
- Owensboro Public Schools, KY
- San Francisco Unified School District, CA
- Georgetown County Schools, SC
- Kent School District, WA
- Community Unit School District No. 4, IL
- Community Consolidated School District 181, IL
- Cross County Schools, AR
- East Noble School Corporation, IN
- Ferndale School District, WA
- Kuna School District, ID
- Natick Public Schools, MA
- Reeds Springs, MO
- Richland School District Two, SC
- Salisbury Township Schools, PA
- Southern Lehigh, PA
- Inman Schools, KS
- Sunnyside School District, AZ
- Minnetonka Public Schools, MN
- Godfrey-Lee School District, MI
- Cullman City Schools, AL
- Lexington Public Schools, NE
- O'Neill Public Schools, NE
- Westside Public Schools, NE

Where is 1:1?

- Ainsworth Public Schools, NE
- Alma Public Schools, NE
- Arnold Public Schools, NE
- Wilcox-Hildreth Public Schools, NE
- Silver Lake Public Schools, NE
- Arapahoe Public Schools, NE
- Cambridge Public Schools, NE
- Madison Public Schools, NE
- Pierce Public Schools, NE
- Chambers Public Schools, NE
- Spencer Public Schools, NE
- Wheeler Central Schools, NE
- Sargent Public Schools, NE
- Anselmo-Merna Public Schools, NE
- Centura Public Schools, NE
- Weeping Water Public Schools, NE
- Lyons Decater Public Schools, NE
- Arthur Public Schools, NE
- Sutherland Public Schools, NE
- Hershey Public Schools, NE
- Wallace Public Schools, NE
- Paxton Public Schools, NE
- Garden County Public Schools, NE
- Broken Bow Public Schools, NE
- Spalding Public Schools, NE
- Arcadia Public Schools, NE
- Palmer Public Schools, NE
- Fullerton Public Schools, NE
- Louisville Public Schools, NE
- Red Cloud Public Schools, NE
- Franklin Public Schools, NE
- Sutton Public Schools, NE
- Ravena Public Schools, NE
- Alliance Public Schools, NE
- Loup City Public Schools, NE
- Ansley Public Schools, NE
- Humbolt Table Rock Stainauer Public Schools, NE
- Hampton Public Schools, NE
- Burwell Public Schools, NE
- Pender Public Schools, NE
- Laurel-Concord Coleridge Schools, NE
- Cedar Rapid Public Schools, NE
- Humphrey Public Schools, NE
- Ogallala Public Schools, NE
- Norfolk Public Schools, NE
- Fort Calhoun Public Schools, NE
- Fort Payne Schools, NE
- Papillion-LaVista Schools, NE
- Schuyler Public Schools, NE
- Grand Island Northwest, NE
- Wood River Public Schools, NE
- Cozad Public Schools, NE
- Tri County Public Schools, NE
- Kershaw County School District, SC
- Council Bluffs, IA
- Leyden, IL
- Richland Two, SC
- Spearfish, SD
- Fullerton School District, CA
- Chamberlain, SD
- Chester Area Schools, SD
- Dupree School District, SD
- Flandreau Public Schools, SD
- Kadoka Area School District, SD
- Wagner Community School District, SD
- Manitou Springs School District, CO
- Wood Dale School District, IL
- Hall County Schools, GA
- Alum Rock Union Elementary School District, CA
- Clark County School District, NV (Pilot)
- Chicago Public Schools, IL (Pilot)
- Forrestville Valley School District, IL
- Little Falls Public Schools, MN
- Becker Public Schools, MN
- Spring Lake Park Schools, MN
- Corcoran Unified School District, CA
- Gurnee School District, IL
- Beresford, SD
- Converse County/Wyoming School District 1, WY
- Berwyn, SD
- Garrett-Keyser-Butler Community School District, IN
- Needham School District, MA
- Zeeland, MI

Can We Get There?



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Digital Curricular Materials and Devices: Evidence of Success

Impact Data on Student Achievement and Teacher Effectiveness

- The results of the 2011 National Assessment of Educational Progress (NAEP) for writing showed that students whose teachers asked them to use computers to draft and revise their writing before 5-19 points higher on the assessment. The more frequently students were asked to use computers, the higher the student scored.
- Of the eighth and twelfth grade students who scored above the 75th percentile on the NAEP writing assessment, 99 percent reported having access to a computer at home.
- According to a 2013 survey of Advanced Placement and National Writing Project teachers, conducted by PEW Research Center, found that 84 percent use the internet at least weekly to find content that will engage students and 92 percent say the internet has a major impact on their ability to access content, resources, and materials for their teaching.

Results From Other Places: Maine[1]

In 2002, the state of Maine began implementation of a statewide 1:1 laptop initiative for all middle school students and teachers. The initiative expanded in 2007, to include high school teachers and again in 2009 to include high school students. A 2009 study from the Center for Education Policy, Applied Research and Evaluation found that:

- Nearly 80 percent of teachers agreed (strongly or somewhat) that their students were better able to study real-life issues/problems using laptops than they would without them.
- Nearly 70 percent of teachers claimed the quality of their students' work increases when they use laptops.
- Writing scores improved approximately 1/3 of a standard deviation on the state assessments after introduction of the laptops.
- Twice as many students who used the laptops in the writing program met state proficiency standards as those who used the laptops only as a finishing tool.
- For math teachers – teacher knowledge significantly improved and students in the experimental group classroom scored significantly higher on the state math assessment.

A 2004 report from the Maine Education Policy Research Institute found that:

- Over 70% of the teachers surveyed reported that the laptops helped them to more effectively meet their curriculum goals, and individualize their curriculum to meet particular student needs.
- Over 75% of the teachers reported that having the laptops helped them better meet Maine's statewide learning standards, the Learning Results.
- More than 4 out of 5 teachers surveyed reported that students are more engaged in their learning, more actively involved in their own learning, and produce better quality work.
- More than 70% of the students surveyed reported that the laptops helped them to be better organized, to get their work done more quickly, and with better quality.
- Teachers reported that all types of students are more engaged in their learning and more motivated to learn, particularly at-risk and special needs children.
- A sample of ninth grade students who no longer have laptops reported that they get less work done without the laptops, and the quality of their work has declined without the laptops.

Results From Other Places: Mooresville Graded School District, North Carolina

In 2007, the Moorseville Graded School District began implementation of a digital conversion initiative. The initiative focused on a shift from print to digital curricular materials and a 1:1 internet accessible device for every student and teacher. Since 2007, the district's graduation rate has increased 25 percent, making them the third-highest cohort rate in the state. The district also realized improvements in student

[1] http://maine.gov/mlti/resources/MLTI_March_09.pdf

achievement; moving from the bottom quarter of all districts to the third highest performing district in the state.[2]

Results From Other Places: Floydada School District, Texas[3]

In 2004, Floydada implemented a 1:1 Technology Immersion Pilot project that gave laptops to all middle school students and teachers. The district has since expanded to include elementary and high school students. Floydada is a rural district with rough 86 percent free and reduced price lunch students. Results include:

- A 50 percent reduction in middle school discipline referrals.
- Double digit gains in all core subject areas on the state assessments.
- Increased opportunities to enrich learning through projects with NASA engineers, access to online college courses, and interaction with people and experiences outside of the district.
- In school year 2010-20111, seniors earned 450 college credits, saving their families $65,000 in tuition fees.

Additional Information

"Florida, Maine, Michigan, North Carolina, Pennsylvania, Texas, and Virginia found generally positive relationships between 1:1 environments and various aspects of the teaching and learning process. They reported that teachers used the laptops to develop instructional materials, access information related to instruction, and communicate with colleagues; students used laptops to complete classroom assignments and conduct research. Since the implementation of the initiatives, in many implementing locales there has been a shift from teacher-centered to student-centered instructional practices in the classroom, with teachers facilitating more and presenting less, and many students becoming more self-directed learners. Students have shown an increase in engagement and motivation after the implementation of several of the 1:1 initiatives. Some but not all of the evaluations also have found an association between laptop use and increased student achievement in several academic areas. Evaluators also report that laptops have facilitated the development of 21st century skills (e g , digital literacy, creativity and innovation skills, critical thinking and problem solving skills, communication and collaboration, and self directed learning) among students."[4]

Since 2009, West Virginia requires that publishers include an interactive version of all print-based text.[5]

"Henrico County, Virginia began a one-to-one laptop initiative in 2001. Eighty percent of district schools were fully state accredited at the start of the program. By spring 2003, every regular school in the district was fully accredited. The district attributes the 100 percent accreditation to the one to-one initiative. Unanticipated results were teacher enthusiasm, retention and recruitment and increased parent involvement and technology literacy."[6]

[2] http://www.all4ed.org/files/DigitalLearningImperative.pdf
[3] Ibid
[4] https://www.fi.ncsu.edu/assets/podcast_episodes/white-paper-series/laptop-initiatives-summary-of-research-across-six-states.pdf
[5] http://www.ecs.org/clearinghouse/81/98/8198.pdf
[6] Ibid