

*JWS CONSULTING, INC.*  
*493 Bing Crosby Blvd.*  
*Advance, NC 27006*  
*336-998-7239 janetwsmith@aol.com*

## **Evaluation of the NCTA Technology Demonstration Project for Taylorsville Elementary**

### **Overview**

North Carolina Technology Association (NCTA) Education Foundation obtained a grant of \$95,305 from the U.S. Department of Education to conduct a Technology Demonstration Project at Taylorsville Elementary School in Alexander County, North Carolina. The purpose of NCTA's Technology Demonstration Project is to :1) power-up a school with infused technology tools as well as 2) provide high quality professional development for all teachers at the grantee school. 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.

This report summarizes the implementation of the grant at Taylorsville 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 Taylorsville; and Conclusion.

### **Background**

Taylorsville Elementary, located in Alexander County, North Carolina, is a school with grades K-5 and has approximately 260 students. It is a very underserved school, having 77% of students on free and reduced lunches and a 44% minority population. In addition 17% of the population of students are special needs students. These students come from an extremely low socio-economic situation, with very limited parental involvement in the student's education. The family life of many of the students is at high risk with many single parents and often families torn apart by custody issues as well as other personal issues. With such conditions, the student's home environment generally does not include

computer access. Therefore, the only exposure to technology occurs at the school. For most of the students this exposure is limited to one day per week for 30 minutes during the weekly computer lab or a few minutes per week for the Accelerated Reading (AR) test. The one existing computer lab in the school is constantly used for specific required basic skills learning programs leaving little time for research and for all the technology skills that are taken for granted in today's global economy. The principal and teachers noted that the students have lots of catching up to do because of their lack of exposure coupled with their home environment. Taylorsville Elementary is a Title 1 elementary school thus receives supplementary funding. Yet the school has lots of climbing to do to compete even with other elementary schools in the district. This school is supported by the community with local businesses, churches and local government, but there is very little parental participation in school events, activities and the Parent Teacher Organization (PTO).

Taylorsville Elementary School is fortunate to have a very strong, enthusiastic principal who has a clear vision for technology across the school and exhibits a genuine drive to improve the learning environment. Her vision includes the goal to see full integration across the curriculum with every child provided an optimal learning situation. This means that the staff must have good skills in using technology in the classroom. She is well liked by her administrative staff, teachers and students so her influence will be effective as this grant process is realized. She understands the goals of the technology demonstration project and succinctly described her own goals from the grant: *" I want to see greater enthusiasm for teaching and learning; help students acquire the skills needed in the 21st century and [have] the ability to connect what they learn [by making] learning rigorous and relevant; provide teachers with the tools they need in the classroom."* She also stated that, *"Providing [the students] with the newest technologies will impact their educational performance in a positive way. I envision test scores rising, students showing more motivation to learn, less boredom with daily routine of school, collaboration among staff and the possibility of engaging our parents in the education process."*

Furthermore, the county has an extremely supportive superintendent who has been personally involved in the NCTA grant activities and process. He is a visionary who understands how important it is to up fit all schools in the district to appropriate levels of technology to prepare students for the 21st century jobs. He has made himself available to the NCTA Education Foundation Director to move this project along efficiently and effectively and has provided the leadership that makes for success.

### **Technology Capability Prior to the Grant**

The equipment at Taylorsville Elementary School is very limited across the school with most of the hardware being very dated equipment. There is no consistency in hardware and one teacher described it as a "hodge podge of parts." The situation is so bleak and the interviews with the teachers reflected the situation. Statements that support the difficult situation are as follows:

*"Technology is limited and nonfunctioning a large percentage of the time."*

*"Sometimes it works. Sometimes it doesn't."*

*"We use [technology] in class some, but we all get frustrated because we have to all try to gather around and see the little monitor screen."*

*"I have no updated technology in my classroom...I feel my students are being cheated."*

*"Computers are outdated - during our last upgrade we had to sacrifice 2 computers to build 1 usable computer."*

*"To even use a computer, my students have to go to the library or lab."*

*"The technology we have is very outdated. When you go to use it, it may take a long period of time to get it working properly. Therefore, too much instructional time is wasted, which makes me leery of using technology."*

*"The lack of technology and the outdated technology we do have hinders student learning."*

*"We seldom go to the computer lab because the hardware tends not to work."*

The computer lab is equipped with 31 desktop computers with varying levels of efficiency. One teacher noted, *"I am very interested in using technology....I would like to use it more but with such a limited amount of time it is difficult for me to decide to use the lab when it is so unreliable."*

The media center has 7 desktop computers that seldom operate efficiently and make it virtually impossible for the teachers or the media coordinator to conduct research sessions with any degree of success. Only 4 of these computers are available for students with the others for the media specialist, 1 for the assistant and 1 for circulation. As the principal noted, *"The students often complain that their computer is slow or not working at all, leaving the teachers and the students unsatisfied."*

The classrooms have 69 desktop computers distributed across the school but many of these only work sometimes. A few are not even connected to Internet. Generally speaking most of the classrooms have 2 or 3 computers of which 1 is available for the teacher's use only and the others for the student's activities. The Title 1 Lightspan Reading Lab also has 21 Sony Playstations for their use.

There are only 4 laptop computers in the school with 1 of those in the media center, 1 in the administrative office and 2 in the technical education classrooms.

There are 26 laser printers with 3 of these in the computer lab, 1 in the media center, 2 in the administrative offices and 20 distributed across the classrooms. Inkjet/ DeskJet printers are also distributed across the school with a total of 37 with 1 in the lab, 1 in the media center, 3 in the offices and 32 in the classrooms.

Television monitors are throughout the school with 31 total of which 1 is in the lab, 2 in the offices, 5 in the media center and 23 in the classrooms. VCRs are also available with 3 in the media and 12 in the classrooms. There are 2 DVD players and 2 TV/VCR combinations.

Other various peripherals include an Interactive Whiteboard, a graphical scanner, a data scanner, 1 document camera, 2 digital cameras, 1 Windows CE, 1 Interactive Slate, 1 LCD Flat Panel, and 10 Data/Video Projectors.

More recently some new equipment was installed at Taylorsville Elementary. However, not every classroom teacher was able to get the new technology. Permethian Activboards, along with a data projector and document camera, were installed in 7 classroom environments as well as a set for the media center. The distribution of the new equipment was as follows: 1 in EC classroom, 1 in 1st grade, 1 in 2nd grade, 1 in 3rd grade, 2 in 4th grade and 1 in 5th grade. Also with this infusion of hardware was 6 new wireless key pads to be used with the Permethian Activboards. The media center houses 1 document camera, 1 projector, 1 Interwrite Pad, and 1 digital camera for checkout by the teachers. An additional digital camera is available for the yearbook activities. However, the equipment resources are still so dire that one resource teacher described her situation as follows: *"I borrow a DVD from [another school] to use with a novel ...I bring a CD player from home and a camera from home to make honor roll, field trips and special programs."* She continues by saying, *"Our access on the computer has really hurt our reading and writing program."*

## Software

Taylorsville Elementary School has the basic software components. However, with so many exceptional students (EC) more software is desired to reach the needs of these special children's' learning requirements. All PCs have Microsoft Office, Microsoft Works and Internet Explorer. A few of the classrooms do not have Internet access due to the electrical deficiencies in the old 1950s school. The core software includes the following:

Cornerstone	Orchard
Renaissance Place	Study Island
NCWISE Owl/Gale Group	Mozilla Firefox
Electronic Encyclopedia	

## Faculty

Taylorsville Elementary has approximately 260 students with 16 classroom teachers which includes the Exceptional Children. This is made up of 3 Kindergarten teachers, 2 teachers for each of the grades 1st through 5th and 3 EC teachers. Also with the student population there is 9 support teachers to serve these students. All the teachers are very enthusiastic about the NCTA grant, being very receptive to new strategies to enhance instruction, especially through the use of technology. They clearly want to use technology to improve the teaching and learning environment, not technology for technology's sake. The teachers are expecting great results from the infusion of limited technology and staff development. Some remarks regarding what they hoped to achieve with the grant are as follows:

*"[I want] to allow my students to learn to be efficient with 21st century technology."*

*"[Be able] to bring technology and global awareness into the classroom and develop 21st century students."*

*"I would like to learn new and fun ways to implement and use technology in my classroom."*

*"Ideally it would be good for students to be able to use a computer in the classroom in alignment with their school work."*

*"We are so excited about the opportunity to move beyond this [unreliable technology] and to gain the materials and knowledge that is necessary to make Taylorsville Elementary a 21st century school. Thank you."*

*"By staying current with technology we have the opportunity to keep our students engaged and our skills sharp."*

*"[I want] new and exciting ways to teach my students."*

*"I hope to gain ways to get technology into the classrooms that excites both students and teachers."*

*"[I want] to be more interactive with my lessons and the use of technology."*

*"My students have behavior issues. They love playing games and the use of technology is a great way to bring them into being interested in our lessons. The technology we do have is utilized but more is needed."*

*"My experience and comfort level is 'old school' but I am learning and using technology more each day. I want to **up** that knowledge very much."*

*"[I hope to gain] both equipment and knowledge so that we can better prepare our students for the present and the future."*

As is typical of schools, the faculty displays varying levels of technology proficiency. The greatest percentage of teachers are in the middle with their level of comfort when using technology. Some teachers do appear to be intimidated with new technologies but most are very receptive to learning and growing in their technical skills. This was evident during the latest infusion of technology that occurred last summer when Permethian Activboards were installed in 7 of the classrooms. Furthermore, the faculty has lots of concern and a high sense of urgency to raise the bar quickly for these deprived kids. The teachers continuously strive to collaborate with parents, students, businesses, and faith-based and community organizations to impact student achievement.

## **Evaluation Approach**

The evaluation report provides a full chronological account of what happened at Taylorsville Elementary school 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. 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 as well as interviews (pre and post) of the faculty; teacher reflections; and artifacts from the teachers' Quality Teaching and Learning (QTL) summative projects.

The NCTA Education Foundation Director met with the school and district leadership in late summer 2008 to discuss the Technology Demonstration 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 project would have on Taylorsville Elementary 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. Specific objectives of the 2008 Technology Demonstration Project were to: 1) Infuse an under-equipped, low-wealth school in a rural area with 21st Century technology tools 2) Provide education software 3) Provide quality professional development designed to help teachers and administrators and 4) Provide an individual Technology Demonstration Project school with resources to demonstrate the educational value of integrating technology as a tool in the teaching and learning environment.

## **Analysis of Pre-Survey Materials**

All the Taylorsville teachers were given two different surveys to assess the knowledge of their use of technology environment as well as their individual approach to teaching. Open-ended questions were included in the pre-survey to better understand each of the teacher's starting point. When participants were asked, "**How do you currently use technology?**" responses generally fell into the category of personal use of technology related to lesson preparation and enhancement. The Taylorsville teachers were also analyzed across three primary areas from a short survey administered prior to the install of new technology and during the beginning of the QTL training. These areas examined were: Technology Confidence, Availability/Reliability of Equipment, and Level of Student Engagement. The following reflects the findings of the surveys.

### **Technology Confidence**

Almost **60%** of the participants had an **average to less than average** comfort level with technology. **Less than 20%** of teachers scored **very confident** on the use of technology in the teaching and learning environment. Evidence of the need for staff development prior to the install of the newer technologies was very clear.

### **Availability/Reliability of Current Equipment**

This area reflects the necessity to upgrade the classroom equipment for the students enrichment. **Sixty-two %** of participants scored equipment **totally unavailable to somewhat available** for the teaching and learning environment. Many of those with the least reliability of equipment involved those teachers dealing with troubled students with performance issues.

### **Student Engagement**

In spite of the lack of resource robustness within the learning environment the scores for student engagement were better than expected. Almost **80%** of participants said their students were **mostly engaged to very engaged**. However, it should be noted that the resource teachers including the 3 EC teachers were not included in these numbers. Many of the anecdotal information obtained through interviews with those special education teachers spoke of the need for more resources to keep the behavioral and performance problem children engaged in their learning activities. If these numbers were included the scores would have been much less. Regardless, having 20% not fully engaged remains an issue. Perhaps with the infusion of both training and technology to the teaching and learning environment the post assessment will reveal this progress.

## **Equipment Implementation**

The actual technology purchase was a multi-step process. The first two steps of purchases in December 2008 and the late March, early April 2009 timeframe provided the bulk of the technology. Every dollar of the grant was judiciously used to provide the maximum tools for the school because the reduced grant monies made it challenging to provide all teachers a base group of technology tools for the classrooms. The NCTA Education Foundation Director monitored this very carefully to maximize the project objectives by buying any additional hardware components until all funds were expended.

## **Grant-Supported Activities**

Key activities supported directly by the grant included:

- Purchase of 24 laptop computers with 1 gigabyte of additional memory
- Purchase of 14 document cameras
- Purchase of 14 LCD projectors
- Purchase of 16 digital camcorders
- Purchase of 6 digital still cameras with 4 gigabyte flash cards
- Purchase of 1 zoom digital camcorder
- Purchase of 46 Microsoft Office licenses ( Lab and Notebooks)
- Purchase of 4 Activboards
- Purchase of 6 Desktop computers and monitors
- Purchase of 7 Webcams

In addition to the direct grant activities, the NCTA Education Foundation assisted in the creation of a training center on the campus of Taylorsville Elementary. The training facility was established using a large storage room in an adjacent building to the school. Since the Alexander County school system does not have a training center this addition is a major ongoing indirect benefit. This center is now a state-of-the-art training center that can be used for multiple purposes and is available for district-wide usage if so desired. Outfitting of the center was done through philanthropic means. The Education Foundation of NCTA sent out requests for donated computers and received 24 used, refurbished desktop computers with flat screens as well as 22 laptop cases, 2 media carts , books and assorted materials to help with training. The NCTA Education Foundation funded some additional memory upgrades for the desktops. The electrical requirements and the tables and chairs for the training center were funded from Alexander County school funds.

## **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 Education Strategies with Technology (BEST) program. Multiple cycles for training were conducted for a total of 50 hours.

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. On Day 6 the teachers were given an opportunity to connect their learning to student learning by creating and implementing a collaborative project that combine all the instructional theories and, practice with the use of technology learned during Day 1-5. Teachers worked in teams over the next weeks at the school to complete their projects. These collaborative projects were presented on April 28, 2009.

The Quality Teaching & Learning (QTL) training cycles began on January 14, 2009. Thirty -two people participated in the onsite training. Cycles 1-5 were accomplished by mid February 2009. All classroom teachers from Taylorsville Elementary attended the classes. Some of the newer teachers were quite knowledgeable on the use of technology and thus embraced the QTL training quickly. Those less familiar with the newer technologies tended to be the more veteran teachers. However, the attitudes of all teachers during the QTL course were wonderful with high levels of professionalism exhibited. The instructor was very impressed with everyone. Those teachers having the most distance to come, pushed hard to enhance their technical skills. They worked outside of class in groups to enhance their knowledge and also practiced on areas that needed improvement. Those teachers with stronger skills learned new strategies and techniques for doing things as well as were introduced to new software and programs.

## **Impact to Taylorsville**

### **Teachers**

The impact of the Technology Demonstration Project to Taylorsville Elementary has been significant and is growing daily. The continuum of progress has followed a very natural evolution. Some teachers struggled in the first day of training because those who understood technology and were seasoned teachers felt that they might be wasting their time. However, it did not take long before their eyes were open with wonderment to all the software, learning strategies, techniques and technology tools that could be utilized routinely within the teaching and learning environment. Everyone in the end was very committed to taking what they learned and using it almost immediately. As the QTL instructor reflected on the teachers' growth, she felt that the teacher groups were at varying stages of establishing professional learning communities, as they should be, and

were diligently focused on student needs and strategies to help students improve their performance in the classroom. One teacher described the situation as *"Great. The teachers got loads out of the training and are thrilled and eager to take advantage of the new equipment and organize their lessons plans to grab the children's attention."* Some of the teachers are still getting acclimated to the new equipment. With the grant monies now each classroom is equipped similarly and teachers can work together to help each other. The principal noted, *"Although the county had assisted with the purchase of seven 21st century classrooms, not all of my staff had easy access to the new technology. Receiving this grant has helped to even out the technology among the classrooms and given all staff and students equal opportunity to implement technology and the 21st century learning."* The principal was pleased to see the camaraderie and collaboration that is becoming a norm since this Technology Demonstration Project has been underway. The media coordinator stated, *"All are very supportive of each other. If someone knows who needs that extra boost on their hallway they jump in to help them. It has been so great to see this collaboration. We have needed that team work to become the norm."*

### **Effective Use of Instructional Practice**

One aspect of the staff development was the degree of knowledge gained around the latest instructional practice and how the participants accepted the application of the practice immediately into their teaching and learning environment. The principal saw clear evidence that the teachers have embraced the new approach with technology saying, *"Teachers are incorporating more research and project-based learning within their lesson plans, requiring the students to use the technology."* They have such an interest in reaching everyone of these needy students. The students at Taylorsville Elementary are very disadvantaged and the teachers feel very responsible for providing every opportunity to advance them. Thus their attitudes toward the grant activities were extremely positive and their eagerness to learn everything they could to pass along to the students was obvious. The Taylorsville teachers were very vocal about all the knowledge gained during the QTL about the "best practices" of instruction. Some of the comments are as follows:

*"Much of what we learned on instructional practices is how I know teaching should be. QTL has helped make it more 'do-able'. It has opened my eyes to focusing on multiple intelligences. I think the students will love it!"*

*"QTL has definitely impacted my instructional practice. I am integrating much more technology."*

*"I think this training has made me more aware of the various types of instructional practices that I need to incorporate into my classroom to ensure the learning of all children. I feel that I will be more aware of my students' various learning styles and will strive to implement more varied techniques as well as to plan more group/team-work activities."*

*"I will reflect on the different strategies that have been presented. I also realize that students have different learning styles and will try to implement whatever is necessary to help the students learn."*

*"I will walk away today with excellent ideas that I can use in my classroom. ...This training has made me more aware of the intelligences and has provided me with ways I can meet many of the intelligences in one lesson."*

*"I have learned that there are a myriad of ways to introduce my students to the world around them. I will be looking for more ways to make my lessons 'student-based' and also to make my lessons more 'global'."*

*"This class will impact my instructional practice in that I will try to focus on higher order thinking skills when I plan lessons. I can use what I have learned about learning styles to benefit the children."*

*"I feel that I was 'awakened' to how students need to learn in order to retain information."*

*"This experience has reminded me of what it is like to be a student. By varying learning/teaching techniques, the students will gain increased ownership over the learning process and reap greater benefits in the end."*

*"I have been able to put myself in the place of a student in the classroom. It has been interesting to see how the lessons have affected others and me. We need to understand that all people, children AND adults, learn in different ways and that the way we teach cannot be the same for every student or situation."*

*"I think that we always need to be mindful that just as there are many different teachers and styles of teaching, there are many different ways that children learn. This means to be an effective teacher you have to be willing to put yourself in unfamiliar 'waters', to take risks yourself, for the sake of your students."*

## **Comfort in Technology**

Asking specific question related to technology comfort yielded the desired results. All the participants that in the pre-survey were less than average in their level of technology comfort as well as those who were very uncomfortable made a significant jump in their skills improvement after the QTL training. The teachers realize that practice is going to be the key to moving even further into the comfort zone but are so committed to doing so. As one of those teachers who was frightened in the beginning of the Technology Demonstration Project stated, *"I am very appreciative for the opportunity to participate in QTL. I have learned a great deal and still have a lot more to learn , especially with things on the computer."* Clearly the teachers are beginning to move into higher levels of technology confidence and usage of technology into the lessons plans. The principal was

delighted with the findings, stating, *"I have witnessed greater use among the staff at all grade levels as I completed staff evaluations and conducted classroom walkthroughs. Teachers who were more reluctant to use the technology during the first of the year are using it more and more with instruction."* Faculty also openly commented on their transition into the technology integration into their daily classroom activities as follows:

*"I am gaining more confidence in trying new things with my students, to incorporate the old and new."*

*"I've always been afraid to try PowerPoint but now I am able to do on my own. I am finally able to think outside the box."*

*"Teachers have gained insight on how to bring much needed experiences through technology to students who are greatly lacking in experiences outside of their homes/community."*

*"This QTL process has helped me become more comfortable in learning to use technology with my students. I will not be afraid that I am going to harm something."*

*"Although technology is not needed to make lessons effective it is a wonderful tool to engage students. I know that I need to do more with not only presenting them with technology through my Activboard but I need to teach them to use it themselves."*

*"I have learned many new ways to utilize technology in my classroom. Students can design PowerPoint presentations to share information."*

*"I have learned that there are a myriad of ways to introduce my students to the world around them. I've also discovered ways to improve the multi-media/technology use I already used."*

*"I see more technology being utilized in the classrooms. Along with this I see students and faculty more comfortable with using technology in their lessons."*

*"QTL has provided me with several new ideas for integrating technology into daily or unit instruction. I feel more confident working with PowerPoint presentations and view them more as a tool to demonstrate learning as opposed to limiting use to lecturing aids. I found that it can be fun to step out of my personal comfort zone and try new things in new ways."*

*"I have seen how much we have grown in our technology skills and are able to complete creative tasks at a more rapid pace."*

*"I am teaching my students how to use technology."*

*"I am integrating more student led technology into the classroom rather than teacher led."*

*"I am able to bring more technological interaction with the students and allow my students to use their math, reading and writing skills on the computer and not just on paper."*

*"Staff members now feel comfortable with Word and PowerPoint and are using it more often."*

*"I feel that I am more at ease using technology in the EC classroom.... I am using the technology personally more than with the children as they are cognitively delayed. I have grown and feel confident in trying new things on the computer."*

*"I have learned so much this past month that I do not know where to begin. I have grown in my technology skills and am able to complete tasks at a rapid pace. Thank you all who had anything to do with giving us this opportunity ...It has been a great one."*

*"I have learned a lot of useful tools dealing with the computer."*

*"When we started QTL training, I felt that I had a good handle on the technology piece. As the media coordinator at Taylorsville Elementary School it is part of my job to be a technology leader. But, I have learned new ideas to use with my students."*

*"I have thoroughly enjoyed the technology sessions. I walk away today with excellent ideas that I can use in my classroom."*

*"The technology class has given me more tools and ways to reach each student and to make learning fun."*

*"I feel equipped to use technology to reach different modalities."*

## **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 hard empirical data to gauge precise student performance, there are rich anecdotal data as well as some collaborative projects which tested student competency before and after using technology and the newly-learned strategies. This data fully supports a significant increase in the potential for student learning, through more active participatory learning and a greater increase in interest levels. The final reflections served as the summative report of the participants' work, where teachers shared the results of the Focused Collaborative Cycle with the staff. Each of the grade-level teams presented projects designed to improve student progress in areas that had been identified as those needing the most attention. All projects included a pre-assessment of the student competency, teaching using technology and the learning strategies from QTL, and a post-assessment to determine the successes and additional challenges. Increases in student performances were most impressive.

One project dealt with a learning adventure in probability. The goal was to gain an understanding of the concept and create a picture representation to demonstrate mastery. The pre-assessment showed only 2% proficiency among the students, 2% approaching proficiency and 96% below proficiency. The teachers employed research-based strategies including cooperative learning, brain-based, inquiry based and multiple intelligences. Technology tools were also employed using Lightspan Lab, document cameras, Activestudio and multiple websites. A target goal was for 80% of the students to gain proficiency. The goal was missed by 26% however, 59% achieved proficiency and another 25% was approaching proficiency. The impact was obvious for the students and teachers. While the pre-assessment caused stress for many students, with continue review and supporting activities anxiety was decreased. The students enjoyed the learning activities and were very actively engaged in hands-on cooperative learning. The teachers gained lots from this cooperative project as well. The teachers benefitted from the sharing and compiling of resources and evaluated practices, devising new plans and reflecting on less effective lessons. They were amazed with all the lessons learned from the exercise. One of the most impressive things from observing these project presentations was the degree of commitment and plans for improvement in processes where students did not reach the pre-set goal. They knew what could be done better and were already adjusting the lesson plans to drastically improve the student performances.

Another project involving the kindergarten students was to recognize, model and write whole numbers 1 through 30. The pre-tests showed the beginning proficiency was 0% with 23% approaching proficiency. A target goal was set for 80% accuracy. The learning strategies employed included one-on-one assessments, small group settings, and center rotations. The technology tools used included Lightspan, multiple websites and visuals. The results were impressive with only 8% falling below proficiency and 46% proficient and another 46% approaching proficiency. These students were some of the more learning challenged students, including language barriers. The teachers observed that the small group settings were very effective and increased assessment scores quicker among these students. They also discovered the ability to incorporate reading strategies into the activities by using the visuals. The single most impressive outcome was a very autistic student was able to read the WORDS by the end of the testing and that was an unexpected outcome. While describing this child's accomplishment emotions were openly exhibited. One of the kindergarten teachers participating in this project team said it so well by saying, *"Our goals are small but they are also indeed huge, because the strides are so big for these challenged students."* Another stated that with many of the students the progress was inch by inch but all so *priceless*.

The fifth grade collaborative group did their project around the use of algebraic expressions, patterns, and one-step equations and inequalities to solve problems. The pre-test results showed only 17% were proficient, 38% approaching proficient and 45% were below proficiency. The teachers set their goal for success at 90% for the combination of proficient and approaching proficiency. Technology was integrated into the lesson plans using Activboard flipcharts, Internet 4 classrooms, Classcapes and the Futures Channel. The strategies employed involved cooperative learning, small group

instruction, modeling, graphic organizers, and super source and illuminations inquiry-based hands on lessons. The student engagement was great. They enjoyed discovering the math and algebraic expressions in the patterns given to them, They were motivated to continue learning beyond the required expectations. They were very active in thinking and reasoning and made significant gains in their proficiency. The post-test results fell slightly short of the goal with 78% being proficient but the teachers learned some valuable lessons. The teachers observed that the student excitement and motivation were greatly improved and the student confidence in Algebra was greatly improved. Furthermore, all students made gains and several struggling learners made significant gains. The teachers discovered the value of pre and post tests in the assessment process and the importance of whole class kinesthetic lessons and will incorporate this strategy more often.

All the other teacher teams had similar project results. Every teacher was so engaged and learned so much from the collaborative projects with big plans for continued employment of the QTL strategies and the integration of technology into their daily lesson plans. It was confirmed in their minds that all the students were positively impacted by the infusion of technology into the day-to-day learning. Many of the teachers had plans to meet in teams during the summer to tune their lesson plans for the upcoming year. They plan to use this time to digest all they have learned and have time to research and develop embellished lesson plans for next year. One teacher noted *"It made me consider different learning styles, integration and use of technology. I used a few things this year and I definitely have big plans for next year."* The impact to students was highly visible. The teachers could not say enough about the reaction among their students. Some specific comments were as follows:

*"I have used the Permethian board with my high group for involved research, allowing students to maximize their learning experience. The interest of the students has been very high. I can see growth not only academically from testing, but also socially. I hope to continue to see these results, enabling my children to make the most of their learning experiences."*

*"I have seen an increase in use [of technology] and enthusiasm in students."*

*"Nearly all of the students raised their hands to work and explain the fraction problems using the Activboards. There is a real excitement in the air when they get to explain how to solve a problem using technology."*

*"Video chunking was very exciting and my students just love it. I use rubrics a lot and have very much enjoyed rubistar! "*

*"With different types of motivation and planning the students are more engaged in what they learn. I expect to see more growth from the students."*

*"I see students empowered to take responsibility for their own learning, building on cooperation and collaboration with one another, and having fun while doing so."*

*"I see an increase in student based learning and project based learning. I think this will help the students grasp the information better."*

*"I foresee more collective learning among my students."*

*"My students are much more engaged and excited about learning. They seem to grasp things quicker."*

*"The children are more engaged and seem to have better recall."*

*"Because I use the projector, I know that all students are looking up and paying attention. Therefore, they are scoring better on tests."*

*"Students seem more engaged and excited to be doing new things. I expect to see greater accountability for students once they are able to be given a greater role in the learning community."*

## **Collaboration**

Another side benefit that was experienced by the faculty at Taylorsville Elementary was the issue of collaboration. The Technology Demonstration Project helped break down the isolation of the teaching profession. Communications and camaraderie have improved among the faculty as a result of their time together in the QTL classes and the subsequent team effort in the collaborative project activities. One teacher described the situation beautifully. She said that with all this technology she felt the largest thing she was walking away with was a newfound respect for her colleagues. Although she had worked with these same people for almost 2 years she was able to see a side of each of them that she had not seen during school. She saw more of their personal side, such as their sense of humor, their strengths and how they approached things in their classroom and in life. She felt they were all coming away with much more than how to help the students learn. She knew they had the best recipe for working together to gain the most from lessons or activities, by sharing thoughts and ideas in a comfortable atmosphere. Comments re-iterate this same progress.

*"The training has given everyone an idea of the areas of technology/knowledge that other staff member 'specialize' in or have particular interests and we can go to each other for information/activity ideas or help with areas we find difficult."*

*"I see more cooperation among the staff who attended and more excitement in the ways we teach!"*

*"It has become even clearer that we must work together as a cooperative team in order for all of our students at TES to be successful. We cannot look upon our teaching as a competition."*

*"As we worked in our groups we have seen a varying level of experiences and skills placed together to create successful projects. In each group experience, we have seen everyone in the groups bring something different to the table whether it was knowledge in a certain subject or technology skills. This will help me use fun group projects so that students thrive."*

*"Time [for the class] may seem to be a negative factor[but it is] time well spent More time spent with colleagues and collaboration."*

*"Great experience. Just the social aspect of getting to know and work with your peers was wonderful."*

*"A wonderful experience. We got to be with staff that we ordinarily didn't get to be with."*

*"Got to know a lot of people better which was positive and priceless."*

*"Working together has made us develop closer relationships among coworkers. Therefore, if teachers are all working closer together, then the students will be more successful in a more positive environment."*

*"We learned how important it is to work together. We saw the progress the students made and realize how effective the collaboration and Professional Learning Community component can be."*

*"I have been able to connect more with fellow employees, allowing us to become more of a 'team'. Students have picked up on this also."*

## **Conclusion**

Clearly the Technology Demonstration Project has significantly impacted the teachers and students at Taylorsville Elementary School. Continuous daily progress is being made. Steps are being taken to further embellish the depth of knowledge among all the teachers. All the teachers attending the QTL classes stretched themselves far beyond their starting point, growing in technology skills and in teaching knowledge. They learned the best practices related to the research-based instructional theories, how to incorporate technology into the best practice and how to reach all students. A higher standard of teaching was established. While the reduced grant monies did not allow a full state-of-the-art technology enabled school it did allow a more even distribution of high level technology per classroom to give teachers the opportunity to engage students in active participatory learning. 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 goal that the principal had in the beginning of this project has become reality. As she stated in the onset *"I want to see greater enthusiasm for teaching and learning; help students acquire the skills needed in the 21st century; provide teachers with the tools they need in the classroom....students showing more motivation to learn and ...more collaboration among the staff."*

The Taylorsville teachers have done exactly what the principal envisioned. They are very proud of what the Technology Demonstration Project has done for the school. The pride and enthusiasm is very evident throughout the faculty. The teachers are so committed to helping the students acquire the necessary life skills to succeed in the 21st century. Every classroom is now equipped with the same base hardware and software allowing teachers to integrate technology into the teaching and learning environment. The students are reacting with high levels of participation and the earlier projects show marked results in academic performance. Furthermore, there is a camaraderie among the staff that was not present at the onset of the project. The school was very lacking and this NCTA Technology Demonstration Project has given a boost and a "shot in the arm", lifting the faculty's spirit. The energy level is evident and the appreciation for the grant was unanimous.

The transformation has begun and great progress has been made in a very quick timeframe. In summary the more noted changes include:

- Significant increase in the comfort level with technology
- Significant increase in the integration of technology into the curriculum
- More effective use of best instructional practices and an awareness of multiple options for reaching all students
- More collaboration and sharing of new ideas across the school
- More empowered teachers with innovative technology now readily accessible in the classroom
- More active participatory learning and a greater interest from students
- More faculty enthusiasm and team spirit

Taylorsville Elementary school has a lot of momentum underway. The enthusiasm is great among the teachers, administrators and the students and this enthusiasm is very contagious. One teacher described the impact of the Technology Demonstration Project so beautifully saying, *"With this [project], I found in myself good things, bad things, and characteristics I possess that I did not realize I could utilize in my classroom. I discovered things in myself, in others, and in this community that would be fascinating to my students. I have found the path that I need to take in order to turn that vague idea I have of what a real teacher should look like into a reality."* Originally, the principal wrote in her application for this grant that her vision for technology at Taylorsville Elementary school was that every child be provided an optimal learning environment and to do this, ongoing staff development in the use of technology was required as well as hardware and software supporting their learning efforts. This grant fulfilled that vision and more than met the original objectives of the Technology Demonstration Project.

