John Locke FOUNDATION

spotlight

No. 396 – August 16, 2010

Good Classroom 'Disruption'

Use the Internet to expand educational options in rural school districts

KEY FACTS: **• North Carolina has the infrastructure to expand online course offerings significantly. An average of 99 percent of North Carolina classrooms in rural districts have an Internet connection. Moreover, there is a statewide average of 2.43 students per Internet-connected computer.**

• While statistical tests would need to confirm a causal relationship, districts that enroll few students in online courses generally have a higher per-pupil expenditure than those that enroll a higher number of virtual school students.

• This report offers several recommendations, including:

– Introduce virtual charter schools.

– Expand online course offerings from private and for-profit companies, community colleges, and universities.

– Develop off-site high school campuses.

Dispersed rural populations rarely have the same educational choices afforded to their counterparts in urban and suburban districts. Rural communities typically have a limited supply of private, charter, and alternative district school options. When educational alternatives are available, factors such as distance, travel time, roads, weather, and cost mitigate or prohibit attendance. It is often difficult for rural districts to offer a full menu of Advanced Placement courses, foreign languages, advanced mathematics, and the like. Those factors, in conjunction with the size of the district, also limit the kinds of courses available to public school students and place rural students at a disadvantage compared with urban and suburban students.

An Alternative Model: Disruptive Innovation

At first glance, promoting "disruption" is counterintuitive. Only anarchists, physicists, and the IRS endeavor to bring disruption to an otherwise orderly environment. When the system deviates from that core mission because of en-

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trenched interests or a powerful status quo, however, radical or "disruptive" change is required.

According to Clayton Christensen (Harvard Business School), Michael Horn (Innosight Institute), and Curtis Johnson (Citistates Group), public schools should replace their outdated, standardization model with a customized, student-centric approach that meets the educational needs of individual students. The authors argue that the use of individualized computer technology may become a source of disruptive innovation within the public school system, that is, it could transform the market from complicated and expensive products into one where "simplicity, convenience, accessibility, and affordability" dominate.[1]

Despite various political and bureaucratic obstacles and market constraints sustained by the public education monopoly, disruptive forces penetrate the market by targeting "non-consumers," such as students using computer technology to take Advanced Placement courses or remedial courses online. The authors speculate that online schools will continue to expand their clientele, improve instructional delivery, raise student achievement, and eventually, fundamentally change the public school system itself. In this way, disruptive innovation does not occur through direct competition with the system but through serving consumers (or non-consumers) whose needs are not being met by the current system.

As Gisele Huff has pointed out, "The existing system was not built to meet these [21st century] challenges. Rather than insisting on tweaking it, we need to harness the potential of computer-based learning, using powerful new technologies, to deliver personalized education in a way our children instinctively understand."[2] Huff argues that it is time to rethink the approach to educational reform, and Christensen and his colleagues outline a viable course of action.

Translating that course of action from theory to state education policy and advocacy is no easy task. Seldom do cookie-cutter approaches to education reform succeed. A generic campaign to introduce disruptive innovation in public schools nationwide is no different. Rather, education reformers must tailor their efforts to the unique challenges and opportunities presented by the political environment of the state.

With the North Carolina General Assembly facing revenue shortfalls in the billions, legislators usually resistant to school choice are now amenable to money-saving school choice proposals. The goal of this study is to outline a school choice proposal that achieves two goals:

1. Decrease public school expenditures in North Carolina significantly
2. Expand the use of disruptive technologies in the state's public schools

The focus of this study is on districts that qualify for one of the programs under the federal Rural Education Achievement Program (REAP). They include districts that are eligible for the Small, Rural School Achievement Program (SRSA) and the Rural, Low-income Schools Program (RLIS). For the 2009-2010 school year, 43 districts qualified (see Table 2).[3] Among this study's proposals are introducing virtual charter schools, expanding online course offerings from community colleges and universities, and developing off-site high school campuses.

This study pays particular attention to the use of, and need for, disruptive technologies in North Carolina's rural school districts. For many rural school districts, there are greater demands to increase student achievement in spite of declining enrollment and a weak tax base. For those reasons, rural communities seldom have the resources to implement the kinds of education reform efforts employed by urban and suburban communities. In this proposal, however, rural school districts will serve as the source of a statewide school choice effort anchored by disruptive technology.

Rural Schools in North Carolina

The North Carolina Department of Public Instruction classifies 874 of the state's 2,515 schools (35 percent) as rural.[4] The performance of North Carolina's rural schools varies considerably, although, on average, schools that have

Table 1. Performance of North Carolina's Rural Schools, 2008-09[5]

Economically Disadvantaged	Number of Rural Schools[6]	Performance Composite	Expected or High Growth	Met Adequately Yearly Progress
1-20%	24 (3%)	78.1	19 (79%)	20 (83%)
21-40%	176 (20%)	79.8	146 (83%)	118 (67%)
41-60%	281 (32%)	74.8	229 (81%)	206 (73%)
61-80%	246 (28%)	69.0	200 (81%)	186 (76%)
81-100%	122 (14%)	56.7	87 (71%)	84 (69%)

Table 2. Characteristics of Selected Rural School Districts in North Carolina[7]

School Districts	Per-Pupil Expenditure	Allotted ADM	ADM Change Since 2000	Four-Year Graduation Rate	Student-to-Internet Ratio	Connectivity to the Internet	Total NCVPS Courses
Alleghany County Schools	$11,203	1,587	+10%	78.1	1.95	100%	7
Beaufort County Schools	$9,081	7,196	-3%	62.2	2.15	100%	122
Bertie County Schools	$11,872	3,045	-17%	62.4	2.21	100%	6
Bladen County Schools	$9,561	5,429	-5%	59.2	3.08	100%	4
Cherokee County Schools	$9,888	3,656	+4%	77.2	3.55	99%	125
Cleveland County Schools	$8,772	16,768	+76%[8]	66.0	2.62	100%	277
Clinton City Schools	$9,782	3,223	+24%	77.1	2.84	100%	4
Columbus County Schools	$8,932	6,890	-7%	69.7	2.28	100%	63
Davidson County Schools	$7,253	20,841	+9%	71.2	3.17	100%	445
Duplin County Schools	$8,657	8,987	+4%	71.9	2.83	100%	209
Edenton/Chowan Schools	$9,885	2,432	-4%	70.6	2.58	100%	34
Elkin City Schools	$9,650	1,259	+16%	88.2	1.95	100%	24
Graham County Schools	$11,006	1,199	0%	70.5	1.90	100%	17
Greene County Schools	$9,912	3,366	+16%	62.1	0.95	100%	22
Halifax County Schools	$10,667	4,543	-27%	54.8	1.90	100%	21
Hertford County Schools	$10,749	3,286	-19%	60.1	1.81	100%	0
Jones County Schools	$12,696	1,247	-18%	66.1	1.69	99%	18
Lenoir County Public Schools	$8,402	9,634	-6%	65.6	2.33	100%	3
Lexington City Schools	$9,806	3,094	-5%	70.1	2.69	100%	2
Macon County Schools	$8,912	4,434	+6%	77.0	2.20	99%	36
Madison County Schools	$9,276	2,642	+3%	64.0	3.34	100%	62
Martin County Schools	$10,102	4,071	-17%	74.3	2.23	97%	42
Mitchell County Schools	$10,078	2,199	-9%	70.7	2.94	99%	11
Montgomery County Schools	$9,645	4,454	-3%	67.1	2.10	100%	127
Mount Airy City Schools	$10,342	1,671	-17%	81.8	2.66	100%	6

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School Districts (cont.)	Per-Pupil Expenditure	Allotted ADM	ADM Change Since 2000	Four-Year Graduation Rate	Student-to-Internet Ratio	Connectivity to the Internet	Total NCVPS Courses
Northampton County Schools	$11,471	2,728	-28%	71.6	1.62	100%	0
Pamlico County Schools	$11,761	1,500	-18%	81.4	2.33	100%	30
Pasquotank County Schools	$9,136	6,162	+2%	69.3	2.68	100%	17
Perquimans County Schools	$11,366	1,881	+5%	64.4	2.29	100%	16
Richmond County Schools	$8,994	7,973	-5%	67.5	2.63	100%	188
Roanoke Rapids City Schools	$9,165	2,964	-3%	66.8	3.33	80%	11
Robeson County Schools	$9,010	23,867	0%	63.0	2.55	100%	5
Rutherford County Schools	$8,756	9,666	-4%	64.0	2.68	99%	239
Sampson County Schools	$8,186	8,409	+5%	65.6	2.61	100%	88
Scotland County Schools	$10,506	6,772	-3%	64.9	2.75	99%	60
Surry County Schools	$8,318	8,730	+4%	77.7	2.75	100%	73
Thomasville City Schools	$10,038	2,613	+12%	65.3	1.5	100%	58
Tyrrell County Schools	$15,581	574	-26%	57.9	1.15	100%	7
Vance County Schools	$9,176	7,669	-4%	61.9	2.42	100%	74
Warren County Schools	$11,052	2,707	-17%	68.0	2.83	100%	7
Washington County Schools	$12,455	2,046	-15%	68.4	1.77	99%	48
Weldon City Schools	$13,204	1,022	-12%	75.6	4.80	100%	8
Whiteville City Schools	$9,141	2,555	-8%	72.9	1.97	100%	66
Yancey County Schools	$9,536	2,513	+1%	80.6	2.49	100%	27
Averages:	**$9,851**	**5,216**	**-2%**	**69.2**	**2.43**	**99%**	**2709**

80 percent or more economically disadvantaged students do not perform as well as schools with a lower percentage (see Table 1). It should be noted that a vast majority of rural schools enroll a population of economically disadvantaged students that falls between 20 and 80 percent.

North Carolina's Technology Infrastructure

External evaluators have given mixed reviews to North Carolina's technology infrastructure. In their 2008 ranking of technology leadership, *Education Week* researchers awarded North Carolina a B-minus grade, which placed the state 10th out of 50 states and the District of Columbia. In the 2009 ranking, North Carolina received an A grade for technology leadership but a D grade for the capacity to use technology. *Education Week* found that the state had lax technology training standards for teachers and administrators.[9] Those findings suggest that we have plenty of technological resources that few know how to use properly.

"Connectivity" and computers with Internet access are widely available in North Carolina's rural public school districts. An average of 99 percent of North Carolina classrooms have an Internet connection. Moreover, there is a statewide average of 2.43 students per Internet connected computer (see Table 2). Some school systems in rural areas

would be required to upgrade computer hardware or software, but given the extensive infrastructure already in place, investments in computer technology would not be a burden.

Home Computer Use and Laptop Initiatives

Calls to improve the technology infrastructure of public schools should not be used as an endorsement of state- or city-provided broadband services for households or laptop initiatives for public school students. Much of the research literature fails to establish a relationship between home computer access, home broadband access, and student achievement.

In their study of North Carolina public school students, Jacob Vigdor and Helen Ladd found that home computer technology with high-speed Internet access had a statistically significant negative impact on math and reading performance.[10] One possible explanation for this finding was the use of the computer for non-academic activities, including social networking and gaming. In their review of the research literature, Vigdor and Ladd find, "Very little evidence exists to support a positive relationship between student computer access at home and academic outcomes."[11] The authors point out that a rigorous evaluation of the Texas Technology Immersion Project, a project with many similarities to North Carolina's 1:1 Learning Collaborative, found virtually no benefit from issuing students their own laptop computer.[12]

In addition to the Texas Technology Immersion Project, state education agencies have initiated laptop pilot programs in North Carolina, Florida, Illinois, Maine, Michigan, New Mexico, Pennsylvania, South Dakota, and Virginia. An evaluation of Maine's laptop initiative, the largest and oldest laptop program in the nation, found that disadvantaged elementary school students enjoyed using laptop computers. While the author reported anecdotal evidence of benefits in reading and math performance, she provided no quantitative data to substantiate those findings.[13]

The NC 1:1 Learning Collaborative is one of North Carolina's primary technology efforts. The program distributes laptop computers to each student at a school – one student, one laptop (hence 1:1). As of August 2009, the NC 1:1 Learning Collaborative distributed laptops to over 8,000 students and 662 teachers in eight Early College high schools and 11 traditional high schools. Approximately 8,000 students and 650 teachers received laptops from locally supported initiatives in 14 school districts.

A recent NC State University evaluation of over 6,000 students and 365 teachers from North Carolina who received laptop computers from 2007 to 2009 found:

1. Attendance was above 92% in all 1:1 schools and remained virtually unchanged over the three-year period.
2. Dropout rate across the 1:1 schools decreased, on average, between 1% and 2%.
3. Student engagement increased in the 1:1 learning environment.
4. Students' 21st century learning skills increased in the 1:1 learning environment.
5. Student standardized test scores do not improve rapidly, but evidence from other states has found increases over longer implementation periods.[14]

None of these findings suggests that the NC 1:1 Learning Collaborative has increased student achievement in any meaningful way. In particular, there is no evidence that access to computer technology has any causal relationship to the attendance or dropout rate. Furthermore, student engagement and 21st century learning skills are vague, often unintelligible concepts that provide little information about student performance.

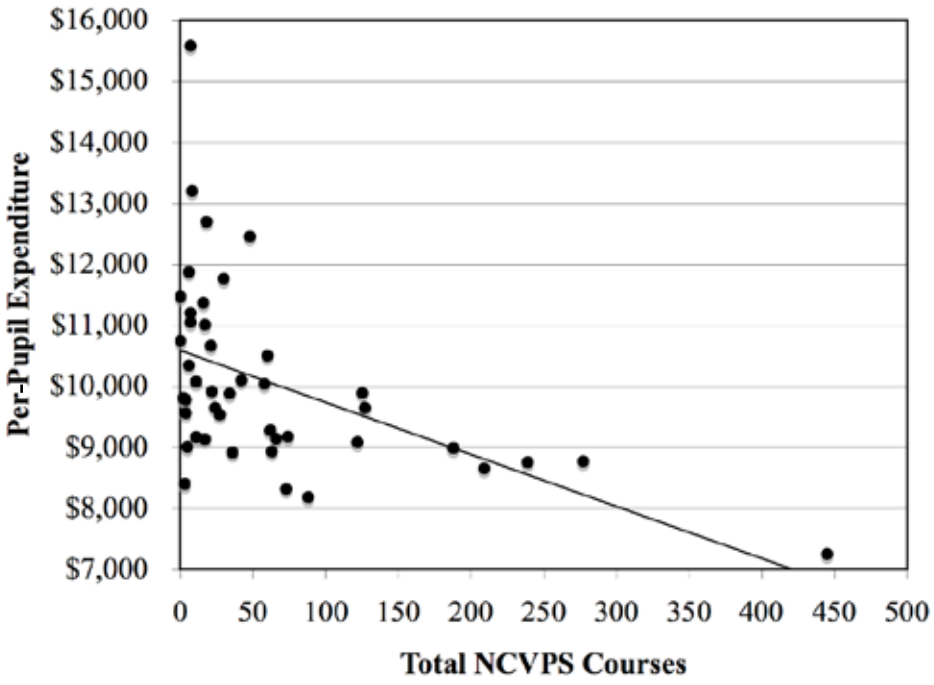
A similar student laptop initiative, called IMPACT, has issued over 16,000 laptops to students and 1,300 laptops to teachers and operates in 30 schools. An NC State University evaluation of the state's IMPACT I, III, and IV technology programs, funded through a federal grant program (EETT), found mixed results.[15]

The North Carolina Virtual Public School

North Carolina has one of the largest and fastest growing state-operated virtual schools in the nation. Enrollment in the North Carolina Virtual Public School (NCVPS), which allows students to complete academic coursework over the Internet, has increased significantly since it began offering online courses in the summer of 2007. Between the Fall 2008 and 2009, virtual school enrollment doubled to an estimated 35,000 students.[16] The state designed the NCVPS to serve only a portion of the high school population and operate exclusively on a supplemental basis. Despite the limitations on North Carolina's virtual school, demand for online courses continues to grow. There is also a growing demand for a virtual school model, currently operated in states like Florida, that serves students in grades K-12 on a full-time basis.[17]

Students in a number of rural counties take few courses from the NCVPS. In Fall 2009, nearly two-thirds of the state's rural districts enrolled students in fewer than 50 online courses, while nearly one-third of North Carolina's rural school districts enrolled student in 10 or fewer online courses (see Table 2). The NCVPS is not reaching a significant portion of the state's rural student population. In terms of disruptive technology, those students are non-consumers who could become catalysts for systemic change.

Figure 1. Per Pupil Expenditures and NCVPS Enrollment



Interestingly, there appears to be a relationship between the number of virtual school courses and per-pupil expenditure. Districts that enroll few students in online courses generally have a higher per-pupil expenditure than those that enroll a higher number of students (see Figure 1). While statistical tests would need to confirm a relationship between the two, a reasonable hypothesis is that districts with fewer virtual school students have a labor-intensive enterprise that requires employing more teachers, thereby increasing per-pupil expenditures.

Clearly, research into cost-savings from online learning is in its infancy and estimates vary considerably. There is widespread disagreement about the proper methodology used to calculate marginal cost and the elasticity of demand for virtual schooling. In particular, the methodology used to calculate the fiscal implications of vouchers and tax credits would not necessarily apply to a virtual school scenario. Whereas students who take advantage of vouchers and tax credits exit a public school system completely, a portion of the virtual school population will only utilize the school for select courses. Savings from enrollment in virtual courses depends on many factors that may be difficult to predict, including the number of students (locally and statewide) that enroll and drop out of courses; their part/full time status; the number and type (required versus elective) of course offerings; and state and local budgetary limitations on enrollment in virtual courses.

In a review of the literature related to costs and funding associated with virtual schooling, Dr. Cathy Cavanaugh,

a professor of education technology at the University of Florida, found that the average yearly cost of online learning was lower than a traditional classroom setting. In one study, the cost was significantly lower.

A survey of the directors of 20 virtual schools in 14 states found that the average annual cost for a full-time online student was $4,310 in 2008, while the U.S. average per-pupil expenditure in public schools was $9,138, as of 2006. Only one of the virtual schools had a cost exceeding its state average. Other estimates place online programs as high as $8,300 per student per year.[18]

A 2006 study of the Florida Virtual School concluded that the state saves $1,048 per student (capital costs excluded) when they enroll in the online school.[19] For the 2006-2007 school year, the virtual school cost taxpayers an estimated 20 percent less per student, compared to the cost of funding a traditional classroom setting. Without a doubt, states realized savings from students who enroll in the virtual school full-time, but questions remain about net savings or costs associated with students who enroll part-time or enroll in elective courses.

The North Carolina Virtual Public School (NCVPS) officials acknowledge that the current recession has made calculating costs savings an extremely difficult task. The volatility of the national and state economies continues to limit the amount of state revenue dedicated to programs like the virtual school, thereby artificially deflating access to online learning. In North Carolina, there is no free market where money follows the student to their choice of a classroom or virtual course.

Dr. Bryan Setser, director of the NCVPS, identified five general areas where online learning is saving (or may save) North Carolina taxpayers money:[20]

1. **Teachers.** Whereas a face-to-face teacher makes an average of $55,000 per year (including benefits), a NCVPS Virtual Teacher makes $31,500 to teach the same number of students online.

2. **Professional Development.** Although cost estimates are not available, the NCVPS has the capability of conducting webinars, e-learning communities, and a host of professional development services at a fraction of the cost required to conduct face-to-face professional development sessions.[21]

3. **Tutoring Programs.** Contract, time, and facility costs associated with face-to-face tutoring are higher than those of e-tutors provided by the NCVPS.

4. **Facilities Costs.** School districts can avoid millions of dollars in facilities costs by utilizing alternative schedules (e.g., early morning or evening academies) and multiple access points (e.g., libraries, computer labs, auditoriums, or underutilized classrooms).

5. **Advanced Placement.** The cost of training, recruitment, and pay incentives associated with Advanced Placement course offerings can be substantial. The primary Advanced Placement instruction could take place via the NCVPS with assistance from teacher assistants in the classroom.

In lieu of sound methodology for calculating cost savings, it is useful to examine expenses incurred by brick-and-mortar schools, online schools, or both (see Table 3). Without a doubt, the primary difference between the two types of schools is the cost of maintaining school buildings and other capital expenses.

In North Carolina, the state has contributed over $2 billion for school construction and renovation since 1995. School districts, which are responsible for financing their own capital programs, have spent over $11 billion during the same period. Taking into account all sources of revenue, school districts have spent nearly $13.2 billion for school capital expenditures since 1995.[23] A robust online education program would have the potential to save the state billions in capital expenses over the long term.

Table 3. Full-Time Student Cost Comparison: Brick-and-Mortar School and Online School[22]

Cost Categories	Brick-and-Mortar School	Online School
Access to computers	✔	✔
Administration	✔	✔
Athletics	✔	
Buildings, roads, parking lots, and grounds	✔	
Classroom décor	✔	
Computer and Internet access for every student		✔
Computer and Internet access for every teacher	✔	✔
Course content and materials	✔	✔
Course-management system		✔
Courses and course outlines approved by governing board	✔	✔
In-school suspension (ISS) and disciplinary personnel	✔	
Marketing and advertising		✔
Mobile-communication devices for teachers (e.g., cell phones)		✔
Music program	✔	
Network infrastructure	✔	✔
Nursing services	✔	
Photocopies and paper	✔	
Printed correspondence to parents	✔	
Professional development	✔	✔
School breakfast and lunch programs	✔	
Security systems and personnel	✔	
Software licensing agreements	✔	✔
Space for offices and computer lab for students	✔	
Special education services	✔	✔
State testing program	✔	✔
Student information system	✔	✔
Student support services	✔	✔
Students	✔	✔
Substitute-teacher costs	✔	
Teachers	✔	✔
Technology support for students and parents (help desk, troubleshooting, course updates, server maintenance)	✔	✔
Telephones		✔
Textbooks	✔	✔
Transportation and fuel	✔	
Utilities	✔	
Video projectors, interactive whiteboards, and DVD/VCR players	✔	
Word processing, spreadsheet, presentation, and email software	✔	✔

Conclusion and Recommendations

The addition of online course offerings is not a panacea for a statewide public education system that continues to graduate less than three-fourths of North Carolina's high school students in four years. Nevertheless, virtual schools expand parental choice and personalize learning, which are two long-sought reforms that promise to improve public education in North Carolina and beyond.

Going forward, this study recommends the following policy changes:

1. **Conduct a rigorous cost-benefit analysis of virtual schooling that assesses fiscal implications, student/parent satisfaction, and student performance.** While the initial findings of cost savings are suggestive, the state should only expand online course offerings if the cost of those courses decreases current personnel and capital outlays at the school district level.

2. **Allow state, local, and federal funds to follow the student to the traditional or virtual school (or courses) of their choice.** If a statewide initiative is not politically feasible, give preferences to low-income students and rural counties by implementing a means-tested program.

3. **Allow any proposed statewide virtual charter school(s) to be exempt from student enrollment restrictions placed on traditional charter schools.**

4. **Maximize competition in course offerings by expanding the number of virtual school providers, including private and for-profit online schools, as well as institutions of higher education in North Carolina and beyond.**

5. **Develop off-site high school campuses in conjunction with government agencies, private companies, and small businesses.** According to this model, students could spend a portion of their day fulfilling course requirements online and use the remainder of the day to gain practical experience in a field or profession of their choice.

6. **Shift tutoring and professional development online by utilizing and expanding e-tutoring services and e-learning communities.**

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End Notes

1. Clayton M. Christensen, Michael B. Horn, and Curtis W. Johnson, *Disrupting Class: How Disruptive Innovation Will Change the Way the World Learns* (New York: McGraw Hill, 2008), p.11. In *Liberating Learning: Technology, Politics, and the Future of American Education*, Terry Moe and John Chubb agree that computer technology has the potential to revolutionize public education, including the power structure content to perpetuate the status quo.
2. Gisele Huff, "It's time to change our approach," *Philanthropy Roundtable*, May 2008, *enews.philanthropyroundtable.org/K12/2008/05/disruptive-technology-huff.htm*.
3. North Carolina Department of Public Instruction (NC DPI), Program Monitoring, "Rural Education Achievement Program (REAP)," *www.ncpublicschools.org/program-monitoring/reap. Davidson County did not qualify for the Small, Rural School Achievement Program (SRSA) or the Rural, Low-Income Schools Program (RLIS) but was added to the list because the two city school systems in Davidson County, Lexington and Thomasville, did qualify for federal dollars*.
4. *Ibid.*
5. North Carolina Department of Public Instruction (NC DPI), "The ABCs of Public Education," *abcs.ncpublicschools.org/abcs*.
6. Of the 874 rural schools on the list, 25 (3%) did not have an "economically disadvantaged" classification.
7. NC DPI, Financial and Business Services, "2009-09 Selected Financial Data," *www.ncpublicschools.org/fbs/resources/data*; NC DPI, Financial and Business Services, "Allotments," *www.dpi.state.nc.us/fbs/allotments*; NC DPI, "4-Year Cohort Graduation Rate Report," *accrpt.ncpublicschools.org/app/2009/cgr*; NC DPI, Instructional Technology, "Annual Media & Technology Report [data]," *it.ncwiseowl.org/accountability/amtr/a_m_t_r_data*; and NC DPI, North Carolina Virtual Public School, "Spring 2010 Student Performance," *www.ncvps.org/results*.

8. This increase was a result of the Cleveland County Schools merging with the Kings Mountain and Shelby city school systems in 2004.
9. "Technology Counts 2009: Breaking Away from Tradition," *Education Week* 28, no. 26, March 26, 2009; "Technology Counts 2008: STEM: The Push to Improve Science, Technology, Engineering, and Mathematics," *Education Week* 27, no. 30, March 27, 2008. Both reports and state technology grades are available at *www.edweek.org/ew/tc/index.html*.
10. Jacob L. Vigdor and Helen F. Ladd, "Scaling the Digital Divide: Home Computer Technology and Student Achievement," NBER *Working Paper* No. 16078, June 2010, *www.nber.org/papers/w16078*.
11. *Ibid.*, p. 3.
12. *Ibid.*, p. 26. The study they cite is K. Shapley *et al.*, "Evaluation of the Texas Technology Immersion Project: Findings from the Second Year." Texas Center for Educational Research, 2007.
13. Chrystalla Mouza, "Learning with Laptops: Implementation and Outcomes in an Urban, Under-Privileged School," Maine International Center for Digital Learning, 2008, *www.redorbit.com/news/technology/1459551/learning_with_laptops_implementation_and_outcomes_in_an_urban_underprivileged/index.html*.
14. Jeni Corn and Phil Emer, "NC 1:1 Learning Technology Initiative Update [for the] Joint Legislative Education Oversight Committee," February 16, 2010, p. 19, *www.fi.ncsu.edu/assets/presentation_posts/nc-11-learning-technology-initiative-planning/february-16-2010-update-on-the-nc-11-learning-technology-initiative.pdf*.
15. Researchers did find statistical significance at the .0001 level, which significantly reduces the power of the test.
16. See Jamie Sachs and June Weis, "2009 Report on State Virtual Schools in SREB States," Southern Regional Education Board (SREB), *www.sreb.org/page/1295/publications.html*.
17. *Ibid.*
18. Cathy Cavanaugh, "Getting Students More Learning Time Online: Distance Education in Support of Expanded Learning Time in K-12 Schools," The Center for American Progress, May 2009, *www.americanprogress.org/issues/2009/05/distance_learning.html*.
19. See Amy Anderson *et al.*, "20/20 costs and Funding of Virtual schools" (Atlanta: BellSouth Foundation, 2006).
20. Bryan Setser to Terry Stoops, personal e-mail correspondence, June 29, 2010.
21. For examples of this, see the Oregon Virtual School District at *orvsd.org*.
22. Rob Darrow, "Brief History of K-12 Online Learning," doctoral student at California State University-Fresno, 2008, *robsdoc.wikispaces.com/onlinecosts*. A number of cost categories have been added to Mr. Darrow's original list.
23. NC DPI, Financial and Business Services, "Highlights of the North Carolina Public School Budget: February 2010," p. 27, *www.dpi.state.nc.us/fbs/resources/data*.