

Concerns Based Adoption Model (CBAM) Project

Innovation Focus: MLTI Shead High School Laptop Initiative for Teachers

Innovation Configuration Checklist

Part IA: List and summarization of information sources

The information sources used to justify this evaluation of the MLTI – Shead High School Laptop Initiative for Teachers (MLTI-HST) included several individuals and research articles. The individuals were selected to reflect a diverse cross section of concerned parties including state MLTI staff, school administration, and teaching staff. The research articles are directly related to the Maine laptop program looking at the impact of the laptops on performance as well as teacher integration. Some sources are indirectly related to the purpose of this evaluation but important to understand the potential of the tool and the mentality of the adopters.

Three of the principal members of Maine's MLTI have been instrumental in developing the MLTI innovation for the state of Maine and the rollout across the state. Furthermore, they are all immersed in the continued training of adopters and surpassing the necessary critical mass. Critical mass is important in the innovation process because it enables the innovation's adoption to become self-sustaining (Rogers, 2003). Information from the three state MLTI members were taken from various trainings and group meetings over the past three years.

Shead's principal is not a technology innovator, but has been an early adopter of this program. His role as administrator and ultimate decision maker to implement the laptop program within the school moves the adoption within the organization into the category of an authority driven-decision. Staff was instructed on required uses and actions to perform with the implementation of the innovation. Some of the decisions were driven by state requirements associated with participation and others were internal. However, the principal identified a need to involve the staff in stages of the process where flexibility was warranted creating a greater sense of inclusion and fostering improved adoption rates. For example, the tool was promoted to post student progress for parent access via the Internet. In a concession to staff, the demand on reporting was modified to a weekly update rather than a daily one to ensure timely communication but not unduly stress the staff.

Also, there were three instructors from different core subject areas with differing level of adoption identified. The first staff member (Uno) is an early adopter of technology innovations with a regular contribution from technology into lessons (Rogers, 2003). There is a willingness to quickly adopt new innovations and provide feedback for peers and accept a leadership role when dealing with technology. The second staff member (Dos) falls within the range of an early majority member when adopting technology in the classroom (Rogers, 2003). There is a willingness to try to use new things when the ideas and modeling have been presented as successful elsewhere. The third staff member (Tres) is relegated the laggard in the system (Rogers, 2003). There is a tendency to wait until others have tried and tested the system and then still a reluctance to use it within the classroom citing traditional methods as superior to new innovations.

The different research articles were written by the Maine Education Policy Research Institute at the University of Southern Maine. Each article focuses on the laptop program and its impact on classroom performance. One article is directly examining the connection to writing programs, one focuses on middle school teacher and student impact, and one explores the connection to classroom assessment. The first article, "Maine's Middle School Laptop Program Creating Better Writers," identifies a valuable statistical gain from using laptops with students during all phases of the writing process (Silvernail, 2007). The study examined students' writing scores prior to the programs initiation and in 2005, five years after inception. The second article "The Impact of Maine's One-to-One Laptop Program on Middle School Teachers and Students: Phase One Summary Evidence, Research Report #1," examined the role of laptops in various school systems (Silvernail, 2004). It further tried to address the issues, positive and negative, with the initial phase of the laptop program that began in the middle schools. The MLTI project coordinators to improve the program for the preceding middle school phases and the initial high school phase used this

information. The third article "The Impact of Maine's One-to-One Laptop Program on Middle School Teachers and Students: Use of Laptop Computers and Classroom Assessment: Are Teachers Making the Connections? Research Report #4," focuses on a particular school system's adoption of the laptops (Beaudry, 2004). The study reported that the laptops created a significant deviation from normal teaching strategies, but were unable to be conclusively linked to improved understanding and assessment quality by the instructors. The causes cited were training for instructors and clear goals and instructions for the students. The open nature of the tool provided unanticipated challenges.

These three studies all highlight the historical evidence that guided the first high school phase of the laptop program. The computers were provided to instructors only and are to be considered for students if the funding and continuation are warranted. The intention is to enable the instructors to develop an understanding of how to integrate the tools before the students have them. Then when the students are integrated into the program, the instructors will be able to better accommodate the challenges of insufficient goals and directions. Furthermore, it will enable them to more fully understand how to utilize the tool to achieve higher results. Partial integration of the laptops into instruction in the writing process offered some gains, but inclusion in all phases had a much more significant gain (Silvernail, 2007).

Shed High School's laptop adoption began at the start of the 2007 school year and is entering the second year. This examination of the innovation will be instrumental in guiding the development of short and long-term goals for the continuation of the project. Areas of focus are further mechanisms for communication both internal and external, increasing technology for higher order thinking skills in students, and development of real world interactions to support student achievement. The development of a technology plan for Shed High School is dependent on funding and resource availability.

Part IB: Draft of IC Checklist

Innovation Configuration Checklist – Draft A			
MLTI Shead High School Laptop Initiative for Teachers			
Component	Optimal	Acceptable	Unacceptable
Set up / Ease of Use	Able to power up & perform needed tasks.	Minor connections & routine actions allow power up & performance of needed tasks; takes under 3 minutes.	Significant connections or actions to power up & perform needed tasks; takes longer than 3 minutes.
Classroom Functionality – based on Grappling’s Technology and Learning Spectrum	Transforming Uses: Essential Learning Tasks – Complex learning & thinking; Community learning; Assessment; Productivity to construct meaning.	Adapting Uses: Optional / Adaptive Learning Tasks – Drill & practice; Instructional games; Productivity; Curriculum for tech uses.	Literacy Uses: Acquiring / Practicing Tech Skills – Literacy classes; Learning hardware & software; Projects tech focused not standards; Curriculum for tech uses.
Computer Performance / Usability	No unexpected program terminations; fast performance with no file size restrictions; no platform issues.	Infrequent terminations; or occasional slow downs with very intensive actions; or platform issues but where a suitable alternative is available.	Frequent program terminations; or slow performance for multiple tasks; or platform issues that have no suitable alternative.
Program Availability	Loaded with a variety of standard programs for all subject areas & able to quickly & easily add individual programs as needed.	Loaded with a variety of standard programs for all subject areas & able to add individual programs with support from IT department.	Only basic programs with limited options for classroom use or unable to add individual programs.
Multimedia Capabilities	Audio & video features for classroom use ready to use.	Audio & video features for classroom use able to be added.	Audio & video features for classroom use unable to complete task.
Internet / Network Access	Automatic network negotiation & connectivity for any open network. Simple IT request for closed networks; fast connectivity.	Network negotiation & connectivity for open or closed networks with support from IT department; moderate to fast connectivity.	Network connectivity limited even with IT support; or slow connection & data transmission.
Communication	Support for email, video & audio chat.	Support for email & audio chat only.	Support for email only.
Training	Support & training for hardware & software specific to classroom integration; includes in class modeling & feedback.	Support & training for hardware & software available upon request with limited wait time	Limited or slow training or support without subject specific modeling or support.

Part IC: Final Checklist

Innovation Configuration Checklist				
MLTI Shead High School Laptop Initiative for Teachers				
Component		Optimal	Acceptable	Unacceptable
Set up / Ease of Use		Able to power up & perform needed tasks.	Minor connections & routine actions allow power up & performance of needed tasks; takes under 3 minutes.	Significant connections or actions to power up & perform needed tasks; takes longer than 3 minutes.
Classroom	Functionality – based on Grappling’s Technology and Learning Spectrum	Transforming Uses: Essential Learning Tasks – Complex learning & thinking; Community learning; Assessment; Productivity to construct meaning.	Adapting Uses: Optional / Adaptive Learning Tasks – Drill & practice; Instructional games; Productivity; Curriculum for tech uses. Literacy Uses:	Acquiring / Practicing Tech Skills – Literacy classes; Learning hardware & software; Projects tech focused not standards; Curriculum for tech uses.
	Student Connectivity	Easily share information and resources with others	Able to transfer information and resources to another system for sharing	Unable to share resources
Computer Performance / Usability		No unexpected program terminations; fast performance with no file size restrictions; no platform issues.	Infrequent terminations; or occasional slow downs with very intensive actions; or platform issues but where a suitable alternative is available.	Frequent program terminations; or slow performance for multiple tasks; or platform issues that have no suitable alternative.
Program Availability	Administrative Tools	SI system access; virtual communication easily accessed.	Limited SI system access; limited virtual communication with staff.	No SI system access; or no virtual communication with staff.
	Classroom Tools	Loaded with a variety of standard programs for all subject areas & able to quickly & easily add individual programs as needed.	Loaded with a variety of standard programs for all subject areas & able to add individual programs with support from IT department.	Only basic programs with limited options for classroom use or unable to add individual programs
Multimedia Capabilities	Audio	Recording & playback features with editing capabilities; able to export for sharing.	Recording & playback; able to export for sharing.	Playback only
	Video	Recording & playback features with editing capabilities; able to export for sharing.	Recording & playback; able to export for sharing.	Playback only
Internet / Network Access		Automatic network negotiation & connectivity for any open network. Simple IT request for closed networks; fast connectivity.	Network negotiation & connectivity for open or closed networks with support from IT department; moderate to fast connectivity.	Network connectivity limited even with IT support; or slow connection & data transmission.
Communication		Email, video & audio chat.	Email & audio chat only.	Email only.
Training Usage	Hardware	Orientation training to facilitate proper procedures for using peripherals; maintenance and care; easily accessible IT support.	IT support available upon request; mostly trial and error.	Trial and error; no support.
	Software	Orientation training to facilitate proper procedures for using programs; sharing; organization; customizing.	IT support available upon request; mostly trial and error.	Trial and error; no support.
	Security	Orientation training to facilitate proper procedures for safely using network; classroom security.	IT support available upon request; mostly trial and error.	Trial and error; no support.

Part 1D: Data Collection Summary (see appendix B – figure 1)

The data collection was done using a survey conducted with pencil and paper selection, interview, and observation methods with a return from 9 of the 14 users of the innovation. Six of the surveys were completed using a paper and pencil response by selecting the appropriate choice from the Innovation Configuration Checklist (ICC). Two of the nine were completed by interview where choices were marked during the interview process according to the discussion responses. One of the nine was completed using an observation over two class periods during a typical school day. The data were not segregated by subject area because of insufficient data points to be statistically valid. Instead, the focus was on adoption through the entire school, which is the goal of the technology plan.

The data highlighted a greater level of optimal usage than anticipated when considered with the initial negative responses about the computers from a year ago. When the laptops were first provided to the staff at the start of last year, the common response was negative and that the Mac platform would be too difficult to adopt. After one year, responses showed a majority of optimal use or interactions that signify the diffusion is going successfully. The identified issues from the University of Southern Maine studies examining the initial phase of the innovation to the middle schools highlighted a need to support the staff with training and a need to adjust assessment methods (Silvernail, 2004) (Beaudry, 2004).

The first of two areas of acceptable usage that would be desirable to advance to optimal was expected because it is one of the more difficult areas of the innovation to bring to optimal usage. The first is the Classroom Functionality with an emphasis on moving higher up Grappling's Technology Scale. This particular area of interest requires time to develop skills and usage to bring lessons and assessments to higher order thinking processes. Trainings in this area often depend on a level of comfort with technology that appears to be in place at this time and offers opportunity for greater improvement during the upcoming year.

The second area again is focused around the classroom environment under the category of Program Availability with an emphasis on Classroom Tools. The teachers are still feeling restricted in their ability to obtain the necessary programs or find alternatives for the Mac platform. They have been able to use many alternatives, but the restrictions in the disk image to manipulate the account are perceived as a hindrance.

Stages of Concern (SoC) Interview

The stages of concern interviews were with the principal and Tres in order to judge the innovation from an administrative level and a laggard's perspective. Each interview began with the same question, "How do you feel about integrating technology in the classroom?" Depending on the responses, follow up questions were integrated into the discussions. For example, Tres a known non-user of technology for most of his classes was asked why he thought it was great and what kept him from using it more now?

The principal was comfortable with the laptops for the staff but has personally not used the MLTI laptop. He finds it easier to stick with his Dell laptop instead of taking the time to learn the new Mac system adopted by the MLTI program. Hord's CBAM places him at the Stage 0: Awareness level but uncommitted to the innovation beyond that point (Hord, Rutherford, Huling-Austin, Hall, 1998). He repeatedly stated that he wants to incorporate the innovation but does not have the time and does not see it as beneficial to him as an administrator since it is geared towards classroom use. For him, the continued implementation of the innovation will require further information sharing and training on ways to involve the innovation in his routine.

Tres surprisingly had many positive things to say about technology integration in the classroom but not surprisingly most of the uses were substitution or adapting rather than transforming or real world integration. The limiting factor that was identified for the MLTI-HST innovation was the availability of computers for all students in the classroom. It was felt that if every student had access there could be greater adoption into the lessons. Most of the positive attributes of technology referenced the ability to speed up tasks after the basics were learned using traditional methods. The laptops were seen strictly as

a replacement for graphing calculators, which are a closely related technology for math classrooms. The ability to use the computers as a tool to produce real world products was accepted as a great possibility when asked about it specifically, but would require more training. Tres did see the use of computers as a good way to take advantage of a student interest for technology to foster a connection to the math skills. After the interview, I found that an initial laggard on Rogers' scale of adoption was responding in a Stage 4: Consequence on the SoC scale after one year with the MLTI laptop (Hord, 1998). Tres appears willing to consider the innovation with some modeling and positive feedback over the course of the year.

Levels of Use Interview

A level of use interview was conducted with three different staff members related to the use of technology in their classroom emphasizing how the MLTI-HST innovation plays a part. Each of the users was heavily weighted towards the adapting stage of Grappling's Technology Learning Spectrum. One began the transition to the transforming level by developing one lesson to have students interpret graphic novels and then create their own for sharing. This is a good start for a first year and will hopefully act as a model of the benefits of technology to support higher level thinking skills. Also, it is not a problem that in the first year there was a high degree of adapting as the comfort level increased with the laptops. The key is to see the innovation move more rapidly now that it is proven.

The adapting uses were principally typing papers, grammar and spell check, showing videos, submitting grades, and research. These responses were indicative of the Routine on the Level of Use scale (Hord, 1998). The research substitution is of considerable value though for the school since budget cuts have relegated the funding for the library to relatively nothing. The connectivity of the Internet to primary source and current readings is indispensable. The increased awareness of the power of the tool as these projects develop has created a sense that more connectivity and interaction is possible with these tools. One possibility is the use of blogs in the English rooms to connect readers to book discussions expanding beyond the classroom. Others involve access to online learning sources and data to use for developing public service announcements or other real world applications. Within special education settings, the tools enable further access to differentiated instruction by offering the teacher greater resources for the room as budgets are restricting depleting budgets. These considerations and adoptions are indicative of the Integration level on the Level of Use scale (Hord, 1998).

According to Holt's Levels of Use scale, the interviewees were at Decision Point D-1: Level IVA-Routine, Decision Point E: Level V-Integration (Hord, 1998). The Routine level users are not unexpected with a new innovation that has a significant learning curve, but needs to be surpassed to allow the innovation to reach a critical mass of acceptance. The innovation needs to develop more towards the Integration level or above such as the English teacher and others that are developing lessons that are impossible to complete without the tool. The simple substitution of a device allows for the device to be easily replaced depending on the environmental conditions, but if the integration becomes a dependent factor as it does in the higher Refinement and Integration phases it is more difficult to discard.

Final Analysis

Ultimately, Shead High School is seeing benefits from the MLTI-HST innovation after one year of use. The staff has a fairly high level of appreciation for the innovation according to the data in Appendix B showing the Innovation Configuration Checklist. The majority of the answers were in the optimal range. The Stages of Concern (SoC) Interview highlighted some issues that were present at the onset of the teacher rollout such as insufficient computers for students in the classroom. These are issues related more to resources that need to be overcome but that do not directly negate the value of the innovation itself. Surprisingly, the interviewees for the SoC showed a positive outlook towards the continuation of the project even though they were chosen because of their anticipated reluctance. The Level of Use (LoU) Interview also showed promise for the schools integration. There was a lot of attention to incorporating the devices and learning how to better move them into higher order thinking processes. The current use was not there, but the interest to develop the understanding to use the technology available to allow it to move was evident. This innovation has a good chance of success based on these data points and the optimism of the staff expressed in the surveys and interviews.

References:

Beaudry, Jeffrey S. (Feb 2004). *Research report #4 use of laptop computers and classroom assessment: are teachers making the connections*. University of Southern Maine. Retrieved Oct 17, 2008, from <<http://www.usm.maine.edu/cepare/mlti.htm>>

Hord, Shirley M., Rutherford, William, Huling-Austin, Leslie, Hall, Gene, (1998). *Taking charge of change*. 3rd printing. Austin, TX: Southwest Educational Development Laboratory.

Rogers, Everett M. (2003). *Diffusion of Innovations*. 5th ed. New York: Free Press, 2003.

Silvernail, David L, Gritter, Aaron K, (Oct 2007). *Maine's middle school laptop program: creating better writers – research brief*. University of Southern Maine. Retrieved Oct 17, 2008, from <<http://www.usm.maine.edu/cepare/mlti.htm>>.

Silvernail, David L, Lane, Dawn MM, (Feb 2004). *Research report #1 the impact of Maine's one-to-one laptop program on middle school teachers and students*. University of Southern Maine. Retrieved Oct 17, 2008, from <<http://www.usm.maine.edu/cepare/mlti.htm>>.

Appendix A:

The following descriptions offer a more in-depth view of the different individuals and articles that are discussed in the information sources list and summary.

MLTI Staff for the State of Maine – MLTI staff are integral in the development of the innovation and the management of its sustainability. All have been involved with group and individual discussions concerning the states role and expectations for the project as well as training situations to facilitate the success of the project. An underlying premise of the discussions focus on a need to develop lessons and assessments that challenge students to use higher level thinking and reasoning to create meaningful products.

Shed High School Principal – Shed's principal is interested in keeping the school moving forward with technology integration in a manner that positively influences instruction without undue negative impacts on staff. His primary concern of the MLTI project is an increased burden on staff to implement technology in the classroom for the sake of justifying the equipment. To ensure a more rapid adoption of the laptops in teaching, he instituted some requirements for staff that forced them to utilize the laptops. These included grade submission into a networked student information system, digital communication channels, and technology training sessions. Along with the requirements, he did a good job tempering the authority with open communication between staff and acceptance of suggestions related to the project.

Uno – MLTI Technology Teacher Leader for Shed High School – Uno has been involved in the training and implementation of the MLTI laptop program for Shed because of the high level of technology integration in the classroom. Uno has tried to develop staff trainings that meet the goals of the state and Shed by offering specific activities that staff can use with students to foster more learning in new ways.

Tres – Shed High School Math Teacher – Tres is a typical math teacher that is not overly eager to integrate laptop technology into instruction because it has yet to show enhancements to learning over traditional methods. Tres uses graphics calculators with some courses, but has not found the laptop to offer sufficient promise. Tres's role in the project is to examine the innovation from a laggard's point of view and to help identify the elements that will improve integration.

Dos – Shed High School English Teacher – Dos is a typical English teacher that has begun to incorporate technology a great deal into the classroom. Over the first year there has been expressed interest in developing a website or Moodle site for classes. As well, Dos has been able to create a renewed interest for some of students by using technology to allow students to explore graphic novels and create their own using ComicLife novels. Dos has also use the audio and video features of the laptop to further entice students' interest in creative writing by exploiting their interest in technology. Each idea integrated into the classroom was gleaned from an early adopter's successful modeling. Dos's role in the project is to examine the innovation from an early majority's point of view and to highlight the features of the innovation that make it beneficial for classroom adoption.

Appendix B:

Figure 1 showing data analysis from the Innovation Configuration Checklist Survey. Surveys were completed using interview format to analyze user responses, observation format, and paper-pencil format. There was no distinguishable difference between the methods of completion.

