U.S. House of Representatives
Committee on Education and Labor
Hearing on Miller/McKeon Discussion Draft of ESEA Reauthorization

Testimony of Frances Bryant Bradburn
Director of Instructional Technology
North Carolina Department of Public Instruction
fbradbur@dpi.state.nc.us

Good Morning. Thank you to Chairman Miller, Representative McKeon, and the Committee for inviting me to testify today. I would also like to thank Representative Virginia Foxx for her dedication to improving education in western North Carolina and Committee members Representatives Hinojosa and Biggert for their leadership in promoting systemic reform and professional development using technology. In several schools in North Carolina, we have had the opportunity to implement a school reform model utilizing technology to transform teaching and learning. After four years, the results are staggering and include increased students achievement, increased likelihood for students to stay on grade level, increased college-going rates, and increased teacher retention. I will share with you why we believe it is our responsibility to lead an education system that prepares students for the 21st Century and how we are beginning to accomplish this in many districts in our state.

Technology in Education Critical to Ensuring America's Competitiveness
Reauthorizing No Child Left Behind is an important step in helping to ensure America's competitiveness in the 21st Century. As you know, the effective use of technology throughout education is critical to preparing our students for a global marketplace. We are not talking about putting some computers in the back of a classroom – we are talking about utilizing the power of technology to change the way teachers teach and children learn. The education community needs the resources and investment that the business community made as it transformed its practices throughout the last 20 years.

The Committee has demonstrated its focus on the critical role that technology plays in our education system by the inclusion of the ATTAIN Act in the reauthorization bill as Title II, Part F. Technology is also integral to the effective implementation and use of data systems, on-line assessments, virtual AP Courses, and on-going and sustainable professional development. Many states currently use educational technology to reach these goals and have shown to improve student achievement, certify highly qualified teachers and help close the achievement gap.

While many of you cannot imagine your workday without technology to access resources or communicate, this is still not the case for many students and teachers on a typical school day. From the upper middle class suburbs of Baltimore to inner city San Diego, it is often considered a bonus if teachers have access to a laptop for planning or students to have wireless access. It is hard to imagine, but some students only access to technology is a visit to the computer lab once a week. Unfortunately, we cannot assume that technology has been maximized in most schools – a Department of Labor study shared that education

was actually 55th out of 55 industries studied in use of technology[1]. Although access to the Internet and the ratio of students to computers has improved over time, there is only an average of only 1 computer for every 3.8 students in American schools[2]. In addition to Internet access and devices, teachers and students must also have reliable access to new applications such as those used for delivering education content, managing courses, collecting student data, and accessing professional development.

Training is critical to helping teachers utilize the resources and applications. Teachers need the skills to utilize technology within their instruction and to maximize the engagement of curriculum, data, and other tools available to improve student learning. These tools frequently provide opportunities to reach more students through individualized instruction which ultimately helps to increase student achievement.

As we look at America's future, we must also reflect on the present. Only 5% of U.S. college students currently major in math or science fields, more than 57% of our post-doctoral engineering students are from outside of the U.S., and the fact that U.S. Patent applications from the Asian countries grew by 759 % from 1989 to 2001. Patent applications from the U.S. during the same period grew at 116 %. High-speed global networks enable nearly instantaneous communication, collaboration and knowledge sharing which gives our competitors more advantages than they had in the past. Any approach to our challenge of educating America's youth must rely on technology solutions that are scalable, flexible, reliable, and have the ability to cost-effectively individualize education for all students.

While it is easy to be discouraged or overwhelmed by disappointing graduation rates, information on how students are not prepared for work, or how education has not changed, it is not too late to make a real difference for students in our country. Key tools and proper training are making a difference and model programs can be replicated throughout the country.

For example, in my state of North Carolina, we developed and implemented the IMPACT model.

The IMPACT Model
North Carolina's IMPACT model, the basis of the North Carolina Educational Technology Plan, is a school reform model of technology immersion with an intense focus on collaborative planning. When you enter an IMPACT school, you quickly experience that collaborative learning, higher level thinking skills, and student engagement are pervasive whether students are learning math, science, reading, or history. School and teacher leaders drive change and learn from one another to utilize data to address the individual needs of each student. Using digital cameras, interactive white boards, and computers, students are provided with opportunities to collaborate and connect to the rich and relevant content that would not always be readily available to some students. They are experiencing school in a new way that builds those 21st century

---

[1] U.S. Department of Commerce (2003), *Digital Economy 2003*
[2] Business Roundtable, Tapping America's Potential: The Education for Innovation Initiative

skills necessary to succeed. Teachers have become the facilitators of learning and students become engaged in their own progress.

The transformation in the IMPACT schools is largely a result of the role of the school library media coordinator or technology learning facilitator plays in working with small groups and individual teachers to provide professional development and modeling as more and more technology is used to engage students in instructional units. Teachers work together to develop new lesson plans, consider how to facilitate learning, and utilize data to individualize instruction. As ideas are shared, new technology tools are incorporated to enhance the unit. Often the new tool is demonstrated or even taught during the meeting, or a special training date is determined for additional professional development. This type of planning and collaboration among teachers result in a transformation of learning, and the results are significant.

North Carolina's Scientifically-Based Research Results
North Carolina had the benefit of receiving a grant from the U.S. Department of Education to implement scientifically-based research to study the IMPACT model from 2003 to 2007. The Evaluating State Educational Technology Programs (ESETP) grant allowed North Carolina to compare high need, high poverty schools implementing the IMPACT model with similar comparison schools that did not utilize IMPACT. The study focused specifically on math, reading, leadership, and teacher retention. After controlling for background demographics such as race, sex, grade, days absent, parent education, and free/reduced lunch status, results of the study include (for three years unless otherwise noted):

Student Achievement - Math:
- When looking at change in passing status (going from passing to failing or failing to passing):
    - The odds that IMPACT students would go from non-passing to passing status over the three years were 42% higher than that for comparison students
    - In the fourth year, the odds of IMPACT students passing the Math EOG were 24% higher than that of comparison. This effect was stronger in earlier grades.
- IMPACT students were less likely to drop achievement level, and more likely to increase achievement level over these three years than comparison students.
    - The odds of IMPACT students dropping one or more achievement levels were 25% less than comparison students
    - The odds of IMPACT students increasing one or more achievement levels were 37% higher than comparison students
- When looking at pass/fail rates for the End of Grade (EOG) tests, in the baseline year IMPACT students were significantly less likely to pass the math tests than comparison students. By the fourth year, IMPACT students were more likely to pass the test.
- IMPACT students had stronger growth curves than comparison school students. Higher grades had stronger differences.

Student Achievement - Reading:

- When looking at change in passing status, the odds that IMPACT students would increase from failing to passing over the four years were 55% higher than the odds for comparison students. When looking at Year two to year four with the larger sample, the odds were 43% higher for IMPACT students.
- The odds of IMPACT students increasing achievement level from the second to the fourth years were 3 times that of comparison students
- When looking at pass/fail rates for the EOG tests, in the baseline year IMPACT students were significantly less likely to pass the reading EOGs than comparison students. By the fourth year, IMPACT students were equally likely to pass the test.
- In general, IMPACT students had stronger growth curves

Results - Teacher Retention:
- The odds of IMPACT teachers being retained for these three years were 65% higher than that for comparison school teachers.
- The odds of beginning teachers being retained was 64% higher in IMPACT than comparison schools.
- Similarly, teachers in years 4-10 did not have a significant effect, but the odds IMPACT teachers would be retained were .71 that of comparison teachers.
- Finally, there was a highly significant effect for master teachers (11+ years, Odds ratio =2.87, $p < .002$), indicating that the odds that master teachers in IMPACT schools would be retained across these three years was 2.87 times that of comparison master teachers.

Technology & Teacher Attitude Results:
- Based on the School Technology Needs Assessment (STNA) developed by SERVE and used by North Carolina State University (NCSU), IMPACT teachers perceived that their schools were more supportive of risk-taking, and had more linkages to the community than did comparison schools.
- Attitudes: IMPACT teachers consistently saw IT as more useful, and had more positive attitudes toward the usefulness of email, the World Wide Web, multimedia in the classroom, and instructional technology for teachers than the comparison teachers. Ironically, comparison school teachers were more likely to view student interaction with computers more positively.
- IMPACT teachers started out less confident (about a half standard deviation below) than their comparison teacher counterparts, but had substantially stronger growth so that by the beginning of the second year of the project, IMPACT teachers had much higher overall scores on the NETS-T (about one-half standard deviation *above* the comparison teachers)

Modified IMPACT Model in High School – Greene County, NC
Greene County embraced the potential of technology to transform its school district and community five years ago by immersing schools with technology, providing students with a 24/7 laptop, and ensuring that teachers had access to high quality, on-going professional development. Greene County is a district with 70% free & reduced lunch and 50% African American and 18% Latino students. When the program began, the college going rate in Greene County was 24%, and the County was predicted to be the

fastest declining district in terms of population. This modified IMPACT model has in fact changed the entire learning process and the lives of students and all people in this community, and technology has been the catalyst for change.

Results – Greene County:
- Since the inception of the program, the college going rate of students has increased from 24% to 84% in 2007. The goal for 2008 is 90%.
- Greene County was #2 in North Carolina for number teenage pregnancies and has dropped to #18 in the state.
- Test scores in middle and high schools have increased.
- Linked to a growth in population of 2-3% and an increase in economic development that has allowed the county to build its first golf course and public park.

The IMPACT model includes key components significant for any organizational change and critical to maximize the power of technology to transform teaching and learning, including: quality leadership, on-going professional development, data driven decision making, and high quality resources and tools.

Achievement through Technology and Innovation (ATTAIN)
The results above demonstrate that the IMPACT model has had a significant impact on students in North Carolina, and many districts have replicated this model with their own funding. In North Carolina, the ATTAIN Act would serve as a catalyst to allow more districts and schools to replicate the IMPACT model or a similar systemic approach. With ATTAIN's focus on systemic school reform and teacher training to integrate technology into reading, math, and science lessons, this legislation will help to ensure that our students are competitive in the 21st Century global economy and are able to achieve at high levels.

I want to congratulate the Committee for recognizing this crucial need to promote comprehensive, systemic, and innovative approaches to changing teaching practices and student behavior. These principles are reflected in the ATTAIN Act – Title II, Part F of the Discussion Draft of NCLB Reauthorization, which encourages states to develop their own versions of IMPACT or enhance existing programs that have proven results. The formula program of ATTAIN ensures that districts can implement on-going and sustainable professional development similar to those referenced with in the IMPACT model, which transforms instruction of core curricular subjects.

ATTAIN provides necessary leadership for states like North Carolina to provide systemic approaches to utilizing technology to:
1. Ensure every student has access to individualized, rigorous, and relevant learning to meet the goals of NCLB and to prepare all students for the 21st Century work force needs.
2. Increase on-going, meaningful professional development around technology that leads to changes in teaching and stronger curriculum, and which improves student achievement, including but not limited to core curricular subjects, and student technology literacy.

3. Evaluate, build upon and increase the use of research-based and innovative systemic school reforms that center on the use of technology and lead to school improvement and increase student achievement.
4. Utilize real-time data to understand the individual needs of students and connect students with the appropriate curriculum and resources to immediately help them achieve.

Through the State Educational Technology Directors Association (SETDA), North Carolina communicates with other states that have implemented similar projects with real progress in teacher quality and academic achievement by implemented integrated technology initiatives. Programs reflecting these principles currently having significant effects on students in other states include:

- In Utah, Missouri, and Maine, the eMINTS program provides schools and teachers with educational technology tools, curriculum, and over 200 hours of professional development to change how teachers teach and students learn. In classrooms in the same school (one with eMINTS and one without), the student achievement of students in the eMINTS classroom was repeatedly over 10% higher than the control classroom.
- In West Virginia, students receiving access to on-line foreign language courses performed at least as well as those in face-to-face versions of the classes, providing comparable high quality instruction for those in rural areas who otherwise would not have access to such courses. [3]
- In Michigan's Freedom to Learn technology program, 8th grade math achievement increased from 31% in 2004 to 63% in 2005 in one middle school, and science achievement increased from 68% of students proficient in 2003 to 80% 2004. [4]
- In Texas, the Technology Immersion Pilot (TIP), implemented in middle schools, demonstrated that discipline referrals went down by over ½ with the changes in teaching and learning; while in one school, 6th grade standardized math scores increased by 5%, 7th grade by 42%, and 8th grade by 24%. [5]
- In Iowa, after connecting teachers with sustainable professional development and technology-based curriculum interventions, student scores increased by 14 points in 8th grade math, 16 points in 4th grade math, and 13 points in 4th grade reading compared with control groups. [6]
- In Alaska, over twenty-five percent of school districts offer eLearning classes through videoconferencing and the web. The Kuspuk School District began distance education via video conferencing through support from Enhancing Education Through Technology and Rural Utilities Service grants. They offer traditional courses

---

[3] eMINTS, http://www.emints.org/, and http://www.emints.org/evaluation/reports/

[4] Freedom to Learn Evaluation, http://www.ftlwireless.org/content.cfm?ID=505

[5] This recent article highlights the results in two districts: http://www.thejournal.com/articles/20931_1 in a very succinct way. The evaluation site is: http://www.etxtip.info/, and the program site can be found at: http://www.txtip.info/.

in AP English, Algebra 1, and Algebra 2; as well as unique courses including publications, service learning and FAA Groundschool. Imagine the value of completing Groundschool in one of the district's eight villages accessible only by air and river travel through eLearning.

The ATTAIN Act provides an important catalyst for helping more states, districts, and schools implement systemic reform models and on-going and sustainable professional development that have been proven to improve student achievement and ensure that students are competitive in the 21st Century global workforce.

The Role of Technology throughout ESEA Reauthorization

We applaud your leadership in understanding the importance of technology in systemic reform and professional development and see many opportunities for technology to increase effectiveness and efficiency throughout the reauthorized ESEA. Specifically, technology plays an integral role in reaching the goals stated in the following areas:

- Graduation Promise Fund
- College and Work-Ready Standards and Assessments
- Growth Models
- Performance Index
- ELL and Special Education Students
- School Improvement and Assistance and School Redesign
- Parental Involvement
- Extended Learning Opportunities
- Improving Teacher and Principal Quality
- Partnerships for Math & Science Quality Improvement
- Math Success for All
- Innovation for Teacher Quality

Although we understand that technology may be assumed in some of these areas, we ask that you specifically state the potential role of technology in meeting the requirements and goals throughout the reauthorization with NCLB. We cannot afford to miss the opportunity that technology provides to engage students, to improve instruction and teacher quality, and to ultimately improve student achievement so that our students are prepared for the 21st Century.