Investigating the Impact of the Cisco 21st Century Schools Initiative on Forrest County School District

Summative Report

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Cisco Global Education

Transforming school systems for the 21st century

Cisco Global Education is engaged in shaping 21st century teaching and learning through thought leadership, practical engagements, and communication. Education systems urgently need to prepare students for the fast-moving demands of this century—this is not in question. Our work focuses on developing, scaling, and replicating successful working models to promote global system transformation. Through practical engagements, we test and refine these models in real-world situations, driving hands-on change in schools in Louisiana, Mississippi, New York, Jordan, and China.

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Executive Summary

Located in southern Mississippi, the Forrest County School District (FCSD) consists of six schools: three K–6 elementary schools, two K–8 elementary–middle schools, and one high school (grades 9–12), all of which have been involved in the Cisco Initiative since its inception. The district employed 16 administrators, 7 technology staff members, and 224 teachers in 2009.

Student enrollment numbers in the district have been relatively stable (with minor fluctuations) over the four years since the Cisco Initiative began. In 2008-2009, 2,420 students were enrolled; 41 percent were African American, 58 percent were White, and 1 percent were Hispanic. Students eligible for free or reduced lunch totaled 72 percent.

In the FCSD, the participation rate in the survey studies has increased significantly over time, so year-to-year interpretation is complicated. For example, 7 of 7 technology personnel completed the survey in 2009, whereas none completed the 2008 survey. Student participation over the same period increased from 3 to 14 percent, but is still too low to provide generalizable findings. Teacher responses were received from 57 percent of staff in 2009, up from 22 percent in 2008 and 19 percent in 2007, but parent rates for all years never surpassed single-digit percentages. Administrator responses were highest in 2009, but even then, only 6 of 16 administrators responded. Because of these challenges, qualitative findings will be emphasized, and all findings in this summary should be understood in this context.

Vision and Leadership

A clear and well-communicated vision is an essential element in transforming a school district into an effective 21st century learning environment. From the beginning of the Initiative, Forrest County administrators' vision for the program has focused on raising student achievement and increasing student motivation.

As the vision has matured over time, the language used to describe it has moved from vague notions of "growth," "opportunity," and "inspiration" to more concrete conceptions of "mathematical proficiency," "successful transition to high school," and "strong work ethic." In 2007, administrators spoke of their hope that technology would give students more "opportunities to grow" and would "enhance the educational process." By the last year of the Initiative, that vision had become more specific, centering on preparing students as "productive citizens [who would be] competitive in a growing market."

In 2009, 100 percent of administrators and 98 percent of teachers who answered the survey agreed that technology is an integral part of the overall education program in their district, thus showing strong congruence around this central pillar of the 21S vision.

The 21S Initiative is built around three structural transformations:

- *Connected District/School:* The Connected District/School component established a secure and manageable baseline technology platform (data, voice, video, etc.), which encompasses all the equipment and human resources necessary to support all administrative and instructional processes in the district.
- *Connected Learning:* The Connected Learning component supported administrators, teachers, and technology personnel to create 21st century learning environments through access to expertise and international best practices.
- *Connected Community:* The Connected Community component helped schools develop plans for interacting effectively with parents, local businesses, and community members and turn each participating school into a hub of the community.

Connected District/School

To create a 21st century learning environment capable of supporting administrative efficiencies and a student-centered approach to teaching and learning, the district revamped its entire technology infrastructure and acquired new technology tools.

Infrastructure and Tools: FCSD acquired hardware, such as interactive whiteboards, laptops, digital cameras, video conferencing equipment, and microphones. The software purchases included BrainPop, Fast Math, Nova Net, and Berbee Internet Protocol (IP) phone software. New math and science labs were built, security systems were upgraded, and ports were installed for NovaNet curriculum software.

District Access: Implementation appears to have been successful in Forrest County. In 2009, all administrators and technology personnel survey respondents reported that the overall state of implementation in Forrest County was on or above target. By contrast, in 2008, 75 percent of administrators rated implementation below expectations, and in 2007, 60 percent of technology staff said that implementation was below expectations. Looking more closely at specific implementation efforts, this past year, 100 percent technology personnel reported that access to hardware, software, network services, and IP phone technology has been on target or above their expectations, and 100 percent reported significant positive change in infrastructure, equipment, and Internet reliability.

School Access: Access to technology at the school and classroom level has also increased in a number of important areas. In 2009, all technology personnel surveyed reported that wireless Internet in the schools is on or above target, compared to only 20 percent in 2007. All agreed, as well, that technology installation into classrooms was on target or above expectations—an increase of 60 percentage points from 2007.

Teacher Access: Forrest County teachers report greater access to a wide array of technological tools and software, with the biggest gains in access to video equipment, personal digital assistants (PDAs), and interactive whiteboards. Almost all (90 percent) of surveyed teachers said they had access to computers, Internet and telecommunications, and organizational software.

Technical Support: Having equipment, though, is of little value unless it is properly supported and maintained. Fortunately, Forrest County has made great strides in providing technical support as well. In 2009, technology staff reported that they spend, on average, 6 hours weekly supporting teachers in their use of technology tools, about the same as in 2007. Since 2007, though, the amount of time spent troubleshooting and maintaining equipment has increased by over 8 hours per week.

Teachers and administrators appreciate these efforts. In the last year of the Cisco Initiative, 100 percent of administrators stated technology staff members were very helpful, and almost three-quarters of surveyed teachers said technical support was either frequently or always available.

Connected Learning: Educator Outcomes

The Connected Learning component of the Initiative is focused on professional development resources and programs aimed at leadership and administrative practices, technology access and integration, and student-centered instructional practice. Other measures of Connected Learning include the quality and quantity of professional development and ongoing instructional and technology integration support for educators.

Professional Development: The biggest focus of professional development in Forrest County centered around pedagogy and instruction. Staff attended seminars by companies such as Understanding By Design, Education Trust, Marzano's Engaged Learning, and International Center for Leadership in Education. Because of an increase in advanced placement (AP) courses offered to students, subject-

specific trainings were offered to teachers of those classes. Teachers also took advantage of IC3[1] technology training, as well as product-specific workshops on tools such as interactive whiteboards and SuccessMaker software.

To change an entire system, all parts of the system need to change. Thus, professional development was offered to administrators and technology staff, as well as teachers, to update their knowledge, skills, and practices. The majority of administrators reported seeing significant change in the quality and amount of professional development provided for them. While only 29 percent of technology personnel reported seeing significant change, the level of their satisfaction was high for the training they did receive.

Technology Integration Support: In addition to the considerable technology support they receive from the district's technology personnel, teachers also benefit from the support of the Digital Opportunity Trust (DOT) interns. These interns are college students and recent college graduates who provide another level of technology integration support. Teachers' perceptions of administrative support have remained consistently positive over time. Almost all teachers surveyed agreed that research and best practices are shared in their school, and that the discussion of school goals and how to achieve them is a regular part of faculty meetings. Additionally, 70 percent of teachers surveyed said that they have sufficient administrative support to effectively integrate technology into their lessons.

Proficiency: One of the impacts of professional development in the district is that 90 percent of teachers surveyed said they were highly proficient, somewhat proficient, or approaching high proficiency in their ability to integrate technology into their teaching practices. As a result of the training and ongoing support they have received, in 2009 almost 80 percent of teachers surveyed reported using technology in their classes frequently.

Communication and Collaboration: To drive innovation in the schools, teachers must be able to share their growing understandings and exchange best practices. In the FCSD, two-thirds of administrator respondents and over 70 percent of technology staff surveyed agreed that there has been significant change in teacher collaboration over the course of the Initiative. Over three-quarters of teachers surveyed also reported that they frequently meet to share ideas and improve instructional practices, interact with global networks, share samples of students' work, and mentor each other. Research shows too that teachers learn best from each other—so it's encouraging that 75 percent of teachers surveyed said they have role models in their school for integrating technology.

Connected Learning: Student Outcomes

The most significant measure of the 21S Initiative, of course, is its impact on student learning. EDC researchers looked for evidence of student achievement and student engagement and measured such inputs as participation in classroom activities, graduation, absenteeism, and behavior incidents.

As noted earlier, the 2008–2009 school year saw a higher survey completion rate among students than the prior year (14 percent up from 3 percent). The difference in completion rates complicates any year-to-year comparisons of survey data, while the low return rates every year (even in 2009) make it inappropriate to generalize the findings to the whole student population.

[1] IC3 is the abbreviation and registered trademark of the "Internet and Computing Core Certification." The IC3 is a certification program that is designed to teach individuals the digital literacy skills associated with basic computer and Internet use. IC3 is the first computer certification to be recognized by the National Skill Standards Board.

Student Use of Technology: Students are the ultimate consumers of the technology that FCSD has put in place as a result of the 21S Initiative. Happily, of those students responding, almost all registered a high level of satisfaction with the technological access in their classrooms, with over 90 percent saying they were using more technology in their classes, and that they felt confident using a wide range of tech tools. All administrators and 71 percent of technology personnel believed that students' Information and Communication Technology (ICT) literacy has improved as a result of participating in the Cisco 21S Initiative.

Student-centered Instruction: The 21S Initiative also aimed at changing instructional practice to focus more attention on progressive instructional techniques and active teaching of 21st century skills. These efforts have paid off according to two-thirds of responding administrators and over half of technology personnel who report a positive change in the overall quality of teaching since the Cisco 21S Initiative began. Those teachers who responded to the survey report high levels (90 percent) of student-centered teaching practices, such as having students use higher order thinking skills, asking open-ended questions, having students work in collaborative groups, and encouraging them to present their work to the class. Although comparison is tricky, in 2009 teachers reported employing these practices more frequently than in the prior year.

Student Achievement: While test scores should not be seen as the only, or even best, measure of student learning, they are useful ways to assess content mastery. Highlights on state tests include:

- On mathematics, the percentage of Forrest County students scoring proficient or above increased in two of the six grades tested. The largest increase was for seventh-grade students, where the percentage of students scoring proficient or above increased by 4 percentage points.
- On language arts, between the 2007–2008 and 2008–2009 school years, the percentage of students scoring proficient or above increased in four of the six grades tested. The largest increase was for fourth-grade students, with an increase of 6 percentage points. Further, the 6th and 8th grade students either outperformed or scored at the same level as students across the state.
- There have been increases in the percentage of Forrest County students receiving passing scores on two of the four SATP (Subject Area Testing Program) subject tests, specifically, the algebra and U.S. history tests. In addition, in 2009, Forrest County students outperformed their peers across the state on the algebra, U.S. history, and biology tests.

Graduation and College Preparation: Graduation rates remained relatively stable in terms of student dropout and high school graduation between the first two years of the Cisco program. Providing a more qualitative view, 80 percent of both teachers and administrators who answered the 2009 survey were confident that students are better prepared for college and the workforce. A similar number of students (80 percent) said they were confident that they are better prepared for college and future employment. Many students have participated in college preparatory activities this past year, with more than 50 percent of those surveyed saying they gained work experience and 43 percent saying they took a college preparatory exam. Far fewer students, however, participated in community service in 2009 than 2008 (a 23 percentage point drop).

Course Offerings: Providing more diverse courses was also an important component of the Connected Learning inputs (33 percent). Forrest County schools chose to offer AP classes for science and math, as well as more courses in language arts and math. There has also been an emphasis on preparing students for college, with an increase in funding for college level courses as well as an emphasis on dual-enrollment classes.

According to the district, the number of students taking AP courses increased in 2008–2009. However, no students have taken AP subject tests in the past three years. In 2005–2006, the American College

Test (ACT) participation rate in the FCSD was 80 percent, with students achieving a composite score of 18.9, which decreased to 18.2 in 2006–2007 and went up significantly to 18.8 in 2007–2008.

Student Fairs: The number of students participating in math and science fairs at the district level increased between 2005–2006 and 2006–2007, but then decreased slightly in the following years. The number of student entries in a local reading fair has steadily decreased over the past four years.

Student Engagement: In addition to test scores, EDC researchers sought out other measures of student learning. The vast majority of teachers, administrators, and students surveyed agree that students have become more engaged in their classes. Students report their class participation has increased as has the frequency of measures of student-centered learning, such as the use of higher order thinking skills, preparing two or more drafts of a paper or assignment, and asking open-ended questions.

District-provided data on absenteeism and late arrivals shows very large swings from year to year, suggesting that this data may be unreliable. For instance, absences in the district ranged from 19,597 incidents in 2006 to 23,328 in 2008, but dropped to 5,516 in 2009. Such a precipitous drop is not credible, so perhaps there is a reporting error. Other numbers show similar, if less dramatic, swings. Readers are referred to the full report for this data.

Forrest County students who took the 2009 survey were asked to respond to eight statements about the amount of support available to them in their schools. Most students agreed that they have at least one adult in their school who cares about them (81 percent), and that overall people in their school accept them for who they are (71 percent). Additionally, many also agreed that they feel safe at school (75 percent), and they feel supported and respected by teachers (77 percent), administrators (82 percent), and their peers (66 percent).

Connected Community

The Connected Community component of the 21S Initiative centers on promoting positive relationships with parents and the larger community. Forrest County's multifaceted approach included reaching out to key stakeholders to inform them about the Initiative and to seek their support and input regarding its implementation. The district also made efforts to work with local universities to improve its technology mentoring program, and began to offer after-school computer lab access in an effort to increase ICT literacy among students and community members.

All administrators and most teachers (84 percent) surveyed said that parents' ideas and opinions are actively sought out to inform decision-making when appropriate. Low survey response rates from parents make it difficult to validate that claim. However, according to those who did reply, there has been an increase in parental outreach by Forrest County Schools. The district has employed a variety of communication methods within the schools to keep parents informed, and more parents are receiving phone calls and e-mails from their children's school, and using the FCSD's websites to stay informed.

Remaining Challenges

Vision and Leadership Challenges

Clear Expectations: Despite the high levels of agreement among FCSD leaders, EDC research suggests that teachers are not fully aware of what leaders expect of them. On a number of measures, administrators expect their teachers to engage in activities much more frequently than teachers believe they are expected to, most notably, in the areas of performance-based assessments, preparing students to take standardized tests, and using the Internet to post lesson plans. Setting and communicating these expectations would help ensure that teachers know what to prioritize in their day-to-day teaching.

Change Management: Additionally, the district would benefit from developing a change management process for monitoring innovation throughout its education system. In 2009, 40 percent of administrators reported that they have not developed any type of process, and an additional 20 percent said they have created a process but have strayed from that blueprint. Coupled with well-articulated vision, a change management plan can help identify specific steps to reaching previously identified goals, and assist with budget management and long-term planning.

Sustainability: Forrest County would do well to develop alternative sustainability strategies if the district hopes to maintain its current technology infrastructure and professional development support system. While developing a specific budget for technology is the first step, few administrators or technology staff mentioned responding to grants, fundraising, or developing partnership support networks as a means to securing long-term funding.

Connected District/School Challenges

About one-third of administrators felt that providing ongoing access to hardware was a challenge. A similar number of teachers surveyed agreed that they do not have access to an adequate number of computers for their students.

Connected Learning Challenges

Technology Integration: Two-thirds of administrators surveyed saw challenges ahead in providing sufficient technical professional development, in getting teachers to integrate technology into their lesson plans, and in changing outdated teaching philosophies.

Use of Data: Technology can also promote learning by providing data to enable instruction to be tailored to the individual student. In 2009 in FCSD, more than 80 percent of administrators surveyed reported seeing significant change in the use of data to inform instructional decisions. However, fewer technology personnel (57 percent) reported this level of change in data use. And 40 percent of surveyed teachers reported that they are never expected to use data to inform instructional practices; however, 96 percent believed that teachers used data to inform their instructional practices. This conflicting profile suggests that expectations and practice around data use are not yet well-articulated, and consistent and frequent use of data to inform decision-making has not yet taken hold in the district.

Technical Support: More than half of the technology staff reported the lack of adequate staffing as a great challenge. Lack of training may also be hindering their efficiency. Over 85 percent of technology personnel surveyed reported they did not receive training in 2009 in products, software, or integration of technology, and 100 percent said that they did not receive any training in security administration, network management, wireless Internet technologies, or team building.

Connected Community Challenges

Two-thirds (67 percent) of administrators noted that it is a challenge to get more parents and community members involved in the program the district offers. Yet few of the parents who responded to the survey reported that their children's school offered activities and events outside traditional work hours (35 percent), technical support (26 percent), or outreach staff (26 percent) to help increase their involvement.

Lessons Learned

As the 21S Initiative draws to a close, and Cisco ends its formal partnership with the FCSD, it's appropriate to look back at the experience to identify the lessons learned. Effective leadership is among the most powerful factors in any school transformation. Looking back at the past four years of the

Initiative, a number of recommendations can be framed from the Forrest County findings. To achieve an effective transformation, school leaders should commit themselves to the following:

- Creating and communicating a clear vision of a 21st learning environment that involves all members of its stakeholder community
- Crafting structures and processes to enable key stakeholders to participate in the change process
- Providing vehicles and processes to foster communication and collaboration among educators, parents, and community members
- Building an ambitious professional development plan and bolstering it with ongoing technological and pedagogical support
- Strategically cultivating community partnerships

In moving the FCSD into a 21st century learning environment, school leaders were able to make important steps towards the realization of their vision by enacting the following:

- Revamping the technology infrastructure and improving access to software, hardware, wireless Internet, and technology-based security systems at both district and school levels
- Installing a variety of educational hardware and software in the classroom to support student learning
- Providing technical support to teachers and administrators
- Offering teachers, administrators, and technology staff professional development learning opportunities to foster effective technology use and instruction within the district
- Enabling teachers to collaborate and share best practices
- Promoting student-centered teaching practices to prepare students for life in an ever-changing global economy
- Offering richer and broader courses for students

EDC researchers also conducted a correlation analysis to determine the relationships between Forrest County's implementation inputs and project outcomes. The analysis reveals the key programmatic components necessary for the systematic transformation of a small rural school district seeking to become a 21st century education system. They are as follows:

- Access to software
- Access to wireless and stable, reliable Internet services
- An environment where communication and collaboration among teachers is encouraged
- Consistent support for teachers from administrators
- High-quality technical professional development, particularly in the area of technical support
- Inclusion of parents and community members in the decision-making processes

Researchers also sought out those FCSD outcomes that had the greatest correlation to Connected School, Connected Learning, and Connected Community inputs. This analysis suggests that the following items are the most likely outputs when the right mix of school and district level inputs are in place:

- Decreased student discipline problems
- Increased student motivation and engagement

- Increased number of students who are better prepared students for future employment
- Increased collaboration within the district
- Increased collaboration with other school districts
- Increased interaction with local institutes of higher learning
- Improved community perception of the school or district

Introduction

Education systems in the early 21st century are in transition and have the potential to evolve into very different institutions. Embodying the values of diversity and collaboration, encouraging innovation, and integrating technology into every aspect of the learning environment, these new systems enable students to be active participants in defining, pursuing, and assessing their own learning so that they can develop the skills and habits of independent thinkers and lifelong learners. Education leaders, policymakers, community leaders, businesses, government agencies, and research organizations have come to realize that the approaches that worked just 50 years ago will no longer serve to prepare students for the challenges in today's world. They are calling for the transformation of current education systems.

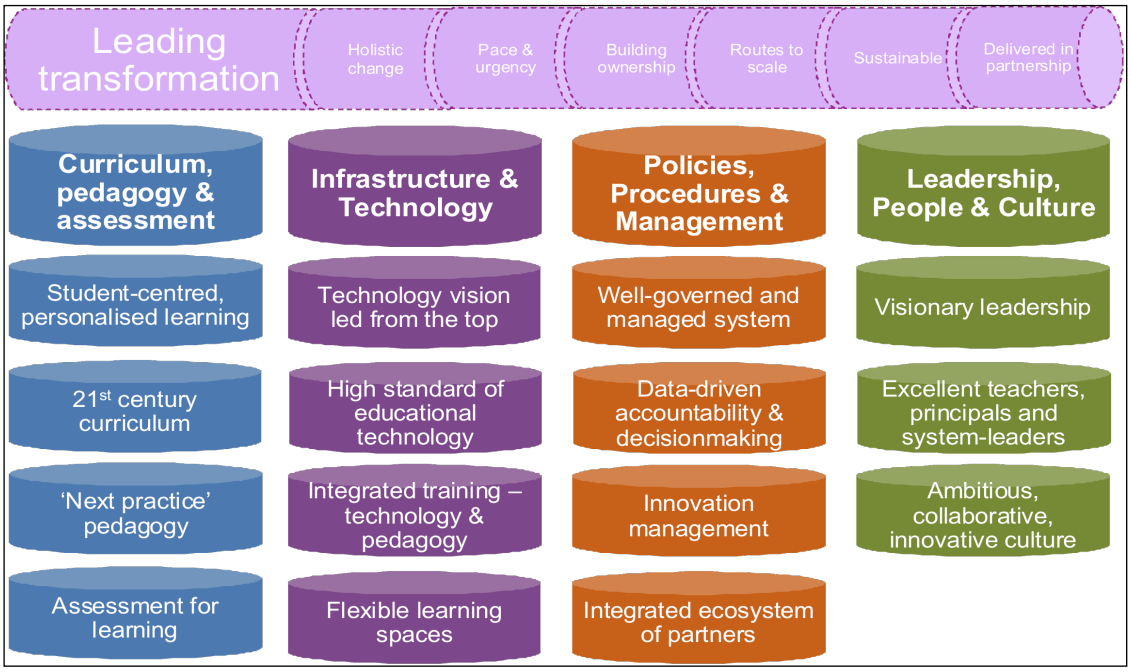
As this education transformation agenda was under review at the national and international levels, Cisco Systems, Inc. (Cisco), was in the process of responding to Hurricane Katrina's destructive impact on Mississippi and Louisiana. After several visits to the region and consultation with the education leadership in Mississippi and Louisiana, Cisco leadership chose to focus on education and offered to develop a complex and large-scale education technology project, which is called the "Cisco 21st Century Schools Initiative," but is best known as the "Cisco 21S Initiative." The Initiative represents an intensive, four-year $80 million investment in technology, training programs, and Cisco employee resources. Its goals are not only to help rebuild the Jefferson Parish Public School System in Greater New Orleans and seven districts in Mississippi post-Katrina,[2] but also to transform these districts to meet 21st century educational demands. The Initiative is organized around the following three interrelated structural components:

- *Connected District/School:* The Connected District/School component established a secure and manageable baseline technology platform (data, voice, video, etc.), which encompasses all the equipment and human resources necessary to support all administrative and instructional processes in the district.
- *Connected Learning:* The Connected Learning component supported administrators, teachers, and technology personnel to create 21st century learning environments through access to expertise and international best practices.
- *Connected Community:* The Connected Community component helped schools develop plans for interacting effectively with parents, local businesses, and community members and turn each participating school into a hub of the community.

Helping districts and schools make connections across all three components of the program is central to the 21S Initiative. Through the implementation of these program components in the Gulf Coast region, Cisco has learned how to effect rapid 21st century education transformation in real education systems. As a result, Cisco's education and technology leadership have articulated a concrete vision and framework for a 21st century education system (Cisco Systems, 2008). In conjunction, they have developed tools to better manage the process of education transformation. The principles of 21st century education fall into four key categories, which are shown in Figure 1 and described below.

[2] The selected districts in Mississippi include Petal School District, Hattiesburg Public School District, Moss Point School District, Harrison County School District, Forrest County Agricultural High School, Forrest County School District, and Lamar County School District.

Figure 1: Cisco's global education roadmap



Source: Cisco, 2008

1. *21st century curriculum, pedagogy, and assessment:* The adoption of 21st century curriculum, pedagogy, and assessment allows all stakeholders to have a role in promoting student-centered and personalized learning and addressing the full range of knowledge and competencies that students need to prosper in a global world economy. A system-wide pedagogical agenda emphasizes adopting and improving best practices from around the world and constantly seeks emerging practices. Finally, formative and summative assessment techniques are consistently employed to improve learning and to gain a full insight into the abilities of each and every student.
2. *High-quality infrastructure and technology:* In a 21st century education system, the educational technology vision is led from the top but shared, owned, and effectively managed throughout the system. A high standard of technology is deployed effectively to support 21st century teaching and learning. Initial training and ongoing support integrate technology with pedagogical development. The physical environment is designed to optimize 21st century teaching and learning.
3. *Policies, procedures, and management:* A 21st century education system is governed and managed with the ultimate goal of maximizing learning outcomes for all students. There are transparent processes in place to communicate and implement decisions, develop and monitor curriculum, sustain the budget, and procure resources. Additionally, policies and procedures are implemented to enable these education institutions to use data to drive school standards and accountability while stimulating and managing innovation. Finally, school learning is recognized as being embedded within and dependent on an ecosystem of partners that support learning and–or provide other essential children's services (e.g., health, social services).
4. *Leadership, people, and culture:* The entire system is a learning organization with a supportive culture that promotes ambitious and innovative approaches to teaching and learning. Leaders throughout the system champion and model the 21st century educational vision and work with well-trained and -supported teachers. Emphasis is placed on the recruitment and retention of

both principals and teachers through carefully designed outreach efforts and training programs. A 21st century system explicitly promotes a culture of high expectations, respect, collaboration, and shared accountability.

Cisco has supported all participating districts to strive for the above principles and encouraged them to develop their own system of transformation that is grounded in their prior specific cultural context, resource capabilities, and specific educational goals. As of September 2008, the goals of FCSD are to (1) increase awareness of technology; (2) build teamwork through shared practices and interdisciplinary planning and lessons; (3) provide instructional technology support to teachers; (4) provide quality technical support to teachers; (5) provide teachers professional development geared toward sustainability; (6) broaden community outreach; and (7) increase students' awareness that they are part of a global community and workforce development.

Evaluation Approach and Activities

The Center for Children and Technology at Education Development Center, Inc. (EDC), conducted the Initiative's summative evaluation, which is designed to measure system change at the district, school, and community levels. EDC researchers used a multi-method approach to gain a broad view of the implementation status of the 21S Initiative in the FCSD and measure its impact on the entire system, especially on participants (e.g., through survey, outcome data). The following questions guided the summative evaluation in Forrest County:

- What are the key programmatic components being implemented and how are they being implemented?
- What is the impact of the Initiative at the district, school, classroom, and community levels?
- What are the lessons learned from the implementation of the Initiative?
- What are the program recommendations for future Cisco education engagements?
- How can–will the Initiative be sustained when Cisco is gone?

To answer these questions, the EDC research team engaged in the evaluation activities listed below.

Collecting and Reviewing Documents: Cisco and the district shared relevant documents with EDC researchers. Most of the documents contained data on the demographic characteristics of administrators, teachers, students, and parents, as well as information about 21S implementation, community outreach, and dissemination. The research team reviewed the collected documents to better understand the 21S implementation process in Forrest County.

Compiling 21S Participation Data: The research team developed a series of implementation data collection charts that district staff used to gather data about 21S participation across the district. District leaders compiled the numbers of administrators, technology personnel, teachers, students, and families who have participated in the 21S Initiative over the last four years. EDC researchers used the data to better understand the strategies used to roll out various components of the Initiative and to involve different stakeholders over time.

Tracking Yearly Implementation Progress: The EDC researchers tracked district progress related to the three principal components of the 21S Initiative: Connected School, Connected Learning, and Connected Community. They asked district administrators to list activities and projects that they planned on implementing over the course of the school year. At the end of the year, district staff marked each input as completed, in-progress, or not completed, according to its status at that time. The categories of inputs along with the percentage completion rates are presented as pie charts in this report (see pages 23, 29, and 52).

Compiling Outcome Data: The Outcome Data Tables are a series of four unique tables that aided in the collection of yearly data related to administrator, teacher, student and parent outcomes. District administrators collected student test scores, teacher retention rates, administrator professional development participation, and outreach to parents. They populated the table with as much information as they had available.

Collecting Survey Data: EDC researchers designed five online surveys, one for each key stakeholder group, to gather a wide range of information related to technology use in classrooms, schools, and homes across the district. Questions also focused on the impact of the Initiative on participants. Surveys were made available to participants between April 12 and May 31 of 2009. It took around 30 minutes to complete a survey. The number of participants in all categories increased from the previous two years. In fact, the number of students and teachers who took the survey increased five fold and the number of teachers who participated nearly tripled (see Table 1).

Table 1: Survey participants and response rates

Participants	2006–2007	2007–2008	2008–2009
Administrators*	4 (22%)	2 (12%)	6 (38%)
Technology Personnel	5 (100%)	0 (0%)	7 (100%)
Teachers	45 (19%)	53 (22%)	128 (57%)
Students	N–A	69 (3%)	346 (14%)
Parents (approximate)	10 (1%)	33 (4%)	57 (7%)

* These values include both school and central office administrators.

Data Analysis: EDC researchers employed both quantitative and qualitative methods of analysis. For quantitative data, they used SPSS, a statistical software package, to conduct frequency, cross-tabulation, and correlation analyses (e.g., surveys, outcome data) (Dillman, 2000; Shadish, Cook, Campbell, 2002).

Organization of Report

This report is a case study of Forrest County and is organized into two main sections: District-level change and school-level change. The first section depicts a broad view of the system changes taking place at the district level, while the second section includes lessons learned from the Initiative and provides programmatic and strategic recommendations for future Cisco education engagements.

District System-Level Change

21st century districts are complex organizations working toward the common goal of moving away from a bureaucratic system and adopting a knowledge-based, next-generation education system. Districts engaged in this change often have difficulties managing the process, which occurs on numerous levels at the same time over a long period of time, and addressing local, state and federal education requirements. Most of the 21S districts have been able to manage well the demand for 21st century change and have seized it as an opportunity to improve their education vision, leadership practices, technology vision and resources, professional development strategies, and organizational culture.

This section presents the findings drawn from the vision and experiences of those involved in the education reform efforts in the FCSD. To measure these efforts at the district system level, EDC researchers looked at the following:

- Community environment
- Number of schools, staff, and student demographics
- Level of participation of the district in the 21S Initiative
- District's 21st century education vision and leadership
- District's learning environment
- Relations between the 21S inputs and expected outcomes

District Locale and Background

With a central location in Southern Mississippi, the city of Hattiesburg was founded in 1882 and incorporated two years later. Hattiesburg is the county seat of Forrest County but the city has grown in recent years to include a portion of eastern Lamar County. It is the principal city of the Hattiesburg, Mississippi Metropolitan Statistical Area (MSA), which encompasses Forrest, Lamar, and Perry counties. The MSA population almost exceeded 150,000 as a result of a 10% increase following Hurricane Katrina in August 2005; also Hattiesburg itself surpassed Biloxi post-Katrina to become Mississippi's third largest city. Hattiesburg experienced a gain in population of approximately 7.3% compared to Gulfport, Mississippi, the closest similar-sized urban area to Hattiesburg, which lost 4.5 % of its population. Forrest County also experienced a 5% increase in population. Hattiesburg and Forrest Counties have grown in population, although they have had to deal with some after-effects of the storm.

According to US Census Estimates, 2008, the population of Hattiesburg is 51,993 and American Community Survey (ACS) 2005-2007 Estimates report a 45% White and 50% African American population. Hispanics and Asians make up approximately 2% each, while Native Americans make up the remaining percentage. Out of an estimated population of 79,425, Forrest County is 62% White and 35% African American. Hispanics make up approximately 2%, while Native Americans and Asians make up the remaining percentage. As of 2007, according to ACS Estimates, 2005-2007, the median income in both Hattiesburg ($28,987) and Forrest County ($32,393), as a whole, was lower than the median income of the State of Mississippi ($35,632) and lower than that of the United States ($41,994). The poverty rate in Hattiesburg is 31.7% and is higher than that of both Gulfport (18.5%) and the State of Mississippi (21.1%), and significantly higher than that of the United States (13.3%). The same is true of the poverty rate in Forrest County (25.9 %). In May of 2009, the unemployment rates in Hattiesburg (7.8%) and the greater Forrest County (7.8 %) were lower than that of both the state (9.6%) and the United States (9.4%) as a whole. Finally, as of 2007, the violent crimes index in Hattiesburg (4.84 per 1,000 people) is higher than that of both the State of Mississippi (2.91) and the United States (2.31), but

on par with that of Gulfport (4.44). The index in Forrest County (0.13) is significantly smaller than all other geographies, in comparison. This diverse urban city is where the seat of the Forrest County School District (FCSD), the subject of this report, is located. Schools in the FCSD are found primarily in the city of Hattiesburg and Brooklyn, Mississippi.

Forrest County School District

The number of schools in the FCSD has remained the same over the past four years of the 21S Initiative (see Table 2). The six schools (see Table 3) that are a part of the FCSD include five elementary–middle schools, including three K–6s and two K–8s. There is also one middle–high school that includes grades 7–12.

Table 2: Schools in Forrest County School District

School	Grades
Dixie Attendance Center	K–8
Earl Travillion Attendance Center	K–6
North Forrest Elementary School	K–6
North Forrest High School	7–12
Rawls Springs Attendance Center	K–6
South Forrest Attendance Center	K–8

The number of administrators grew in 2006–2007 but decreased over consecutive years to 16. Additionally, the number of technology staff increased in both the 2006–2007 and 2007–2008 school years. Finally, the number of teachers in the district increased significantly 2006–2007 and again the following year, but has since decreased to 224. Consequently, the FCSD is served by 16 administrators, 6 technology personnel and 224 teachers. The average teacher-student ratio is 1:11.

While the student population in the FCSD decreased over the first two years of the 21S Initiative, enrollment increased in the 2008–2009 school year (see Table 3). As of 2007–2008, of the total enrollment, 40.6 percent were African American, 57.7 percent White, and 1 percent Hispanic. Native Americans and Asians made up the remaining percentage. The student population consists of 52 percent male students and 48 percent female students. The free and reduced lunch population, as of 2008–2009, was 72 percent.

Table 3: School district makeup

School Year	Schools	Administrators*	Technology Staff	Teachers	Students
	#	#	#	#	#
2005–2006	6	17	4	210	2478
2006–2007	6	18	5	233	2455
2007–2008	6	17	6	237	2370
2008–2009	6	16	6	224	2420

* Includes administrators in schools and central office

Overall, Forrest County has experienced an increase in the number of staff employed in the district. The number of teachers in the district rose steadily between the 2005–2006 and 2007–2008 school years. This number then declined slightly in 2008–2009. The number of teachers who returned the following school year increased between 2006–2007 and 2008–2009 (see Table 4).

The number of administrators employed by the district has decreased slightly. The number of technology specialists in the district has increased. In addition, as the number of technology staff has increased over the years, the ratio of teachers to technology specialists has dropped from 53:1 in 2005–2005 to 39:1 in 2008–2009. Table 4 provides more information about employment.

Table 4: Employment

	2005–2006	2006–2007	2007–2008	2008–2009
Number of teachers returning the following year	*	168	135	177
Number of school level administrators employed	9	10	9	8
Number of administrators returning the following year	9	9	8	8
Number of technology staff employed	4	5	6	6

* Data not available

The percentage of days that teachers missed increased between the 2005–2006 and 2007–2008 school years and then decreased in 2008–2009. The percentage of days that administrators missed increased between 2005–2006 and 2006–2007 and has been decreasing in the last three years. See Table 5 for more details on attendance.

Table 5: Absences

Percent Absences by	2005–2006	2006–2007	2007–2008	2008–2009
Teachers	11%	13%	14%	11%
Administrators	18%	21%	20%	19%

Teacher Qualifications

FCSD teachers have impressive qualifications. For the 2008–2009 school year, 100 percent of teachers have a teaching certificate, 64 percent of teachers have a bachelor's degree and 34 percent have a master's degree. See Table 6 for more details on teacher qualifications.

Table 6: Qualifications

	2005–2006	2006–2007	2007–2008	2008–2009
Teachers—Number with teaching certificate	210	230	243	224
Teachers—Number with bachelor's degree	139	153	173	154
Teachers—Number with master's degree	66	67	75	80

Professional Development

The number of administrators attending professional development activities steadily increased between 2005–2006 and 2007–2008. The number of professional development hours attended by administrators peaked in 2006–2007 and then declined in 2007–2008 and 2008–2009. Table 7 provides more details on professional development.

Table 7: Professional development (PD)

	2005–2006	2006–2007	2007–2008	2008–2009
Number of PD opportunities offered to administrators	7	8	8	7
Number of administrators attending PD activities	13	18	17	16
Number of PD hours attended by administrators	712	964	718	648

Cisco 21S Participation

In 2008–2009, there were 8 administrators, 224 teachers and 6 technology specialists involved in the Cisco 21S Initiative in Forrest County District. All of the schools in the district have been involved with the 21S Initiative since its inception. In addition, all of the district technology staff, teachers, and students have been involved in the 21S Initiative across all four years. Table 8 provides information on population and 21S Initiative involvement for each of the six schools in the district.

Table 8: Cisco participation

Year	Schools	Administrative Staff	Technology Staff	Teachers	Students
	Percent Involved	Percent Involved	Percent Involved	Percent Involved	Percent Involved
2005–2006	100%	100%	100%	100%	100%
2006–2007	100%	100%	100%	100%	100%
2007–2008	100%	100%	100%	100%	100%
2008–2009	100%	100%	100%	100%	100%

In addition to Forrest County district staff and students, 65 community businesses and organizations have also been involved in the 21S Initiative. The majority of these (34 percent) are religious organizations. Community involvement in the 21S Initiative has come from religious organizations, charitable-service organizations, health service providers, higher education institutions, youth programs, and the local media.

21st Century Education Vision and Change Leadership

Articulating a clear education vision is the first step in the transformation process for the successful implementation of a 21st century education system. From the beginning of the 21S Initiative, the vision of the FCSD administrators for the program has focused on raising student achievement and increasing student motivation. As the vision has matured with time, the language and vocabulary used to describe it has moved from vague notions of "growth," "opportunity," and "inspiration" to more concrete concepts of "mathematical proficiency," "successful transition to high school," and "strong work ethic." In 2007, the administrators' vision emphasized that they hoped technology would give students more "opportunities to grow" and that in general it would "enhance the educational process." By the final year of the Initiative, there was more focus on the importance of cultivating students who would both be "productive citizens and competitive in a growing market." There was also mention of the potential impacts on teachers who would be more prepared to use data to "promote high standards and establish plans for instruction." Administrators in 2009 reemphasized their focus from previous years and wrote about stimulating the growth of children and fostering productive citizens to participate in a "technology-oriented society." It is clear that the 21S Initiative has helped the FCSD vision grow and develop along with the changing needs of teachers and students.

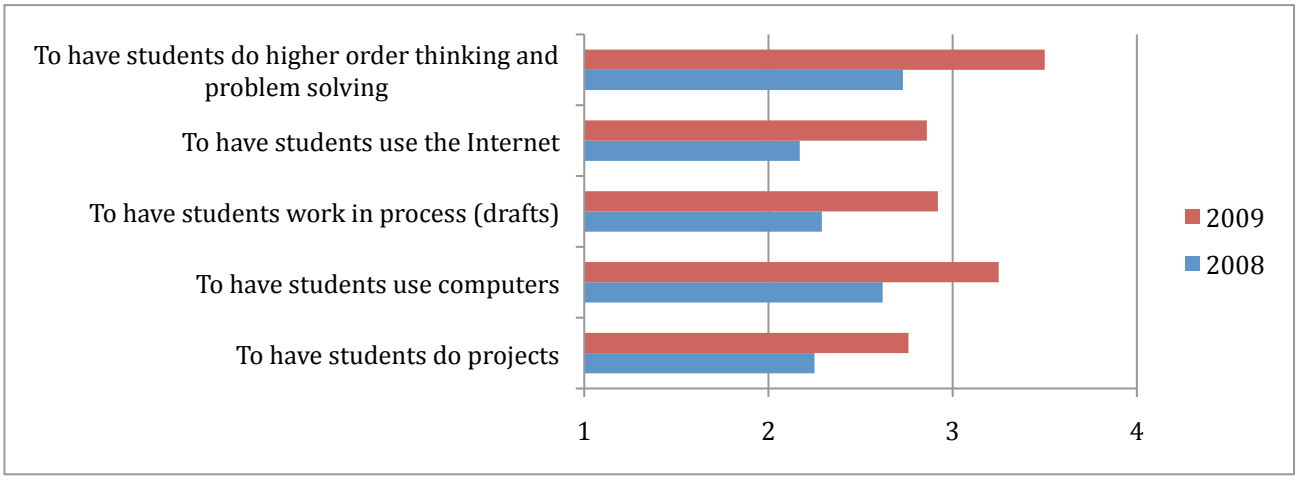
In part because discussing goals and how to achieve them is a regular part of meetings, administrators noted that their colleagues shared these beliefs of what the central goals and vision of the school should be. In addition to sharing a vision, administrators throughout Forrest County also agreed that innovation and experimentation are fundamental in the district. All administrators (100 percent) agreed

that research and best practices are shared and discussed and that educators are continually learning and seeking new ideas. There was also unanimity in the belief that Forrest County teachers have input regarding these innovations, projects, and changing practices. Eighty-three percent (83 percent) of administrators agreed that the district actually encourages that type of experimentation and innovation.

In tandem with the development of a common vision, the 21S Initiative encouraged administrators at both the district and school levels to establish leadership teams to help build and disseminate that vision. As a result, 67 percent of Forrest County administrators report that there is a Cisco 21S Initiative team in their school or district, while 50 percent report having a general reforms team involved. There are on average nine people on each leadership team in Forrest County, compared to 2007, when there were only two people on average on their teams. These teams comprise a diversity of constituents: 67 percent of them feature teachers (compared to 75 percent in 2007) and technology staff (compared to 25 percent in 2007); 50 percent of the teams feature the principal and superintendent; 33 percent have administrators, an assistant superintendent, and Digital Opportunity Trust (DOT) interns. Seventeen percent (17 percent) of teams feature Cisco fellows and parents.

Finally, nearly all administrators (100 percent) and teachers (98 percent) agreed that technology is an integral part of the overall education program in their district. As evidence, administrative expectations over time clearly reflect that technology has become an increasingly important focus. Figure 2 shows that more teachers in 2009 than 2008 believe they should always have their students use the Internet and computers. The administrative message about the importance of technology use is clearly reaching teachers in their classrooms. Figure 2 also reveals a change in pedagogical emphasis. Over time teachers indicated that they were increasingly expected to do higher order thinking and problem-solving with their students in addition to encouraging them to produce multiple project drafts.

Figure 2: Teachers' perceptions of administrators' expectations over time



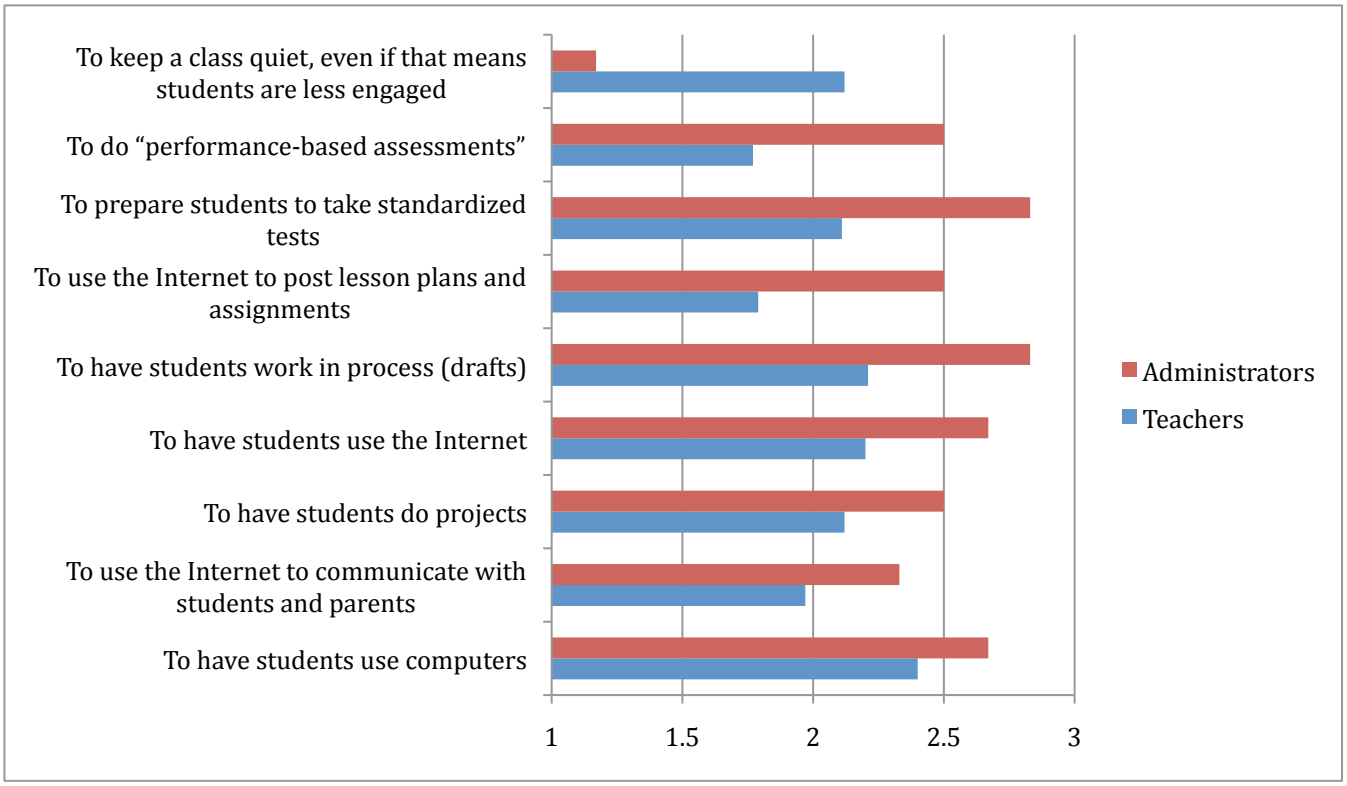
Note: Teachers rated each statement on a scale from 1 (never) to 4 (always), with higher scores indicating that teachers believe they are expected to engage in the task more frequently.

A clear vision and change management plan are necessary but not sufficient to lead the district to a fully sustained 21st century education system. Access to resources is critical to the long-term sustainability of the innovation. Administrators (83 percent) and technology personnel (43 percent) indicated that to ensure future funding in their district, they have established a dedicated technology budget to be managed and distributed as seen fit.

Challenges with Vision

Despite the high levels of agreement among administrators about vision and leadership in the FCSD, the data would suggest that teachers are not fully aware of what leaders expect of them. On a number of measures, administrators expect their teachers to engage in activities much more frequently that teachers believe they should. Most notably, administrators indicate that they expect teachers to do performance-based assessments, prepare students to take standardized tests, and use the Internet to post lesson plans. In addition, administrators almost never expect teachers to keep a class quiet even if the students are less engaged, while teachers believe that in fact they are supposed to do that regularly. More direct and clear communication of expectations would help ensure that teachers know what to prioritize in their day-to-day teaching. Figure 3 shows inconsistencies in expectations between teachers and administrators.

Figure 3: Alignment of administrator and teacher expectations



Note: Administrators and teachers rated each statement on a scale from 1 (never) to 3 (always), with higher scores indicating that teachers are expected to (or believe they are expected to) engage in the task more frequently.

Additionally, it would be beneficial for Forrest County administrators to spend some time thinking about developing a change management process for monitoring innovation throughout their education system. As of now, 40 percent report that they have not developed any type of process, and an additional 20 percent say they have created a process but have strayed from that blueprint. In conjunction with a well-articulated vision, a change management plan can help identify specific steps to reaching previously identified goals. It also assists with budget management and long-term planning.

Forrest County would do well to develop some alternative sustainability strategies if the district hopes to maintain its current technology infrastructure and professional development support system. While developing a specific budget for technology is the first step, few administrators or technology staff

mentioned responding to grants, fundraising, or developing partnership support networks as a means to maintain long-term funding.

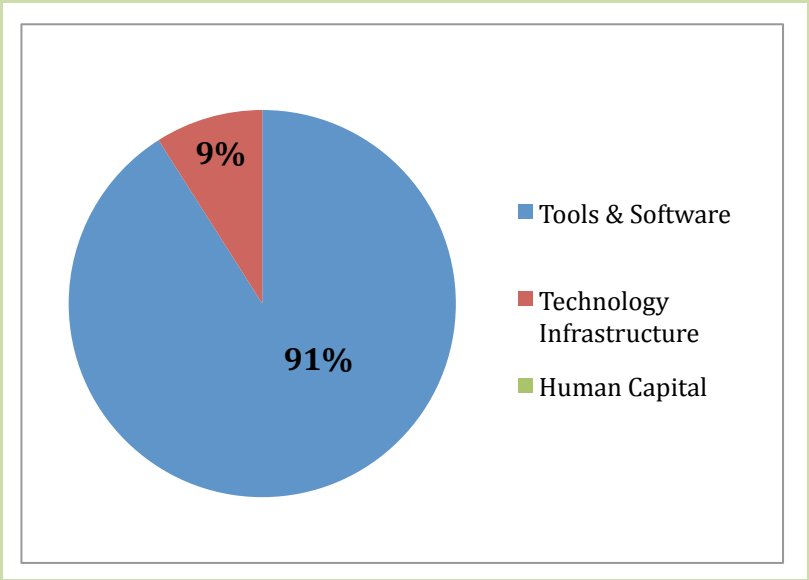
21st Century Learning Environment

To create a 21st century learning environment capable of supporting administrative efficiencies and a constructivist approach to teaching and learning, the district revamped its entire technology infrastructure and acquired new technology tools, provided professional development to staff and teachers, and engaged the community over a four-year period. This section presents the findings about the implementation and impact of the 21S Initiative on (1) FCSD as a system and (2) all stakeholders, including administrators, teachers, students, parents, and community.

Connected District/School

Over the course of the Initiative, 91 percent of the Forrest County's Connected School inputs came in the form of technology tools and software. More specifically, the district used its resources to buy hardware, such as interactive whiteboards, laptops, digital cameras, video conferencing equipment, and microphones. The software that was purchased included BrainPop, Fast Math, Nova Net, and Berbee IP phone software. In addition, Forrest County built new math and science labs, upgraded its security system, and installed ports for the NovaNet curriculum software. Figure 4 shows how inputs were distributed over the course of the Initiative.

Figure 4: Connected schools input distribution pie: 2007–2009

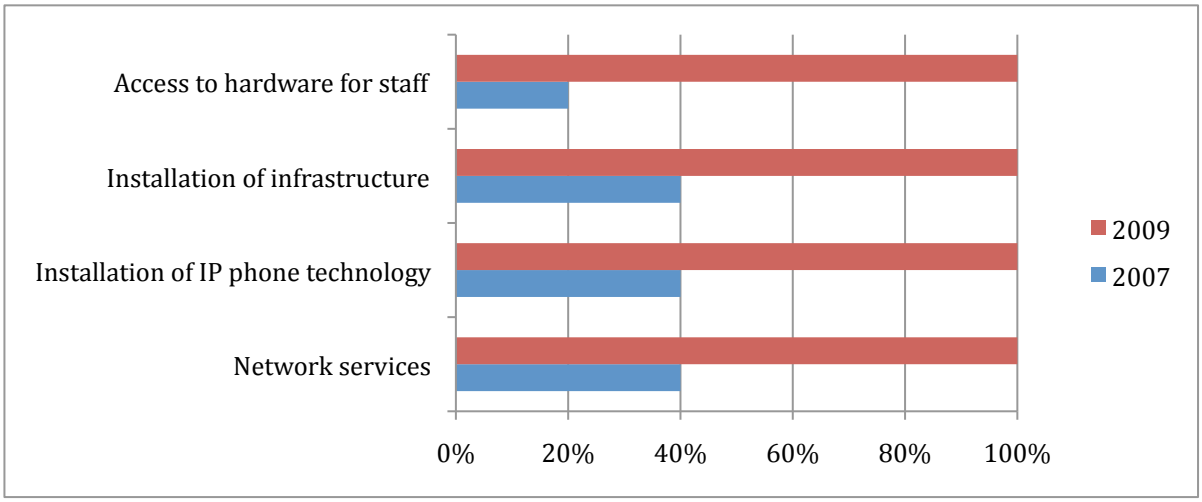


Access at the District Level

Access to technology on the district level has increased tremendously since the inception of the Cisco 21S Initiative. In 2009, all administrators (100 percent) and technology personnel (100 percent) reported that the overall state of implementation in Forrest County was on target or above their expectations. In 2008, administrators were not as equally unanimous in their appraisal, with only 25 percent reporting that implementation was on target, and 75 percent rating it as below expectations. Technology personnel have been increasingly positive since 2007; in 2007, only 40 percent believed that overall implementation was on target, and 60 percent believed that it was below their expectations.

In regard to implementation of technology in specific areas, technology personnel have been, for the most part, positive in their assessment. All technology personnel (100 percent) in Forrest County have reported that access to hardware, software, network services, and IP phone technology has been on target or above their expectations. Since 2007, there has been a marked increased in access to all of the aforementioned tools (see Figure 5).

Figure 5: State of implementation at the district level



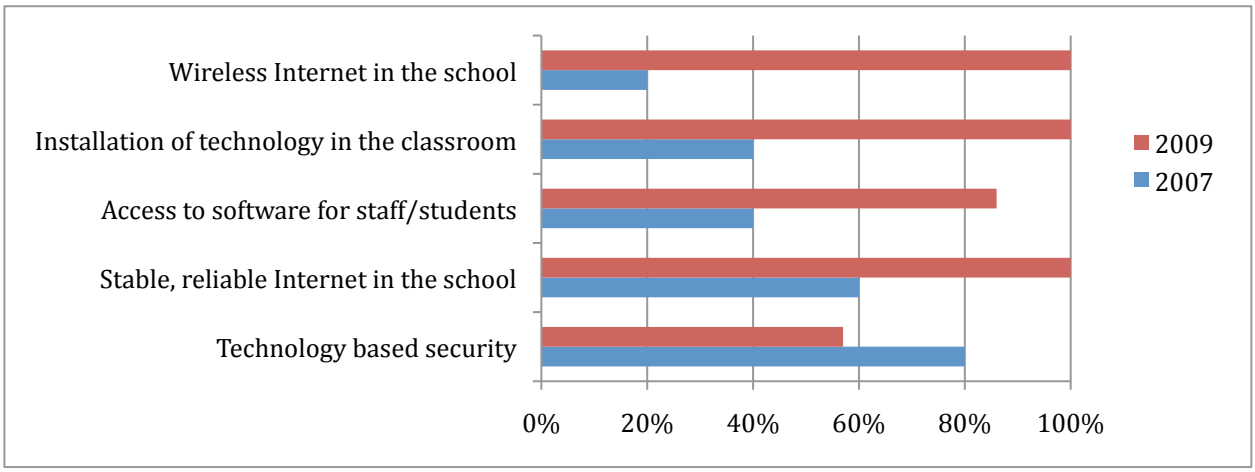
Note: Percentage of administrators who reported that these infrastructure aspects were "on target" or "above their expectations."

Most administrators agree with the technology staff and 84 percent rate the quality of access to hardware and software as on target or above expectations, representing an increase of 9 percentage points from 2007. Overall, 43 percent of technology personnel state that they have seen positive change as regards technical problems, and 100 percent have seen significant change as regards consistency of Internet connection and reliability of infrastructure and equipment.

Access at the School and Classroom Level

Access to technology at the school and classroom level has increased in a number of areas. Most notably, all technology personnel (100 percent) report that the wireless Internet in the schools is on target or above their expectations, compared to only 20 percent who said that in 2007. In addition, they report that technology installation into classrooms was on target or above expectations—an increase of 60 percent points from 2007. Figure 6 highlights how other areas of technology access have changed over time.

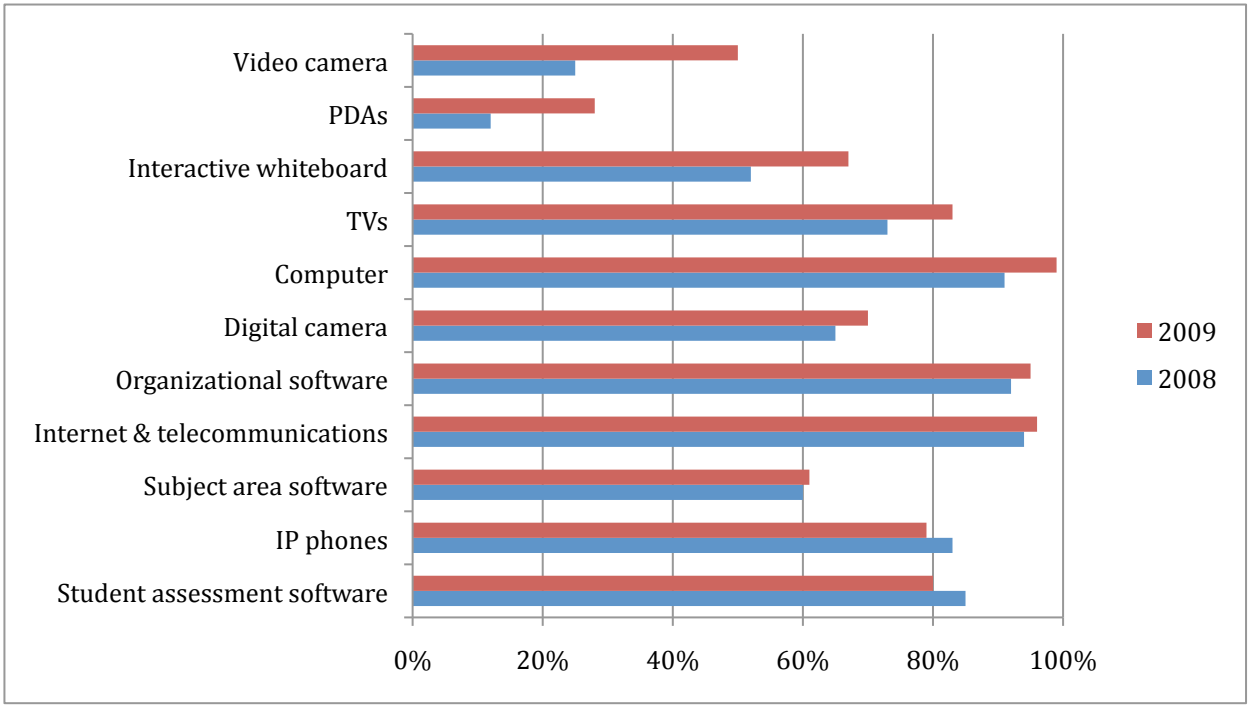
Figure 6: Staff assessment of technology access at the school



Note: Percentage of technology personnel that reported access was either "on target" or "above their expectations."

In addition to what administrators and technology personnel report, Forrest County teachers have access to a wide array of technological tools and software. A majority of teachers had access to computers (99 percent), Internet and telecommunications (96 percent), organizational software (95 percent), televisions (83 percent), and IP phones (79 percent) in their classrooms. The biggest increase in access has been for video cameras (25 percentage points), PDAs (16 percentage points) and interactive whiteboards (15 percentage points). See Figure 7 below for more details about teachers' access over time.

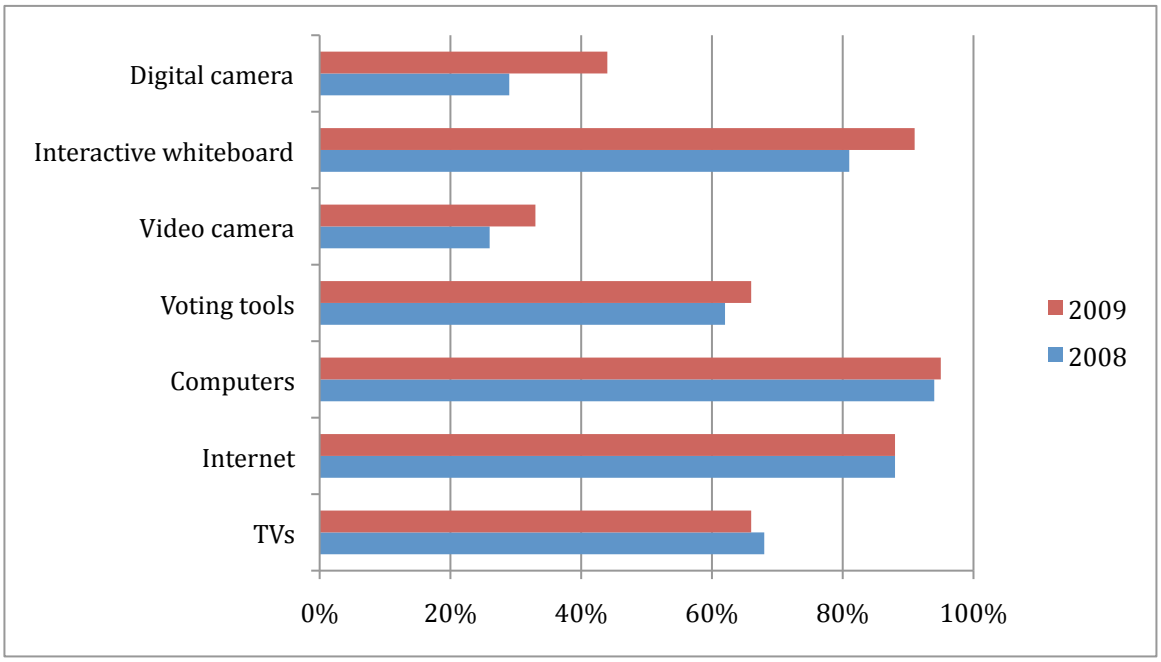
Figure 7: Teacher access to tools and software



Students in Forrest County report having access to a wide range of technology tools in their classrooms; those that seem to be most prominent are computers (95 percent of students have

access), interactive whiteboards (91 percent), the Internet (88 percent), and televisions (66 percent). The biggest increases in access since 2008 are for digital cameras (15 percentage points) and interactive whiteboards (10 percentage points) (see Figure 8).

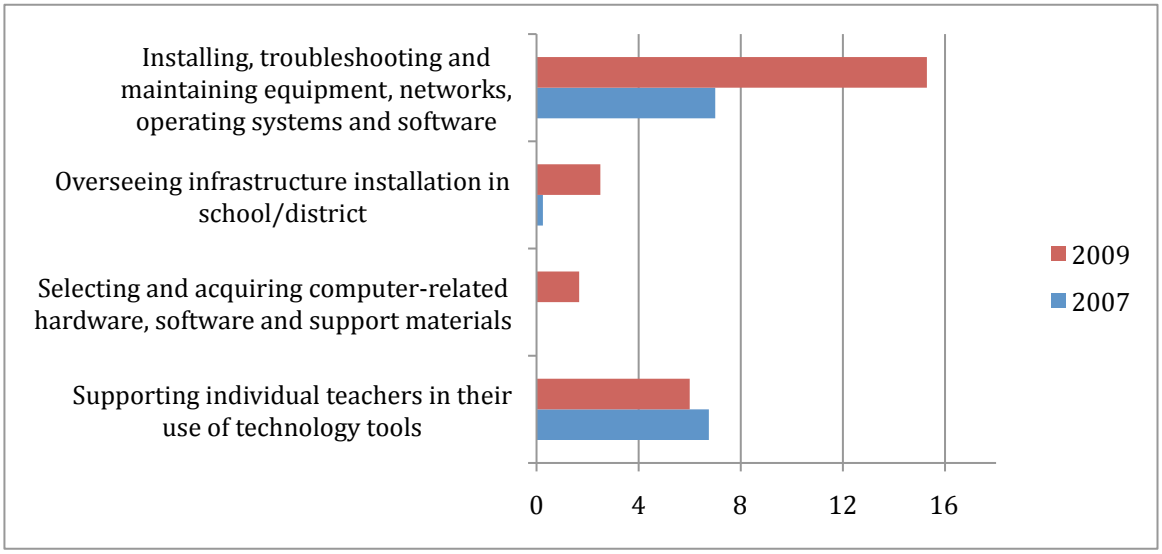
Figure 8: Student access to technology



Technical Support

Fifty-seven percent (57 percent) of technology personnel reported spending 15 hours or more per week installing, troubleshooting, and maintaining equipment. On average, they spend 6 hours per week supporting teachers in their use of technology tools. The biggest change in technical support was around troubleshooting and maintaining equipment (an increase 8.3 hours per week). Figure 9 shows how technology personnel spent their time between 2007 and 2009.

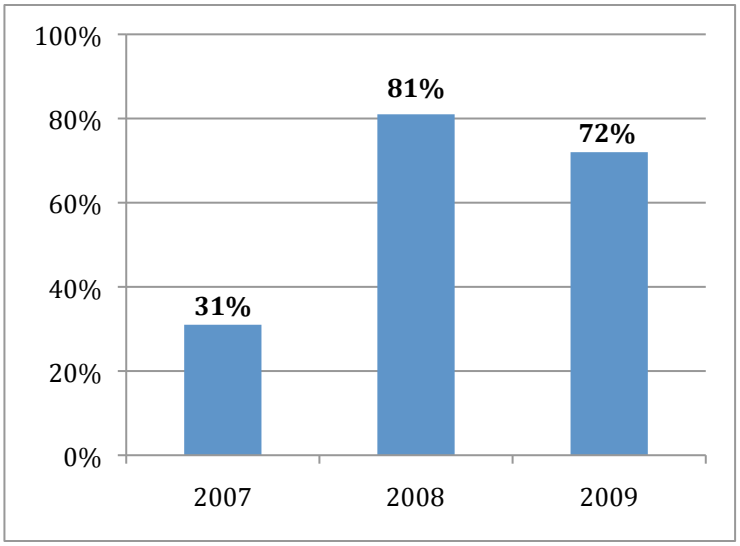
Figure 9: Average hours per week on technical support



In terms of access to technological support, the majority of teachers report that access to technical support (89 percent) and to instructional technological support (88 percent) was on target–above expectations. In 2007, 50 percent of administrators stated that technical support implementation was on target, and that number doubled to 100 percent in 2009.

All administrators (100 percent) stated that the support they had received from technology staff was very helpful. The percentage of teachers who felt that technical support was frequently or always available more than doubled from 31 percent in 2007 to 72 percent in 2009, although it dropped from 2008 to 2009. Figure 10 shows the change in technical support over time.

Figure 10: Availability of technical support 2007–2009



Note: Percentage of teachers who report that technical support is frequently or always available.

Connected District/School Challenges

Forrest County respondents had little to say in the way of challenges surrounding access to technology in their district. Two minor issues that can be addressed, include providing more consistent access to hardware for administrators and providing more computers for student use. Thirty-nine percent (39 percent) of teachers agree that they do not have sufficient access to computers for their students.

Connected Learning

The Connected Learning component of the Initiative is focused on providing high quality, professional development resources and programs, which are intended to improve leadership, streamline administrative practices, increase technology access and integration, and promote student-centered teaching and learning through technology. In addition to its focus on professional development, this component also aims to affect the general learning environment present in a district. This includes, but is not limited to, the quality and quantity of professional development, the type of pedagogical practices used in the classroom, and the level of student engagement as measured through classroom participation and everyday reading practices.

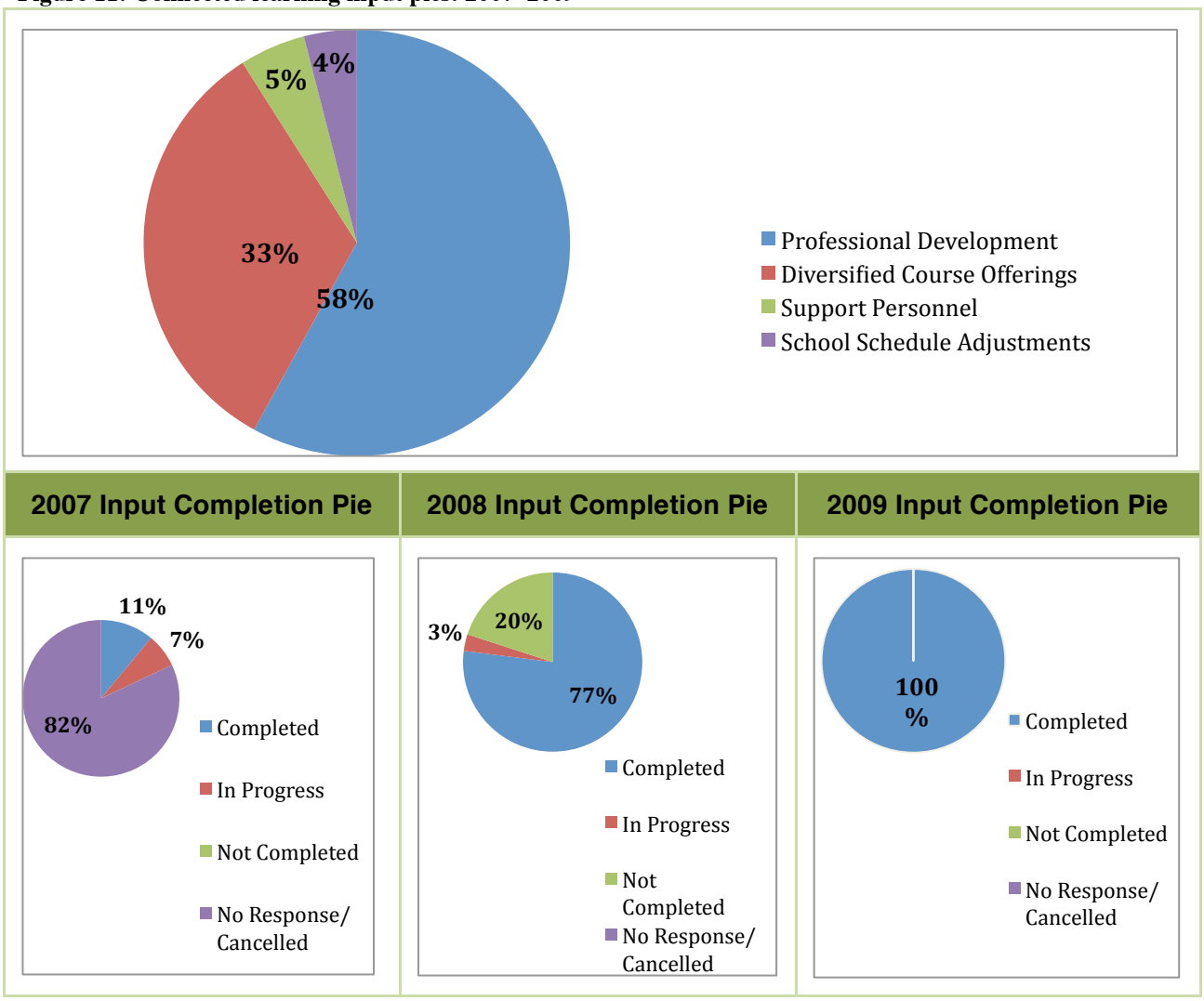
To better understand how this component has been impacted by the 21S Initiative, stakeholders were asked directly about their perceptions of the learning environment. The data below highlights areas such as teacher communication and collaboration, and administrative and school support. High

technology use and integration into the curriculum and external resources (e.g., experts, museums) are crucial for this component.

Forrest County had completed 100 percent of the Connected Learning inputs that it set out to put in place during the 2008–2009 school year. Cumulatively over the course of the Initiative, 58 percent of the district's Connected Learning inputs were related directly to providing professional development for its teachers and administrators. The biggest focus of professional development in Forrest County was around pedagogy and instruction. Staff attended seminars presented by companies such as Understanding By Design, Education Trust, Marzano's Engaged Learning, and International Center for Leadership in Education. Because of an increase in AP courses offered to students, there were a number of subject-specific trainings for individuals wishing to teach those classes. There was also significant technology training for teachers, including IC3 training as well as workshops around tools and software, such as the interactive whiteboards and SuccessMaker software.

Offering more diverse courses was also an important component of the Connected Learning inputs (33 percent). Forrest County schools chose to offer AP classes for science and math, as well as more RAMP-UP courses in language arts and math. There has also been an emphasis on preparing students for college, with an increase in funding for college level courses as well as an emphasis on dual-enrollment classes. Figure 11 shows how Connected Learning inputs were distributed and at what rate they were completed over the course of the Initiative.

Figure 11: Connected learning input pies: 2007–2009



Administrator and Technology Training and Support

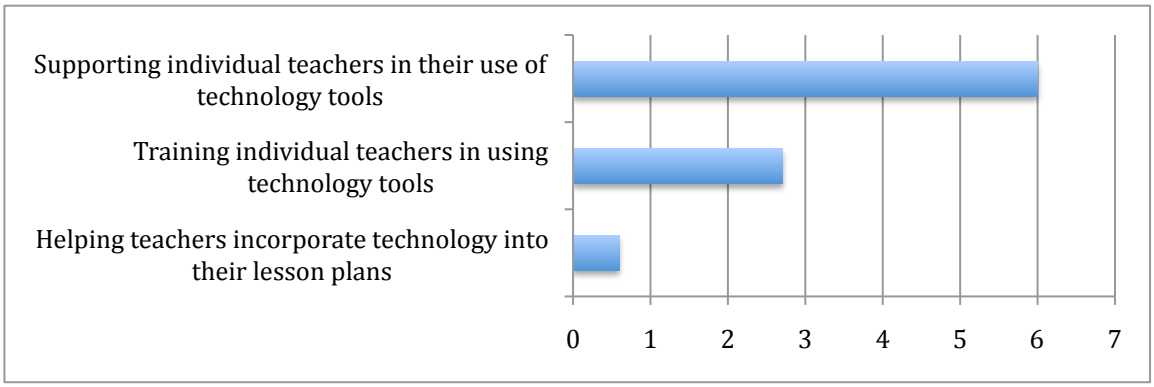
The majority of administrators (83 percent) report seeing significant change in the quality and amount of professional development provided for them regarding technology training. While only 29 percent of technology personnel report seeing significant change, the level of their satisfaction was high for the training they did receive. Eighty-six percent (86 percent) report that training for technology staff was on target or above their expectations. The majority of training for technology personnel (80 percent) came from conferences or was provided internally by their district. In terms of quality of this training, 60 percent characterized the district trainings as very helpful, while 40 percent said that the conferences were very helpful. Not only were the trainings helpful, 83 percent of technology staff stated that the trainings were an appropriate length, and that there was adequate follow-up support afterwards.

Teacher Technology Training & Ongoing Support

Technology personnel spend considerable time per week supporting teachers: 72 percent spent 6 hours per week on average supporting teachers. The same number (72 percent) spent 2.5 hours per week on average training teachers to use technology tools. As per assisting teachers to incorporate

technology into their lesson plans, 60 percent reported that they spent on average 1/2 hour per week. Figure 12 shows the average time spent per week on each task.

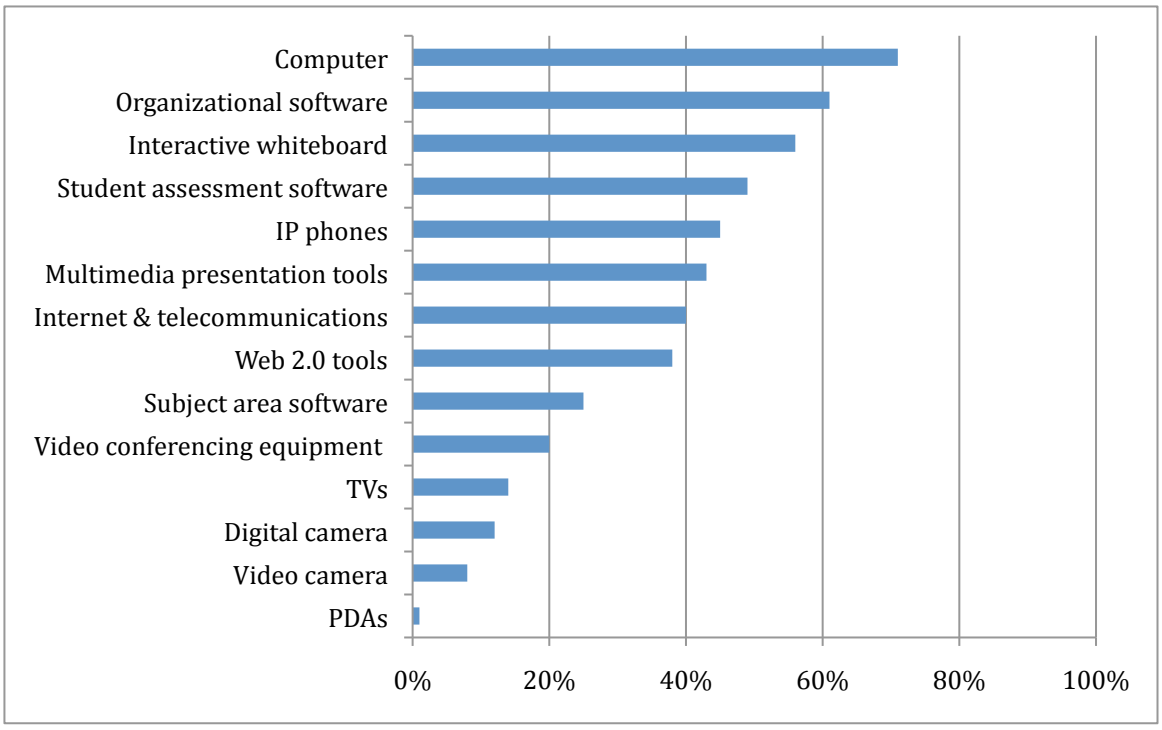
Figure 12: Number of hours per week spent on teacher support by technology personnel (2009)



DOT interns also provide technology support to teachers. The majority of teachers (71 percent) have worked with DOT interns. The most common collaboration reported by teachers was around hardware and software troubleshooting (41 percent), though some also worked with the interns to integrate technology into lesson plans (28 percent), do Internet research (28 percent), and receive training on software (26 percent).

Besides the ongoing weekly support, teachers reported on the specific training they received for various technology tools. The most common training received by Forrest County teachers was around computers (71 percent) and interactive whiteboards (56 percent). Figure 13 shows the variety of technology training received in 2009.

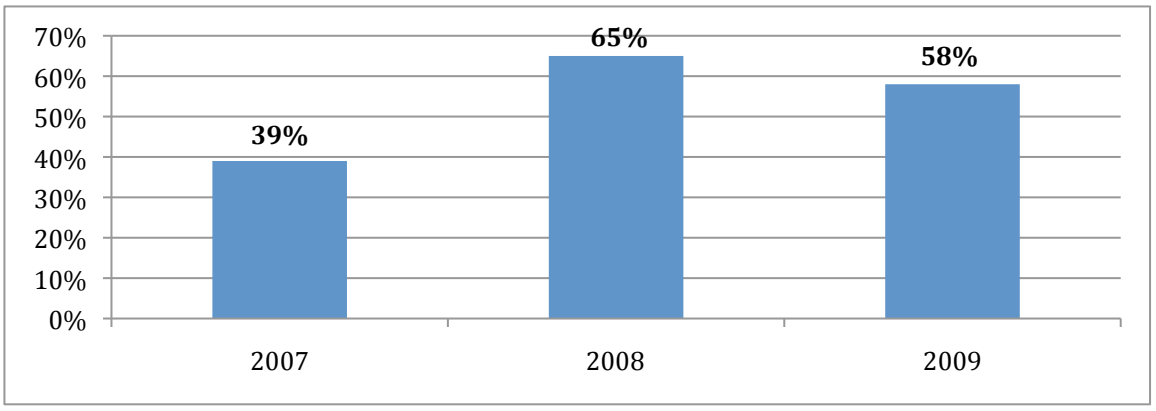
Figure 13: Teacher technology training received (2009)



Teachers report varying levels of satisfaction with the trainings they received from different sources. The trainers who were perceived as most helpful by the most teachers were other classroom teachers (60 percent), school-level technology specialists (52 percent), and district-level technology specialists (51 percent). For the most part, these figures are on par with 2008 data, with the ratings for district-level technology specialist standing out: 12 percent more teachers found this particular training very helpful, compared to last year (2008).

There has been an increase in the availability of technology support since the inception of the 21S Initiative. Since 2007, the percentage of teachers who felt that instructional support was frequently or always available increased by 19 percentage points, although it decreased between 2008 and 2009. Figure 14 shows the change in perceived availability over time.

Figure 14: Instructional support availability



Note: Percentage of teachers who report that instructional support is frequently or always available

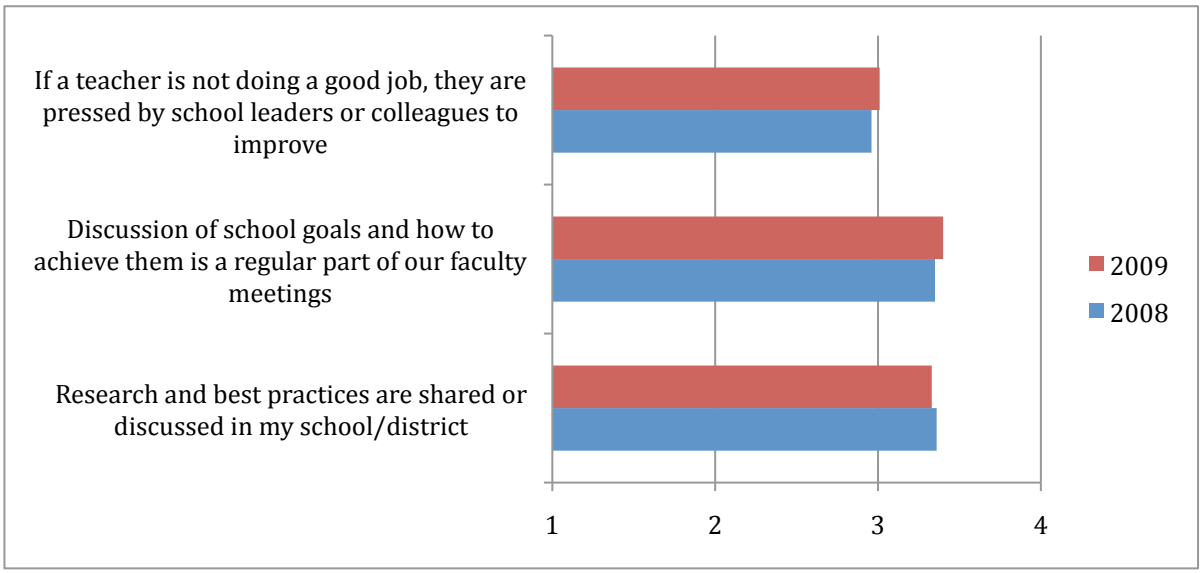
Impact of Professional Development

To assess the impact of the professional development resources and programs offered to administrators, teachers, and students, EDC researchers looked at administrative support, management and data use, teacher technology use, student technology use, pedagogical practices, technology integration, and communication and collaboration.

Administrative Support

Teachers' perceptions of administrative support have remained consistently positive over time. A majority of teachers agree that research and best practices are shared in their school (95 percent), that the discussion of school goals and how to achieve them is a regular part of faculty meetings (94 percent), and that if teachers are not doing a good job, they are pressed by colleagues to improve (82 percent). Additionally, 70 percent of teachers agree that they have sufficient administrative support to effectively integrate technology into their lessons. Figure 15 shows change in teacher perceptions of administrators' support over time.

Figure 15: Administrative support as reported by teachers (2009)



Note: Participants indicated how much they agreed or disagreed with statements on a scale from 1 (strongly disagree) to 4 (strongly agree). Higher scores indicate greater agreement.

Management and Data Use

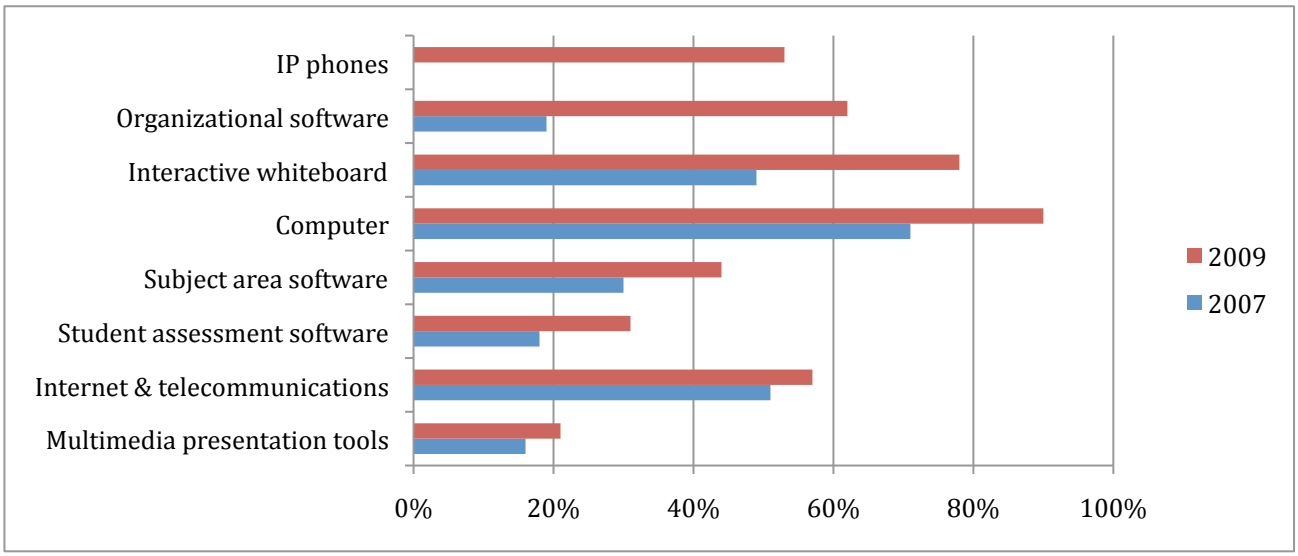
Most administrators (83 percent), and, to a lesser degree, technology personnel (50 percent) report seeing significant change in administrative efficiency, including data collection, analysis and dissemination and the use of data to inform decisions. A smaller percentage of technology personnel agree that those areas had been impacted by the Initiative.

Forty percent (40 percent) of teachers report that they are never expected to use data to inform instructional practices, but an overwhelming number of teachers (96 percent) believe that teachers in their school used data to inform their instructional practices.

Teacher Technology Use

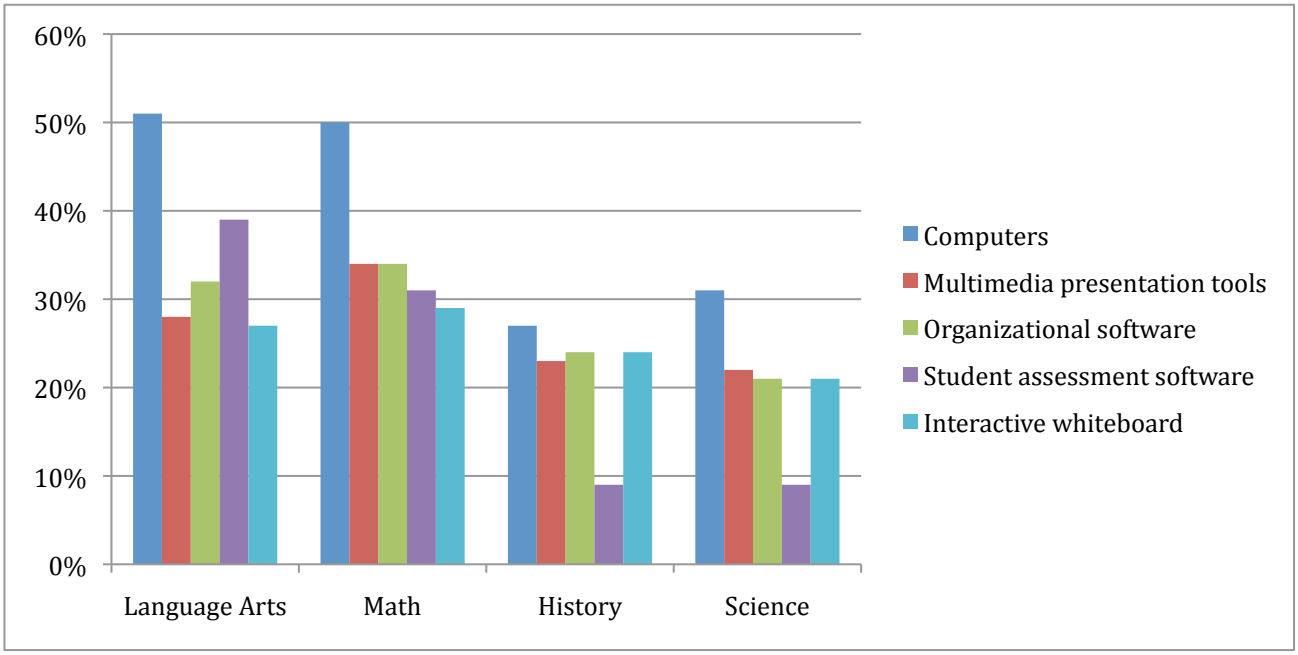
Teachers use a variety of technology tools in their classrooms. Although they are used with varied frequency, some tools are more likely to be used on a daily basis. The highest percentage of teachers use the following tools every day: computers (90 percent), interactive whiteboard (78 percent), organizational software (62 percent), and Internet and telecommunications (57 percent). The districts saw the largest increases (2008–2009) in usage of IP phones (from 0 to 53 percent), and organizational software (43 percentage point increase). See Figure 16 for the change in use for other technology tools and software.

Figure 16: Percentage of teachers who use the tools on a daily basis



Teachers were also asked how often they use technology tools in math, language arts, science, and history. Across subjects, the most commonly used technology tools were computers, organizational software, interactive whiteboards, student assessment software, and multimedia presentation tools. In general, the highest percentage of teachers use technology tools in language arts, and the smallest percentage use them in science. Figure 17 shows teachers' use of technology tools by subject area in 2009.

Figure 17: Percentage of teachers' use of technology tools by subject area (2009)

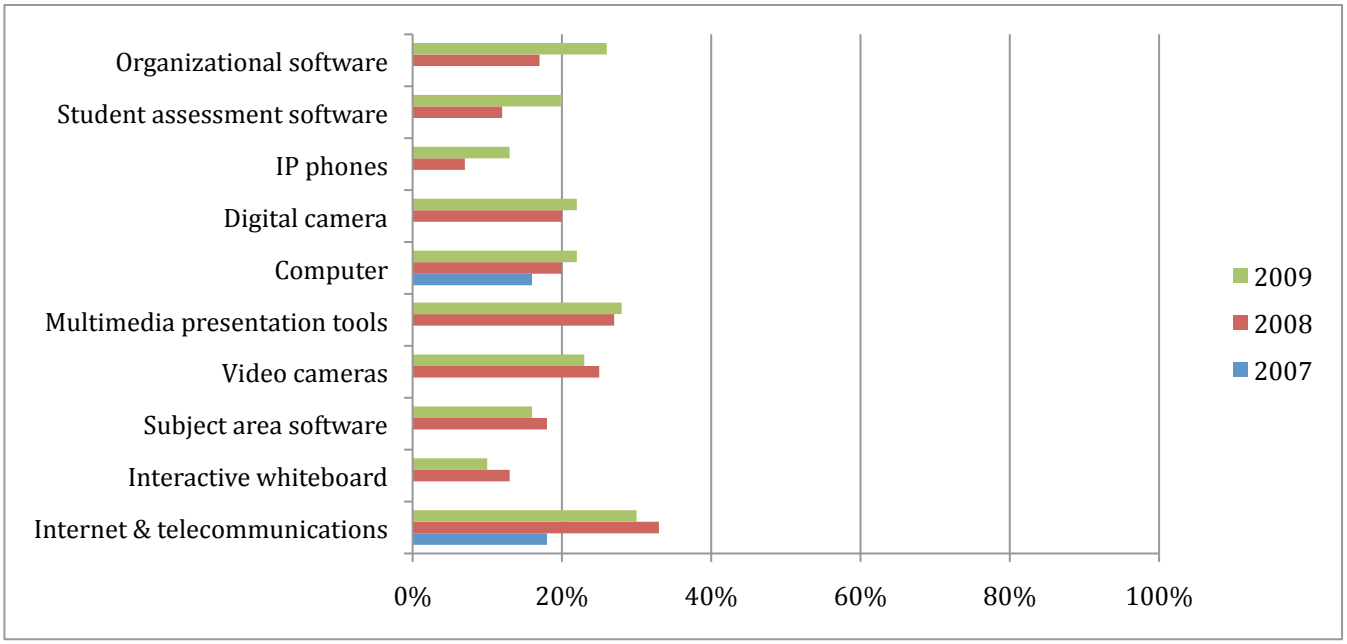


Teachers were asked to rate their own level of expertise using a variety of technology tools and software. While reported levels varied across the type of technology and the variety of software, in general, more teachers identified themselves as intermediate than either expert or novice. In 2009, the largest percentage of teachers (who had access to these technologies) indicated that they were at

either the expert or intermediate level in using televisions (95 percent), Internet and telecommunications (90 percent), computers (90 percent), video cameras (86 percent), and organizational software (85 percent).

The percentage of teachers who considered themselves experts increased for several technology tools in the past two years. The tools with the most notable changes were both organizational and student assessment software with 9 and 8 percentage points increases, respectively. See Figure 18 for more details. With several tools, there was a decrease in the number of those reporting as experts; this may be attributable to the much larger respondent rate among teachers this year.

Figure 18: Teachers' technology expertise over time



Note: 2007 data was only available for computers and Internet and telecommunications.

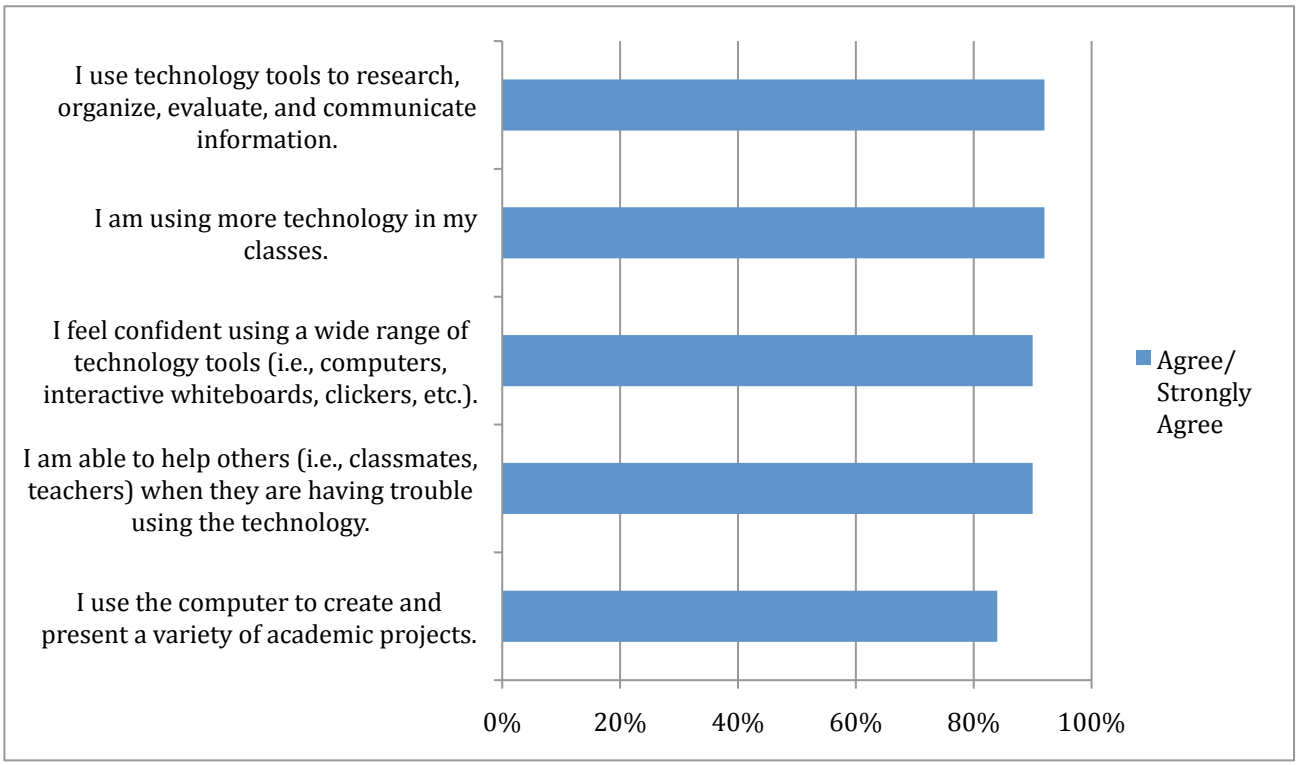
Student Technology Use

Like teachers, students use a variety of technology tools in their classes. The ones that many students use on a daily basis include computers (81 percent, an increase of 19 percentage points from 2008), interactive whiteboard (80 percent), and the Internet (57 percent, an increase of 9 percentage points from 2008).

While students report using technology in a wide array of subjects, they cite the following as classes where technology is used on a regular basis: math (83 percent), history–social studies (68 percent), English–language arts (67 percent), and science (52 percent). From 2008 to 2009, there was a 22 percentage point decline in the number of students who use technology in science.

All administrators (100 percent) and 71 percent of technology personnel believe that students' ICT literacy has improved as a result of participating in the Cisco 21S Initiative. In general, students agree that they are using more technology in their classrooms, and that they feel confident using a wide range of tools. They also feel comfortable helping others. For example, 92 percent of students agree that they are using more technology in their classes, and that they use tech tools to research, organize, evaluate, and communicate information. Additionally, 90 percent agree that they feel confident using a wide range of tech tools, and 84 percent agree that they use computers to create and present a variety of academic projects (see Figure 19).

Figure 19: Student ICT literacy



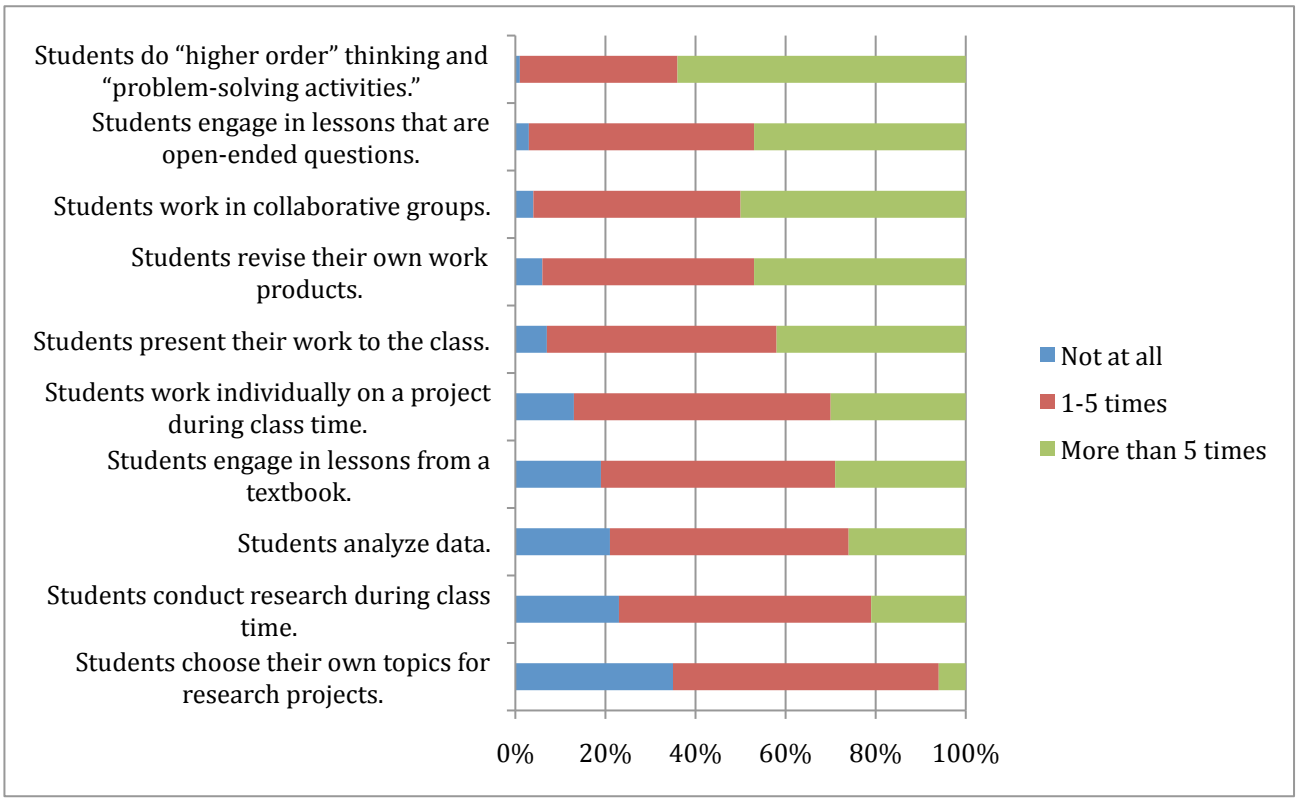
Pedagogical Practices

The Connected Learning program component of the Cisco 21S Initiative also aimed to influence teacher pedagogy and teaching styles. The goal was to shift teachers towards a constructivist teaching approach. Constructivism is an approach to teaching and learning based on Jean Piaget's belief that students learn by fitting new information together with what they already know. Constructivist teaching puts the students at the center of the classroom, where the teacher acts as a facilitator of student exploration, synthesis, and social interaction. Subsequently, learners develop their own understanding through carefully designed and supported learning experiences.

Many administrators (67 percent) and technology personnel (57 percent) have seen a positive change in the overall quality of teaching since the implementation of the Cisco 21S Initiative. On average, teachers scored a 3.06 on the pedagogy scale (0= traditional vs. 5=constructivist), indicating a slightly more constructivist than traditional pedagogy. Of the teachers who responded to the survey, only 2 percent received a 0 on the pedagogy scale, indicating that they endorsed all five traditional pedagogy statements. In contrast, 16 percent of teachers received a 5 on the pedagogy scale, indicating that they endorsed all five constructivist pedagogy statements.

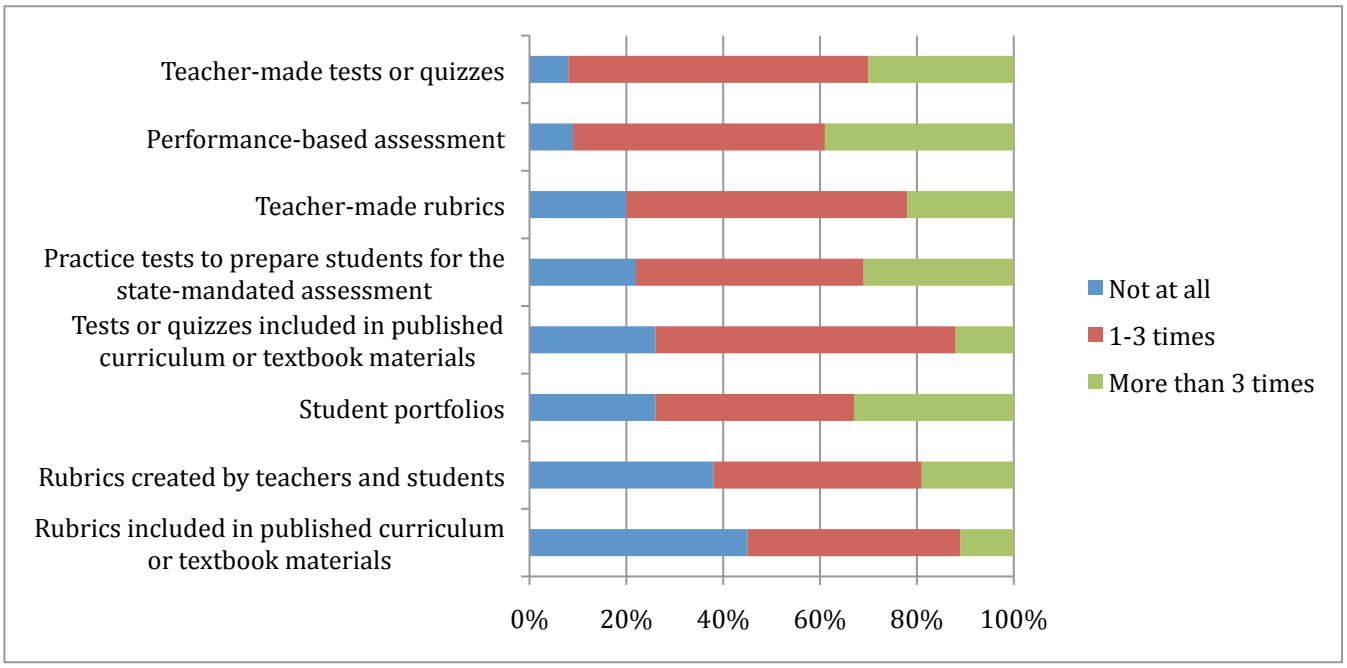
Teachers utilize a variety of instructional techniques in their daily and weekly teaching practices. Forrest County teachers reported on the frequency with which they use particular teaching and assessment techniques in a typical two-week period. The most frequently used in Forrest County include having students use higher order thinking skills (99 percent) and engage in lessons that are structured around open-ended questions (97 percent). Teachers also frequently have students work in collaborative groups (96 percent) and allow them to present their work to the class (93 percent) (see Figure 20). In many of these areas, teachers have employed these practices more frequently than in 2008.

Figure 20: Teaching practices



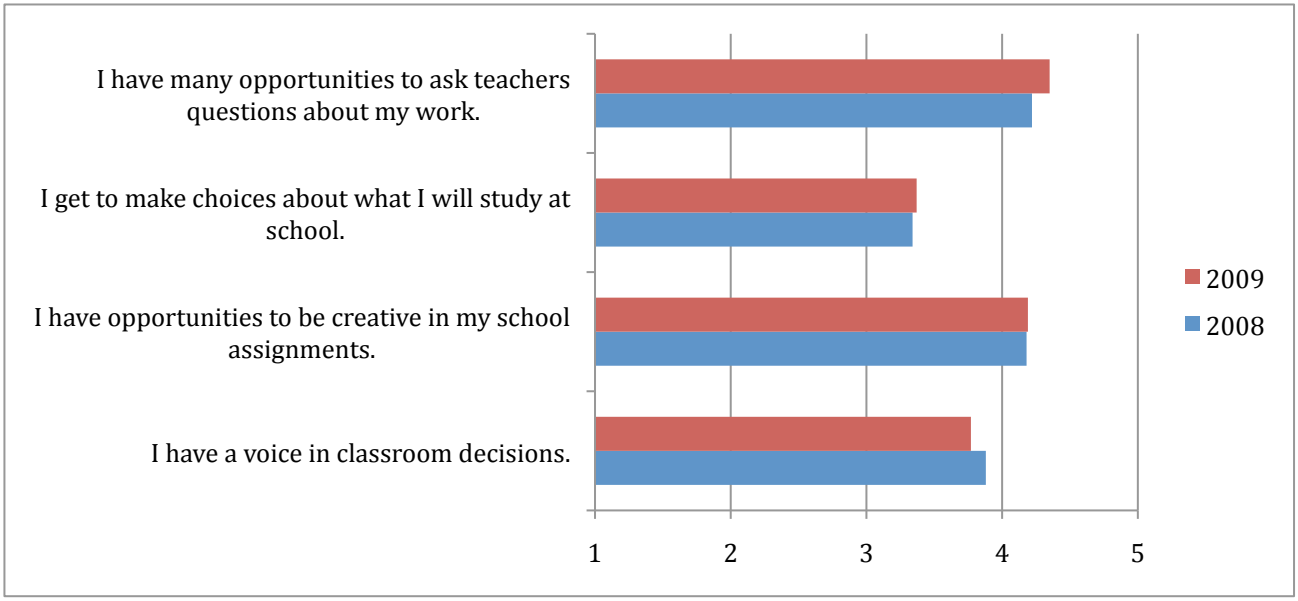
The assessment techniques that are most commonly used at least once in a two-week period include teacher-made tests and quizzes (92 percent), performance-based assessments (91 percent), teacher-made rubrics (80 percent), and practice tests to prepare students for the state-mandated assessment (78 percent) (see Figure 21).

Figure 21: Teacher assessment practices



FCSD students were also asked several questions about the role they play in their classrooms. Overall, students agree that they are active participants in their learning, indicating that they have opportunities to ask teachers questions and to be creative in their schoolwork. They also agree that they have a voice about what happens in the classroom and about what they want to study. These numbers have remained relatively consistent over the past two years (see Figure 22).

Figure 22: Student agency in the classroom



Note: Participants indicated how much they agreed or disagreed with statements on a scale from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicate greater agreement.

Technology Integration

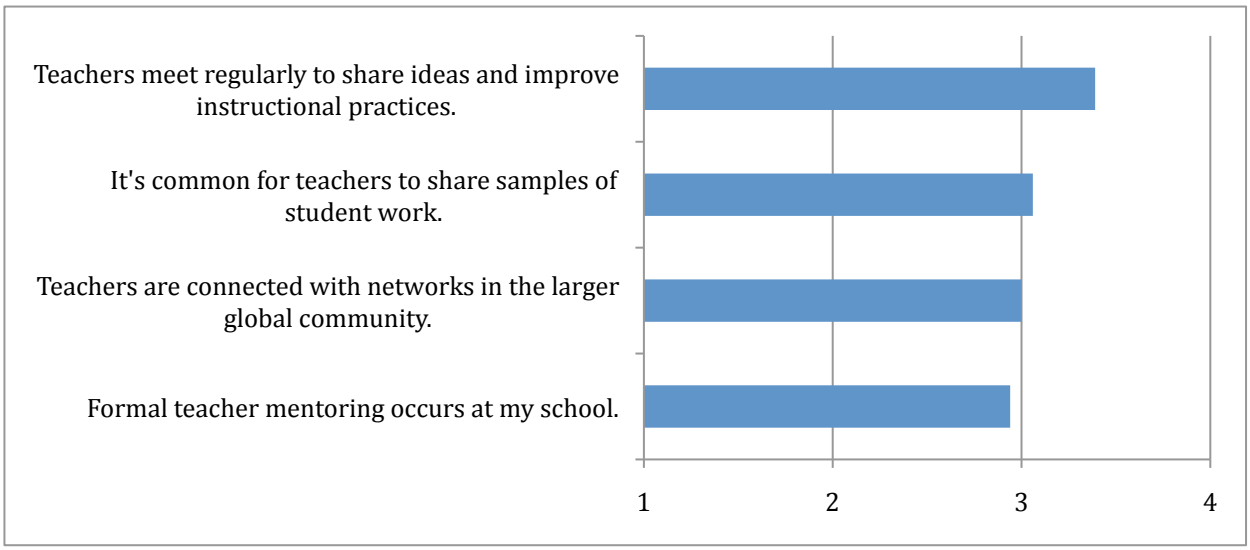
The ability of teachers to integrate technology into their daily lesson plans is a vital component of the 21S Initiative. Although only about 45 percent of teachers said they were highly proficient or approaching high proficiency in their ability to integrate technology into their teaching practices, 78 percent of teachers reported using technology in their classes in 2009, an increase of 11 percentage points since 2007. These statistics are in part related to the fact that 75 percent of teachers in Forrest County agree that they are provided sufficient support to integrate new practices into their teaching.

Administrators and technology personnel share similarly positive sentiments about the quantity and quality of technology integration in their district. All technology personnel (100 percent) report that technological integration into curriculum has been on target (an increase of 20 percentage points from 2008), while only 50 percent of administrative respondents agree. Overall, most technology personnel (86 percent) and administrators (83 percent) have noted significant change in technological integration into curriculum.

Communication and Collaboration

Many of the administrators (67 percent) and technology personnel (71 percent) surveyed agree that there has been significant change in teacher collaboration over the course of the Initiative. Teachers report a high level of agreement on four unique measures of collaboration, indicating that they frequently meet to share ideas and improve instructional practices (95 percent), interact with global networks (80 percent), share samples of students' work (79 percent), and mentor each other (73 percent). Additionally, 75 percent of teachers agree that they have role models in their school for integrating technology into their teaching, representing a 52 percentage point increase from 2007. Figure 23 shows where Forrest County teachers fall on a four-point scale.

Figure 23: Teacher communication and collaboration

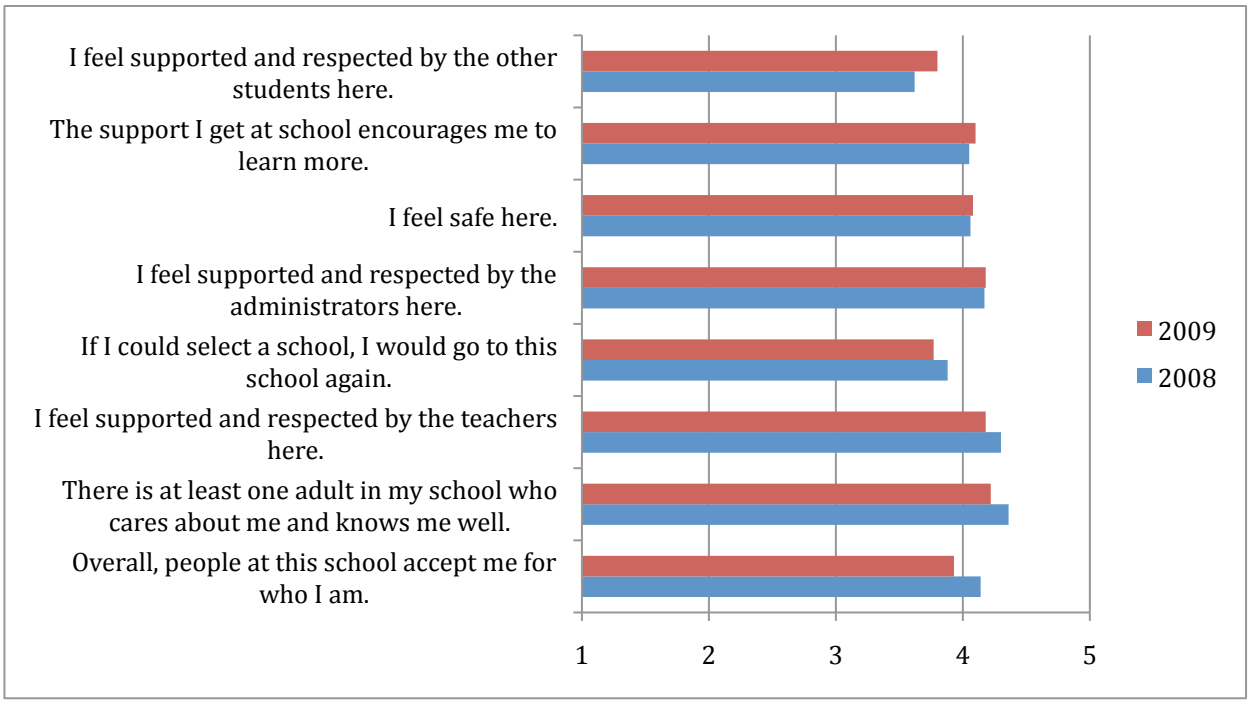


Note: Participants indicated how much they agreed or disagreed with statements on a scale from 1 (strongly disagree) to 4 (strongly agree). Higher scores indicate greater agreement.

Forrest County teachers were asked to report how often during a typical two-week period of instruction they communicate with students using six different methods of communication. The *most commonly* used form of communication was using the Internet to post lesson plans (56 percent) and student assignments (41 percent).

The amount of communication and collaboration present in the learning environment can impact students' perceptions of support. Forrest County students were asked to respond to eight statements about the amount of support available to them in their schools. Most students agree that they have at least one adult in their school who cares about them (81 percent) and that, overall, people in their school accept them for who they are (71 percent). Additionally, many also agree that they feel safe at school (75 percent), and they feel supported and respected by teachers (77 percent), administrators (82 percent), and their peers (66 percent). Student responses were relatively consistent over time. Figure 24 outlines more specific measures of student perceptions of school support.

Figure 24: Students' perceptions of school support



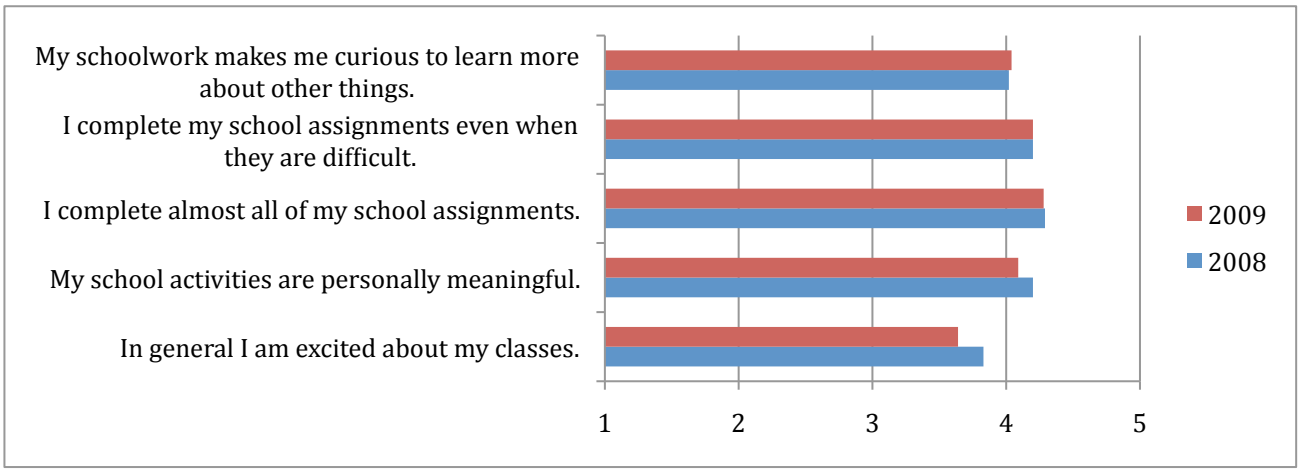
Note: Participants indicated how much they agreed or disagreed with statements on a scale from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicate greater agreement.

Impact on Students

Student Engagement and Motivation

The majority of teachers (88 percent), administrators (100 percent), and students (88 percent) agree that students have become more engaged in their classes. More specifically, students were asked a series of statements assessing their engagement in classroom activities. Generally, Forrest County students report fairly high levels of engagement in their classes and schoolwork. More specifically, many report that they are learning more on their own (82 percent) and that they actively participate in class (87 percent). Recent data are similar to that from 2008 (see Figure 25).

Figure 25: Student engagement over time



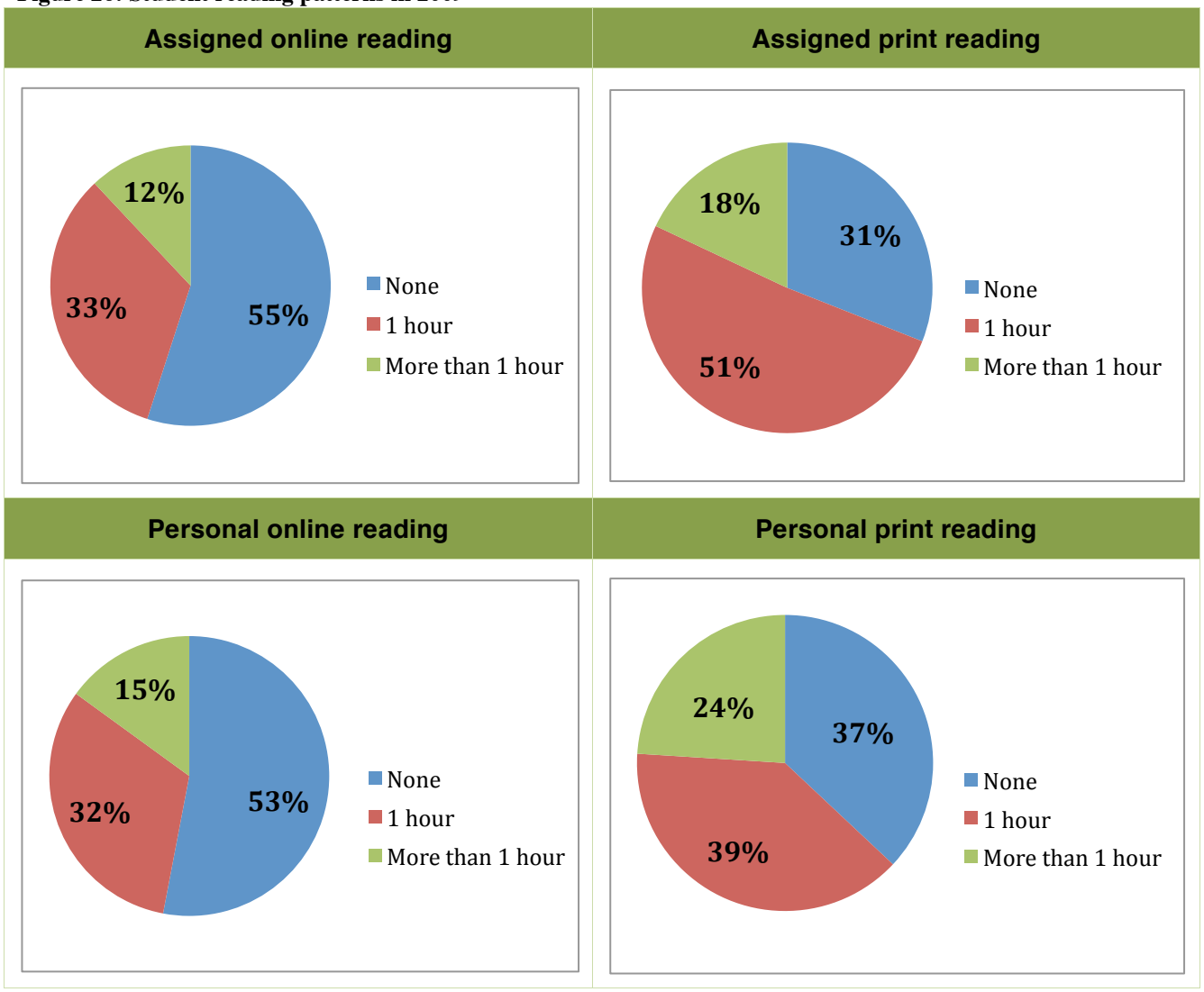
Note: Participants indicated how much they agreed or disagreed with statements on a scale from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicate greater agreement.

Interest in Reading

Another impact indicator beyond classroom participation is increased reading levels. In 2008, 39 percent of students reported reading more than 1 hour a day, and that number jumped to 44 percent in 2009.

The following pie charts show on average how much personal and assigned reading students do each week. It also distinguishes print from online reading. As the data indicate, more time is spent on assigned print reading and personal print reading. Assigned print reading is still more common than assigned online reading. Figure 26 compares types of reading.

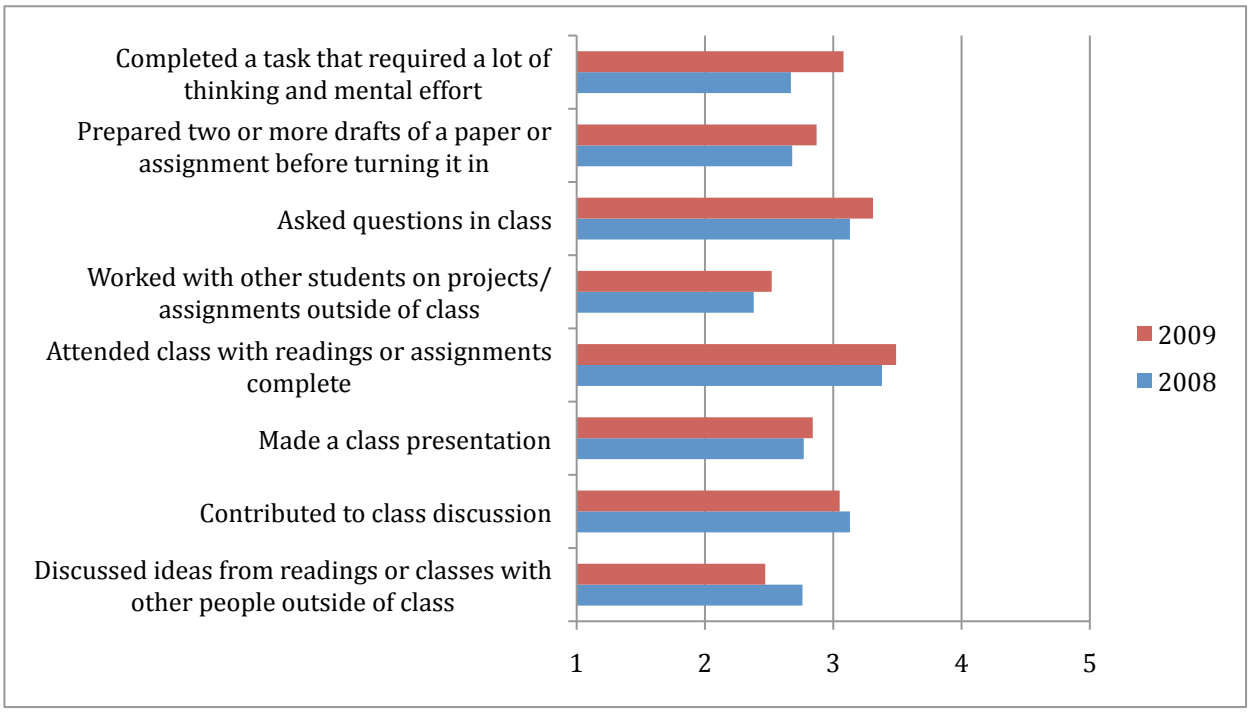
Figure 26: Student reading patterns in 2009



Class Participation

Teachers were also asked to report on student participation in their classes. Sixty-four percent (64 percent) of teachers reported that at least 70 percent of students ask questions in class about the lesson. According to students, class participation has remained stable. More students report completing tasks that required a lot of thinking and mental effort, preparing two or more drafts of a paper or assignment before turning it in, and asking questions. Figure 27 depicts how students' ratings of participation have changed over time.

Figure 27: Class participation over time



Note: Participants indicated how much they agreed or disagreed with statements on a scale from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicate greater agreement.

Participation in Math and Science Fairs

The number of students participating in math and science fairs at the district level increased between 2005–2006 and 2006–2007 but then decreased slightly in the following years. The number of student entries in contests, specifically the reading fair, has steadily decreased over the past four years (see Table 9 for more details).

Table 9: Student participation in math and science fairs over time

	2005–2006	2006–2007	2007–2008	2008–2009
Number of students participating in math–science fairs at the district level	221	262	234	217
Number of entries to student contests (reading fair)	128	93	90	71

Behavior Incidents

The number of classroom behavior incidents, absences, late arrivals, and suspensions dropped in Forrest County between the 2005–2006 and 2008–2009 school years. However, the number of expulsions has increased since last year. Table 10 provides more information about students' behavior incidents.

Table 10: Behavior incidents

Number of	2005–2006	2006–2007	2007–2008	2008–2009
Classroom behavior incidents	1,448	3,771	3,278	1,064
Absences	19,597	20,605	23,328	5,516
Late arrivals	5,570	7,842	12,036	6,521
Detentions	130	2,066	1,729	480
Suspensions	434	627	517	166
Expulsions	16	6	3	12

Test Scores–Academic Performance

To understand how students' scores on standardized tests may have been affected by the 21S Initiative, EDC researchers collected and analyzed district and state test scores. The test scores that were examined include the Mississippi Curriculum Test (MCT), the Mississippi Curriculum Test 2 (MCT2), and the Subject Area Testing Program (SATP) (see definitions of MCT, MCT2, and SATP in Box 1).

Box 1: What are the MCT, MCT2, and SATP?

The MCT was based on the Mississippi state standards and used to test student proficiency in three subject areas: reading, English and math. The test was administered to students in grades 2–8.

In 2007, the test was updated to align with the revised 2006 language arts and 2007 mathematics frameworks. It is now called the MCT2 and is administered to students in grades 3–8. The areas of language arts and math are tested.

Results from both tests are grouped into four achievement levels: minimal, basic, proficient, and advanced.

High school students participate in the SATP, which tests proficiency in the areas of English, algebra I, biology I and U.S. history. The test measures how well students are meeting the state's grade level expectations. Students must pass the SATP to graduate from high school.

SATP results are scored between 0 and 500, with 300 and above considered to be a passing score.

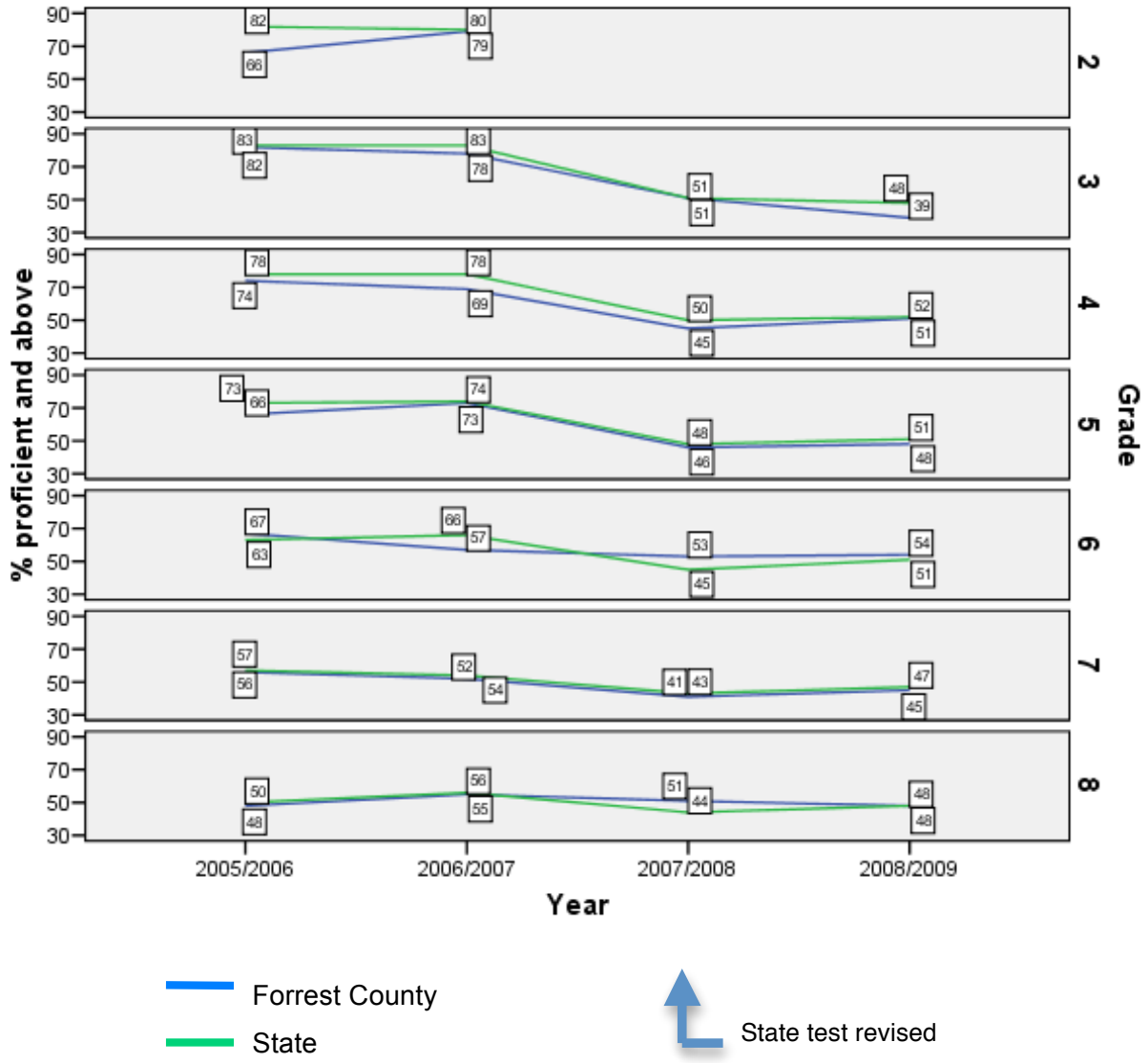
EDC researchers examined patterns of change across testing years for both FCSD and the state overall. The Mississippi Curriculum Test (MCT) and Subject Area Testing Program (SATP) were updated in 2007–2008. These changes make it difficult to compare scores across 2006–2007 and 2007–2008. Therefore, in our analysis, we focus on patterns of change between 2007–2008 and 2008–

2009. To compare the position of Forrest County's test scores relative to state scores, state scores are also included in the graphs.

Language Arts MCT–MCT2

Overall, there have been increases in the percentage of Forrest County students scoring proficient or above on the language arts MCT2. Between 2007–2008 and 2008–2009, the percentage of students scoring proficient or above increased in four of the six grades tested. The largest increase was for fourth-grade students with an increase of 5 percent. There were slight declines for third- and eighth-grade students. In general, students across the state outperformed Forrest County students in 2009. The two exceptions to this pattern were at the 6th and 8th grades, where Forrest County students either outperformed or scored at the same level as students across the state (Figure 28).

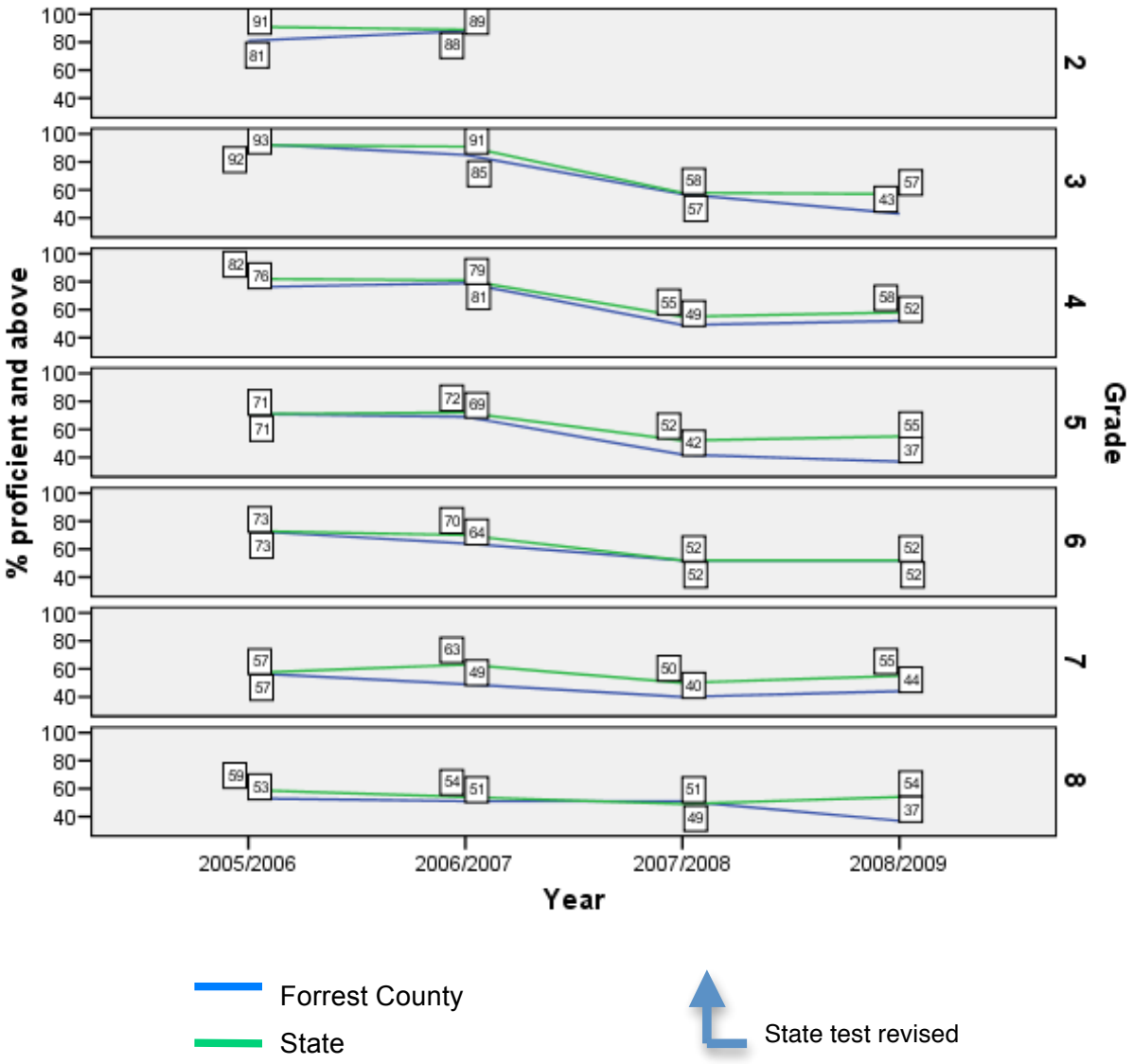
Figure 28: Language arts MCT and MCT2 (percent proficient and above)



Mathematics MCT–MCT2

Between 2007–2008 and 2008–2009, there have been increases in the percentage of Forrest County students scoring proficient or above in two of the six grades tested. The largest increase was for seventh-grade students, where the percentage of students scoring proficient or above increased by 4 percent. There was no change for sixth-grade students and decreases for third, fifth, and eighth graders (see Figure 29).

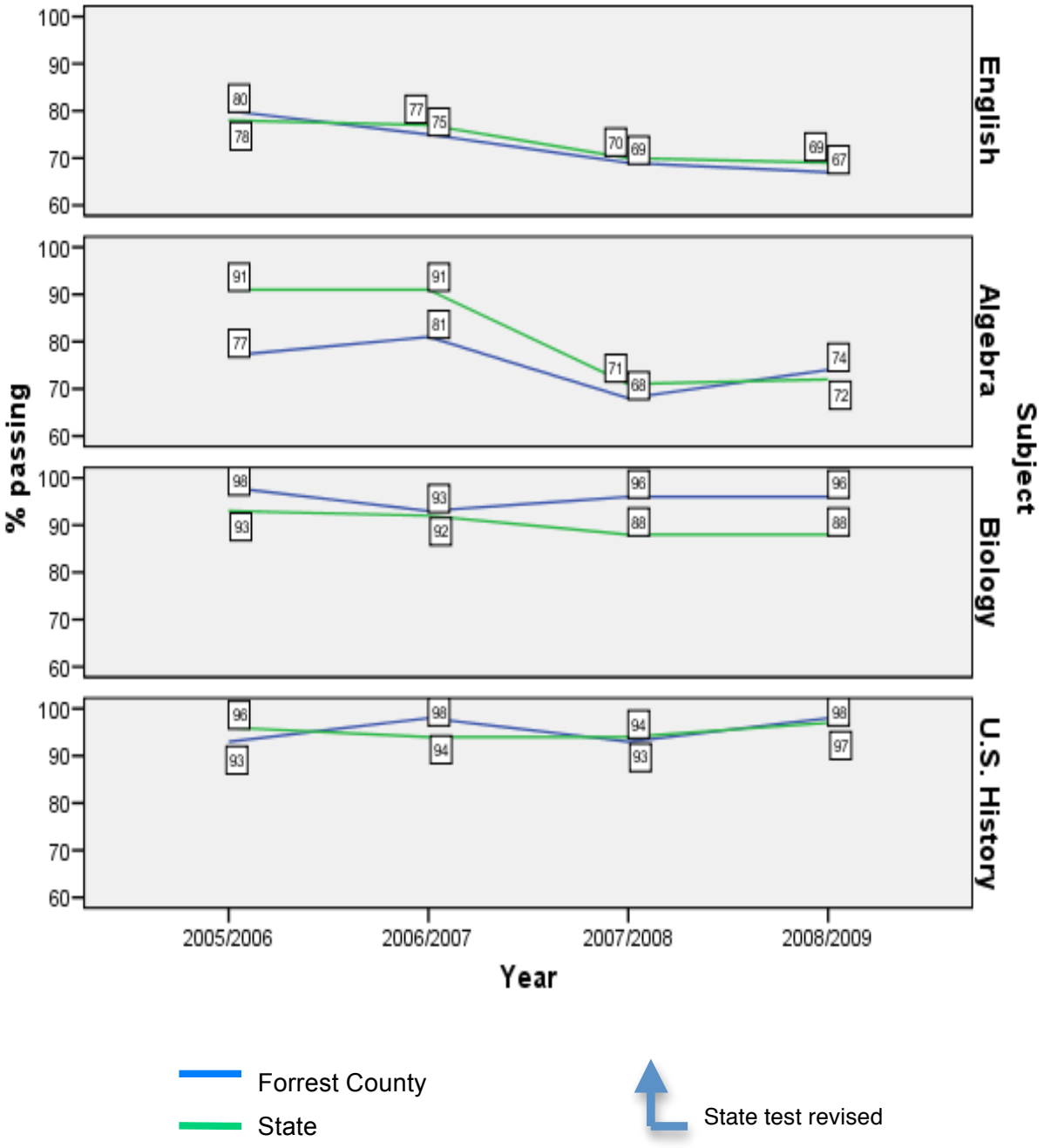
Figure 29: Mathematics MCT and MCT2 (percent proficient and above)



SATP

There have been increases in the percentage of Forrest County students receiving passing scores on two of the four SATP subject tests, specifically, the algebra and U.S. history tests. There was no change on the biology test and a slight decrease on the English subject test. In addition, in 2009, Forrest County students outperformed their peers across the state on the algebra, U.S. history, and biology tests (see Figure 30).

Figure 30: SATP (percent passing)



In addition to the test scores, 88 percent of students believe that they are writing more effectively, compared to 79 percent who reported the same in 2008. Additionally, 90 percent of students believe that the Initiative has impelled them to think more deeply and critically, compared to 76 percent who reported the same in 2008. Additionally, 66 percent of teachers believe that their students' abilities are comparable to those of other students across the nation.

Students report increased interest in their educational aspirations. When asked how far they thought they could go in terms of their education, 29 percent mentioned a college degree (up from 14 percent in 2008), and 49 percent mentioned a graduate degree or advanced professional degree (up from 29 percent in 2008).

Grade Promotion and Graduation

FCSD remained relatively stable in terms of student dropout between 2005–2006 and 2006–2007, and the high school graduation rate slightly decreased between 2005–2006 and 2007–2008. However, the percentage of students moving on to the next grade level has steadily increased between 2005–2006 and 2007–2008. Table 11 provides more information about grade promotion and graduation.

Table 11: Grade promotion and graduation

	2005–2006	2006–2007	2007–2008
Number of students moving on to the next grade level	2,319	2,327	2,284
Percent of students moving on to the next grade level	93%	95%	96%
Number of students who dropped out	11	10	**
Number of students receiving diplomas*	55	48	49
Percent high school graduates	89%	88%	87%
Number of students receiving GED	1	0	4

* This includes certificates and occupational diplomas.
** Data not available.

College Acceptance and Scholarships

The number of students accepted to two- and four-year colleges has increased from 47 in 2005–2006 to 50 in 2007–2008. There have been relatively few students accepted to trade or vocational schools over the past three years. In addition, the number of students receiving scholarships has remained stable at 23 between 2005–2006 and 2007–2008. Table 12 provides more information about the district's college acceptance and scholarship rates.

Table 12: College acceptance and scholarships

	2005–2006	2006–2007	2007–2008
Number of students receiving scholarships	23	23	23
Percent of students accepted to college receiving scholarships	48%	48%	45%
Number of students accepted to 2- and 4- year colleges	47	46	50
Number of students accepted to trade or vocational school	1	2	1

College and Workforce Readiness

The majority of teachers and administrators are confident that students are better prepared for college (80 percent, same for both) and the workforce (83 percent, 80 percent, respectively). Similarly, a large number of students are confident that they are better prepared for college (84 percent) and future employment (89 percent).

According to the district, the number of students taking AP courses decreased slightly in 2006–2007 but then increased in 2008–2009. However, no students have taken AP subject tests in the past three years. In 2005–2006, the ACT participation rate in the FCSD was 80 percent, with students achieving a composite score of 18.9, which decreased in 2006–2007, and then increased in 2007–2008. Table 13 provides more results about the FCSD's college entrance exams.

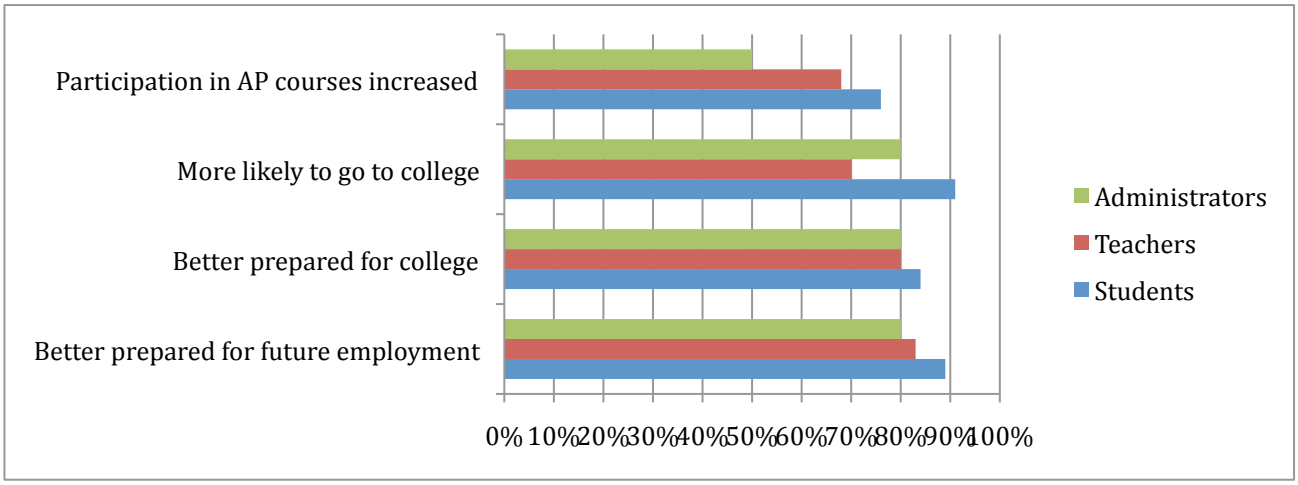
Table 13: College entrance exams

	2005–2006	2006–2007	2007–2008
Percent ACT participation rate	80%	79%	**
ACT composite score (District)	18.9	18.2	18.8
ACT composite score (State)*	18.7	18.9	18.9
Number of students taking AP courses	16	14	14
Percent AP test participation rate	0%	0%	0%

* Kids Count Data Center, 2009
** Data not available

Additionally, as a result of the Initiative, administrators (80 percent), teachers (70 percent) and students (91 percent) all agree that students are more likely to go to college. The same three groups believe that students will also be better prepared when they get there. Figure 31 shows comparisons across constituent groups.

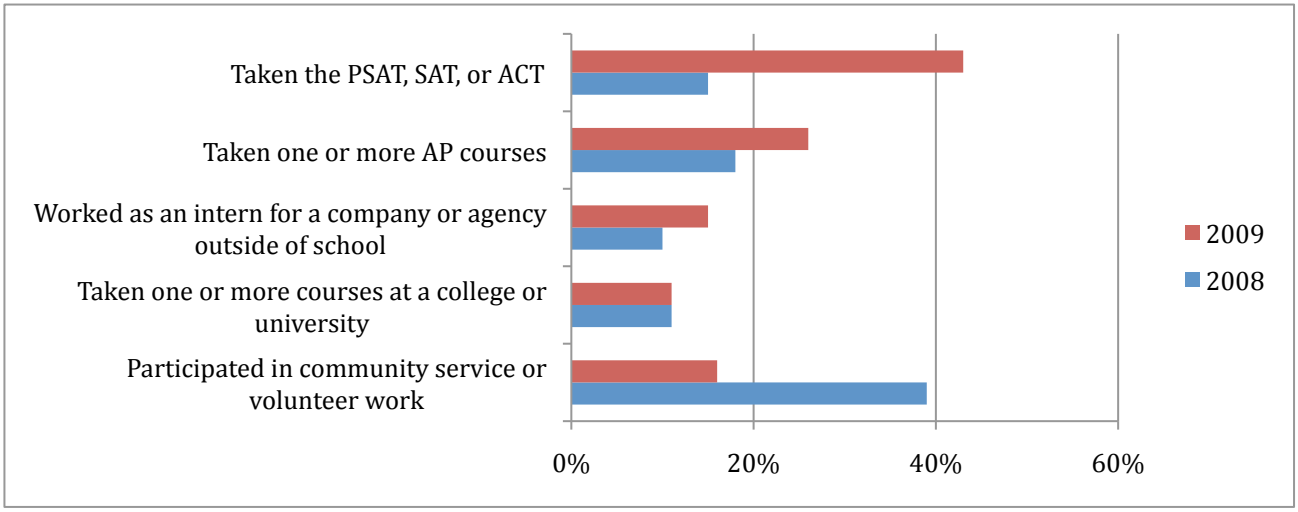
Figure 31: College and workforce readiness



Note: Participants indicated how much they agreed or disagreed with statements.

Many students have participated in college preparatory–related activities this year. The most prominent among these were gaining work experience (51 percent, not reported in Figure 32), and taking the PSAT, SAT or ACT (43 percent). Far fewer students participated in community service in 2009 than 2008 (23 percent point drop). See Figure 32 for more details.

Figure 32: College prep over time



Connected Learning Challenges

Few technology personnel (14%) received training on how to integrate technology into the curriculum. Additionally, no technology personnel received training around security administration, network and wireless management, and team building. Fifty-seven percent (57 percent) of the technology staff reported lack of adequate technology staffing as a great challenge.

Sixty-six percent (66 percent) of administrators characterize the following as challenges: providing sufficient technical professional development, getting teachers to integrate technology into their lesson plans, and changing antiquated teaching philosophies.

Connected Community

Community Outreach

An integral piece of the Connected Community program component is the positive promotion of the relationship between the school district and parents and the community. FCSD's approach to the Connected Community component of the 21S Initiative is multifaceted and includes reaching out to education institutions, youth programs, businesses, and faith-based groups, as well as parents and other community partners. Figure 33 and Table 14 show the wide variety and type of community organizations involved in the district over the course of the Initiative.

Figure 33: Community partnership distribution

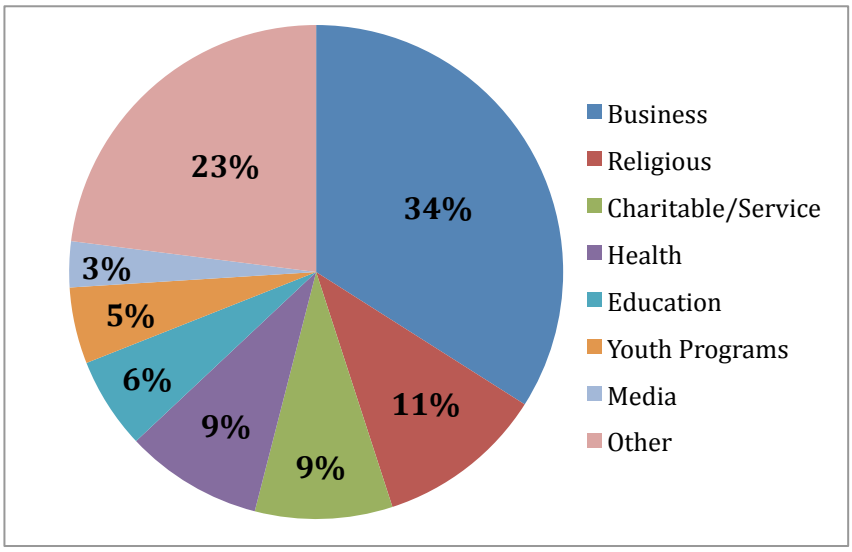
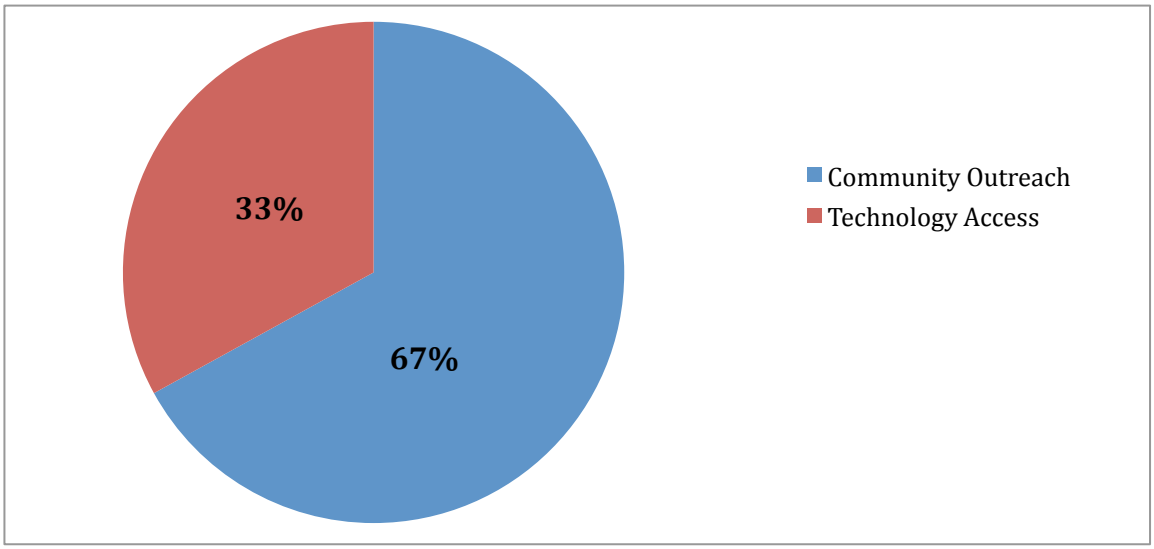


Table 14: Forrest County community partnerships

Business	Health
Best Buy	Forrest General
Cici's Pizza	Hattiesburg Clinic
Cisco	Pine Belt Mental Health Resources
Coca-Cola	Pine Grove Recovery Center
Cracker Barrel	Rural Health Center
Dairy Queen	Southern Bone and Joint
Exxon Mobile	**Education**
Home Depot	Dubard School for Language Disorders
Lenny's Sandwich Shop	University of Southern Mississippi
Office Depot	USM Department of School Psychology
Pine Belt Oil	William Carey University
Plaid Rhino	**Youth Programs**
Po-Boy Express	Community Youth Football, Basketball, and Cheerleading
Popeye's	Boy Scouts
Sam's Club	Girl Scouts
Sonic	**Media**
South Mississippi Power	Hattiesburg American
Turtle Creek Mall	WDAM - TV
Wal-Mart	**Other**
Ward's	Camp Shelby
Warren Paving	Dixie Volunteer Fire Department
Wesley Retirement Center	DOT USA
Religious	DREAM
Dixie Baptist Church	FORDETRA
Dixie Methodist Church	Forrest County Board of Supervisors
Edwards Street Fellowship	Forrest County Multipurpose Center
First Priority	Forrest County Sheriff's Department
Hattiesburg Community Church	Forrest County Soil and Conservation
Maybank Baptist Church	Hattiesburg Arts Council
Rawls Springs Baptist Church	Hattiesburg Parks and Recreation
Charitable/Service	Hattiesburg Police Department
Area Development Partnership	North Forrest Volunteer Fire Department
Concerned Citizens of Palmers' Crossing	Woodmen of America
Junior Auxiliary	YMCA
Lacey Post VFW	
MS Association of Gifted Children	
United Way	

The district uses outreach efforts to strengthen partnerships, increase parent involvement, and improve the general ICT literacy of the community. The majority of Connected Community inputs in Forrest County are related to community outreach, including using surveys to gauge student and teacher satisfaction, community involvement, and the quality of public relations. Efforts were also made to work with universities to improve the mentoring program. The district has also begun offering after school computer lab access to both students and community members in an effort to increase ICT access and literacy. Figure 34 shows how the Connected Community inputs were distributed from 2007 to 2009.

Figure 34: Connected community input distribution pie: 2007–2009



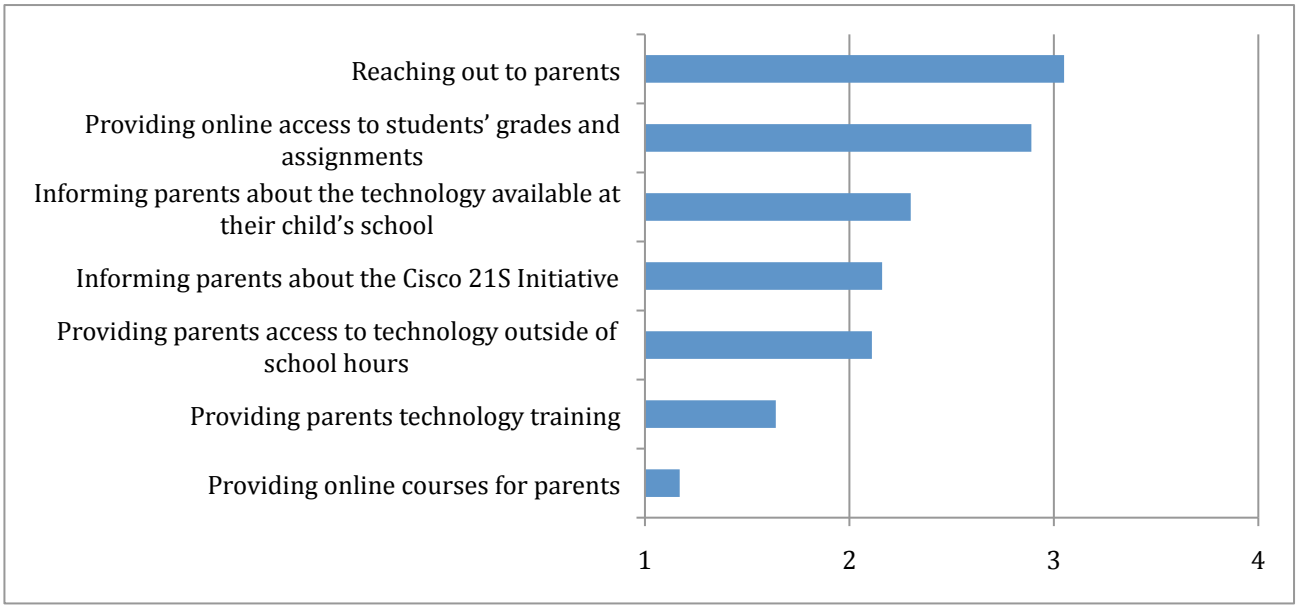
As evidence of an increased focus on connecting the community with the school, 83 percent of administrators agree that community members are included in the decision-making process when appropriate. There are diverse partnerships with community organizations; administrators report that the following exist with the school: faith-based (67 percent), businesses (50 percent), mentoring (50 percent), community health services (50 percent), childcare programs (33 percent), and scouts (33 percent).

In terms of interaction with the community, 50 percent of technology personnel report that they currently spend at least 1 hour a week to promote the use of technology at the school and in the community (in 2007, only 25 percent of technology staff spent this much time on this task).

Outreach to Parents

Parents are an important part of the school community and Forrest County teachers and administrators have made a concerted effort to ensure parent involvement at multiple levels. Parents were asked to rate the level of success of their child's school outreach to them. Figure 35 shows how parents rated various outreach efforts on a scale of 1 to 4. While satisfaction with general outreach and the provision of online access to student grades is high, there are a number of areas that could use improvement, including providing online courses and technology training for parents.

Figure 35: Success of school outreach



Note: Participants indicated how much they agreed or disagreed with statements on a scale from 1 (strongly disagree) to 4 (strongly agree). Higher scores indicate greater agreement.

Forrest County schools also utilize a variety of methods to communicate with parents. The most common methods as reported by parents include phone calls (77 percent), letters (75 percent), and the school website (74 percent).

In addition to those methods listed above, the district offers other resources and services as a means to increase parental involvement. Parents reported that their children's school offered activities and events outside traditional work hours (35 percent), technical support (26 percent), and outreach via office/staff (26 percent) to help increase their involvement.

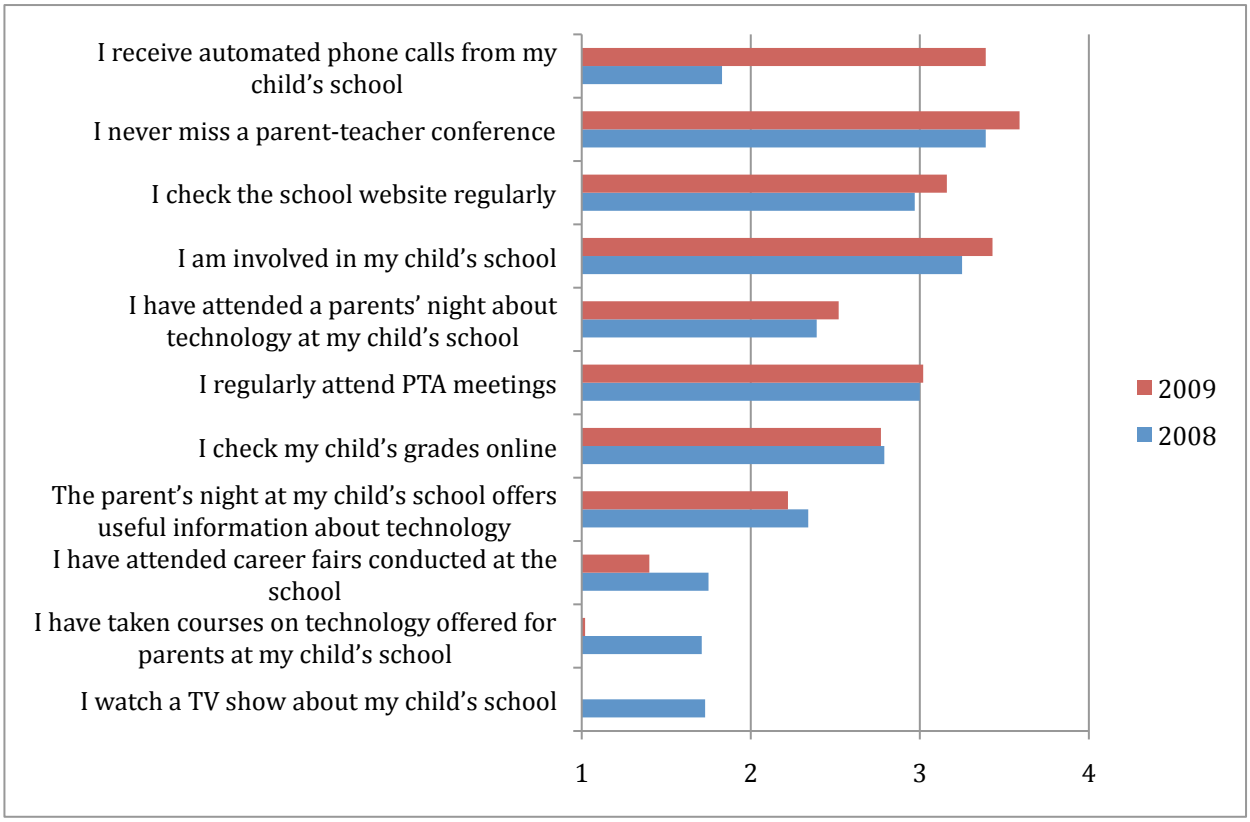
All administrators (100 percent) and 84 percent of teachers said that parents' ideas and opinions are actively sought out to inform decision-making when appropriate. In a typical two-week period of instruction, many teachers report speaking with parents on the phone (99 percent), meeting with parents face-to-face (91 percent), and e-mailing (41 percent). Fifty-seven percent (57 percent) report sending a newsletter home at least once in a two-week period.

Impact of School Outreach to Community and Parents

Eighty-three percent (83 percent) of administrators agreed that interaction with local institutes of higher learning has increased, although only 40 percent said that the support has been very helpful. Thirty-three percent (33 percent) of administrators saw significant change in school–community partnerships, while 50 percent of administrators noted significant change in district–community partnerships.

Parent involvement has also increased over time in a variety of areas. Most notably, more parents agreed that they are checking the school website regularly, and attending a parents' night about technology at their children's school. More parents also said that they regularly attend Parent Teacher Association (PTA) meetings and do not miss teacher conferences. Figure 36 shows the change over time of parent involvement.

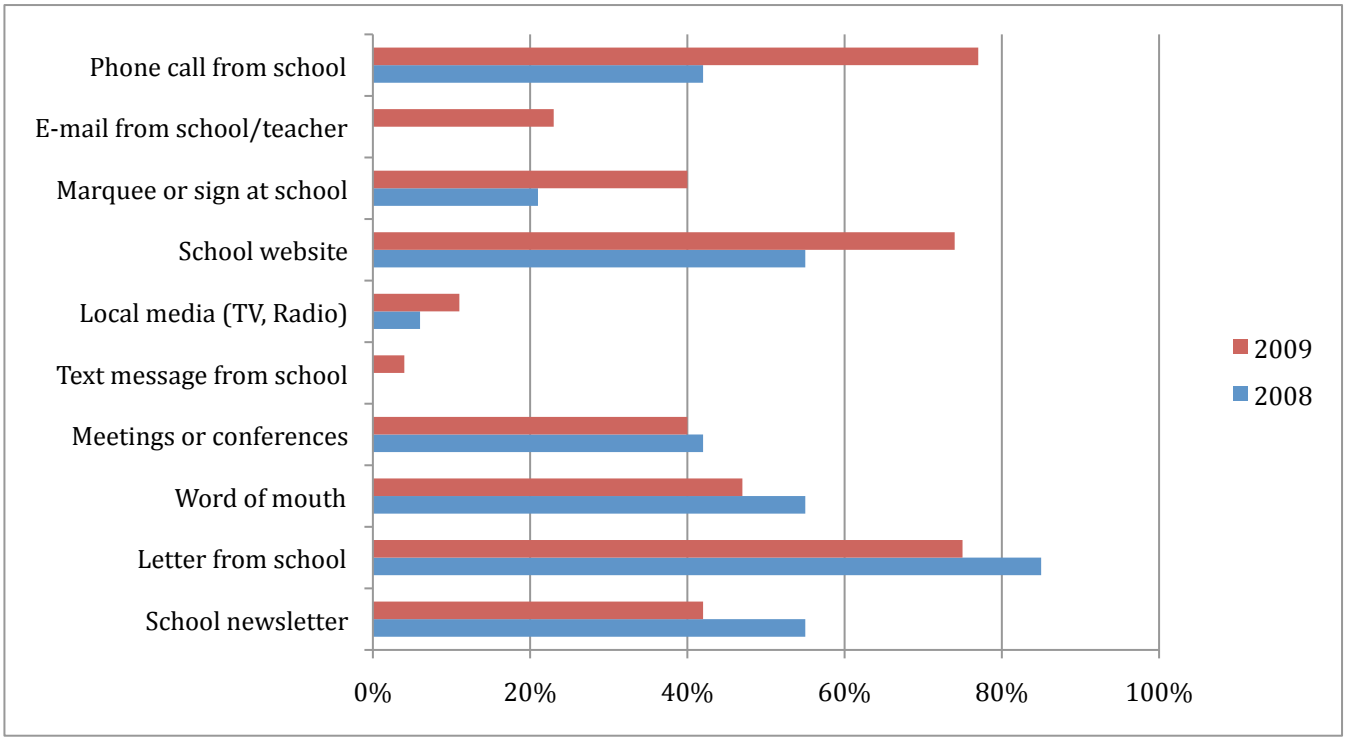
Figure 36: Parent involvement over time



Note: Participants indicated how much they agreed or disagreed with statements on a scale from 1 (strongly disagree) to 4 (strongly agree). Higher scores indicate greater agreement.

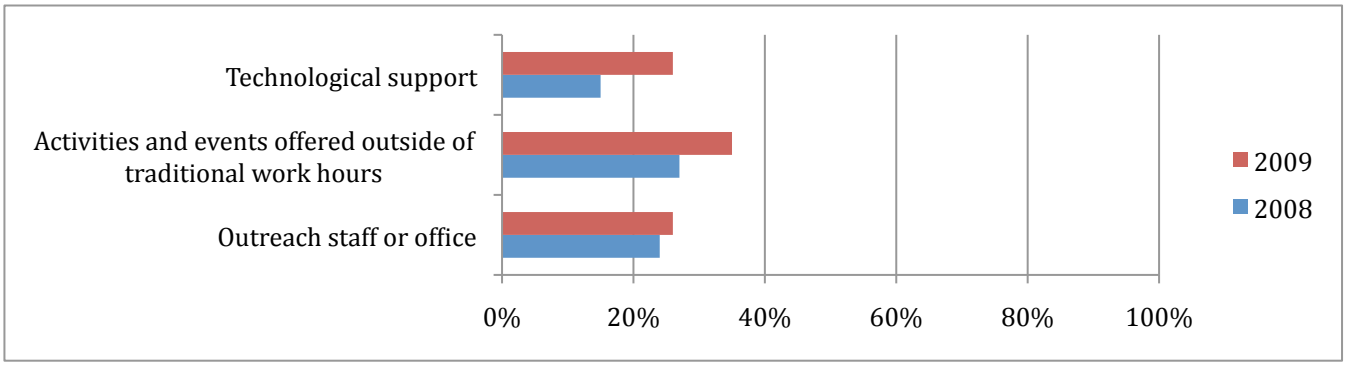
According to parents, there has been an increase in parental outreach by Forrest County Schools. Most notably, a variety of communication methods employed by the schools to keep parents informed has become more common. More parents are receiving phone calls and e-mails from their children's school. There has also been a huge increase in the number of parents who note that they use the school website to share information. See Figure 37 for more information about change in communication methods over time.

Figure 37: Communication methods used by school



From last year, there was an increase in the number of parents who reported a change in support resources offered by the school: the largest increases were around technological support and the planning of activities and events outside traditional work hours (see Figure 38).

Figure 38: Resources provided for parents



Eighty-four percent (84 percent) of administrators and 58 percent of teachers believe that parents are more interested in students' work, and 71 percent of technology personnel report seeing significant change in school-home communication.

Challenges of Connected Community

Sixty-seven percent (67 percent) of administrators note that it is a challenge to get more parents involved at the schools and community members involved in the programs.

While satisfaction with general outreach and the provision of online access to student grades is high, there are a number of areas that could use improvement, including providing online courses and technology training for parents.

System-Level Relationships between Inputs and Outcomes

In addition to reporting on the status of Cisco 21S program inputs (e.g., technology, professional development) and outcomes (e.g., college preparation, community perceptions), this summative evaluation report explores the relationships between these variables. This section of the report examines whether participants' ratings of implementation inputs are related to their ratings of outcomes.[3] For example, do teachers who report high levels of program implementation in their schools (input) also report high levels of targeted outcomes (e.g., school attendance, test scores)? This type of correlation analysis allows us to gain a better understanding of how specific inputs may influence outcomes.[4] This section of the report is organized around the following implementation inputs: Connected School, Connected Learning, and Connected Community.

Connected School Inputs: The Connected School inputs that are correlated with the most outcomes are access to (1) software, (2) wireless Internet services, and (3) stable, reliable Internet connections.

> *Access to software:* Teachers' ratings of access to software are positively correlated with 7 of the 19 outcomes examined. Access to software is most strongly correlated with a decrease in students' discipline problems and an increase in student engagement. Therefore, teachers who report greater access to software also report decreases in students' discipline problems and increases in student engagement.
>
> *Access to wireless Internet:* Teachers' ratings of access to wireless Internet are positively correlated with 5 of 19 outcomes. Having access to wireless Internet is most strongly correlated with students being better prepared for future employment. Teachers who report more access to wireless Internet also report that students are better prepared for future employment.
>
> *Access to stable, reliable Internet:* Teachers' ratings of access to stable, reliable Internet are positively correlated with 5 of 19 outcomes. Access to stable, reliable Internet is most strongly correlated with increased cooperation within the district. In fact, this outcome is strongly correlated with 4 of the 5 inputs examined. This suggests that access to Connected School inputs may be particularly beneficial for improving cooperation within the district.

Connected Learning Inputs: The Connected Learning inputs that are correlated with the most outcomes include (1) communication and collaboration between teachers, (2) administrative support, and (3) access to technical support.

> *Communication and collaboration:* Ratings of the amount of communication and collaboration that occurs between teachers are positively correlated with 18 of the 19 outcomes. Communication and collaboration are most strongly correlated with increases in student participation in AP courses and students' engagement in their classes. Therefore, teachers who report higher levels of communication and collaboration between teachers in their schools also

[3] Correlations were only run on teacher data. This group was chosen because it was assumed teachers would have accurate reports of input progress, and there was a sufficient number of responses to perform the analysis.

[4] Analyses were conducted using partial correlation analyses. Partial correlations adjust the correlations between variables for demographic characteristics, specifically sex, race–ethnicity, and age. It is important to remember that although this analysis allows us to consider how individual responses are related to each other, it does not allow us to conclude that one variable *causes* the other.

report seeing positive changes in students' participation in AP courses and student engagement.

Administrative support: Teachers' ratings of administrative support are positively correlated with 16 of the 19 outcomes examined. Administrative support is most strongly correlated with decreases in student dropout rates and improvements in the community's perception of the school. This means that teachers who indicate that they have received more support from administrators also report more decreases in student dropout rates and greater improvements in the community's perceptions of the school.

Access to technological support: Access to technological support is positively correlated with 8 of the 19 outcomes examined. Access to technological support is most strongly correlated with students being better prepared for future employment. In addition, access to technological support, technological integration support, and instructional technology support are all positively correlated with increases in cooperation with the district. This suggests that the provision of technical support may be particularly important for increasing cooperation with the district.

Connected Community Inputs: The two Connected Community inputs that are positively related to outcomes are "Parents' ideas are sought out to inform decision-making" and "Community members are included in the decision-making process."

Parent Inputs in Decision-Making: Teachers' ratings of "Parents' ideas are sought out to inform decision-making" are positively related to 17 of the 19 outcomes examined. Teachers' ratings of the inclusion of parents in the decision-making process are most strongly related to increases in students' graduation rates and improvements of the community's perception of the school. Therefore, teachers who indicate that parents are included in the decision-making process also report greater increases in student graduation rates and improvements in the community's perception of the school.

Community Inputs in Decision-Making: Teachers' ratings of "Community members are included in the decision-making process" are positively related to 16 of the 19 outcomes examined. Teachers' ratings of the inclusion of community members in the decision-making process are most strongly related to increased cooperation with other school districts.

In sum, the analysis of the relationships between the implementation inputs and the project's outcomes seem to point out the key programmatic components necessary for the systematic transformation of a large suburban school district wanting to change to a 21st century education system under adverse conditions such as hurricanes and low educational achievements. The key programmatic elements for transformation include:

- Access to software
- Access to wireless and stable, reliable Internet
- An environment where communication and collaboration between teachers is encouraged
- Consistent support for teachers from administrators
- High-quality professional development in the area of technical support
- Inclusion of parents and community members in decision-making processes

Researchers also sought out those FCSD outcomes that had the greatest correlation to Connected School, Connected Learning, and Connected Community inputs. This analysis suggests that the

following items are the most likely outputs when the right mix of school and district level inputs are in place:

- Decreased student discipline problems
- Increased student motivation and engagement
- Increased number of students who are better prepared students for future employment
- Increased collaboration within the district
- Increased collaboration with other school districts
- Increased interaction with local institutes of higher learning
- Improved community perception of the school or district

Lessons Learned

As the full implementation of the 21S Initiative draws to a close, it is appropriate to look back at the experience to identify the lessons learned about leadership, the development and promotion of an educational vision, culture change, and the implementation of the structural components of the Initiative and its impact on all participants.

Turning Vision into Reality

A clear and well-communicated vision is an essential element in transforming a school district into an effective 21st century learning environment. FCSD leaders have focused their vision on increasing student achievement and motivation. Believing that technology is an integral part of the overall education program in their district, and thus showing strong congruence around this central pillar of the 21S vision, they were able to make important steps towards the realization of their vision by enacting the following:

- Revamping the technology infrastructure and improving access to software, hardware, wireless Internet, and technology-based security systems at both district and school levels. The technology implementation appears to have been successful in Forrest County. In 2009, all administrators and technology personnel survey respondents reported that the overall state of implementation in Forrest County was on or above target. Access to technology at the school and classroom level also was on target or above expectations.
- Providing technical support to teachers and administrators. Forrest County has made great strides in providing technical support to teachers, troubleshooting, and technology maintenance. Most administrators and teachers found the technical support at FCSD very helpful.
- Centering professional development around pedagogy, the development of instructional strategies, and technology use and integration. This helped participants update their knowledge, skills, and practices. The level of their satisfaction with the training was high.
- Enabling teachers to collaborate and share best practices. In FCSD, two-thirds of administrator respondents and more than 70 percent of technology staff surveyed agreed that there has been significant change in teacher collaboration over the course of the Initiative. More than three-quarters of teachers surveyed also reported that they frequently meet to share ideas and improve instructional practices, interact with global networks, share samples of students' work, and mentor each other. Research shows too that teachers learn best from each other—so it's encouraging that 75 percent of teachers surveyed said they have role models in their school for integrating technology.
- Promoting student-centered teaching practices to prepare students for life and an ever-changing global economy. Two-thirds of responding administrators and more than half of technology personnel report a positive change in the overall quality of teaching since the Cisco 21s Initiative began. Those teachers who responded to the survey report high levels (90%+) of student-centered teaching practices.
- Making efforts to work with local universities to improve the district's technology mentoring program, and beginning to offer after-school computer lab access in an effort to increase ICT literacy among students and community members. The district has used a variety of communication methods employed by the schools to keep parents informed, with the result that more parents are receiving phone calls and e-mails from their children's school, and using the district's websites to stay informed.

EDC's analysis of the relationship between programmatic inputs and student outcomes reveals that access to reliable wireless Internet, software, consistent administrative support for teachers, support for teacher communication and collaboration, technology support, and involvement of community members and parents were the factors most closely correlated with positive student outcomes. Further analysis suggests that the following items are the most likely outputs when the right mix of school and district level inputs are in place:

- Decreased student discipline problems
- Increased student motivation and engagement
- Increased number of students who are better prepared students for future employment
- Increased collaboration within the district
- Increased collaboration with other school districts
- Increased interaction with local institutes of higher learning
- Improved community perception of the school or district

Remaining Challenges

Vision and Leadership

Teachers are not fully aware of what leaders expect of them. On a number of measures, administrators expect their teachers to engage in activities much more frequently that teachers believe they are expected to, most notably, in the areas of performance-based assessments, preparing students to take standardized tests, and using the Internet to post lesson plans. Setting and communicating these expectations would help ensure that teachers know what to prioritize in their day-to-day teaching.

Change Management

The district needs to develop a change management process for monitoring innovation throughout its education system. In 2009, 40 percent of administrators reported that they have not developed any type of process, and an additional 20 percent said they have created a process but have strayed from that blueprint. Coupled with well-articulated vision, a change management plan can help identify specific steps to reaching previously identified goals, and assist with budget management and long-term planning.

Connected District/School

Providing ongoing access to hardware was a challenge in the district. The district does not have access to an adequate number of computers for its students.

Connected Learning

The challenges ahead in this component include integrating technology into the curriculum, using data to improve decision-making processes and instructional practices, and providing technology support at the classroom level.

Connected Community

It is a challenge to get more parents and community members involved in the programs the district offers.

Sustainability

Few administrators or technology staff mentioned responding to grants, fundraising, or developing partnership support networks as a means to securing long-term funding.

District leadership is aware of these challenges and is taking steps to address them so that the ongoing process of educational reform can be sustained even after the Cisco Initiative formally concludes.

Recommendations

Building on the gains in leading, teaching, and learning that Forrest County School District has accomplished, we suggest that the recommendations below be taken into account in future district's improvement plans:

- Leaders should more clearly articulate what they want teachers to prioritize in their day-to-day teaching. Teachers would benefit from clarity in the areas of standardized and performance-based assessments, and Internet use to post lesson plans. Setting and communicating these expectations would help ensure that teachers know what to prioritize in their day-to-day teaching.
- The district should develop a change management process for monitoring innovation throughout its education system. The Cisco 3.0 Leading Indicator tool can help with the management and implementation process challenges that FCSD is facing. FCSD leadership can request the tool from Cisco Global Education.
- The district should continue to expand access to both hardware and computers for students, and increase technical support at the classroom level.
- The district should provide teachers with additional professional development support around efficient and effective ways to integrate technology into their teaching as well as ways to use data to improve decision-making processes and instructional practices.
- Relationships with parents and other community partners must continue to be cultivated in order to build support and secure resources. New communication tools or different approaches to parent communication may help increase parental involvement in the schools.
- Careful and timely planning must take place to sustain momentum and ensure a continued flow of resources for the Initiative. Without the implementation of the district's sustainability plan, future advances and the gains already made are at risk. The district should apply for grants, organize fundraising events, and develop support networks as a means to securing long-term funding.

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Appendix

Note: EDC researchers will deliver the rest of the Appendix section to Cisco in a separate document.