

**EVALUATION OF THE NCTA EDUCATION
FOUNDATION'S TECHNOLOGY DEMONSTRATION
PROJECT
AT LIBERTY ELEMENTARY SCHOOL**

November 15, 2005

OVERVIEW

North Carolina Technology Association (NCTA) Education Foundation obtained a grant of \$250,000 from the U.S. Department of Education to conduct a Technology Demonstration Project at Liberty Elementary School in Randolph County, North Carolina. This is the third Technology Demonstration Project to be completed.

The purpose of NCTA's Technology Demonstration Project is to: 1) power-up a school with complete technology tools as well as 2) provide high quality professional development for all teachers at the grantee school. As NCTA President and CEO Joan Myers noted: "NCTA is not the education expert. NCTA's goal is to bring needed resources to bear for implementing the school's five-year technology plan in a thoughtful, productive manner, allowing the school to adjust resources to meet the individual goals and objectives."

The teachers are the primary recipients of the grant with the indirect benefits ultimately for the students. Since it is unreasonable to outfit all students with the tools that they need, the Technology Demonstration Project provides all the teachers access to technology tools and extensive hands-on training to prepare them for the opportunities to apply these new practices immediately into their curriculum. This is an achievable cost-effective approach to the integration of technology into the teaching and learning environment and significantly increase active and participatory student learning.

The Technology Demonstration Project has a much broader vision than just technology education. Joan Myers points out, "NCTA views this effort from an economic standpoint as much as from a technology one, realizing for anyone to be successful in the 21st century he must be exposed to technology early. This is a technology literate proposition."

This report summarizes the implementation of the grant at Liberty Elementary School and describes the impact that the Technology Demonstration Project has had on the school's teaching and learning environment. This evaluation report is divided into the following sections: Background; Evaluation Approach; Equipment Implementation; Professional Development; Impact to Liberty; Lessons Learned; and Conclusion.

BACKGROUND

Liberty Elementary School is a large, rural PreK–5 school with approximately 560 students and approximately 45 teachers. Liberty is an underserved school with high levels of poverty and only a sprinkling of the affluent. With this low socio-economic condition there is a 55% - 60% rate of students on free or reduced lunch. Liberty has 35% minority of the student population evenly split between African-American and Hispanic students. The Hispanic population has been growing rapidly with the 2003-2004 data at 13 percent. The school is distant from the rest of the district schools and some of the faculty feels that it is often neglected or forgotten.

The principal of Liberty had attended the Principals as Technology Leader program offered by UNC Chapel Hill, a program that was partnered with the Bill Gates Foundation. While attending this course the principal's eyes were opened to the need to bring his school into the 21st century state-of-the-art with technology readily accessible for the teaching and learning environment. Thus he submitted the application for this Technology Demonstration Project grant to help fulfill his vision and mission.

TECHNOLOGY CAPABILITY PRIOR TO THE GRANT

Liberty replaced equipment in the 2003-2004 school year prior to the grant being approved because the old hardware was more than 7 years old and mostly non-functional. In the spring of 2004, 80 dell computers were purchased replacing all equipment one-for-one. Therefore, the starting point for the grant implementation involved relatively new equipment. There were 80 Dell PCs with 30 of these placed in the computer lab. The other fifty were distributed in the following locations: 5 in the media center, 1 PC per classroom except 5th grade, which had 2 PCs each. Six HP printers were located throughout the school, 4 of these networked printers 1 for each grade level hall, 1 in the media center and 1 network printer in the computer lab. Additional peripherals included 1 Smartboard, located in the computer lab and 1 CPS (Class Participation System) located in the media center. Both of these were available for checkout but had very little usage.

The software functionality was an issue at the beginning of the grant implementation. Most of the old versions of software were incompatible with the new Dell hardware and operating system. Two of the most noted omitted pieces of software were Graph Club and Kidpix. The software that was installed on the Liberty server was:

| | |
|--------------------|---------------------------------|
| Alphabet Express | Kids Work Deluxe Network |
| Math Essentials | Millies's Math House |
| Numbers Undercover | OPAC – Online Card Catalog |
| Reading Counts | Reader Rabbit's Reading Journey |
| Sybershop | Microsoft Works 7.0 |

Many of the teachers were unfamiliar with the replacement software and thus were not using the new software with the students. As one teacher explained to me, *“This year we have a new full functioning PC, but our software is new and we have not had time to train. The previous software seems incompatible with the hardware.”*

Others teachers re-iterated the software situation.

“Our software is very restrictive. We do not have much. It is less than last year with the old equipment.”

“We do not have lots of software for the new dell PCs so that is limiting our ability to fully utilize. As you move to the new hardware you will not always be able to maintain the software functionality as before.”

“With the new hardware, which was so badly needed, we still have a gain but lost some of our functionality.”

“We have gotten new computers at school and we have not had an in-service on how to use them. The software is different from the software that we had previously and the lessons that I had my students complete during center time no longer work with the new computers.”

Furthermore, most of the technology activity with the students was the typical Accelerated Reader testing and drill and kill exercises.

The onsite Technology Assistant heavily assisted the teachers at Liberty in the use of technology. Prior to the grant almost all teachers relied on the Technology Assistant to handle the lab activities during the computer lab time. This was especially true for K-2 classes. A few of the upper grade teachers took an active role in the computer lab time, which was available for each class once a week for 45 minutes.

Comfort Level with Technology

The comfort level with the installed technology was generally low. Almost 50% of the faculty rated themselves on a scale, average to below average, on comfort with technology. Furthermore the use of technology was often very elementary usage and some participants indicated no current usage of technology. Some of the comments along usage were as follows:

“I use office equipment more than anything else. I use the computer sometimes.”

“For the most part I use computers to find things online. I do not have enough background knowledge to use technology very often. I have not had much exposure or training.”

“I do not use it on a daily basis. Sometimes I research on Internet and print the information.”

“I use technology very little in my everyday interaction with the students.”

“I do not use technology; I only use e-mail at school.”

“Now the only way I use technology is to check my e-mail and occasionally I can type something for my class on Microsoft works.”

Fifty-three percent of the Liberty participants indicated their current use of technology was primarily personal, with no indication of student technology use. Within the personal technology usage area there were noted differences in the degree of personal usage. The main distinction was whether technology was used to assist with curriculum/lesson planning or not. Fifteen percent of respondents stated their current use of technology was not related to curriculum/lesson planning or design. Some examples included responses about using e-mail, software for organization and surfing the Internet for fun. Thirty percent of participants indicated personal use of technology related to curriculum/lesson planning. This included researching topics for class over the Internet and the use of technology during class.

The remaining participants (47%) indicated current technology use related to some degree of actual student usage. However, the majority of these uses (36%) were limited to computer use often for remediation or reinforcement in the computer lab. Only (11%) of the participants mentioned technology use with students for projects and part of an assignment. Some of the teacher’s comments on technology usage included the following:

“I check my e-mail, browse on the Internet and play some games.”

“I personally use Word, PowerPoint, Excel and Palm Pilot for my homework and church needs.”

“I do many searches in my personal life that sometimes give me ideas that I can use in my classroom. Most of my free-time surfing is just to satisfy my inquisitive nature.”

“We use the computer in our classroom during center times to reinforce math concepts mostly.”

“I mainly use the computers as daily enrichment and/or remediation for various students when time allows.”

“When my class is studying a topic, and they have questions about it . . . I usually go to the Internet . . . find more information about it, and tell them what they wanted to know.”

“We do explore some on the Internet, as a whole group, on topics we are learning about in the classroom.”

“I use the computer in my classroom for generating a variety of forms/newsletters etc. My children also use the computer to increase their knowledge of skills and concepts.”

“We have used various games such as Fraction Munches, Math Blasters, Reading Counts, to enhance subjects studied in the classroom.”

“They (students) play games on the computer to reinforce skills taught in the classroom such as math facts.”

“We offer computer time during our centers and the children are allowed to play an educational game.”

“I have some electronic games (Math Safari & Geo-Safari) that I use during daily center activities. However, technology is usually limited to the computer lab.”

“I have used computers for projects that deal with the math involved in the stock market, in social studies projects and science projects.”

“We watch . . . weather events, get satellite views (NOAA), look up people. . . . Since there is only one computer in the classroom . . . we line up and look . . . and I tell them how to find on their home computers.”

APPROACH TO THE EVALUATION

The evaluation report provides a full chronological account of what happened at Liberty during the grant implementation. The evaluation provides NCTA information necessary to determine the extent to which the Technology Demonstration Project was effective in its purpose and any lessons learned for improvements to future Technology Demonstration Projects. Data gathered for the evaluation employed both quantitative and qualitative methods. Data collected included: surveys (pre and post) of all participants; multiple site visits to the school for faculty and student observations and interviews (pre and post) of the faculty; teacher reflections; and artifacts of the students' work.

During the course of the evaluation lots of qualitative data were captured about feelings, actions and desires. Qualitative analysis proved to be extremely appropriate since there was a small group of participants (47) and the circumstances for each were quite different. S.D. Johnson in the spring 1995 issue of Journal of Industrial Teacher Education noted that qualitative methodologies are powerful tools for enhancing our understanding of teaching and learning.

The NCTA representatives, along with their business partners for training and evaluation, met with the school leadership in September 2004 to discuss the Technology Demonstration Project process and to establish the priorities for technology and training. The Centers for Quality Teaching and Learning were chosen to conduct the staff development. An independent evaluator was employed to document the impact the Technology Demonstration Project would have on Liberty school. This meeting laid out clear expectations of each group's role for a successful implementation and a timeline that would be followed. A school walk through was conducted.

Sixteen faculty members were personally interviewed by phone during the month of November 2004 to establish a baseline for evaluation. Also this same group was interviewed in person on February 11, 2005 for a short 15-30 minutes timeframe and many of these were observed during the daily normal classroom and lab activities. This was a solid cross-section of the school and included at least 1 classroom teacher from Pre-K through 5th grade. Also included were the Principal, Technology Assistant, Media Counselor, E. C. teacher, Music teacher, Reading Recovery teacher, Guidance Counselor and ESL teacher.

The first five days of QTL training for the Liberty teachers occurred during January 2005 – mid February 2005. Day 6 for these same participants occurred late February 2005 – early March 2005. The Day 7, which included the debrief activities for the Collaborative Project reviews happened during mid April 2005 – late May 2005. An onsite QTL representative visited the school for the project debriefings. The evaluator attended several of these reviews to gain further data for impact to the teaching and learning environment. Because of the delayed software and equipment installations the evaluator made a later trip on September 20, 2005 to gain further insight into displayed changes in the teachers' activities. These multiple documents and observations provided rich data for the evaluation.

The actual technology purchase was a two-step process. The first step of purchases in January 2005 provided the bulk of the technology. Approximately ten percent of the funds were held for a secondary purchase after the staff development was completed. This allowed empowered teachers to affect funds allocation once they were well informed about what was available and how best to incorporate the technology into the curriculum. This two-step purchase approach became a standard as a result of a previous lesson learned from the first Technology Demonstration Project.

EQUIPMENT PURCHASE and IMPLEMENTATION

The first equipment arrived in early May 2005. The timing was not conducive to quick install. The school year was drawing to an end. Much of the focus was on End of Grade (EOG) testing and closeout of school activities. Despite this untimely arrival, the teachers were anxious to get the equipment operational and functional. During visits in late April – early May to review the Collaborative Projects for Day 7 QTL requirements, teachers and administration voiced their desire to get the equipment implemented. Some of the comments voiced from the staff included the following:

“I just need the resources to hit the ground running.”

“It is hard to put into practice unless you are given the practical side of study . . . (the equipment).”

“Technology makes you more efficient; However, getting to that point is taking time.”

“I know that not everything (equipment) is out to the teachers. I’m a little frustrated now - - - it will get better.”

“I was ready to take advantage of the new technology, but the connectivity was not ready. The wiring was not ready, and the plugs were not in place. We needed a manual for the laptop . . . needed to know how to use it.”

“I am very excited about taking advantage of the technology but I am not connected yet. I have lots of activities planned as soon as my PC is functional.”

The first equipment was not installed until September 2005. This delay in installation was a result of the county office level priorities, which performs the actual implementation. Nothing was installed during the summer months after the first delivery of items. Also images for the laptops became an issue because there were three types of laptops purchased from the grant. Each of these type laptops required separate images therefore it was necessary for the county office technical support to make multiple images for the three different types of laptops purchased with the grant.

The second equipment purchase took place in May 2005 and was received in September 2005. The majority of this hardware and software was implemented in September and October 2005. Two pieces of software have not been installed due to not having been processed in the media center.

GRANT-SUPPORTED ACTIVITIES

The following bullets outline the grant-supported activities:

- Purchase of 30 laptops for each of the teachers PreK – 5
- Purchase of 2 desktops with 27” flat panel monitors for the media center
- Purchase of 14 laptops to build out a wireless mobile lab
- Purchase of 4 printers, 2 color and 2 black & white
- Purchase of 13 LCD Projectors
- Purchase of 90 AlphaSmart Neo units to build out 3 carts of 30 units each for checkout – 2 in media center, 1 in grade 1-2 building
- Purchase of 3 SmartOption carts with hubs and cables for the Alpha Smart units

- Purchase of 5 Digital Cameras in media center for checkout
- Purchase of 4 memory sticks for digital cameras
- Purchase of 13 Visual Presenters for each grade 3-5 classroom, 1 for K-2 checkout, 1 for media center
- Purchase of 4 USB Diskette drives
- Purchase of 1 hub and cable
- Purchase of 1 sixteen-module Security Cart in media center for checkout
- Purchase of 1 access point for wireless connections
- Purchase of 1 Follett PHD Dolphin Plus Kit used for book inventory in media center
- Purchase of Software packages:
 - 16 Office Pro 2003 licenses
 - 1 Office Pro 2003 CD
 - 44 Microsoft Works 8.0 licenses
 - 1 Microsoft Works 8.0 CD
 - 25 Kidpix Deluxe 4 site licenses
 - 50 Kidpix user licenses
 - 50 Kidspiration licenses
 - 50 Inspiration licenses
 - Unlimited license for Keybo Keyboarding software
 - Heartsoft Bestsellers Network license
 - Graph Club
 - Timeliner Deluxe
 - Image Blender 2.5
 - Simply VR

PROFESSIONAL DEVELOPMENT

The NCTA Education Foundation concluded from the first Technology Demonstration Project experience that the requirement for training was a prerequisite for a successful implementation of the grant. The Centers for Quality Teaching and Learning, chosen by NCTA as the partner to deliver the professional development, conducted the training utilizing the Quality Teaching and Learning (QTL) Blending Educational Strategies with Technology (BEST) program. Seven cycles (7 days each) for a total of 50 hours of training were conducted as part of the grant. Liberty teachers were divided into 3 of the cycles beginning January 2005.

The QTL BEST program was a practical hands-on staff development session. The first 5 days of the program modeled a classroom environment. Each day the participants were introduced to the best practice of instructional theories being conducted and skills-based activities that seamlessly incorporated the use of technology. The three cycles for Day 6 of the program occurred on February 25, 18 and March 4 after the teachers had a chance to return to the classroom and try specific ideas. On Day 6 the teachers were given an opportunity to connect their learning to student learning by creating and implementing a collaborative project that combined the instructional theories, practice and the use of

technology learned during Day 1 – Day 5. For Day 7 the QTL instructor visited Liberty multiple times to review the collaborative projects and have a debriefing of the teacher’s activities with the project. The QTL instructor, along with the evaluator in several of the briefings, heard how each of the teachers assessed the impact of the collaborative projects, heard how each of the teachers assessed the impact of the collaborative project and heard what the teacher and her students had learned.

A system wide embracing of training was needed for the infusion of technology to be effectively utilized. From the beginning, the teachers displayed different levels of acceptances and/or resistance to the training. The K-2 group of teachers especially struggled with the process. The first QTL instructor and the K-2 group of teachers clashed somewhat. Part of this difficulty might have been personality; lack of technology knowledge by the participants; and all the same grade level participants within the same cycle. Mid-way through the cycle training another instructor was assigned. This resulted in a smoother training process, as this instructor understood the specifics of the lower grade level curriculum. Also the teachers had varying degrees of technical knowledge and instructional theory knowledge. To ask the faculty to accept unequivocally a new paradigm to teaching was a big challenge. The Technology Demonstration Project’s mission was to teach all teachers regardless of experience and attitude. As the classes unfolded so did attitudinal changes. By the end of Day 7 everyone had shown incremental growth. The collaborative projects resulted in relationship building among the teachers. The overall course provided the teachers with a vision of how technology enhanced and enriched learning opportunities for the students.

The Liberty teachers entered the staff development program not knowing much about the content of the program. In fact 53% of the participants indicated that they had not heard anything about the QTL program prior to participation. Some of the candid comments regarding what the teachers understood about QTL included the following:

“I haven’t heard much, but I am very excited about it.”

“I haven’t heard much about it. I know that there will be training sessions and a project to implement at the end of the program.”

“The only thing I know about this is that it will train teachers on the latest technology opportunities.”

“I have not heard anything about the program other than it deals with technology training and we will be required to complete a group project as a culminating activity.”

“Nothing beyond the schedule and the team assignments.”

“Grant was wonderful . . . Knew it meant computers and software. I was surprised to hear we also got training. It was great to be part of it.”

During Day 1 of QTL the Liberty teachers described what they hoped to gain from participation in the QTL program. Clearly the majority of teachers was very open to the training and was hoping to gain much from the QTL staff development.

Their comments regarding what they hoped to learn from the QTL class included the following:

“I would like to gain an even greater understanding for what I can do to further engage my students in this technology – driven world. I would like to learn what else I can do to enable more students to be able to work on the computer at one time.”

“I want it to change the way I teach and create more excitement for learning for the students.”

“I would love to open up my classroom to the use of technology. It is my hope that participation in QTL will be a guide to doing this.”

“Confidence involving the use of technology and awareness of resources and capabilities related to instruction and support.”

“Show me different and more exciting ways I can use technology in my classroom. I also hope to gain more knowledge on how to operate the tools we have.”

I would like to be more proficient with the use of technology and integrating it into all aspects of the learning environment.”

“A stronger background in computer ‘know how’ and things that I can offer to my class and my own children to benefit them.”

“I love to teach but I want to do things differently. What I did 4 years ago doesn’t work today. Kids are getting harder to motivate. I need new ways to approach and engage the kids.”

“Using technology more frequently and in a more productive way that facilitates real learning that can’t be done in the traditional methods, not just for the heck of using a computer when pencil and paper works just as good or better.”

“I would like to gain a knowledge base that enables me to comfortably work with technology so that I can competently and effectively use it in my classroom.”

The teachers’ reactions overall to the QTL training were extremely positive. Some of their candid comments described the benefits of the training:

“I was most impressed with the QTL training.”

“I am very grateful for this experience. This is only my second year as a teacher and I think that I have more resources and information than lots of teachers with more years of experience.”

“This class has given me the confidence to “experiment” in all areas using computer technology.”

“This . . . has given me a feeling that even I can jump aboard the technology train and ride. Thanks to the great instructor this has been a great learning and growing opportunity.”

“As a person who hardly knows anything about computers, I have at times felt very lost. At other times I have felt so excited to see what we can do with this technology. This was a great opportunity for me.”

“From the perspective of a teacher who is (okay was) computer illiterate, I have learned a lot about the many different advantages of using a computer in the classroom.”

“QTL exposed us to so much (information) that we did not have a clue about.”

“The introduction of new equipment and time to become familiar with it has been invaluable.”

“I absolutely loved the QTL program. It was so interesting to see exactly what all you could do with a computer and integrate it into your classroom.”

“As a result of taking part in the QTL program, I have renewed understanding of the learning process. I feel more motivated to incorporate what I have learned about this process into my classroom activities.”

“I have always been interested in new technology but our recent grant has made a lot of it affordable for our school. However, technology requires training. QTL has given us that training on a higher level.”

“The overall participation has given me a better outlook on teaching and ways to improve student morale.”

“This has truly been a wonderful learning experience and will help me in my position.”

“QTL has reminded me that we teachers need to continue learning, changing and growing. Who appreciates a stale teacher? And, more importantly, who learns from a stale teacher?”

“Being involved in QTL training has helped me to be more familiar with other software. This has truly been a wonderful experience and will help me in my position.”

“I am rejuvenated . . . QTL shows some new ways to make things fresh and exciting.”

IMPACT TO LIBERTY

The impact to Liberty school has been significant and is growing every day. The continuum of progress has followed a natural evolution. At the beginning of this project those few teachers with higher technical skills began immediate exploration in the computer lab. The delay in the equipment implementation into the classrooms prevented some of the more advance classroom activities. Those with lower comfort with technology were stalled. After the 5 days of QTL training, small steps began to be made in the usage of technology resources in the computer lab. The grade 3-5 teachers were much more progressive in their technology integration, while many of the K-2 teachers wanted more direction and support. The mandatory collaboration project from the QTL course served as an excellent catalyst for building higher levels of confidence among the teachers and gaining implementation of technology into the teaching and learning environment.

TEACHERS

The teachers’ impact has been tremendous. There was a slower start in this metamorphosis due to the delay in equipment implementation and to the timing of equipment delivery near the end of the school year. This new school year showed evidence across all grade levels of the impact of the Technology Demonstration to the teaching and learning environment.

A thank you note from one of the Liberty faculty members describes the impact quite well. She writes:

“I would like to thank you and let you know the impact QTL has had on Liberty School. At the end of the school year and the end of our QTL training, I witnessed a transformation that I was hesitant to even believe. I worried that when school resumed, the skills and training we received would not be put into practice. I am happy to say that I was wrong.”

An amazing metamorphosis occurred in several of the Liberty teachers. The K-2 grade level was especially reluctant to come aboard with the integration of technology. As one teacher who was totally reluctant at the onset now says:

“I feel more comfortable attempting new things. I have changed greatly. I did not see any use for technology and change in instruction before the grant. Now I

am open to trying new things and have great ideas in the back of my mind once we get the classroom equipment operational. This Technology Demonstration project has changed my teaching career.”

Another teacher described her strong feelings as:

“I feel like I am up-to-date as a teacher. This (grant) has impacted my teaching career in significant ways.”

Furthermore, the valuable lessons learned during QTL course have carried into the new school year. As one of the Liberty faculty members observed:

“Teachers that were totally against being pulled out of their classrooms for training and were frightened of technology are putting technology on the Individual Growth Program with (the principal). They are excited about the hardware, software and peripherals we have acquired through the NCTA grant and are utilizing what they have learned.”

One resource teacher who saw no value of technology in her specialized structured setting has become extremely involved in the integration of technology. She has incorporated research on Internet for subjects that are being read in the structured curriculum. This teacher expressed how this research information has helped to make learning more realistic. When the class read a story about whales, they researched whales on Internet. The students became very excited and their learning went beyond what was just in the book. Also, one of the most reluctant teachers at Liberty has embraced technology and has taken an active role in learning more. She has made a focus on technology a part of her Individual Growth Program. That was quite a feat based on her original starting attitude. Another teacher’s enthusiasm showed through when she described her impact. She commented:

“I have a new outlook and enthusiasm regarding technology in the classroom . . . I try to take advantage of every opportunity . . . to become a better, stronger teacher. This has been one of those opportunities.”

One teacher openly admitted that she was in a slump, had become bored and burned out. This project had lit a fire in her . . . had sparked something and she was ready to go forward.

Other comments reflect the catalyst the Technology Demonstration Project has had on the faculty. Those comments are as follows:

“I was dreading attending the workshop. I came back early from a maternity leave to start the workshop. So I took two days away from the baby . . . It was worth it. The workshop was really applicable to my teaching.”

“QTL only enhanced my belief that learning is a continuous opportunity open to all who are willing to participate in the learning experiences.”

“I have always enjoyed my teaching experience. However, these new ideas have rejuvenated me. I am currently in my 40th year of teaching so that was no easy task.”

“So glad that we were included in the grant. We never feel a part of any group yet we teach every student in the school. Our roles and actions are very important.” Resource Teacher

“I loved the QTL course and was delighted that I was allowed to attend. I was honored to be included.” Resource Teacher

“This grant is not just about the dollars you get and what you obtain, but more about making you look at where you are and how you are doing things. It will cause you to re-evaluate yourself.”

“It has given me a new spark.”

“All participants expressed that the workshop was a valuable experience that impacted their respective educational positions.”

“It gives you more ways to teach.”

“My own personal attitude has changed in a way that I really understand how important the use of technology is in the classroom. I see it as a valuable tool which children can use as well as teachers to increase their knowledge base.”

“When you quit learning in life you might as well retire.”

Viewing all the teachers on a continuum of progress, based on each person beginning point, even those with the lowest entry point have made significant strides in their comfort level with technology; in the integration of technology into the curriculum; and in the collegial interfaces.

COMFORT WITH TECHNOLOGY

All the teachers have mastered many of the technology resources and have begun to use as every day tools. The range of comments listed below point out the advancement:

“I am more willing to take risks and jump on new ideas that involve technology.”

“After going through this program I feel more comfortable using technology professionally as a teacher.”

“Before I began the QTL training, I thought that I used technology in an effective manner. I now have many new ideas that I can implement with my students.”

“I feel more comfortable with the computer.”

“I have become more familiar with the computer and the different programs we have available to our access.”

“I feel so much better prepared to use a variety of technology in my class.”

“I have become more confident with my ability to utilize technology in my classroom.”

“This program gave me some much needed confidence.”

“The faculty at our school has become immersed in technology. We have seen more incorporation of cooperative learning, project based learning, and technology across the curriculum.”

“The grant was a blessing . . . We learned so much. Many of the teachers at the school didn’t use a lot of technology. Now everyone is excited about all the new software and equipment.”

“This program helped me to realize that many of the computer based programs were not really as daunting as I first thought. There are endless possibilities for materials to enhance children’s learning.”

“Even though I am not using it {technology} more, I’m using it better.”

“Having been through the QTL program I feel like I have grown some as far as technical ability but application wise I have grown tremendously.”

I feel that I can more effectively use technology as an instructional tool and not just for my own use.”

“QTL training has had a definite impact on my overall confidence in using more technology based learning in the classroom. The new found confidence has helped me in my day to day preparation for my class.”

“Now I can use the computer with confidence.”

“It gave me a lot more ideas – refreshed me – and made me eager to try the new things I learned. I learned how to use new technology and software that I had never even seen before.”

“I have always had a generalized fear of computers and this class gave me a sense of confidence.”

“It has made me more confident using the computer and (has) varied my teaching method.”

“I feel more comfortable using the digital camera and PowerPoint now.”

“The QTL program gave me great confidence to try new ideas using technology based on some theories and teaching practices that I learned at the workshop.”

“At the first session of this program I was very frustrated because of my lack of ‘ability’ on the computer. As the sessions progressed I became more knowledgeable as well as confident on the computer. I feel like trying new things in my classroom now.”

“I feel like I have much more to offer them (the students) than I did before.”

TECHNOLOGY INTEGRATION INTO CURRICULUM

Assessing the degree of technology integration into the curriculum required teachers to answer specific questions; observations to be made of the teachers and students; and review of actual artifacts of the students work.

The range of answers and data varied across the Liberty teachers but the majority has incorporated technology into their teaching and learning environment. The Milken Exchange in Education Technology describes the stage of progress as Entry, Adaptation and Transformation. Based on these stages most of the Liberty teachers are in the Adaptation stage. As Milken further explains this state, “Educators at this stage have developed skills related to the use of technology but have primarily applied these skills to automate, accelerate and enhance the teaching and learning strategies already in place. Technology is thoroughly integrated into the classroom in support of existing practices.” A few teachers are still struggling and remain in the Entry stage.

Some examples of teacher’s actual technology integration in the curriculum are as follows:

“We have such fascinating options with technology. It has opened up a big area for us. Each day I have an endless arsenal of things to incorporate. It is fascinating.”

“I use it {technology} more and more. Using the computer was separate from the lessons, now it is integrated.”

“Since participating in the QTL program I have begun using some of the strategies in my classroom. We have begun simply, but we are expanding. My

class and I have used several Venn diagrams, and we are in the process of making class cards.”

“I have used the computer and teaching techniques to allow my students to expand and experience materials multi-modally. My students are once again out of their seats and away from just cut and paste, paper and pencil. How fun it has been for me as well.”

“I have discovered through this program that there are several ways to use technology beyond the typical computer uses that are obvious. Many of their uses address different student learning styles which are essential to every student’s learning and technology makes this easier to manage in a classroom environment.”

“This QTL program has introduced me to some exciting software programs that can be used in many areas of instruction.”

“I like the trading card idea, graph club and Kidpix deluxe. I learned some websites to use in the classroom. I feel comfortable using PowerPoint now.”

I have already used a lot of the teaching methods, strategies and technology in my room and have seen a difference in the way my children are receptive to my lessons.”

“Integrating technology with reading was very beneficial.”

“QTL participation has impacted my teaching practices by allowing me to teach in a way that can benefit all students. I have been able to incorporate math, language arts, social sciences and also technology to teach basic skills to all students . . . now the centers have been enhanced using the computer to do actual research and giving each child a part to work on, stretching the center activity further and allowing each child to elaborate on their research.”

“I’ve been able to integrate the computer lab activities more with classroom subject areas especially for doing research, outlines and web. We’ve done all subject areas. Basically I’ve been having more fun with the computer and have been enjoying planning activities for computer lab time and for classroom computer use.”

“I now incorporate technology as part of my planning instead of just planning a technology lesson.”

“I have used the Inspiration Program with our 5th grade students doing Venn Diagrams comparing and contrasting story characters. We have used Bubble Maps in similar ways. The microscope has also been utilized.”

“I tend to turn to it {the wonderful Dell computer} for questions, pictures and anything else that might help with an explanation, concerning a new word, concept or current newsmaker. When the students see the possibilities of just what can be read, I think they are encouraged to improve their own reading abilities.”

“I have been given new ideas in every aspect of my curriculum. This course has helped me apply things I already know . . . and use them with the kids at school. We have been able, as a grade level team, to update and make projects that have been in use and the same for years, more exciting and interesting to do as a student and a teacher.”

“I have learned new ways to integrate using the computer in my classroom. I know more about Inspiration, Graphing, KidPix and using a digital camera.”

Effective Use of Instructional Practice

It is somewhat more difficult to quantify QTL’s staff development impact to the teachers regarding implementation of instructional theories. This could be because the label is often not as paramount to the teacher as the actual application of the instructional practice. The index scores from the cluster analysis yielded a significant rating in the increase in non-traditional teaching practice between pre QTL and post QTL and a significant decrease in traditional teaching. Evidence was noted during interviews that teachers were more thoughtful about the instructional practices and many had become more effective in their employment of best practices.

Some of the specific comments from teachers regarding effective instructional practices are as follows:

“I am using the Each One, Teach One program lots. I love it and it works.”

“The QTL program has provided me with a variety of ways to approach my curriculum. It has also reintroduced the concept that my students have a variety of learning styles and understand and retain information when they experience their world from those perspectives.”

“The QTL program has impacted my teaching by enabling me to see the different ways my students learn . . . and having a creative way to instruct students . . . the strategies and implementations taught were “no nonsense” . . . These varieties opened my eyes to a better way of teaching that allows my students to retain more information taught, and enjoy the classroom methods in an exciting way. I have already used a lot of the teaching methods, strategies . . . and have seen a difference in the way my children are receptive to the lessons. I cannot wait to show them more. QTL is a better way of teaching with the benefit of students wanting to learn to meet their individual successes.”

“I am going to try to give children in my room more licenses to be creative and demonstrate their knowledge in different ways.”

“I have made time to do more project based learning and cooperative grouping with students. We have learned to literally think outside of the box with our . . . projects and we have incorporated technology across the curriculum and subject areas.”

“Since QTL I have used math (measurement) to a greater level. Centers are being used to scaffold my teaching. The weaker students are in centers where I can help them individually and other students are working in centers using hands-on activities as well to better improve their skills. {This} has given me a better outlook on teaching and ways to improve student morale.”

“Participation in the QTL program has provided me with the opportunity to step back and look at my teaching style as well as the learning style of the individual student. . . . my teaching has become more student centered and exploration. I have given students ownership of their learning.”

“I have learned different learning techniques and how I can involve all students . . . students learn different ways, so if I learn how they learn, I can involve all students thru out the day.”

“It restored my faith that kids enjoy learning new things. I have traditionally been a 95% teacher directed style teacher, but I really like giving the students an assignment and letting them ‘go at it.’ They went beyond my expectations with fewer directions.”

“I look at my students more closely to see how they learn and not just that they are learning.”

“It helped me have . . . more patience with the children . . . And some who are not trying to learn, it taught me to . . . find out the reason . . . and help them now.”

“I am trying to link what we are doing in class to the real world. Technology helps with this connection.”

Collaboration / Attitudes

The NCTA grant broke down the isolation of the teaching profession. Communications and comraderie have been transformed throughout Liberty school as a result of the faculty’s time together during this Technology Demonstration Project. The teachers themselves recognized the surprising social aspect of the classroom and project activities. Initial walls were broken down during the professional development classes. While carrying out the collaborative project activities required by QTL for Day 7, further

teamwork and stronger bonding occurred. The teachers realized the value of working together and sharing ideas, expanding their growth as professionals.

Some of the teacher's comments regarding collegiality included the following:

"Through the QTL classes, the teachers got to know one another better. Those with more knowledge helped those of us who were novices. Proud to have been part of the process."

"This Technology Demonstration Project has put our faculty meetings on common ground. We are all in the same boat with the same goals. We have learned who can help each other. The lower grade teachers have become closer personally with the upper grade teachers."

"I learned how to print using the digital cameras and then I showed the other teachers. The outreach is occurring more naturally."

"The K-2 group is getting together to plan best usage of the Alpha Smarts. It is a community effort."

"The social aspects resulting from the grant have been tremendous. There is more camaraderie in the cafeteria. We are closer to our colleagues. It would have taken so much more time to have such a social change."

"Teachers are sharing ideas and encouraging others. It is easier to work with the faculty."

"There has been a sense of camaraderie and school pride as teachers completed their projects and shared with each other. This project brought our group closer together on a professional level."

"There will be more collaboration in the future."

"It was great to help each other get over our own hurdles. Together we came up with better ideas."

"I have . . . assisted and encouraged other teachers in the use of technology."

"The training provided opportunities for us to get to know each other."

"Cross grade-level sharing is evident. Fifth graders helped the fourth graders."

"The grouping of faculty during QTL helped. Teachers were not hesitant to help one another."

“I enjoyed the fellowship with other teachers and assistants from this and other schools.”

“We got to know each other during the QTL training.”

“Made teachers closer . . . showed teachers that they can help one another.”

“The project essentially . . . helped to create a greater connection between staff and students.”

“There is a lot more sharing . . . teachers talk to me that never did before . . . excited to hear what I know and what I am doing! Technology is taking us where we need to be.”

“This . . . has offered the chance for me to get to know my co-workers and for us to brainstorm many ideas. I have also found that many of the things I thought I alone was lacking in that many others felt the same way.”

“I enjoyed the interaction with the other teachers at my school.”

“Overall the workshop was great. It really opened the door to meet with other teachers.”

“School wide we have gained a better understanding of each other as a faculty. We gained a better understanding of each others’ grade levels and the student capabilities at those levels.”

Student Outcomes

One of the true tests for gauging the success of this Technology Demonstration Project is by soliciting answers to the question, “Did it result in a positive impact to the students?” While there are no empirical data to gauge precise student performance, there are rich anecdotal data to support a significant increase in the potential for student learning, through more active participatory learning and a greater increase in interest levels. Multiple responses from the teachers regarding this intensified engagement by students indicated that students were so much more on task and that the students were able to do much without teacher guidance. Furthermore, struggling students, those perhaps at the highest risk, are often the ones resulting in extremely positive changes by this Technology Demonstration Project. One example involved a little boy who had an academic challenge but tried very hard but usually was not successful. During a technology project to do an alphabet book he had the letter ‘R’. He not only was extremely successful but the items he found beginning with ‘R’ were great. He even located a rose that opened up on the screen. He was delighted with himself and furthermore he learned the sound and recognition of ‘R’. Another child with behavioral problems who never stayed focused had the ‘V’ letter. He concentrated, completed his work and produced an excellent word page. He was so proud and asked for more time to

use the PC. One veteran teacher described a student who cannot be reached as the lowest level student she has ever taught. She was in the process of researching PC ideas to help him since he loves to do computer lab work. She was convinced that she would be successful in helping bring him along because of other cases she had experienced. An EC student whose academics are extremely low was shown one time how to do a somewhat complex task on the PC. Within 5 minutes she had mastered the activity and the student began to teach the other students immediately using the computer. The teacher described the event as very powerful. Another teacher described 4 EC kids she had this school year who used the computer to work at their own level and found success where they were unable to in the past. These student examples were priceless.

Other comments from the teachers reflect this strong positive impact to the students. They are as follows:

“The children love to work with technology and are comfortable with it.”

“For BEH children, the computer is sometimes the ‘saving grace’.”

“These kids are very engaged with technology no matter what you asked them to do.”

“Technology changes the attitude for sure especially 5th graders. I had a challenging group. I had 3 students who were tough to reach. I ended up using technology as a carrot. They were very motivated by technology. It worked for them and all 3 ended up passing the EOGs.”

“I have one student who doesn’t read well, but he is engaged in learning through the computer. Computer vs. textbook”

“When we are working with technology everyone is on task.”

“Children are producing better products. They are processing information. [Our] county project [this year] was better. The project changed from a take-home project to an in-school project.”

“The use of technology seems to really help the middle and high performing students.”

“They can remain much more focused when technology is being used.”

“Technology is crucial, particular for high-risk students. Sometimes nothing else will reach them.”

“Kids . . . grew and I was able to target some language [growth], definitely social and emotional growth.”

“When the students were given the freedom to choose their project they put more effort into their work. Also their creativity came out.”

“If you can get a child like [this] to feel successful then you are going to be able to show improvement.”

“I was used to students doing as little as possible, but this way [with technology], they did way more when they got to decide and direct their projects.”

“Teaching is easier when you have the media [technology] and learning is easy too when you are doing rather than listening and taking notes.”

“My kids are very excited about the new technology.”

“Yes it [technology] will most definitely impact student academic performance in the classroom. It will allow more challenging activities for my high learners as well as providing a different comfort level for some of the lower academic achieving students and giving reinforcement in the areas needed. It is a great intervention which can meet the needs of each child individually.”

“The use of technology in the classroom helps keep students more focused. Hopefully performance on standardized tests will improve. Children are noticing the resources for learning are expanding.”

“I had a student that was unable to focus for even a short period of time. He loved using the computer for learning. I used the computer as an enticement/reward.”

“Autistic children can do more – one even became more creative than some of his classmates who didn’t have disabilities.”

“ESL kids profit the most. They struggle with regular activities but the technology helps them greatly. They can answer the questions with a click of the mouse by viewing the pictures. This makes them feel like they have accomplished the task . . . a real motivator.”

“Kids learn at different levels and some learn better through the use of PCs.”

BROADER IMPACT

Clearly the Technology Demonstration Project has significantly impacted the teachers and students at Liberty. Continuous daily progress is being made. Steps are being taken to further embellish the depth of knowledge among all the teachers. The Technology Assistant’s goal to become more of an adviser to the teachers by their taking ownership of the technology integration into the classroom as well as the lab time has become reality. As one faculty member commented:

“It is phenomenal how engaged they are . . . They do all the planning for their lab times and the classroom activities. They are taking ownership for most of this; even the toughest ones became engaged.”

Other comments were:

“Total turnaround from the beginning to now.”

“Teachers are making great strides.”

In fact, every Wednesday after school the Technology Assistant is holding voluntary workshops to further engage the teachers on technology. At least half of the faculty attend on a regular basis. Many of those with conflicts follow up at a later time to seek the chance to learn what they have missed.

Furthermore, this grant allowed an even further impact into the broader community. With the grant dollars multiple Randolph County schools were able to participate in the QTL staff development. A grateful principal from one of the recipient schools voiced his perspective:

“As a result of the people attending [the QTL training], I have witnessed a more thoughtful effort in teaching technology in the computer lab. The use of the digital camera, software for graphing and making bubble maps, and presentation of writing and other projects that encourage the use of technology in multiple ways, [I see] that technology is beginning to be a part of instruction . . . when we secure more computers for the classroom . . . we will see more and more attention given to this powerful resource. Thanks to you and your staff for allowing us to participate.”

A participant from Coleridge Elementary enthusiastically wrote:

The workshops last year were great! They helped us to see how much more we could accomplish by working together and integrating technology . . . we saw how meaningful it was for the students to have more options in expressing what they had learned. Extra software was purchased so we can continue to implement teaching/learning strategies that we were exposed to.”

At Southmont Elementary, the principal used an early release day to do staff development with her faculty on the QTL principles. The 3 teachers who had taken part in the QTL staff development shared what they had learned at the course with their fellow staff members. Therefore, the impact of the grant keeps growing.

The results at Liberty have piqued the interest of the other schools. One of the Liberty teachers was asked to present at a district Math team meeting on what was being done at

Liberty. Liberty is trying to get ideas out there for others about the impact to the teaching and learning environment. As one teacher at Liberty said:

“The teachers are reaching throughout the district.”

Even the Liberty teachers commented on how it made them feel with their district colleagues. Those comments were:

“Liberty has caught up with the other schools in the County and that makes us proud.”

“Once the kids start telling the parents about Liberty’s progress there is widespread pride being felt.”

“There is a degree of envy from other county schools because we have access to so many things. We are helping them pursue ways to get resources for their schools.”

“With the other schools participating because of this grant, makes us feel good. We got both staff development plus technology.”

“The grant has been very good for Liberty. Before this, the school was considered the low end of the totem pole. It has been a place where parents didn’t want their children to go. Now look at the school . . . scores have improved.”

“The school has more respect.”

“Other schools in our district are also curious about everything we are doing. This has helped our school to feel more confident as a unit.”

LESSONS LEARNED

During the Liberty grant implementation, lessons have been learned that could be beneficial for future Technology Demonstration Projects. NCTA’s goal is for continuous improvement with each of these projects in order to leverage the grant dollars for maximization of the positive impact on the teaching and learning environment. Michelle Calton, NCTA’s VP of Membership and Programs and the Executive Director of the NCTA Education Foundation pointed out, *“We are looking to do things bigger, better, seamlessly through our lessons learned at each step.”*

LESSON 1: Seek out the knowledge for making the best first equipment order. With a fixed amount of precious dollars to spend, each school wants to purchase every ideal piece of equipment. At the onset not everyone understands what all is available and what is most appropriate for their particular environment. A determination needs to be made at the school level as to who has the knowledge to place a smart purchase order. Those

decision makers should consider a visit to a model classroom, discussions with NCTA, vendors and QTL representatives and visits and phone inquiries with previous grantee schools to educate themselves. Those schools who have experienced this process have “real life” examples of what worked best and why and are very willing to share this knowledge.

LESSON 2: The equipment and software installations should be done prior to the completion of the QTL staff development classes. This is not always possible due to the balancing and timing of simultaneous events but lack of resources at the school can be a barrier to successful incorporation. Most of the participants leave the QTL classes highly motivated to employ what they have learned immediately into their classrooms. Any delay can create frustration and become a de-motivator. For those more reluctant to move forward inadequate resources allow for an excellent excuse for no action.

LESSON 3: The makeup of the attendees to the QTL classes is extremely important for stronger bonding and greater collegiality across the school. An extremely positive by product of the grant activities is the breaking down of the professional isolation of the teachers. The teachers realize the worth of working together and sharing ideas during the class, collaborative projects and during the day-to-day activities. Same grade level teachers need to be split across multiple cycles so that broader camaraderie can be built. Generally common grade level faculty already knows each other well but that is so much less across all grades and the resource teachers. Furthermore, teacher assistants should not attend with their specific classroom teachers so they are not influenced by each other. A broader mix of attendees correlates to more cross boundary sharing.

LESSON 4: A strong onsite technology leader to carry out the day to day follow-up items is essential. If there is a school Technology Assistant then this position should assume this leadership. If not, a designated person needs to be dedicated for taking on the challenge of accepting the new equipment, following through on installations, learning the equipment, training the teachers and answering the many questions that occur during the project. It is important that this person has the support of staff and administration. Liberty had a wonderful Technology Assistant, who despite the hurdles, made the project move along smoothly and successfully. As one of the QTL instructors stated, “*She has made a big impact to the program.*”

LESSON 5: Ensuring that the technical support for equipment and software implementation is ready to go upon equipment receipt is critical. Careful planning and strong commitment to do the installations quickly upon receipt of the hardware and software is very important. Any delay can be a source of frustration to the school staff and slow down the growth of technology and best practices integration. The Randolph district office was not available to install the equipment upon arrival so some equipment arriving in early May 2005 was not operational until September 2005.

CONCLUSION

The third Technology Demonstration Project has been very successful in delivering a state-of-the-art technology enabled school. Furthermore, the teachers have been provided high quality professional development and have acquired the skills to apply what they have learned immediately into their curriculum using the grant provided tools. Fundamental changes are being made to the teaching and learning environment and the growth is evidenced daily. The dream that was envisioned by the principal has become a reality. As he stated at the beginning of the grant:

“We want to move from teaching technology as an isolated, stand alone skill to using technology as a tool to enhance student learning through project based activities and assignments. Transforming the way teaching and learning takes place through the use of technology is our best hope for ensuring that students are prepared for the real world beyond the classroom. It is our hope . . . to create this new culture of teaching and learning.”

Furthermore, he defined success of this Technology Demonstration Project as *“when teachers take what they have learned in the training classes and bring back to the classroom for integration into the curriculum fully engaging the students with available resources.”* The culture of Liberty school has been changed and the transformation is very much underway.

As NCTA President and CEO Joan Myers stated so well in the initial planning meeting with Liberty: *“The cultural component is an important aspect of these Technology Demonstration Projects. These projects are very powerful and it is good days when you hear teachers tell how they can change and make a significant difference with all the resources. It is great to see the teachers using what they have effectively. It is even more wonderful to watch them look beyond and establish stretch goals, reflecting on what these goals mean to the students.”*

Liberty teachers were all over the board at the onset of this project. There were quite a few extremely reluctant to believe there were better and more progressive ways to approach the classroom environment. Now all that has changed. Some of the ones most anxious and unyielding have stepped forward and have put together some wonderful project based activities utilizing technology very effectively in the classroom. The Technology Assistant has been able to move away from teaching the students technology

because the teachers have assumed ownership. The Technology Assistant commented:

“With the new equipment Liberty has received I am spending more and more time figuring out how to train the teachers, learning the equipment and training and I love it.”

Furthermore, all the students, even those from low-income families, have the advantage of technology resources not available at home. This Technology Demonstration Project has lifted them up and prepared them for future learning.

The cultural movement has begun and great progress has been made in a relatively short timeframe. The following fundamental changes have occurred:

- Significant increase in the comfort level with technology
- Significant increase in the integration of technology into the curriculum
- More effective use of instructional practices and a constant awareness of multiple options for reaching the students
- More active participatory learning and a greater interest from students
- Improved results from high risk students, whether behavioral or academically challenged
- Greater collegiality across the school
- Rejuvenation of the teachers and their career

Results from this Technology Demonstration Project also suggest that future grants would benefit from upfront research regarding the first equipment purchase, the implementation of equipment and software prior to the completion of training, a cross sectional mix of teachers in each training cycle, a strong onsite technology leader, and a technical support group well-prepared for the arrival of equipment.

Liberty is now fully equipped with an arsenal of knowledge (hardware, software and training) to lead to significant change in the teaching and learning environment. A delightful, enthusiastic teacher described the journey, so eloquently when she said,

“We have jumped on board a train that was moving past us before. Now Liberty can ride this fast moving train because we have the knowledge and the resources.”

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