The Digital Transformation of Education in North Carolina K-12 Schools

Dr. Glenn Kleiman
Executive Director
Friday Institute for Educational Innovation
NC State University College of Education
Friday Institute for Educational Innovation

• The mission of the Friday Institute is to advance education through innovation in teaching, learning, and leadership.

• Bringing together educational professionals, researchers, policy-makers, and other community members, the Friday Institute is a center for fostering collaborations to improve education.

• The FI building, opened in 2005, was privately funded
Friday Institute Areas of Work

• Innovations in K-12 teaching and learning
• Technology to enhance K-12 education
• Education workforce development
• Evaluation and policy analyses
• Outreach and engagement in K-12 education
The Digital Transformation of Education

- We are in a period of historical change
  - From industrial age organizations
  - To global, information, digital age organizations
Industrial Age Auto Factory (1913)
Digital Age Auto Factory
Why the Digital Transformation of Education?
Why the Digital Transformation of Education?
Industrial Age Classroom (1907)
Digital Age Classroom?
21st Century Learning
## From Industrial Age to Digital Age Education

<table>
<thead>
<tr>
<th>Industrial Age Education System</th>
<th>Digital Age Education System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common pace and type of instruction</td>
<td>Individualized, variable pace learning</td>
</tr>
<tr>
<td>Time is constant; achievement variable</td>
<td>Achievement is constant; time variable</td>
</tr>
<tr>
<td>End of course or year assessments</td>
<td>Ongoing assessments embedded in learning</td>
</tr>
<tr>
<td>Teacher centered</td>
<td>Student centered</td>
</tr>
<tr>
<td>School based, fixed place and time</td>
<td>Anywhere, anytime</td>
</tr>
<tr>
<td>Printed static text as main resources</td>
<td>Digital, interacted, up-to-date resources</td>
</tr>
<tr>
<td>Informal learning disconnected</td>
<td>Informal learning integrated</td>
</tr>
<tr>
<td>3 R’s focused</td>
<td>3 R’s, New Literacies and 4 C’s focused</td>
</tr>
</tbody>
</table>
The Digital Transformation of Education is Underway in NC

Districts Supported by FI-NCLTI:
43 Total LEAs
# NCLTI Rubric with Four Major Categories

<table>
<thead>
<tr>
<th>CURRICULUM &amp; INSTRUCTION</th>
<th>PROFESSIONAL DEVELOPMENT</th>
<th>LEADERSHIP, ADMINISTRATION &amp; INSTRUCTIONAL SUPPORT</th>
<th>INFRASTRUCTURE &amp; TECHNICAL SUPPORT</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI1 Classroom Use</td>
<td>CI2 Access to Digital</td>
<td>LAI1 Leadership &amp; Vision</td>
<td>ITS1 Student Device</td>
</tr>
<tr>
<td></td>
<td>Content</td>
<td>Planning</td>
<td>ITS2 Access &amp; Connectivity</td>
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<tr>
<td></td>
<td></td>
<td>Instructional Support</td>
<td>ITS3 Classroom Technology</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Communication &amp; Collaboration</td>
<td>ITS4 Technical Support</td>
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<tr>
<td></td>
<td></td>
<td>Sustainability</td>
<td>ITS5 LAN/WAN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Policy</td>
<td>ITS6 Student Access to Distance</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Learning</td>
</tr>
<tr>
<td>CI3 Content Area</td>
<td>CI4 Technology Applications</td>
<td></td>
<td></td>
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<tr>
<td>Connections</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CI5 Mastery of Technology</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Applications</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>CI6 Web-Based</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Lessons</td>
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</table>

Score: Score: Score: Score: Score: Score: Score: Score: Score: Score: Score: Score: Score: Score: Score:
Some Example LEAs

- Mooresville Graded School District
- Asheboro High School
- Kannapolis Middle School
- Cumberland County Schools
- Surry County Schools
- Granville County Schools
- Onslow County Schools
Presentations to Follow

• Dr. Jeni Corn, Friday Institute, *Lessons from Research and Evaluation*
• Dr. Angela Quick, NCDPI, *State Progress and Plans*
• Dr. Tracy Weeks, NCVPS, *Virtual School Update*
• Dr. Glenn Kleiman, Friday Institute, *Policy Considerations*
Lessons from Research and Evaluation

Dr. Jeni Corn
Director of Evaluation Programs
Friday Institute for Educational Innovation
NC State University College of Education
Evaluation Studies of NC Technology Initiatives

Major Evaluation Projects
• IMPACT Model (NCDPI Instructional Technology Initiatives)
• NC 1:1 Learning Technology Initiative
• NC Virtual Public School
• School Connectivity Evaluation/Student Learning Conditions Survey

Evaluation Participants
• 63,368 NC Students
• 2,854 NC Teachers
• 164 NC Schools
• 61 NC LEAs
Evaluation Studies of NC Technology Initiatives

*Identified LEAs are not all inclusive.*

updated, October 1, 2012
Focus of the Evaluations

• School infrastructures and support systems
• Staff attitudes and skills
• Teachers’ instructional practices
• Student learning and achievement
Evaluation Findings

Findings about Teaching

1. Teachers increased *use of technology* for both planning and instruction.
2. Teachers and students reported ready Internet access increased the frequency, reliability, and quality of *communication across the school*.
3. Teachers moved from assigning independent work to *collaborative, project-based lessons*.
4. Teachers shifted to *technology-enhanced modes of assessment*.
5. Decrease in teacher turnover.

Findings consistent with results from other states: Maine, Texas, Pennsylvania, Michigan, Florida, Virginia
Evaluation Findings

Findings about Student Learning
1. Student standardized test scores showed growth over time.
2. Online course enrollments increased.
3. Graduation rates slightly improved.
4. Student engagement increased.
5. Students developed 21st century learning skills (e.g. life and career skills; learning and innovation skills; information, media, and technology skills).

Findings consistent with results from other states: Maine, Texas, Pennsylvania, Michigan, Florida, Virginia
Current Relevant Evaluation Studies

• **NC’s Race to the Top Initiative**
  • Online Professional Development
  • Technology to Support Instruction and Data-Based Decision Making
  • Instructional Improvement System

• **IMPACT V**
  • Distributed model for staffing Instructional Technology Facilitator in 12 middle and high schools

• **Golden Leaf Foundation STEM Initiative**
  • STEM initiatives in 225 schools, 1,190 teachers, and 31,890 students in 43 public school districts in North Carolina.
## Evaluation Questions and Data Sources

<table>
<thead>
<tr>
<th>Evaluation Questions</th>
<th>Examples of Data Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How have school infrastructures and support systems evolved to meet staff and students’ 21st century needs?</td>
<td>*School Archival Data</td>
</tr>
<tr>
<td></td>
<td>*Student and Teacher Surveys</td>
</tr>
<tr>
<td></td>
<td>*Focus Group/Interviews</td>
</tr>
<tr>
<td></td>
<td>*Site Visit Checklist</td>
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<tr>
<td></td>
<td>*Laptop Repair Checklist</td>
</tr>
<tr>
<td></td>
<td>*PD Inventory/Quality</td>
</tr>
<tr>
<td>2. How have staff attitudes and skills changed over time?</td>
<td>*Classroom Observations</td>
</tr>
<tr>
<td></td>
<td>*Student and Teacher Surveys</td>
</tr>
<tr>
<td></td>
<td>*Focus Group/Interviews</td>
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<tr>
<td>3. How have teachers’ instructional practices changed over time?</td>
<td>*Classroom Observations</td>
</tr>
<tr>
<td></td>
<td>*Student and Teacher Surveys</td>
</tr>
<tr>
<td></td>
<td>*Exemplary Lesson Plans</td>
</tr>
<tr>
<td></td>
<td>*Focus Group/Interviews</td>
</tr>
<tr>
<td>4a. How have students’ 21st Century Skills changed over time?</td>
<td>*Classroom Observations</td>
</tr>
<tr>
<td>4b. How have student learning and achievement in core academic subjects changed over time?</td>
<td>*Student and Teacher Surveys</td>
</tr>
<tr>
<td></td>
<td>*EOG, EOC Data</td>
</tr>
<tr>
<td></td>
<td>*Attendance, Discipline, Graduation Rate, Dropout Rate</td>
</tr>
</tbody>
</table>
Consistent findings in other states

Results from 1:1 programs in Maine, Texas, Pennsylvania, Michigan, Florida, Virginia

• Student engagement
  • Increased engagement according to both student and teacher reports

• Classroom activities
  • More active, reflective, collaborative, and project based learning

• Student achievement over time
  • Substantial increases in writing scores
  • Increases in content areas related to teacher preparation and classroom uses of technology
  • Improved test scores for disadvantaged students
Statewide Programs and Progress

Dr. Angela Quick
Deputy Chief Academic Officer
NCDPI
Instructional Improvement System

Why an Instructional Improvement System?

Improve and personalize student learning

How?

Facilitate the teaching and learning process through

• Increased access to high quality resources for all

• Provision of timely and relevant information and data
### Instructional Improvement System

**Why – How – **

<table>
<thead>
<tr>
<th>What</th>
<th>-- When</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learner Profiles</td>
<td>Clear picture of your students and their needs</td>
</tr>
<tr>
<td>Instructional Resources</td>
<td>Tools for you such as unit plans, online learning objects and media-enriched tasks</td>
</tr>
<tr>
<td>Assessment Tools, Items and Strategies</td>
<td>Interim and diagnostic assessment items for use in your classrooms; formative best-practices</td>
</tr>
<tr>
<td>PD Resources and Management</td>
<td>Resources to improve and reflect on your practice and tools to manage your professional development</td>
</tr>
<tr>
<td>Dashboards and Analytics</td>
<td>Tools to display, understand and use data to drive instruction and professional development choices</td>
</tr>
</tbody>
</table>
**Technology**

3 Key Categories

- **Instruction**
  - Application • Support
  - Ensuring pressing **Enter** helps students learn

- **Interconnections**
  - Services • Infrastructure
  - Making sure that pressing **Enter** always works

- **Things**
  - Digital Devices • Tools
  - Something on which to press **Enter**
Technology Platform

One Technology Platform
- Single Sign-on
- Collaborative
- Populated with resources for NC educators

Coming Soon

PowerSchool
Student Information System (SIS)

Instructional Improvement System
Tools for Teaching and Learning (IIS)
Guiding Principles

One Technology Platform

- **Consolidated**
  All operations/data collections will be incorporated into PowerSchool

- **Flexible**
  Maximize flexibility for LEAs and charter schools

- **Improving Data Quality**
  Improve Data Accuracy and Completeness

- **Simplifying Reporting**
  Make reporting easier

- **Secure**
  Maintain security and privacy of information
Statewide Longitudinal Data System (SLDS)

• June 8, 2011 – NCDPI received a $3.8 million SLDS grant award “to develop and link postsecondary and workforce data to the State’s PK-12 data system” called P-20W initiative
NC P-20W Partners

- NC Department of Public Instruction (NCDPI)
- University of North Carolina General Administration (UNCGA)
- NC Community College System (NCCCS)
- NC Independent Colleges and Universities (NCICU)
- Labor and Economic Analysis Division (LEAD) of NC Department of Commerce
- NC Department of Health and Human Services (NC DHHS)
Benefits

• The P-20W system will enable the state of North Carolina to
  – Track student performance across years and sectors
  – Help evaluate institutions and program performance
  – Analyze data in more detail to validate or improve performance
SL 2012-133 (HB 964) Education Longitudinal Data System

- Law passed June 29, 2012
- Expands the partners from the P-20W grant
- Establishes a North Carolina Longitudinal Data System Board of 18 members
- Board members currently being named by legislated individuals
North Carolina Virtual Public School

Dr. Tracy Weeks,
Chief Academic Officer and Interim Executive Director,
North Carolina Virtual Public Schools
Who does NCVPS serve?

Public Schools
Charter Schools
Special Schools
Department of Defense Schools
Bureau of Indian Affairs Schools
Home Schools
Private Schools
Enrollment

- 2006-2007: 6984
- 2007-2008: 13037
- 2008-2009: 21672
- 2010-2011: 46329
- 2011-2012: 49189

North Carolina Virtual Public School
2011-12 Enrollment Distribution
Online Learning Environment

Quality Content

Quality Instruction

Quality Online Learning Environment
NCVPS Courses

Core Courses (33)

World Languages (25)

Test Preparation (1)

Arts & Electives (11)

Advanced Placement (19)

Career & Technical Education (7)

Credit Recovery (10)

Occupational Course of Study (6)
NCVPS Instructional Models

Blended

Traditional

Credit Recovery
Quality Instruction

- 525 Instructors
- 60.2% in NC LEAs
- NC License
- Highly Qualified
Cost

• Funding for NCVPS is generated by the legislatively mandated funding formula (Session Law 2011-145, Section 7.22)

• Total budget for 2011-12: $18,616,464
  – Instruction: $15,750,042
  – Operations: $2,866,923
Obstacles

• Rising costs of technology infrastructure
• Finding and training qualified teachers to teach online
• LEA policies may limit access to NCVPS courses
Role in Digital Learning

• Expand course offerings
• Digital content for face to face classrooms
• Professional Development
Requirements for Success and Policy Considerations

Dr. Glenn Kleiman
Executive Director
Friday Institute for Educational Innovation
NC State University College of Education
Curriculum & Instruction

• Updated curriculum and teaching methods that incorporate both rigorous content standards and 21st century skills.

• Digital resources and tools to support teaching and learning.

• New types of formative and diagnostic assessments to inform teachers’ instructional decisions.

• Virtual learning to expand curriculum opportunities for students.
Professional Development

- Programs to update the education workforce, both teachers and administrators.

- Instructional technology facilitators -- school-based staff who support teachers use of technology to enhance learning.

- Programs to recruit, prepare and retain highly qualified teachers and administrators who are able to further the digital transformation of K-12 schools.
Infrastructure

• High bandwidth connectivity to the school and sufficient wireless connectivity throughout the school.

• A networked, portable, digital device for each student, teacher, and administrator.

• Additional technology tools (interactive white boards, cameras, printers, etc.) in each classroom.

• Local, readily available technical support.
Leadership and System Supports

• Effective school and district leadership teams made up of instructional, technology, administrative and financial leaders.

• Policies for ensuring student safety and appropriate use of computers, while enabling teachers and students access to a wide range of digital resources.

• Support from parents and the community.

• Sustainable funding, which will require new models for state and local funding and new public-private partnerships.
Considerations for the Committee

If the NC General Assembly sets a priority on moving NC forward on the digital transformation of K-12 education, we recommend the following:

1. Provide support and flexibility for local initiatives.
2. Sustain the work that is well underway and supported by Race to the Top funding on:
   - new curriculum standards;
   - new online formative and summative assessments;
   - instructional improvement tools;
   - teacher and administrator evaluation systems; and
   - K-12 cloud technology infrastructure;
   - evaluations to inform future decisions.
Considerations for the Committee

3. Work with the State Board of Education, NCDPI and NCVPS to implement the recommendations from Governor Perdue and the eLearning Commission:
   • NCVPS;
   • NCREN statewide infrastructure;
   • K-12 Cloud;
   • The transition to digital resources;
   • Quality assurance processes for virtual and blended learning;

4. Support initiatives to update and improve the education workforce, both teachers and administrators.
Winston Churchill on Education

• “Personally, I’m always ready to learn, although I do not always like being taught.”