

Digital Conversion and Academic Achievement

“The DNA of our student improvement has been the intertwining of digital resources, academic focus, a culture of caring, and a commitment to second-order change.”

I don't know exactly how to explain the feeling Julie Morrow, Mooresville Intermediate principal, and I had one November day in 2010 after walking through the school and visiting every class. We didn't see anything extraordinary, and yet we were profoundly excited and exhilarated. Class after class of students was fully engaged. Students were using their laptops for a huge range of activities, gathering in small groups in most classes and working together. Often the teacher was working with a small group on reading or math. Many students were using online content or software for their own personalized work. Some students were moving around the room, with purpose.

We passed students working on projects in the hallways and others on their way to the media center for research assistance. Many students were either creating or sharing something. Teachers were highly engaged. There was a hum of activity in the air, a discernible energy and synergy that anyone could feel, a “learning pulse.” I believe that this is the pulse of successful digital conversion.

Since the time the first laptop was handed out in the Mooresville Graded School District (MGSD), we have linked our digital conversion initiative directly to student achievement. The DNA of our student improvement has been the intertwining of academic focus, digital resources, a culture of caring, and a commitment to second-order change—all discussed in detail later in this book.

VISITOR FEEDBACK *“MGSD has adopted a laser focus on data that drives its ability to improve student outcomes. But at the same time the district has supported deep cultural change, acknowledging the importance of caring relationships between adults and children in building success.”*

—Randy Wilhelm
Chief Executive Officer, Knovation

What Is Digital Conversion?

A mother who serves on our parent advisory committee told us she was very impressed with the video math problems her daughter watches at home on her laptop. “I couldn’t possibly help her with her algebra,” she said. “But she can watch this expert teacher teach a problem as many times as she needs until she understands it. It’s like bringing her teacher home.”

Digital conversion refers to the transformation of instruction from a paper-based world to a primarily digital world, in which every student and teacher has access to a personal computing device and the Internet anytime/anywhere. Digital conversion profoundly changes the nature of teaching and learning.

We use the term *digital conversion* to go beyond the more common term *one-to-one computing*, to indicate far more than hardware and software. Our students’ success is the result of one-to-one computing combined with many other factors. The combination of factors has put us on the path toward second-order change.

Moving to Second-Order Change

Larry Cuban, in *The Managerial Imperative and the Practice of Leadership in Schools*, says that first-order changes in education aim only to improve efficiency,

assuming that the status quo is basically adequate and that only certain policies and practices need to be improved. He writes:

“For schools, such planned changes would include recruiting better teachers and administrators; raising salaries; distributing resources equitably; selecting better texts, materials, and supplies; and adding new or deleting old content and courses to and from the curriculum.

When such improvements occur, the results frequently appear to be fundamental changes or even appear to be changes in core activities, but actually these changes do little to alter basic school structures of how time and space are used or how students and teachers are organized and assigned.”

Most school reform efforts over the years have focused on first-order change, with little impact on the basic structures of schooling established over 100 years ago. Second-order change, on the other hand, aims for a deep level of transformation, according to Cuban:

“Second-order change aims at altering the fundamental ways of achieving organizational goals because of major dissatisfaction with current arrangements. Second-order changes introduce new goals and interventions that transform the familiar way of doing things into novel solutions to persistent problems.”

At MGSD, we have adopted second-order change principles as a core tenet of our digital conversion. We are not trying to add on to old ways of teaching and learning. Rather, we are trying to “rethink school” from the ground up, enabled by today’s technologies and guided by the demands of the 21st-century workplace.

As we strive to move toward second-order change, some things stay the same. Our classrooms still feature colorful maps and posters, books, globes, and other traditional learning aids. The essential role of hands-on learning in subjects such as science, music, and art has not changed, although it is now enhanced with interactive software and dynamic online content. In the Career and Technical Education (CTE) program at our N.F. Woods Advanced Technology & Arts Center—in classes such as health occupations and technology and industrial skills—both hands-on and online learning play a part.



Eighth-grade students at Mooresville Middle School

 Listen to the author describe some of the key characteristics of digital conversion.

But digital conversion goes far beyond traditional learning modalities. It supports second-order change by enabling a fundamental shift across all aspects of daily life in our schools. It affects instruction, pedagogy, professional development, student and teacher motivation, student–teacher roles, learning experiences, and relationships. It creates a new vibrancy and energy that come from the currency and connectivity among students and teachers.

STUDENT FEEDBACK *“I never will be able to knit or play my trombone via computer screen. However, computer resources can help me to practice and to find criticism for my work. We still do many hands-on projects, but projects on the computer allow us to explore the digital world in which we will live.”*

—Mooresville High School student

As we move along this path, we sense that the constant coursing of rich online resources throughout our learning activities is making learning more authentic and accessible to every student in every class every day. Teamwork and real-world phenomena are producing a new level of collaborative and connected learning—experienced as an audible “productive hum” in our classrooms—that is defining new learning trajectories for our students.

Addressing the Needs of Today

In the past, of course, the digital workplace did not exist and was not a factor in preparing students for life after school. And many young people were successful in school without the benefit of technology, often because they were lucky enough to have dedicated teachers and a family that could provide books and enrichment. But many less fortunate students did not fall into this category and were not successful. Even today, many children in our country have never owned a book, let alone a computer, and many attend underperforming schools that offer them limited hope for the future.

Digital conversion allows educators to level the playing field and provide every student, including at-risk learners, with anytime/anywhere access to resources and the opportunity to develop the skills they need for today's workplace. And the time has come. In the words of Adam Frankel, executive director of Digital Promise:

“While technological innovation has transformed other sectors of our society and economy in recent decades, our education system has been largely resistant to change. There are a range of challenges that stifle innovation in education, from policy and political hurdles to school culture and market failures to outdated infrastructure in our nation's classrooms. But these are challenges that can and must be overcome if we are going to offer all our students the world-class education that's an essential ingredient in their—and America's—success.”

At MGSD, we believe that school must address the challenges of today and align with what students need to know today. Today's workplace demands not only digital skills but also the ability to work collaboratively and creatively and engage in independent research—all skills that are enabled and enhanced by technology.

STUDENT FEEDBACK *“I constantly hear how today's students need a 21st-century education. My thoughts? We are 12 years into the 21st century. Perhaps it's time to stop talking about it and do what's right. I am glad our district had the courage and insight to understand that while it wouldn't be easy to implement such change, it was the right thing to do for us.”*

—Mooresville High School student

Critical Success Factors

In 2010, a team of researchers who studied one-to-one computing implementations in almost 1,000 schools across the country found that fewer than one percent were practicing all nine “key implementation factors” identified by the study. The findings were published in *Project RED, The Technology Factor: Nine Keys to Student Achievement and Cost-Effectiveness*.

The *Project RED* study found that one-to-one computing was most effective in schools that understood second-order change and the importance of the key implementation factors. In those schools, one-to-one computing significantly improved student achievement, and MGSD was cited as an example of that type



A milestone achieved at Park View Elementary School

of successful implementation. *Project RED* shows that one-to-one computing is complex and involves many factors in addition to hardware and software—a finding that is borne out by our experience at MGSD.

We have coined the term *digital conversion* to encompass the interplay of the factors that are critical to our success, starting with a laptop for every student and going far beyond. We believe that our digital conversion initiative is positively impacting student improvement because of our dedicated attention to many success factors:

Digital Conversion Critical Success Factors

- A commitment to every child
- A shared vision
- A culture of caring and collaboration
- Embrace of the moral imperative
- Relentless focus on achievement
- Personalized, relevant, connected learning
- Deep transformation of instruction
- High expectations
- Digital resources and infrastructure
- Ongoing professional growth
- Ubiquitous leadership
- In-depth planning
- Data-driven decision making
- Creative resource alignment
- All hands on deck
- Joy, laughter, recognition, and celebration
- Understanding of second-order change

Digital Conversion Is for Everyone

More and more districts are embarking on the path of digital conversion and starting to see success. Schools have come a long way since the early days of one-to-one computing, and now educators can take advantage of a new body

of experience. Success is within the reach of all, provided that schools have the commitment and the passion to reexamine old ways, take on new challenges, plan carefully, and be willing to learn and change as they go.

Budget limitations, for example, are often seen as one of the major barriers to digital conversion. But they are generally less of an obstacle than schools fear. MGSD is not an affluent district, but we have addressed the budget challenge by carefully repurposing resources—a strategy that all schools can follow.

VISITOR FEEDBACK *“The experience and proven results evident in the MGSD digital conversion bolstered our collective confidence in our ability to tackle such a potentially overwhelming project. Furthermore, the expertise provided by the MGSD administration saved us valuable time and dollars in the implementation during a mid-year rollout to over 5,850 students, teachers, and administrators.”*

—Bennie Hendrix
Chief Technology Officer, Rutherford County Schools,
Forest City, North Carolina

There are 14,000 school districts in the United States, and 75 percent of them are the size of Mooresville or smaller. In fact, 70 percent of districts have demographics and budgets similar to those of Mooresville. Every school and district can make a start, as we did, and work toward a deep level of transformation and improved student achievement.

You Can Do It Too: Getting Started

- Bring stakeholders together and start the conversation.
- Learn from other districts.
- Build relationships.
- Study second-order change and integrate this thinking.
- Start small, with one or two schools.
- Expand gradually and learn as you go.
- Review all the critical success factors, beyond technology.
- Examine your school culture.
- Look for outside support from initiatives such as Digital Promise, the League of Innovative Schools, and *Project RED*.

Academic Achievement

In 2012, one of our high school graduates was particularly excited about his future. Despite having been in trouble on a regular basis earlier in his school career, this student had been offered academic and athletic scholarships to attend Gardner-Webb University outside Charlotte. He explained the change as follows:

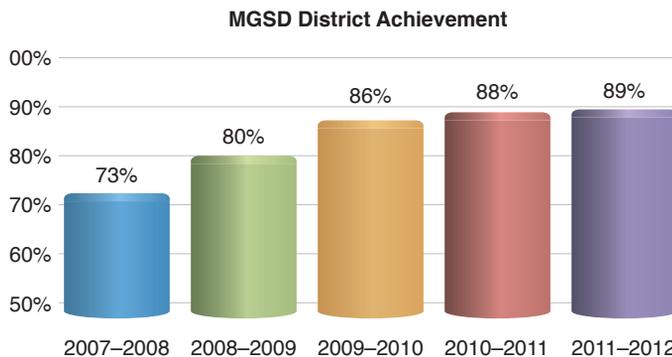
“The main reason I made a change in my life was because of the way the MHS teachers treat you like family. It’s just unreal how the teachers all care about you personally. I didn’t want to let down so many people who had helped me and lifted me up. They helped me change and prepared me, and now it’s up to me.”

The *Every Child, Every Day* focus of faculty, coaches, counselors, and administrators helped this student turn around his attitude and his academic performance, positioning him for a promising future.

Our student performance data is a source of pride for our students, teachers, and entire community. Although we rank 100th in the state of North Carolina out of 115 school districts in per-pupil funding (\$7,463 per student per year), in 2012, we ranked third in the state on our district graduation rate (90 percent, up from 64 percent in 2006) and second in test scores (89 percent composite), ahead of districts that spend at least \$1,500 more per student.

 Listen to the author describe the Mooresville community and the impact of digital conversion on families and community spirit.

FIGURE 1.1



We have been very watchful of our overall MGSD trajectory, and we like what we see—steady-as-she-goes academic achievement improvement in all content areas and at all levels for all students. Although the path to excellence gets steeper at the top—and we have seen an increase in the poverty rate of 25 percent over

the past four years and an increase in class size in grades 4–12—the trend lines are still looking good. What is most exciting is that we feel the momentum of energy and the pulse of collective learning in our schools every day.

Our digital conversion, our focus on student achievement, and our pervasive cultural dynamic of *Every Child, Every Day* are seriously lifting student performance across the curriculum. When we see all subgroups performing above 90 percent on a math test, we feel the wave of momentum and the surge of excellence coming up through the ranks of our students.

FIGURE 1.2

Third Grade Math Data by Subgroup									
	All Students	Asian	Black	Hispanic	Two or More Races	White	Economically Disadvantaged	LEP	Students with Disabilities
Proficient 2010–11	>95.0%	>95.0%	93.2%	94.7%	92.9%	>95.0%	94.1%	93.3%	92.3%
Proficient 2009–10	94.3%	>95.0%	82.1%	90.0%	83.3%	>95.0%	88.5%	90.9%	77.3%
Proficient 2008–09	90.2%	>95.0%	79.4%	81.0%	77.8%	93.0%	80.5%	60.0%	60.0%
Proficient 2007–08	80.0%	71.4%	50.7%	70.6%	60.0%	87.7%	61.3%	50.0%	58.1%
4-Year Growth	15.0%	23.6%	42.5%	24.1%	32.9%	7.3%	32.8%	43.3%	34.2%

Scores above 95% are reported by the North Carolina Department of Public Instruction as >95%.

It is very exciting to track our third-grade data, since third grade is the first year students take the North Carolina end-of-grade exams. When I had an opportunity to brief Secretary of Education Arne Duncan in March 2012, he saw our disaggregated third-grade data and remarked, “You did more than close the gap with this level. You erased the gap!”

We have reduced—and in some cases erased—the achievement gap for our disadvantaged students, including students with special needs, English language learners, and minorities, despite an increase in our free and reduced lunch population from 30 percent to over 40 percent in four years due to the economic decline and increase in unemployment.

The personalization offered by digital conversion has helped our special needs students work at their own pace and level, and the organization of student work on the Angel learning management system (LMS) has helped them improve

FIGURE 1.3

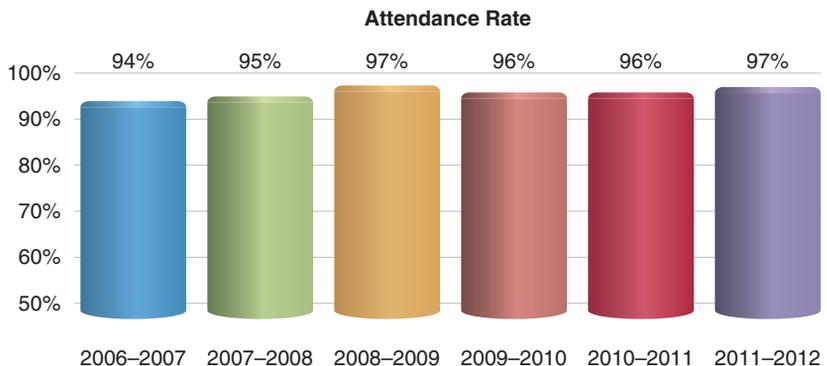
Third Grade LEP Students & Students with Disabilities			
	All Students	LEP (Limited English Proficient)	Students with Disabilities
Proficient 2010–11	>95.0%	93.3%	92.3%
Proficient 2009–10	94.3%	90.9%	77.3%
Proficient 2008–09	90.2%	60.0%	60.0%
Proficient 2007–08	80.0%	50.0%	58.1%
4-Year Growth	15.0%	43.3%	34.2%

Scores above 95% are reported by the North Carolina Department of Public Instruction as >95%.

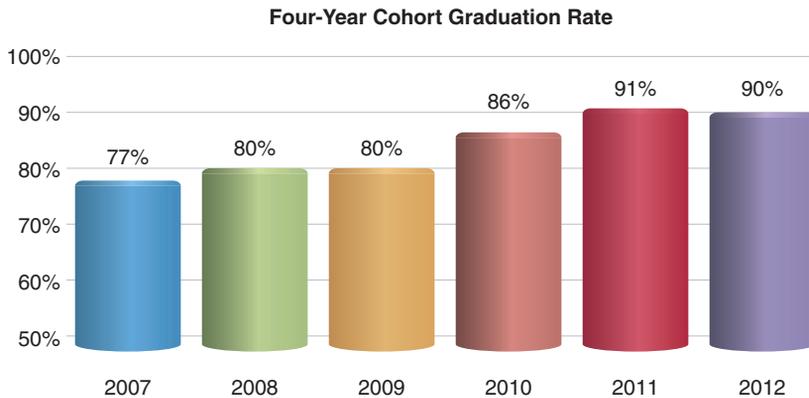
their organizational and time management skills. And our special education teachers are utilizing the functionality of the hardware and digital content to incorporate multiple learning modalities into most lessons, with audio, text, movies, and photos to appeal to different learning styles.

At the high school level, the number of dropouts and suspensions has decreased, and attendance and college rates have gone up, as students have become more engaged in school and more confident about their future, thanks to personalized learning and our relentless belief in them.

FIGURE 1.4



Out-of-School Suspensions Have Decreased by 64%.

FIGURE 1.5

In 2012, our graduation rate topped 90 percent for the second consecutive year, along with only one other North Carolina district, although our graduating class was smaller by 50 students.

In addition, almost 14 percent of our juniors and seniors are now enrolled in community college classes through the North Carolina Huskins Program, which allows them to earn concurrent college credit while in high school.

Especially exciting is that we have seen Advanced Placement (AP) course enrollment more than double, with some students taking multiple AP courses. We offer 16 AP courses, including several online options in subjects not taught in school, and we are adding more.

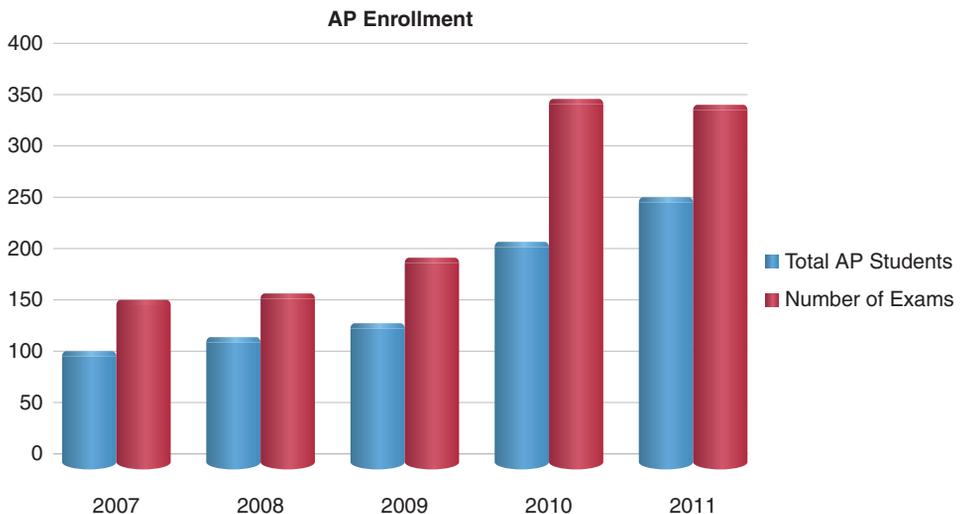
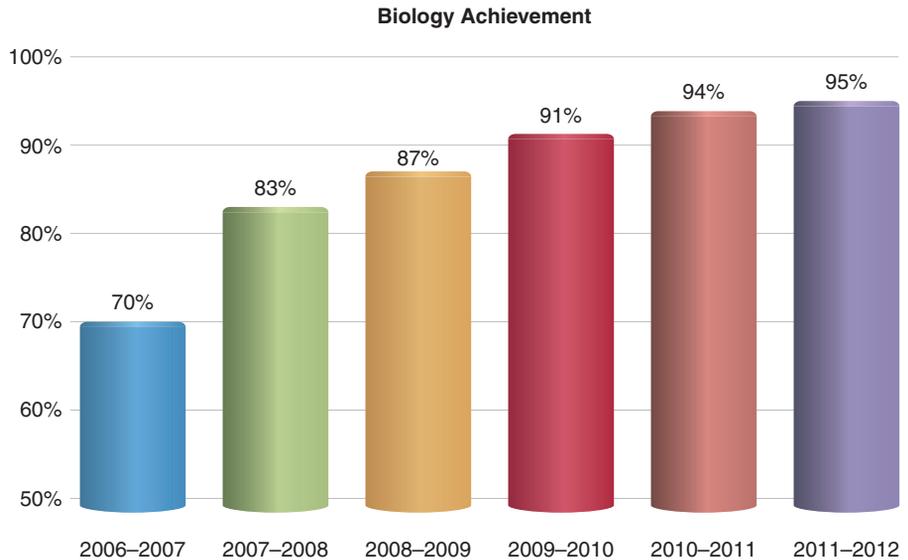
FIGURE 1.6

FIGURE 1.7



Mooresville High School’s performance in biology moved from 68 percent in 2005 to 95 percent in 2012. Every North Carolina high school student takes this end-of-course exam, so our teachers are excited and proud of the progress we have seen. The key to success has been the continuous attention to individual student data that drives our instructional planning every day.

Digital conversion has had a direct impact on the number of students who are able to attend college, regardless of their socio-economic background. For six

FIGURE 1.8



consecutive years, Mooresville High School has set new records in scholarships awarded to graduating seniors and eased the financial burden of higher education for struggling families, with an increase in scholarship dollars of over 300 percent. The hope divide and the opportunity divide are diminishing at MGSD as more students receive scholarships and continue their education after high school.

At the end of the 2011–12 school year, another high school graduate spoke movingly about how the MGSD culture had changed her life and future prospects. “I used to be into all kinds of bad stuff, partying, drugs and alcohol,” she said. “I didn’t care about anything, and then I found out I was pregnant. I was fifteen. I was absent a lot during my pregnancy. It was hard, but Mr. Shinn kept telling me he saw the potential in me, and Mr. Karriker made me try to keep up and helped me open up to get help.

“So many great teachers helped me—Mrs. Graham, Mrs. Kalio, Coach Watson, Coach Stith, Mrs. Verley, Mrs. Jiminiz, Mrs. Mcgee, Mr. Haglan, Mrs. Huntley, Mrs. Rollins, and Mr. Wirt. They all showed a special support for me, and now I’m going to college to be a nurse. I’m so happy for my baby and me, and I’m so thankful.”

REFLECTIVE QUESTIONS

1. What first steps can you take to get started on digital conversion?
2. How can you connect your technology initiative to student achievement?
3. How will you measure your progress toward second-order change?
4. Which critical success factors will support your technology initiative?
5. What impact do you expect to see on day-to-day school life?

REFERENCES

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- Greaves, T., Hayes, J., Wilson, L., Gielniak, M., & Peterson, R. (2010). *Project RED, The Technology Factor: Nine Keys to Student Achievement and Cost-Effectiveness*. Sheldon, CT: MDR.