

Investigating the Impact of the Cisco 21st Century Schools Initiative on Hattiesburg Public 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

The Hattiesburg Public School District (HPSD) is a small urban school system located in southern Mississippi. Of the almost 4,500 students enrolled in its nine schools, 92 percent are African American and 90 percent receive free or reduced lunch. Currently, HPSD employs 34 administrators, 375 teachers, and 11 technology specialists.

Vision and Leadership

When the 21st Century Schools Initiative (21S) began in the 2005–2006 school year, only two of the nine HPSD schools participated—Rowan Elementary and Hattiesburg High School. During the second year of the initiative, however, participation rose to include all of the district’s schools, a level that continues to the present. While the district’s initial vision focused on increasing technology access and student academic performance, that vision has evolved over time and now incorporates 21st century outcomes, such as:

- Fostering innovation and experimentation in the school system
- Producing students who are self-motivated thinkers
- Designing engaging interactive learning experiences

Over time, the 21S vision is helping teachers recognize the value of technology within a 21st century education. In 2008, 83 percent of surveyed teachers agreed that technology was an integral part of their school; by 2009 that number had increased to 92 percent. A large majority of leaders (81 percent) say they have created leadership teams to help support the process of change in their school.

The Hattiesburg school leaders are already preparing for the day when Cisco funding will no longer be available. The district is reapportioning budgets, in particular Title I funds; reorganizing staff; and developing new funding sources in an effort to maintain high quality technology access and support.

The 21S Initiative centers 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 school.
- *Connected Learning:* The Connected Learning component promoted 21st century teaching and learning through new technologies, instructional approaches, and professional development.
- *Connected Community:* The Connected Community component focused on fostering positive relationships between the school and a broad set of stakeholders, including parents, businesses, agencies, and non-profit organizations.

Connected District/School

HPSD leaders report that the 21S Initiative, which has entirely revamped the district’s technology infrastructure, has moved the district far beyond where it would have been without this support. Access to technology has improved greatly over the term of the 21S Initiative, particularly over the past two years. In 2009, 93 percent of administrators and 100 percent of technology personnel surveyed said that the overall state of implementation in Hattiesburg was on or above target. In 2007, only 22 percent of administrators and 50 percent of technology personnel felt that way. Similarly dramatic increases

were noted regarding access to hardware, software, wireless Internet services, and technology-based security systems.

This increased access has positively influenced the district in a number of ways:

- Principals spend less time traveling to district offices because they can participate in meetings via phone conferences.
- Leaders and teachers can more easily collaborate within and across schools.
- Teachers report that tools and software are more available in classrooms.
- Investments in human capital—specifically new district- and school-level technical staff—have ensured more and higher quality technical support.

Within HPSD, one school, Rowan Elementary, was selected as a model school to receive additional technical and financial resources. While Rowan's stakeholders all acknowledge their good fortune, they have also been subject to feelings of resentment on the part of other schools. The district's implementation of a grant request system to initiate the technology roll-out to other schools has helped to allay some of the envious feelings that might have developed towards Rowan.

By 2009, virtually all teachers had access to computers (99 percent), organizational software (93 percent), and the Internet (91 percent) in their classrooms. Compared to the prior year, the percentage of teachers with access to various tools grew significantly, with the largest gains in access to video cameras (up 18 percentage points) and interactive whiteboards (up 17 percentage points).

Hattiesburg teachers also report greater access to technical support. In 2007, 16 percent of teachers reported that technical support was always available; two years later, that number doubled to 32 percent. Administrators, too, noted this improvement, with 92 percent of leaders saying technical support was on target or above their expectations, up from 40 percent in 2007.

Connected Learning: Educator Outcomes

Professional Learning: Over the life of the 21S Initiative, HPSD has dramatically increased its professional development efforts to achieve initiative goals of improved leadership, technology integration, and instructional practices. As a result, the following professional learning gains have been achieved:

- Virtually all HPSD teachers and administrators participated in 21S-related professional development opportunities in 2009.
- Professional development now occurs more often at the school sites enabling greater customization to specific teachers' needs.
- The total number of hours of available professional development has increased almost four fold—from 130 hours four years ago to 509 hours this past school year.
- Teacher satisfaction with training has increased. In 2009, 58 percent of teachers also report training by school-level personnel was very helpful—up 11 percentage points from the prior year.

Impact on Teaching: As a result, a transformation of instructional practice is beginning to take hold in the Hattiesburg schools.

- Teachers report increased expertise and greater frequency of use with all types of technology. This past school year, teachers most frequently used computers (85 percent), the Internet (69 percent), Internet Protocol (IP) phones (62 percent), and interactive whiteboards (61 percent),

with the greatest gains in use shown in IP phones, organizational software and interactive whiteboards. In 2007, only 19 percent of teachers considered themselves experts in the use of computers, but by 2009, that number grew to 35 percent.

- Eighty-three percent (83 percent) of teachers report they use technology in their classes, up 7 percentage points over prior years, with 70 percent saying they used technology daily, a gain of 11 percentage points in two years.
- Communications among teachers are enhanced, with teachers reporting they frequently mentor each other and meet to exchange ideas, share student work, and interact with global networks. The percentage of teachers who said they had role models in their school for integrating technology into their teaching more than doubled from 30 percent in 2007 to 65 percent in 2009.
- More teachers are using facilitation in their classrooms in addition to more traditional forms of teaching.
- Teachers also engage more frequently with outside specialists to bring in “real world” resources and expertise in the classroom.
- One district leader commented that teachers are employing different ways of teaching: “You see them [teachers] using students’ input and actually hearing their students and addressing what they hear. You see them ... actually designing work that engages students, which means they’re looking at why they’re doing it, who they’re doing it for, and changing as they go.”

Connected Learning: Student Outcomes

Student use of instructional technology is one way to promote learning gains—the ultimate goal, of course, of any school change effort. In HPSD, the following are positive signs of development:

- Students say they are using more technology in their classrooms, with 80 percent saying they feel confident using and helping others use a wide range of tools.
- Students say they are active participants in their learning and have opportunities to ask teachers questions and to be creative in their schoolwork.
- More students are reading. In 2008, 31 percent of students said they spent one hour or more reading each day; in 2009, that percentage rose to 48 percent.
- All administrators (100 percent) report Information and Communication Technology (ICT) literacy among students has improved since the 21S Initiative began.

Although results are somewhat mixed (as will be addressed in the Remaining Challenges section), the following behavioral issues have seen positive gains during the time of the 21S Initiative:

- Attendance is improved throughout the district—from an absentee rate of 6.6 percent in 2005–2006 to 5.4 percent in 2007–2008.
- Administrators and teachers agree that student disciplinary issues are fewer.
- In 2008–2009, detentions, suspensions, and classroom behavior incidents were lower than the prior year.

Administrators, teachers, and students overwhelmingly agree that students are more engaged in their learning, as shown in:

- Higher levels of class participation and homework completion
- Dramatically higher levels of participation in state science and math fairs

- Greater number of hours spent reading, both online and in print

Student scores on Mississippi state exams and college entrance exams have shown generally positive gains as well. Because of revisions to the state tests made in 2006 and 2007, comparing recent results to those before the launch of 21S is difficult. While the percentage of Hattiesburg students scoring proficient or above tends to be lower than the state as a whole, as compared to 2007–2008, in the past school year:

- The percentage of Hattiesburg students scoring proficient or above in four of the six grades tested has increased.
- The differential between district and state scores narrowed for students in 3rd through 6th grades.
- Participation in the American College Testing (ACT) program has remained relatively stable over the years though the average ACT score has fallen slightly.
- While fewer students are taking Advanced Placement (AP) courses, more of them are passing the AP exams with a 3 or higher.

Finally, graduation and college acceptance rates are encouraging. Since the inception of the 21S Initiative:

- Dropout rates have halved.
- High school graduation rates have improved steadily.
- The percentage of students receiving college scholarships has steadily increased.
- Students report higher aspirations, with more saying they intend to go to college.

Connected Community

Hattiesburg’s approach to the Connected Community component of the 21S Initiative includes reaching out to businesses and faith-based groups, as well as parents and other community members. Among the measures of success in these:

- School-to-parent communications have increased (e-mail, phone calls, print newsletters, home visits), and 9 of 11 schools now have websites.
- Parents, teachers, and administrators all agree that parents’ involvement in their child’s education has increased.
- More parents noted having access to activities and events offered outside of traditional hours— from 24 percent in 2008 to 37 percent in 2009.
- Since 2005, PTA meeting attendance has increased by a factor of 20.

Remaining Challenges

School change is never simple nor quick. While much has been accomplished in the Hattiesburg Public School District, a number of outcomes are as yet unrealized.

Vision and Leadership: Leaders’ expectations regarding 21st century pedagogies still outpace those of teachers, indicating that further communication and professional development needs to take place to help teachers fully grasp expectations for instructional practice.

Connected School/District: While technology infrastructure and access have improved greatly in the district, some technology inputs still lag, with over half of Hattiesburg teachers reporting lack of classroom access to Web 2.0 tools and 45 percent saying they lack enough computers for all students.

Connected Learning: Professional development, teachers' practices around technology use and instruction, planning time for teachers, data-driven instruction, and student behavior are areas that will benefit from further development. Changing professional habits and teaching philosophies is difficult in any organization, and HPSD data reveals that it, too, has struggled in this area. Teachers initially found it difficult to integrate technology into their teaching, and for a significant number of them, that challenge remains.

Echoing a ubiquitous complaint of educators, HPSD teachers bemoan the lack of adequate planning time for teachers to integrate technology and incorporate new instruction practices into their daily routine. Further, only 11 percent of teachers reported that they were frequently expected to use data to inform their instruction.

While measures of technology integration and teacher collaboration have both increased across the district, there has been a decline in the use of student-centered instructional practice, such as encouraging student-led research, student-led revision, analysis, and student presentation of work products. Reflecting perhaps a bit of "change fatigue," students are also reporting less excitement about their classes than in earlier years of the 21S Initiative.

Student achievement as measured on college entrance tests shows mixed results. While passing rates on AP tests are higher (up 8 percentage points in the past year), participation in AP courses has declined (down 6 percentage points). Average ACT scores have fallen slightly as well (from 17.6 in 2008 to 16.7 in 2009).

Lessons Learned

Now that Cisco's partnership with the Hattiesburg Public School District is drawing to a close, it's a good time to look back to see what lessons can be learned about educational reform.

Vision and Change Leadership: To transform its schools and school culture, Hattiesburg school leaders formulated and carried out the following strategies:

- Articulated a clear and compelling vision for creating a 21st century learning environment
- Developed leadership teams at both district and school levels
- Fostered generative partnerships with local and national organizations
- Improved communication and collaboration throughout the district
- Promoted a culture of innovation and experimentation
- Organized budgets and staffing to sustain the 21S Initiative once Cisco's participation and support ends

21st Century Learning Environment: EDC looked first at the data it had collected to better understand the relationship between the initiative's input and its outcomes. Several factors emerged as the greatest levers of systematic transformation of a school district like Hattiesburg from a small urban district with a tradition of low educational achievement and high poverty to a high-functioning 21st century school system. The factors are as follows:

- Access to sufficient hardware and software
- Access to Web 2.0 tools

- High-quality technical professional development
- Effective communication and collaboration strategies for teachers
- Inclusion of parents and community members in the decision-making processes

Researchers conducted additional correlation analysis to which outcomes were most closely related to inputs associated with Connected School, Connected Learning, and Connected Community. 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:

- Increased number of students passing AP exams
- Increased number of students who are better prepared for future employment
- Increased number of students who are better prepared for college
- Increased number of students who are more likely to go to college
- Increased community involvement
- Increased interaction with local institutes of higher learning
- Increased cooperation within the district
- 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 of today's world. They are calling for the transformation of current education systems.

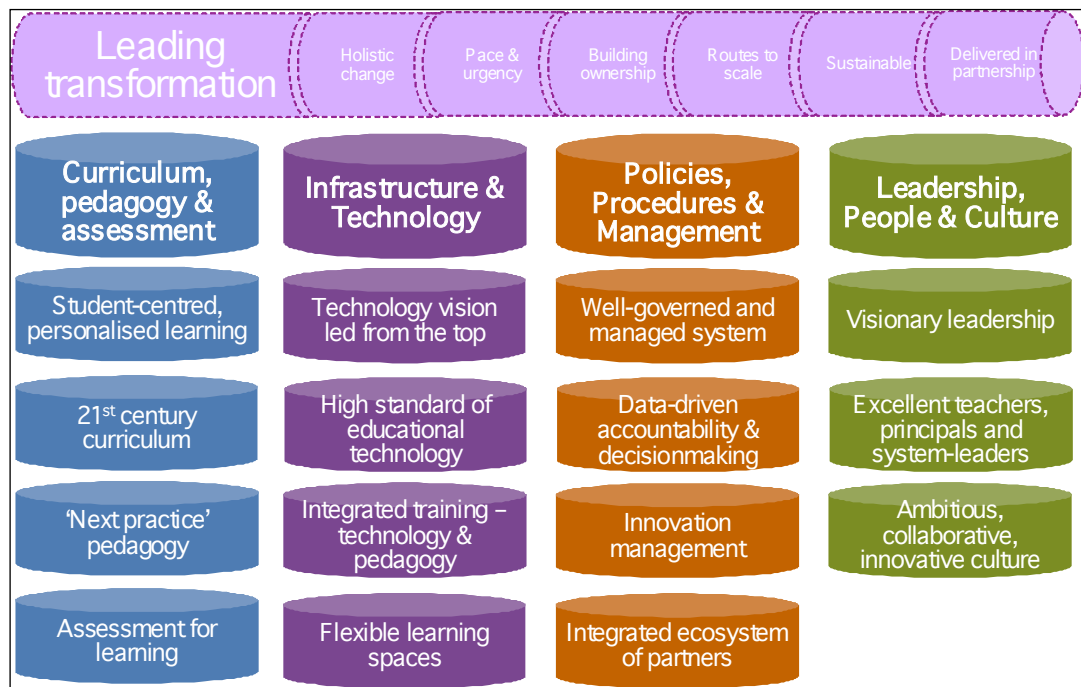
As this education transformation agenda was being articulated at the national and international levels, Cisco Systems, Inc. (Cisco) was in the process of responding to Hurricane Katrina's destructive impact on Mississippi and Louisiana. After several visits to the region and consultation with the education leadership in Mississippi and Louisiana, Cisco 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 to help not only rebuild the Jefferson Parish Public School System (JPPSS) in Greater New Orleans and seven districts in Mississippi post-Katrina,¹ 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 school.
- *Connected Learning:* The Connected Learning component promoted 21st century teaching and learning through new technologies, instructional approaches, and professional development.
- *Connected Community:* The Connected Community component focused on fostering positive relationships between the school and a broad set of stakeholders, including parents, businesses, agencies, and non-profit organizations.

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 more effectively 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.

¹ 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/District, 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 in order 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 well-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 in striving for the principles outlined above and encouraged them to develop their own system transformation grounded in their prior specific cultural context, resource capabilities, and educational goals. Developed and refined over the last four years, the goals of the Hattiesburg Public School District (HPSD) are to: (1) ensure progress in curricular programs through setting goals and monitoring scores in state-administered Mississippi Curriculum Test and Subject Area Testing Program examinations; (2) increase teacher training for new and veteran teachers based on, but not limited to Schlechty, leadership teams, and technology; (3) familiarize administrators with outcomes and evaluation data from district programs; (4) develop a lesson plan evaluation form and collection strategy in order to evaluate teacher lesson plans' alignment to state and/or national standards; (5) implement virtual and distance learning activities through communication and collaboration for students; (6) continue to improve community perception of the school system by increasing "home visits;" and (7) monitor community relations/collaboration.

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 HPSD (e.g., through surveys) and an in-depth understanding of the Initiative at the district, school, classroom, and community levels (e.g., through classroom observations, interviews), and measure its impact on the entire system, especially on participants (e.g., through survey, interviews, outcome data). The following questions guided the summative evaluation in HPSD:

- 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 HPSD.

Site Visits: In February and April 2009, EDC researchers conducted interviews and/or focus groups with major stakeholders in the Cisco 21S Initiative in HPSD, including administrators, technology personnel, teachers, students, and parents (see Table 1). They focused on the following major themes: 21st century educational vision, program implementation and impact, and program challenges (see Appendix). Each theme was explored both as an opportunity and as a potential challenge for HPSD.

Table 1: Number of site visit respondents

Settings	Respondents and participation numbers				
	Administrators	Technology Personnel	Teachers	Parents	Students
Rowan Elementary	2	1	14	11	8
Other HPSD Principals	6	N/A	N/A	N/A	N/A
District	2	2	N/A	N/A	N/A
Total (N=46)	10	3	14	11	8

Classroom Observations: Students from the University of Southern Mississippi (USM) conducted 89 classroom observations and 12 teacher interviews in Rowan Elementary School over the course of the 2007–2008 and 2008–2009 school years. The observations were focused on gathering data about classroom activities (e.g., teacher and student practices), classroom layout, available technology and teaching tools, and the observer’s reflections and impressions about the implementation of the Initiative at the classroom level (see Appendix for the classroom observation instrument).

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: 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 27, 28, 52, 66, and 73).

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 unique 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 each survey. While the number of parents and students participating in the survey increased greatly from the previous year, the number of administrators, technology personnel, and teacher respondents decreased between the school years 2007–2008 and 2008–2009. (See Table 2 below.)

Table 2: Survey participants and response rates

Participants	2006–2007	2007–2008	2008–2009
Administrators	10 (29%)	22 (67%)	16 (47%)
Technology Personnel	2 (22%)	6 (55%)	2 (18%)
Teachers	193 (50%)	217 (59%)	182 (49%)
Students	N/A	98 (2%)	646 (14%)
Parents (approximate)	132 (7%)	55 (3%)	215 (12%)

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). For qualitative data, they used a grounded theory approach (Strauss & Corbin, 1990). They read and coded the interview transcripts for the purpose of identifying common themes such as 21st century education vision, leadership, and environment. Actual transcribed text is provided to document the salience and substance of the themes and sub-themes that surfaced.

Organization of Report

This report is a case study of the Hattiesburg Public School District in Mississippi 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 provides a portrait of what the district-level changes look like within the everyday realities of one school. Each section includes lessons learned from the Initiative and provides programmatic and strategic recommendations for future Cisco education engagements.

District System-Level Change

Twenty-first century school 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, while also 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 HPSD. To measure these efforts at the district system level, EDC researchers looked at:

- Community environment
- Number of schools, as well as 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. The city is located in Forrest and Lamar Counties. It is the principal city of the Hattiesburg Mississippi Metropolitan Statistical Area (MSA), which encompasses Forrest, Lamar, and Perry counties. The MSA population exceeded 150,000 as a result of a 10 percent increase following Hurricane Katrina in August 2005. In addition, Hattiesburg surpassed Biloxi post-Katrina to become Mississippi's third-largest city. Hattiesburg experienced a gain in population of approximately 7.3 percent compared to Gulfport, Mississippi, the closest similar-sized urban area to Hattiesburg, which lost 4.5 percent of its population. As Gulfport continues its recovery, Hattiesburg has grown in population, although it has had to deal with some after-effects of the storm. Hattiesburg is the county seat of Forrest County, but the city has grown in recent years to include a portion of eastern Lamar County.

The city of Hattiesburg is made up of a population that is 49 percent White and 47 percent African American. Hispanics make up approximately 1 percent of the population, while Native Americans and Asians make up the remaining percentage. The median income in Hattiesburg in 2000, according to United States Census statistics, was \$24,409, which is significantly lower than the Mississippi state median income of \$31,330, and considerably lower than the median income of the United States, which is \$41,994. The 7.8 percent unemployment rate in Hattiesburg is roughly 2 points lower than that of both the state and the United States as a whole. The poverty rate, however, is 25.2 percent, which is radically higher than both the state and the United States as a whole. The city of Hattiesburg has

managed to maintain a relatively low violent crime index in the face of hurricane damage since 2005.² The index in Hattiesburg—at 4.84 violent crimes per 1,000 people—is approximately 2 points higher than that of the United States as a whole, but on par with that of Gulfport, which is 4.44 violent crimes per 1,000 people. This diverse urban city is where the Hattiesburg Public School District, the subject of this report, is located.

Hattiesburg Public School District (HPSD)

HPSD is a small urban district composed of nine schools. The number of schools in HPSD has remained the same over the past four school years (see Table 3). The number of administrators has grown since 2006–2007. The number of teachers increased in the 2006–2007 school year, but has decreased since then. Finally the number of students dropped during the 2006–2007 school year; since then, however, the number of students has returned to the same levels as in 2005–2006. Currently, HPSD has 34 administrators, 375 teachers, and 11 technology specialists. The average teacher to student ratio in HPSD is 1:12.

With a current enrollment of 4,491 students, student enrollment has increased slightly over the past four years, but has yet to reach its 2005–2006 number of 4,540 (see Table 3). As of the 2008–2009 school year, 91.6 percent of the students were African American, 6.3 percent were White, 1.6 percent were Hispanic, and Native Americans and Asians made up the remaining portion of the population. Fifty percent of the students are female. The free and reduced lunch population as of the 2008–2009 school year is 90 percent.

Table 3: Hattiesburg Public School District makeup

School Year	Schools	Administrators*	Teachers	Students
	#	#	#	#
2005–2006	9	31	347	4,540
2006–2007	9	34	387	4,469
2007–2008	9	33	365	4,438
2008–2009	9	34	375	4,491

* Includes administrators in schools and central office.

The nine schools (see Table 4) included in HPSD represent the standard three levels of grade configurations; there are six elementary schools (grades K to 6), one middle school (grades 7 and 8), and one high school (grades 9 to 12). The HPSD also includes an alternative school to address the education of students with severe disciplinary issues.

² Violent crime index is a measure of the number of violent crimes (murder, manslaughter, forcible rape, robbery, and aggravated assault) per 1,000 people in a population. Numerous variables mold crime in a particular town, city, county, state, or region, thus crime indices cannot be used to rank various geographies, but can be used to give a general idea about the number of crimes per unit of population.

Table 4: Schools comprising the Hattiesburg Public School district

HPSD Schools	Grades
Lillie Burney Elementary	K–6
Grace Christian Elementary	K–6
Hawkins Elementary	K–6
Rowan Elementary	K–6
Thames Elementary	K–6
Woodley Elementary	K–6
N.R. Burger Middle School	7 and 8
Mary Bethune Alternative School	4–12
Hattiesburg High School	9–12

There has been an increase in the number of staff employed by the district between 2005 and 2009. There are more teachers, technology specialists, and administrative staff at both the school and district level. In addition, the teacher-to-technology specialist ratio has decreased from 39:1 in 2005–2006 to 34:1 in 2008–2009. Table 5 shows more employment information.

Table 5: Employment

	2005–2006	2006–2007	2007–2008	2008–2009
Number of teachers employed	347	387	365	375
Number of technology staff employed	9	9	11	11
Number of administrators employed	30.5	33.5	32.5	33.5
Number of district administrative staff	8	11	11	11

Cisco 21S Participation

The 21S Initiative first began in the 2005–2006 school year. In the first year, only 2 of the 9 schools in the Hattiesburg Public School District were involved in the 21S Initiative. These schools were Rowan Elementary and Hattiesburg High School. However, by the second project year, participation was scaled up to include all of the district’s schools. This high level of involvement was sustained for the next three years. In addition, all of the district’s teachers and students were involved in the Initiative between the 2006–2007 school year and the 2008–2009 school year. There has been involvement from all of the district administrative staff and technology staff across all four years of the Initiative. Table 6 provides more detail on district makeup and involvement.

Table 6: Hattiesburg Public School district profile and 21S initiative involvement

Year	Schools	Administrative Staff	Technology Staff	Teachers	Students
	% Involved	% Involved	% Involved	% Involved	% Involved
2005–2006	22%	100%	100%	***	***
2006–2007	100%	100%	100%	***	100%
2007–2008	100%	100%	100%	100%	100%
2008–2009	100%	100%	100%	100%	100%

*** Data not available

In addition to the great support from the 21S Initiative, HPSD developed diverse community partnerships with religious institutions, charitable and service organizations, health organizations, businesses, institutions of higher education, and youth organizations. To involve parents in their reform efforts, the district has developed a range of strategies, including home visits by district staff and effective home-school communication practices.

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. At the core of HPSD’s vision is a 21st century teaching and learning approach that utilizes technology to enable real world learning and interaction for students, reframe teacher’s instructional practices, and create more effective school management and operating procedures for administrators.

My vision is focused around four major goals: increased academic achievement, parental involvement, safe and orderly schools, and standard operating procedures. We want to ensure that we have utilized every possible means when educating our students. We are a district that strives to meet the needs of each student. (District Administrator)

My vision is to see teachers becoming...facilitators, dealing with diverse groups all the time, dealing with differentiated instruction. And the technology would just be the tool to make it get there. I want our students to begin to literally use a lot of the 21st century skills, the collaboration, the problem-solving, the application, and then coming up with the specific output vs. all of the information coming in all the time, the input, so to speak. (District Administrator)

My vision is that one day in the near future, we’ll be able to walk into classrooms, and you won’t be able to hardly tell who’s the teacher, because everybody’s going to be learning and growing from each other and interacting. (District Administrator)

While staff is passionate about the district's vision to make a difference in children's educational lives, one district leader wants to "continue to make sure that staff and students will always have the technology that is needed." Additionally, she noted, "I think it is very, very important to integrate the technology into the curriculum." Another district leader echoes the belief that technology needs to not only be integrated into curriculum, but into daily instruction as well. Data is being collected systematically across the district to ensure that the above vision is being implemented in schools.

In addition to what school and district leaders say about their vision, 94 percent of administrators and 97 percent of teachers in HPSD agree that discussion of school goals and how to achieve them is a regular part of their faculty meetings. This administrative open-mindedness to talking about the big picture implies that teachers play a role in determining the direction their school takes moving forward. It also implies that teachers have more buy-in as a result of being part of the decision-making process. Therefore, it's not surprising that 93 percent of administrators agreed that their colleagues shared their beliefs about what the central goals of the district should be.

Eighty percent of administrative survey respondents and 92 percent of teachers agreed that technology is an integral part of the education program in their school or district. That is an increase from 2008 when 83 percent of Hattiesburg teachers said technology was integral to education at their school. The fact that technology has become increasingly a fundamental part of the school and district vision is also shared across constituents.

Partners like Cisco Systems, the Schlechty Center for Leadership in School Reform, and Digital Opportunity Trust (DOT) played important roles in supporting the district's vision. As Cisco enabled Schlechty and DOT to be part of the Initiative and work closely with the district, it is described as an unusual corporate partner in that it not only provided substantial amounts of financial funding, but also stayed for the long run to provide quality human capital assistance at all levels.

Another important component of the Cisco 21S Initiative is the creation and sustenance of leadership teams at both the district and school levels. There are a large number of leadership teams in HPSD, with 81 percent of administrators reporting a Cisco 21S Initiative team in their school or at the district level, and 69 percent of administrators saying there was a general reform initiative team involved. On average there are about 7 people on each leadership team in Hattiesburg though teams range in size from 1 to 20 people.

When asked about the existence of a change management process for monitoring innovation, most administrators said they either already had a procedure in place (44 percent) or that a process was currently being developed (25 percent). An important part of managing change is ensuring that teachers and leaders feel they have time, space, and support to try out new ideas.

Almost all of HPSD (94 percent) agreed that, in general, educators in the district are continually learning and seeking new ideas, and 93 percent of administrators believe their district encourages experimentation. Sixty percent of teachers agree that the environment in their school is actively reflected upon for improvement. More specifically, 100 percent of administrators agree that research and best practices are shared in their district. In addition, 87 percent said that new ideas presented at professional development sessions are discussed afterwards with colleagues, while 93 percent said that staff development activities are followed by support to implement new practices. Finally, 94 percent of respondents shared that teachers have input regarding innovations, projects, and changing practices.

A clear vision and plans are necessary but not sufficient to lead the district to a fully sustained 21st century education system. The leaders in Hattiesburg Public School District have spent considerable time preparing for the upcoming school years when the Cisco grant money will no longer be available. The district is rearranging budgets, reorganizing staff, and raising funds in an effort to maintain high

quality technology access and support. The Assistant Superintendent summarized the district's stance when she said, "It is very important that we sustain or do whatever is necessary to make sure that the technology is here and will be provided." The district is conducting in-house professional development for their technology staff, focusing on all the Cisco and Microsoft certifications and applications, Web 2.0, and maintenance.

As part of a concerted effort to address the total cost of ownership of the Initiative, the district is looking to use federal dollars in the form of Title I funds for activities such as training and professional development for teachers. The district is encouraging schools to use their individual Title I funds to upgrade and buy new equipment. For example, principals are urged, "to dedicate a portion of their budget for Promethean bulb replacement or projector replacement regardless and as technology wears out." Additionally, the district wants to secure and write grants so as to not rely too heavily on state or government funding to sustain the Cisco 21S Initiative. Though still in its nascent stage, a foundation has been established by the district with the goal of securing contributions for equipment maintenance and program sustainability.

In order to reflect the changes occurring in the district, the administrators' vision statements about 21st century technology, teaching, and learning have shifted over the course of the Initiative. Initially the focus was on technology access and increasing student academic performance. The current vision statements are infused with terms like "innovation," "self-motivated thinkers," "safe environment for learning," and "the design of interactive learning activities." Table 7 offers a side-by-side comparison of a sampling of actual vision statements as articulated by district and school administrators between 2007 and 2009.

Table 7: Comparison of administrators' vision statements over time

Visions about Technology Infrastructure	
2007 "Faculty, staff and students to have access to a computer in each class."	2009 "To innovate with emerging technologies and techniques."

Visions about Students	
2008 "To increase student achievement through the implementation of technology."	2009 "Students will become fully engaged in appropriate learning activities that lead to increasing achievement that not only meets state and federal curriculum standards, but encourages innovative, self-motivated thinkers."

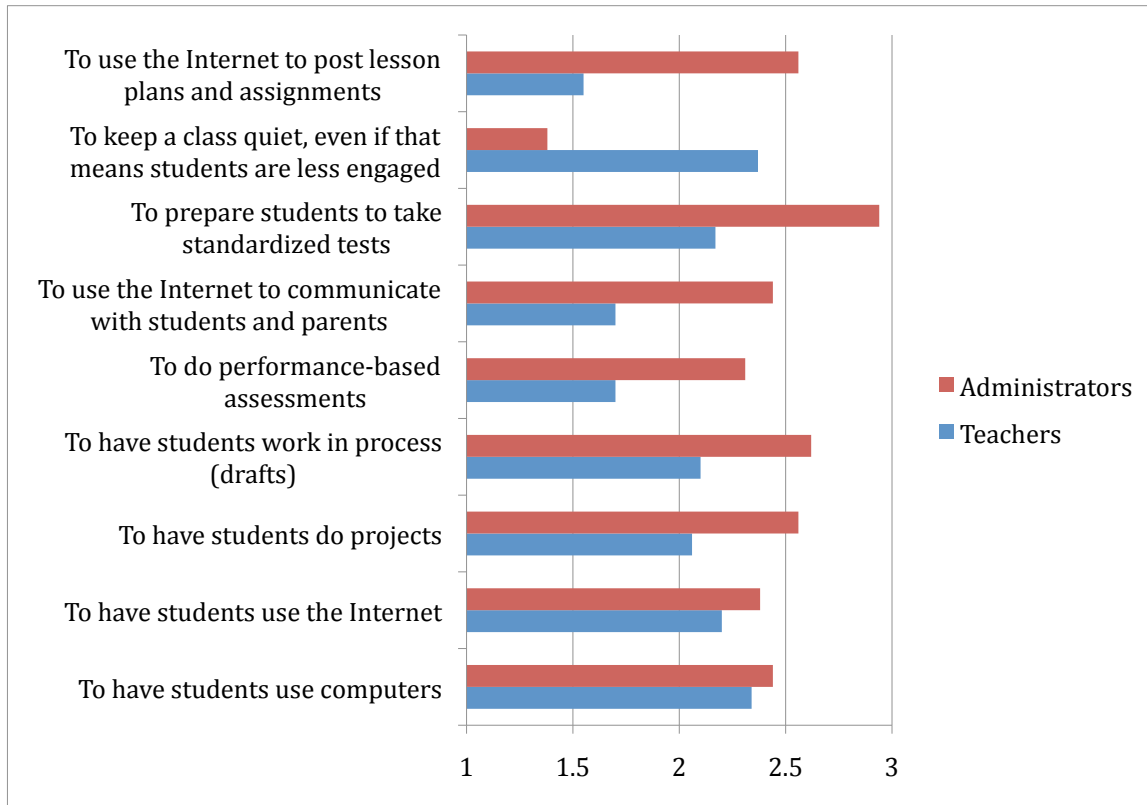
Visions about Teachers	
2008 "To increase the instructors' knowledge of computer programs that are conducive to increasing student academic performance."	2009 "We are striving to integrate technology into every area and to educate all students to be ready and equipped to use technology, and to provide all children with a safe environment for learning."

Challenges with 21st Century Education Vision and Leadership

The alignment of expectations between what administrators expect teachers to do and what teachers believe is expected of them is an indicator that clear and continuous communication is valued and taking place. Despite the high levels of agreement among administrators about vision and leadership in Hattiesburg District, the data would suggest that teachers are not fully aware of what leaders expect of them (see Figure 2). On a number of measures, administrators expect their teachers to engage in activities much more frequently that teachers believe they should. Most notably, administrators indicated that they expect teachers to use the Internet to post lessons and communicate with parents more frequently than teachers think they should. 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 2: 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.

21st Century Learning Environment

Technology access, use, and integration were limited in the district during the pre-21S period. The district lacked access to an advanced technology infrastructure, as well as robust and reliable Internet access.

In this district, when I first came here, the teachers wouldn't use e-mail because it was so unreliable. Because the network was always down, the e-mail system was down. So the change from that to where we are now is a huge difference. (District Administrator)

Connected District/School

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. Today, technology access at the district, school, and classroom levels is complete and of high quality.

Access at the District Level

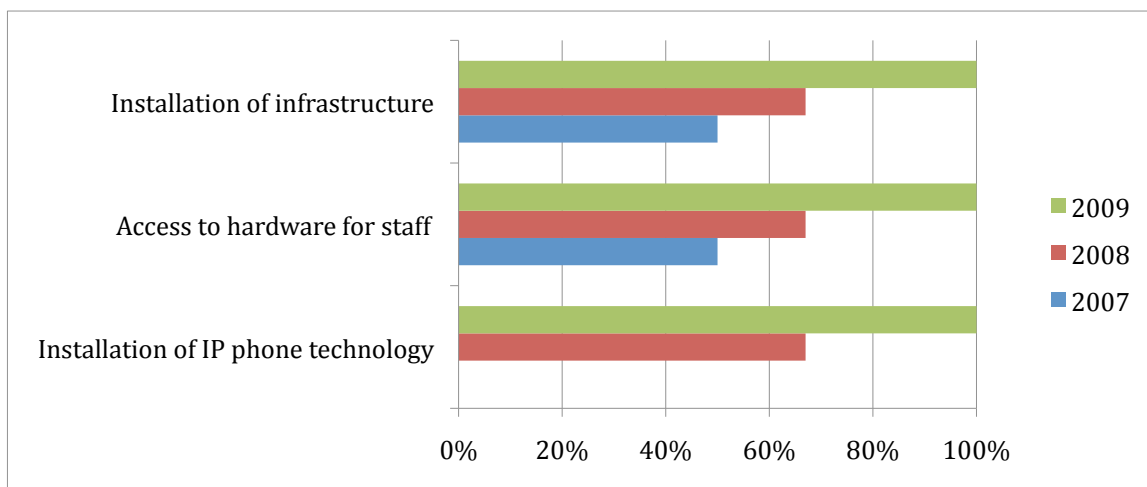
Leaders at the district report that the Cisco 21S Initiative has provided “a springboard of about ten years.” Essentially the district is years ahead of where they would be without the Cisco support. The acquisition of technology infrastructure and interactive technology tools has accelerated and expanded with the additional funding and support from the Cisco 21S Initiative. The Technology Director expressed amazement at the speed at which such a large quantity of materials was infused into their small district. “I think we got a little greedy and maybe brought in too much. ... I mean, it's a two-year process for bringing in Cisco Works and training, and then a two-year process for bringing in the phone systems. And we did it all in a year.” The reliability of technology access, especially at the administrative level, has improved greatly this year. In fact, technology personnel report that there has been positive change in a lessening of technical problems, the reliability of infrastructure and equipment, and the consistency of Internet connectivity in the district over the course of the Initiative.

Access to technology at the district level has increased tremendously since the inception of the Cisco 21S Initiative. An overwhelming majority of administrators (93 percent) and technology personnel (100 percent) reported that the overall state of implementation in Hattiesburg was on target or above their expectations. Only 22 percent of administrators and 50 percent of technology personnel felt that way in 2007.

In 2009, 80 percent of administrators said that access to software is on target or above their expectations, while 71 percent reported that access to hardware was on target or better. Those numbers have increased tremendously since 2007, when only 10 percent of administrative respondents reported that hardware access was on target and only 30 percent felt that way about software access.

Additionally, more technology staff reported that the installation of infrastructure, staff access to hardware, and IP phone technology was on target in 2009 as compared to 2007 (see Figure 3).

Figure 3: State of implementation (on target or above expectations) at the district level



District personnel believe that the school principals play an important role in the successful implementation of the Cisco 21S Initiative at the school and classroom levels. All district personnel reported heavy use of their Blackberries, IP phones, computers, and video and voice conferencing equipment. All of the administrative offices at the school are also wired with IP phones, allowing the district to conduct videoconferences with principals, teachers, and even students. This increased access to communication tools has had major impacts on the ways the district leaders communicate with each other and with schools. Principals spend less time traveling to district offices because they

can participate in meetings via telephone conferences. It has also influenced how principals communicate with each other and with their teachers. Teachers can more easily collaborate with each other within and across schools. Principals now require their teachers to infuse some type of technology into their lesson plans. However, there are some concerns that the principals are slow in changing their perceptions about the roles of technology in education as evidenced by continuing to believe that teachers should be doing most of the work with the technology, not the students.

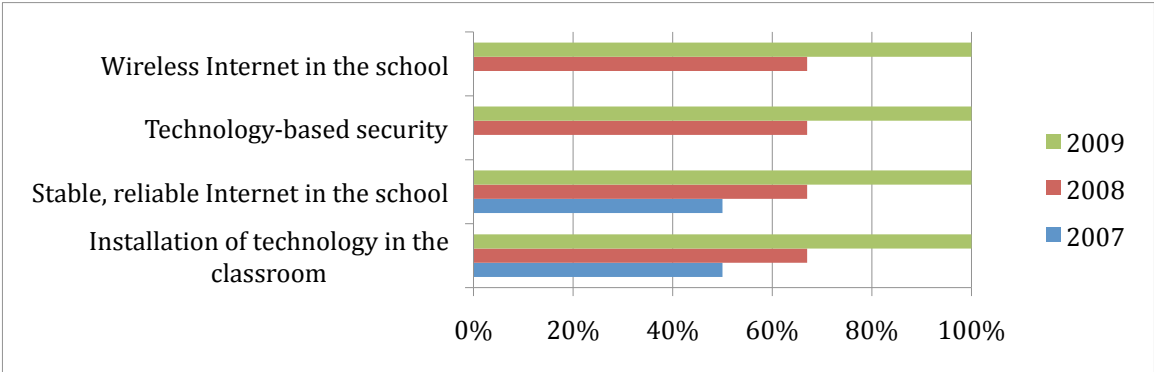
Finally, another aspect of HPSD is its investment in human capital as a supplement to support the new infrastructure. Cisco funding has helped employ both a Director of Technology as well as an Instructional Technologist, both of whom work at the district level. There is also a full-time instructional technologist at Rowan, the model school, and a part-time technology specialist at the high school level.

Access at the School/Classroom Level

All school math, science, and English language arts (ELA) classrooms are now equipped with interactive whiteboards. AP classrooms have also been wired and equipped with interactive whiteboards. There are six Apple Labs and laptop carts in the high school building as well. According to the District Instructional Technologist, “Within the next year or so, every classroom in the high school probably will have interactive technology in one form or another.”

Technology access at the school and classroom levels has seen great increases. In 2007 not one individual on the technology staff felt that the wireless Internet or technology-based security was on target; two years later, all of those who responded to the survey felt it was where it should be. The reliability of the Internet, as well as the installation of technology in the classroom also increased over the same time period (see Figure 4).

Figure 4: State of implementation (on target or above) at the classroom level

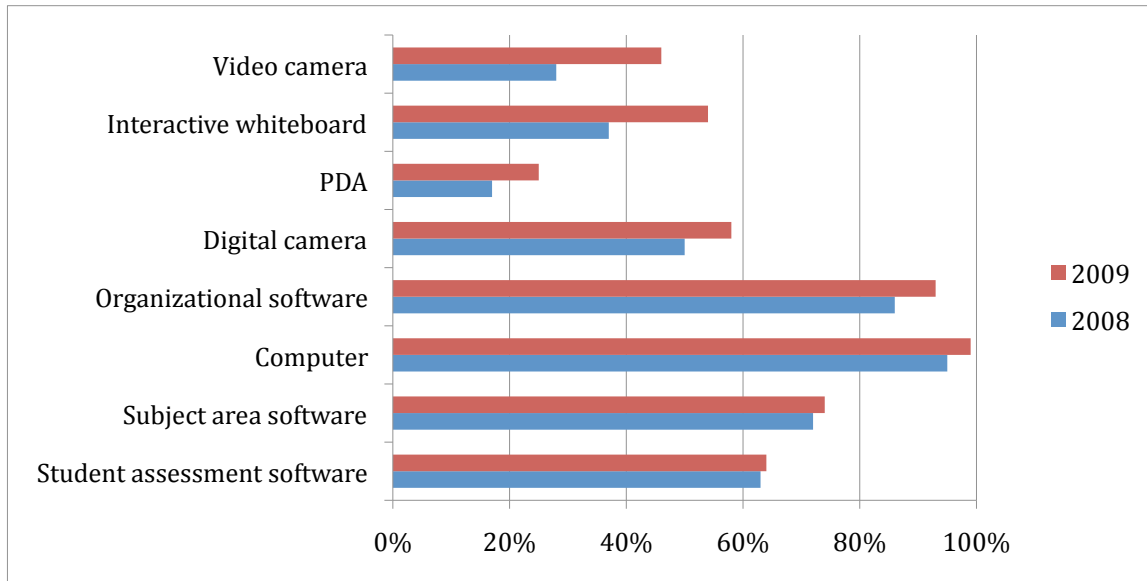


Teachers in Hattiesburg in general agree that access to a variety of technology tools is on target or above where they expected it to be. Most notably, 95 percent of teachers and 92 percent of administrators believe that the reliability and stability of their Internet connection is on target or above their expectations. Nearly as many teachers (94 percent) feel the same way about their wireless Internet connections, though a smaller group of administrators (79 percent) agreed. Besides access to high quality Internet, 70 percent of teachers were satisfied with the level of access to hardware and software in their schools.

Hattiesburg teachers have access to a wide range of technology tools in their schools. Most notably by 2009, nearly all teachers had access to computers (99 percent), organizational software (93 percent), and the Internet (91 percent) in their classrooms. The district has seen major increases in the percentage of teachers with access to various tools, with the largest gains in access to video cameras

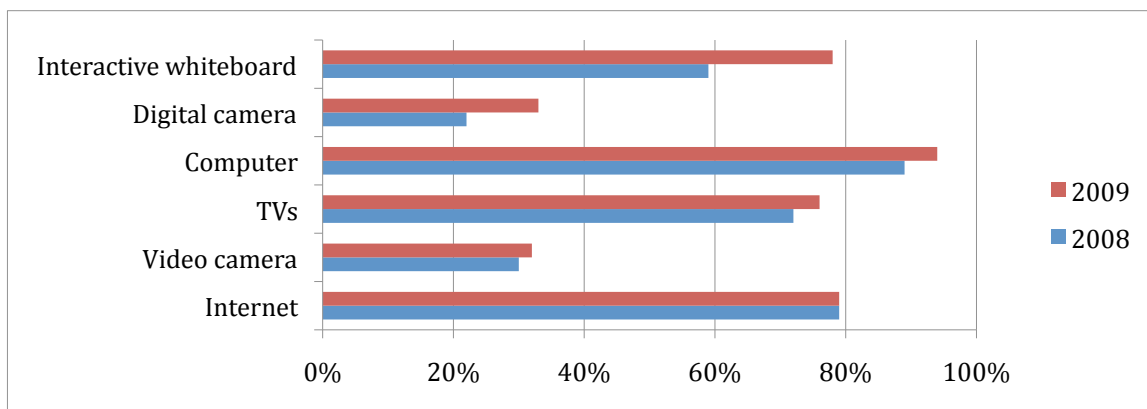
(18 percent point gain) and interactive whiteboards (17 percent point gain). See Figure 5 below for more details.

Figure 5: Teacher access to tools and software



Students in Hattiesburg also report having access to a wide range of technology tools, but the most frequently cited are computers (94 percent of students have access) and the Internet (79 percent of students said they have access). Over the course of the 21S Initiative, technology has become available in more classrooms, consequently allowing more student access. The biggest gains in technology access were in relation to interactive whiteboards. In 2008, 59 percent of students said they had interactive whiteboards in their classrooms and in 2009 that figure jumped to 78 percent (see Figure 6).

Figure 6: Student access to technology



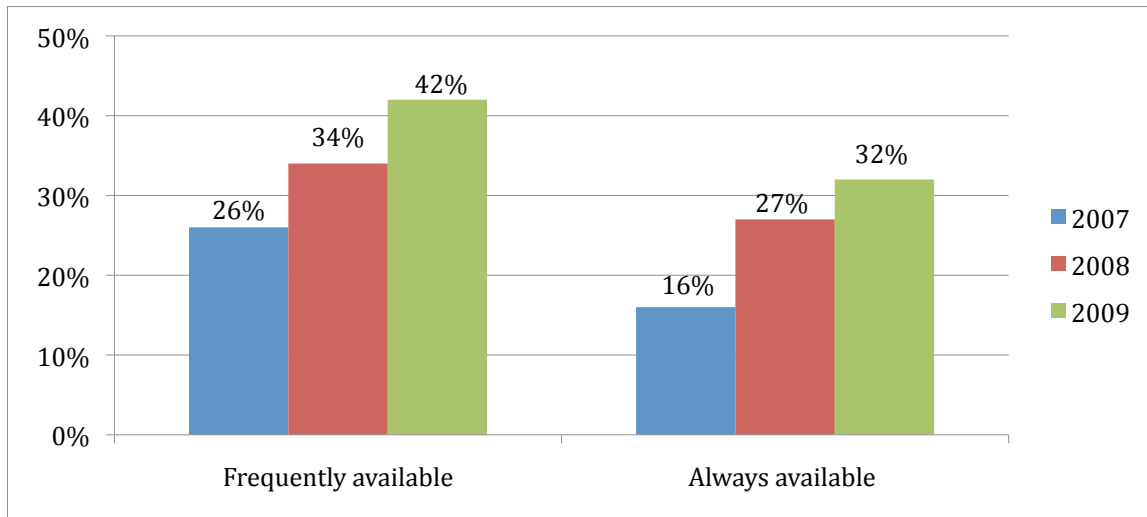
Technical Support

According to technology personnel, they spend on average about five hours a week installing, troubleshooting, and maintaining equipment, networks, operating systems, and software. In addition, they spend about four hours a week selecting and acquiring computer-related hardware, software, and

support materials. Because of technology personnel’s attention to ensuring a stable and reliable network and infrastructure, teachers and administrators report a high level of satisfaction with the availability and quality of technical support in the district.

The availability of technical support in Hattiesburg has increased since 2007 when the 21S Initiative started. In 2007, 16 percent of teachers reported that technical support was always available, and that number doubled to 32 percent in 2009 (see Figure 7).

Figure 7: Availability of technical support 2007–2009

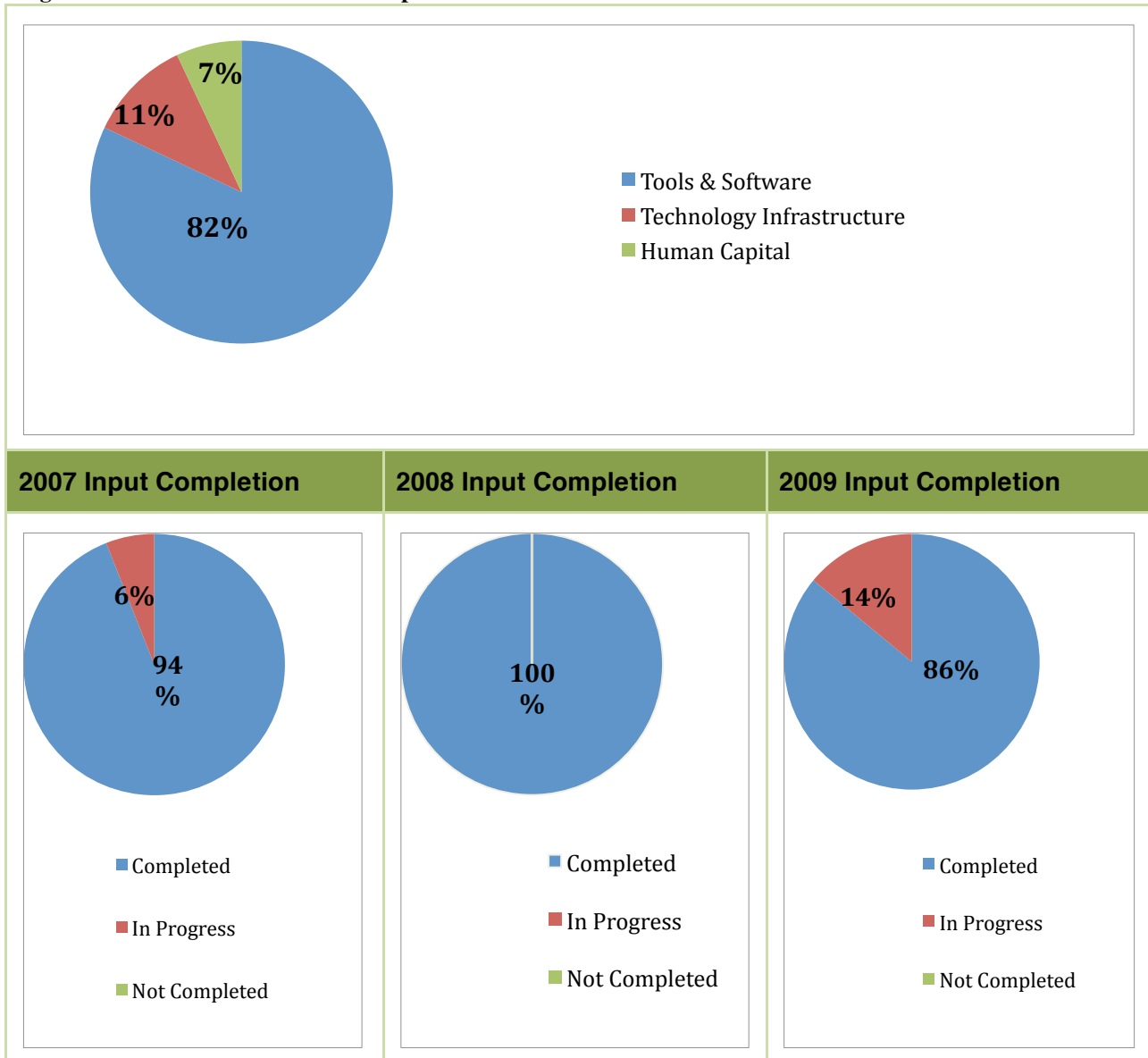


The quality of technical support has also increased and improved over the course of the 21S Initiative. More than three quarters of teachers report that their access to technology support was on target or above their expectations. The largest percentage of teachers was satisfied with the technical support (80 percent) and instructional technology support (77 percent). Administrators rated the state of implementation each year, and in the area of technical support, the percentage of leaders who said the status was on target or above their expectations rose from 40 percent in 2007 to 92 percent in 2009.

In 2009, 93 percent of administrators noted that the quality of support from technology staff in the district was very helpful, which was an increase from 2008 when 77 percent of administrators said the same thing.

As a result of these efforts, the district had completed 86 percent of its technology inputs in 2009 (see Figure 8). The 2009 Connected District/School chart reflects the status of new inputs put into place at the beginning of this school year. Fourteen percent (14 percent) are still in progress. The Input Distribution charts show that the majority of Connected School inputs (82 percent) were in relation to tools and software and a much smaller percentage came in the form of technology infrastructure or human capital.

Figure 8: Connected district/school input 2007–2009



Connected District/School Challenges

While the technology infrastructure and maintenance component of the 21S Initiative has seen many successes in the past years, there are still a few areas that could be improved, including increasing student access to computers and Web 2.0 tools. A significant group of teachers (43 percent) noted that they thought access to Web 2.0 tools was below expectations; 54 percent of teachers reported not having access to Web 2.0 tools in their classroom. Teachers also reported that they felt that they didn't have access to enough computers for all their students (45 percent).

Connected Learning

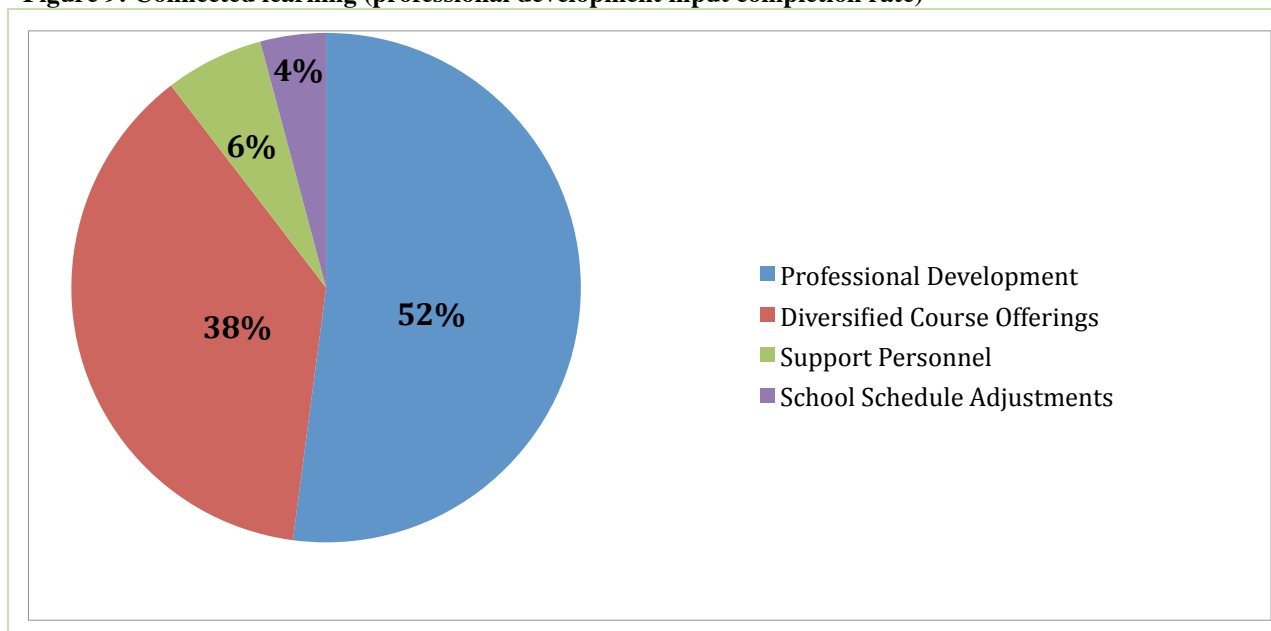
The connected learning component of the Initiative is focused on high-quality professional development resources and programs, which are intended to improve leadership, streamline administrative practices, increase technology access and integration, and promote student-centered teaching and learning

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.

In order to better understand how this component had been impacted by the 21S Initiative, researchers asked stakeholders about their perceptions of the learning environment. The data below highlights areas such as teacher communication and collaboration, as well as administrative and school support. High technology use and integration into the curriculum and external resources (e.g., experts, museums) are crucial for this component.

Over the course of the Initiative, 52 percent of Hattiesburg’s connected learning inputs were related directly to providing professional development regarding the new technology for teachers, administrators, and technology personnel. Another significant portion (38 percent) of inputs were related to offering more diverse courses for students, such as college prep, career readiness, and technology training (see Figure 9).

Figure 9: Connected learning (professional development input completion rate)



Administrator and Technology Personnel Training

Nearly three quarters of administrators (71 percent) say there has been a significant change in administrator training and professional development since the 21S Initiative began. The number of training sessions for administrators increased from 25 to 35 and the number of training hours increased from 175 to 183 in the last two years.

Both of the technology personnel who responded to the survey had participated in training around software and integration of technology into the curriculum. Both agreed that the training they received at conferences was the most helpful of the trainings they received. They also believed that the technology training they participated in was on target. That was an increase from 2008 when only 1 out of 3 respondents felt that their training was on target. In addition, 71 percent of administrators agree that technology professional development in Hattiesburg is on target or above their expectations.

Teacher Training and Ongoing Support

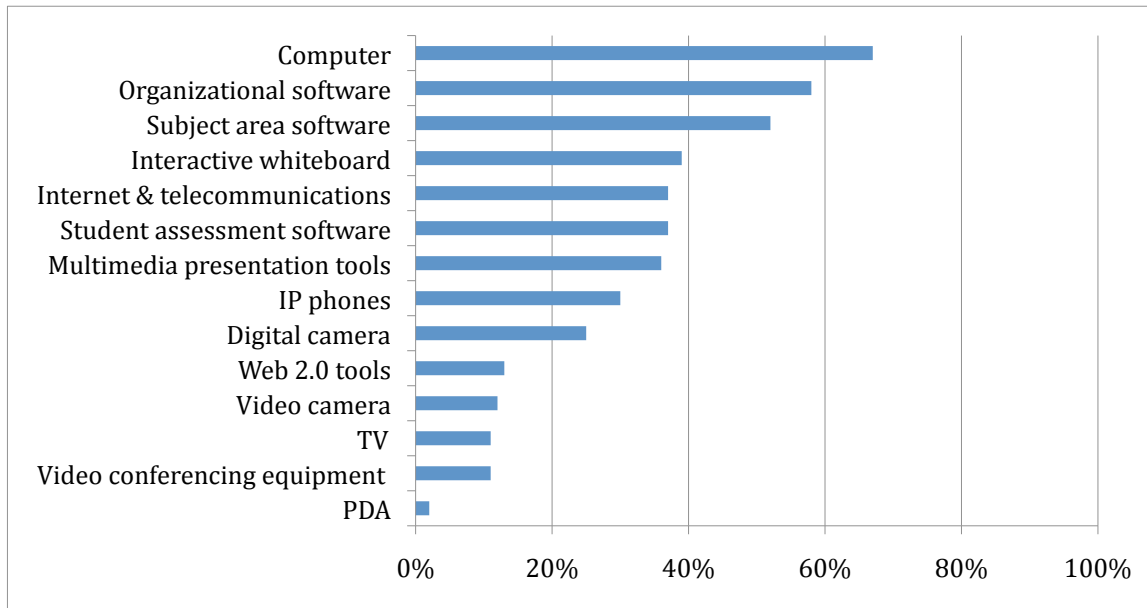
Since 2005, there has been a consistent increase in professional development (PD) opportunities available to both teachers and administrators. All teachers and administrators attended professional development activities across the four years. Table 8 provides more information about professional development.

Table 8: Professional development

	2005–2006	2006–2007	2007–2008	2008–2009
Number of PD opportunities offered to teachers	20	49	114	145
Number of teachers attending PD activities	347	387	365	375
Number of PD hours available to teachers	130	105	223	509.5
Number of PD opportunities offered to administrators	10	15	25	35
Number of administrators attending PD activities	30.5	33.5	32.5	33.5
Number of PD hours available to administrators	130	162.5	175	183

HPSD teachers received training for a variety of technology tools and software packages. The highest percentage of teachers participated in professional development for tools such as computers (67 percent), organizational software (58 percent), and subject area software (52 percent). See Figure 10 for further information about teacher technology training.

Figure 10: Teacher technology training



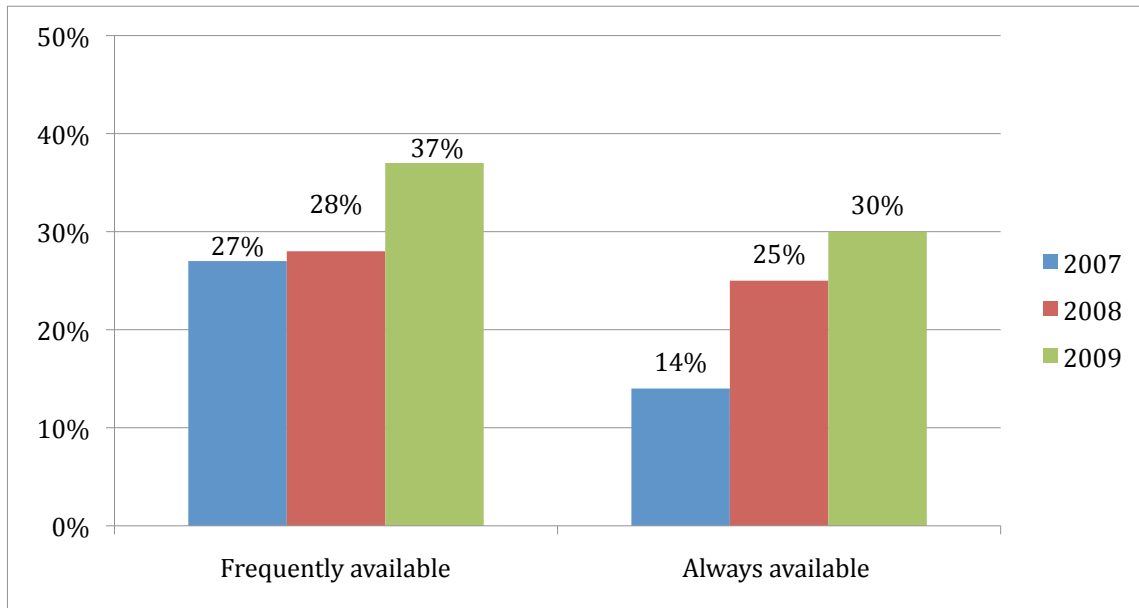
Besides training on specific hardware and software, teachers receive support around integrating those tools into their daily lesson plans. Seventy-five percent (75 percent) of teachers felt that their access to technological integration support was on target or above and 83 percent of teachers agree that after staff development activities they are provided with support to help integrate new practices into their pedagogy.

Over the course of the Initiative, teachers received technology training from a variety of sources including technology coordinators, external partners, other classroom teachers, and DOT interns. Technology personnel reported spending an average of 3½ hours per week training individual teachers to use technology tools, and about 4 hours per week helping teachers incorporate technology into their lesson plans. While nearly all of the trainings were helpful to some degree, in 2009 the highest percentage of teachers found the training by the school-level technology coordinator very helpful (58 percent). That percentage was an increase from 2008 when 47 percent of teachers believed those trainings were very helpful. In both 2008 and 2009 a little over half of teachers found training by their peers to be very helpful (55 percent).

Over half of teachers (54 percent) said they had worked with their school's DOT intern in some capacity and both technology personnel who responded said they had worked with DOT as well. The most common motive indicated by teachers (40 percent) for working with the interns was for troubleshooting and hardware/software problems. The technology personnel had worked with the interns primarily on integrating technology into lesson plans. Most administrators (70 percent) said support from the DOT intern in their school was very helpful; that was an increase from 2008 when 50 percent said the same thing about their intern.

Not only is integration support more common, the availability of instructional support has increased over time. In 2007, 14 percent of teachers said that instructional support was always available to them. That percentage more than doubled to 30 percent in 2009 (see Figure 11).

Figure 11: Availability of instructional support



A Qualitative Transformation of Teaching

Technology and professional development have fundamentally changed teaching in the district. According to the superintendent, nearly one-third of teachers are using facilitation in addition to the necessary “direct instruction” and “teacher-centered learning.”

An increased emphasis on professional development has given more teachers access to high quality learning opportunities to work with outside specialists and to share with each other and has helped teachers better incorporate technology into their teaching.

Currently, the district is partnering with the Schlechty Center for Leadership in School Reform, as well as the Understanding by Design team to provide ongoing professional development in schools. In addition, the district has pushed teachers to see each other as experts with skills and knowledge worth sharing and has created time and space after school and on weekends to allow teachers to meet and engage in conversation. Further, the district has also worked to create ownership at all levels, encouraging teacher input into professional development design and implementation as well as feedback once a session is finished.

We have many teachers who are really interested in lots of the technology tools. We have a Ning site now for teachers. At the high school level they want to either build Wikis or build linked sites for their students as well. (District Technology Staff)

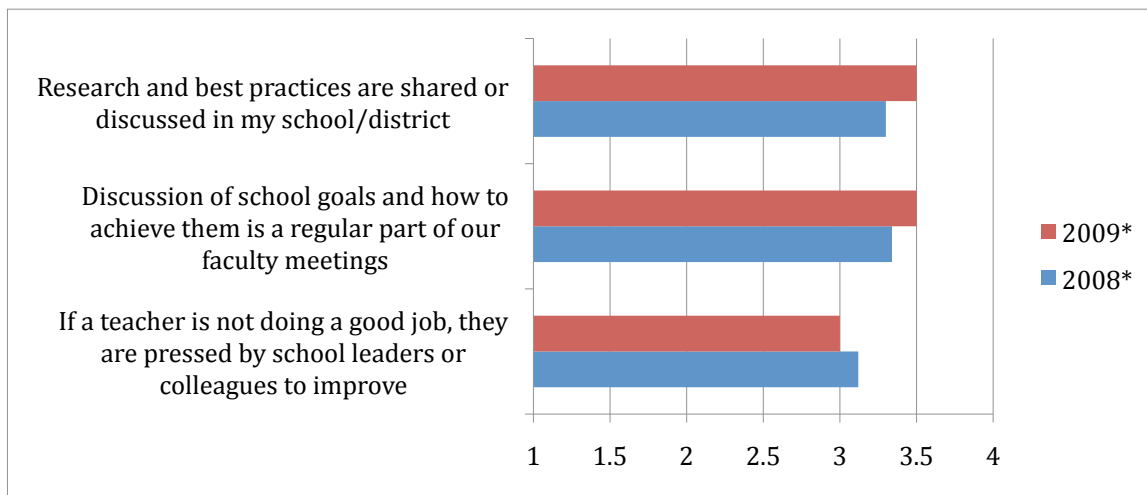
Despite the increased professional development, a feeling still exists at the district level that some teachers remain “very reluctant to use their technology.” Some district administrators reported that, “[teachers] were afraid if they didn’t push the right button or if they unplugged the wrong cord, it would destroy it and it would never be useful again.”

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' perception of administrative support has changed over time. Since last year, more teachers agree that research and best practices are shared and discussed in Hattiesburg. In addition, more teachers believe that the creation of goals and how to achieve them are discussed at faculty meetings (see Figure 12). Nearly three quarters of teachers (73 percent) agree they had sufficient administrative support to effectively integrate technology into their curriculum.

Figure 12: Administrative support 2008–2009



*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

One intended outcome of the 21S Initiative was increased administrative efficiency in daily tasks as well as larger management projects. Most administrators reported significant change in the following areas:

- Data analysis, collection, and dissemination (86 percent)
- Use of data for management, accountability, and instructional and equity decisions (79 percent)
- Administrative efficiency (73 percent)

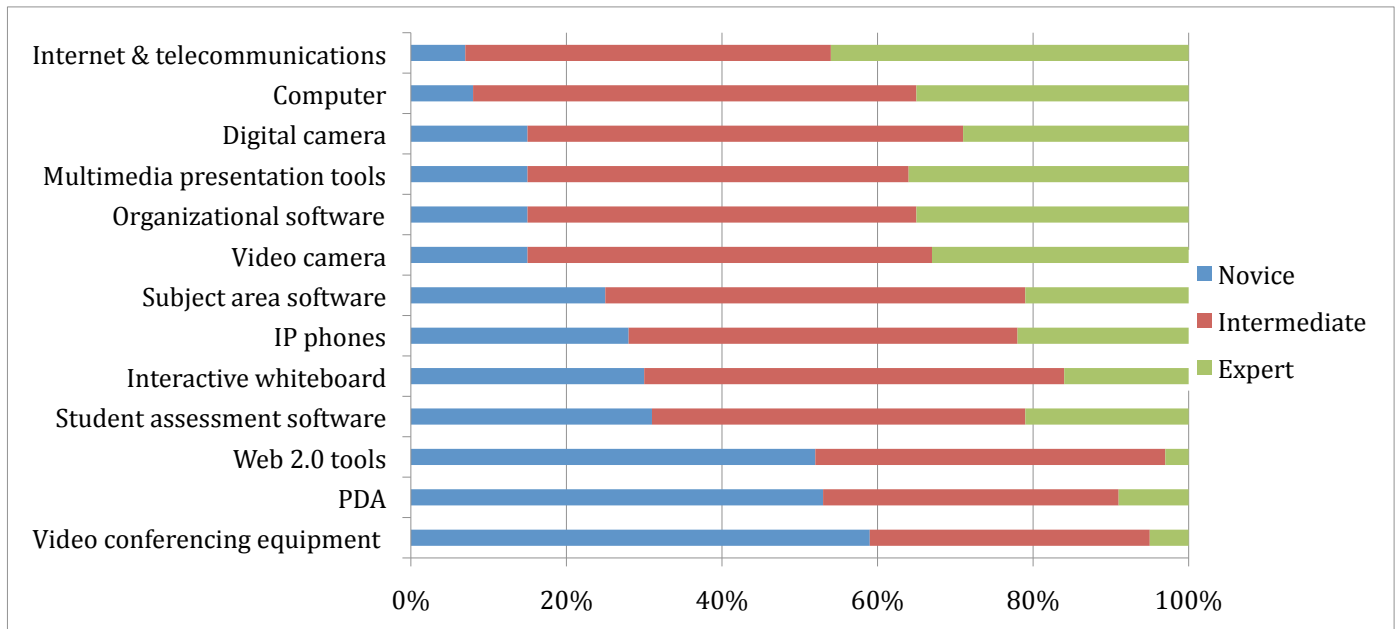
In addition to the administrators' increased and varied experiences with data to support their decisions and practices, a high percentage of teachers reported using data to inform their instructional practices (97 percent).

Teacher Technology Expertise and Use

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

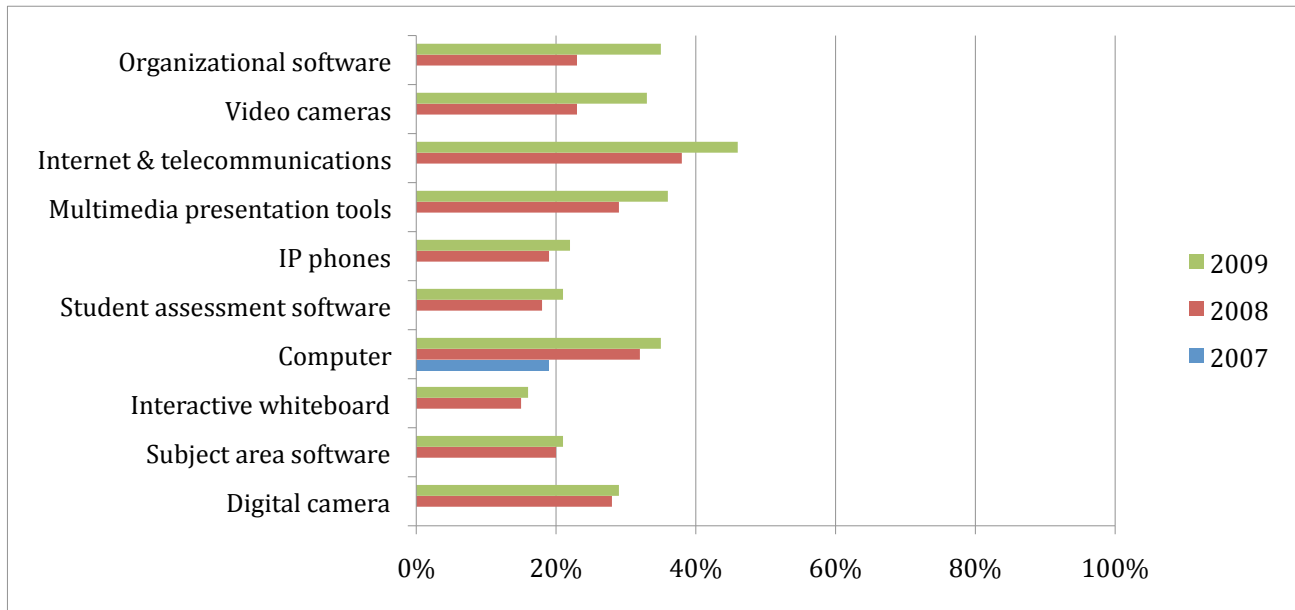
they were at either the expert or intermediate level in using the Internet (93 percent), computers (92 percent), and digital cameras (85 percent). See Figure 13 for more detailed information about teacher-reported expertise.

Figure 13: Level of teacher technology expertise (2009)



The percentage of teachers who considered themselves experts grew for every single type of technology tool in the past two years. The biggest increase was in their ability to use organizational software, video cameras, and the Internet. In 2008, 23 percent of teachers considered themselves experts at using organizational software and that group expanded to 35 percent in 2009. The computer is the only tool that can be tracked since 2007 and, as expected, there was a huge increase in teacher expertise over those three years. In 2007, only 19 percent of teachers considered themselves experts in the use of computers, and that number jumped to 35 percent in 2009. Figure 14 shows the change in percentage of experts over time.

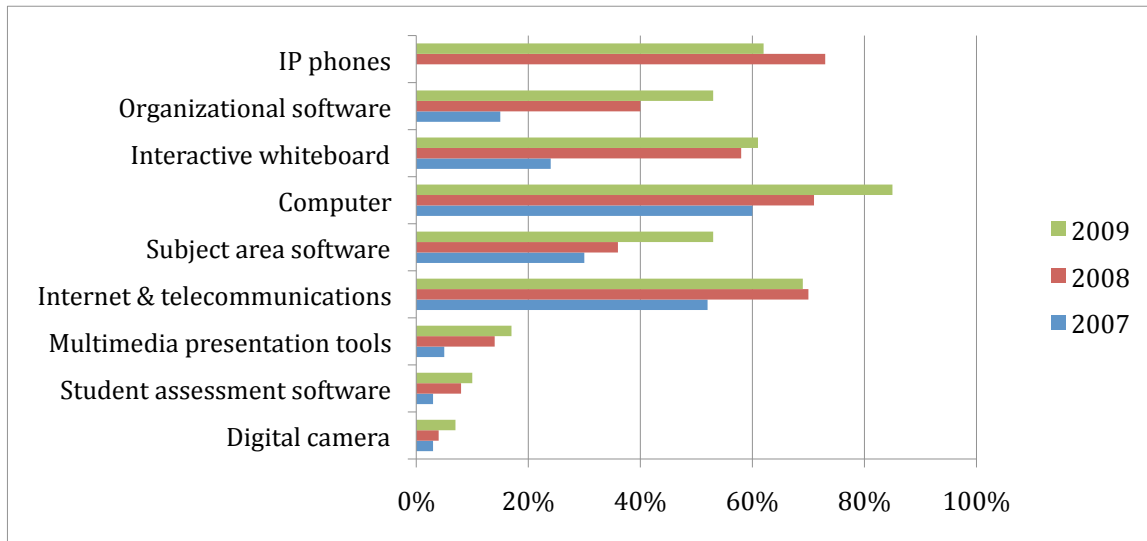
Figure 14: Percentage of teachers who consider themselves experts



Teachers’ use of technology has increased steadily over the course of the 21S Initiative. On average in both 2007 and 2008, teachers used technology in 76 percent of their classes. That number rose to 83 percent in 2009. In 2007, 59 percent of teachers reported using technology in all of their classes. That percentage grew to 70 percent in 2009.

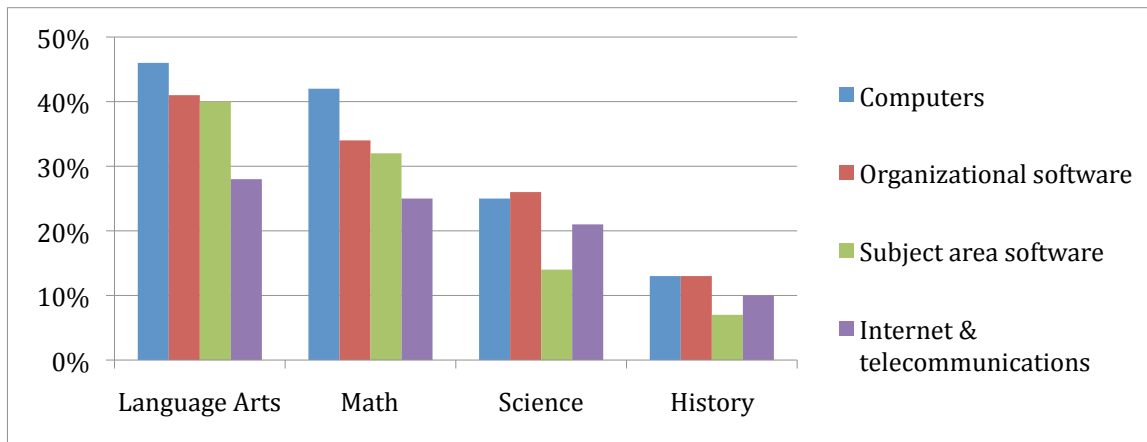
Teachers use a variety of technology tools in their classrooms. Though they are used with varied frequency, some tools are more likely to be used on a daily basis. A high percentage of teachers use the following tools every day: computers (85 percent), the Internet (69 percent), IP phones (62 percent), and interactive whiteboards (61 percent). The district saw the biggest changes in use in IP phones, organizational software, and interactive whiteboards. No teachers said they use IP phones daily in 2007 and that number has now jumped to 62 percent in 2009. The daily use of organizational software increased from 15 percent to 53 percent and the use of interactive whiteboards grew from 24 percent to 61 percent (see Figure 15).

Figure 15: Percentage of teachers using technology tools on a daily basis



Across subjects, the most commonly used technology tools are computers, organizational software, subject-area software, and Internet and telecommunications equipment. In general, technology tools are most often used in Language Arts and least often used in History (see Figure 16).

Figure 16: Use of technology tools by subject area



Student Technology Use

Promises and Challenges: District administrators highlighted the importance and benefits of getting technology into the hands of students in order to increase their engagement in the classroom. Administrators also acknowledged that teachers in Hattiesburg are using a variety of programs and technology tools (e.g., Reading 180, ePals, Skype, Academy of Reading and Math, Compass, Fast ForWord, Gizmos, Orchard, EduSoft, Marco Polo, Hot Chalk, Discovery Learning, and Learning 360) as a means to engage students and enhance instruction. Students are excited about using technology in their classes. However, some teachers reportedly are afraid students will break the technology so they do not let them touch it. The district stresses that “rather than having something sitting that’s not used because you’re afraid it’s going to get broken, get the students engaged using the technology.”

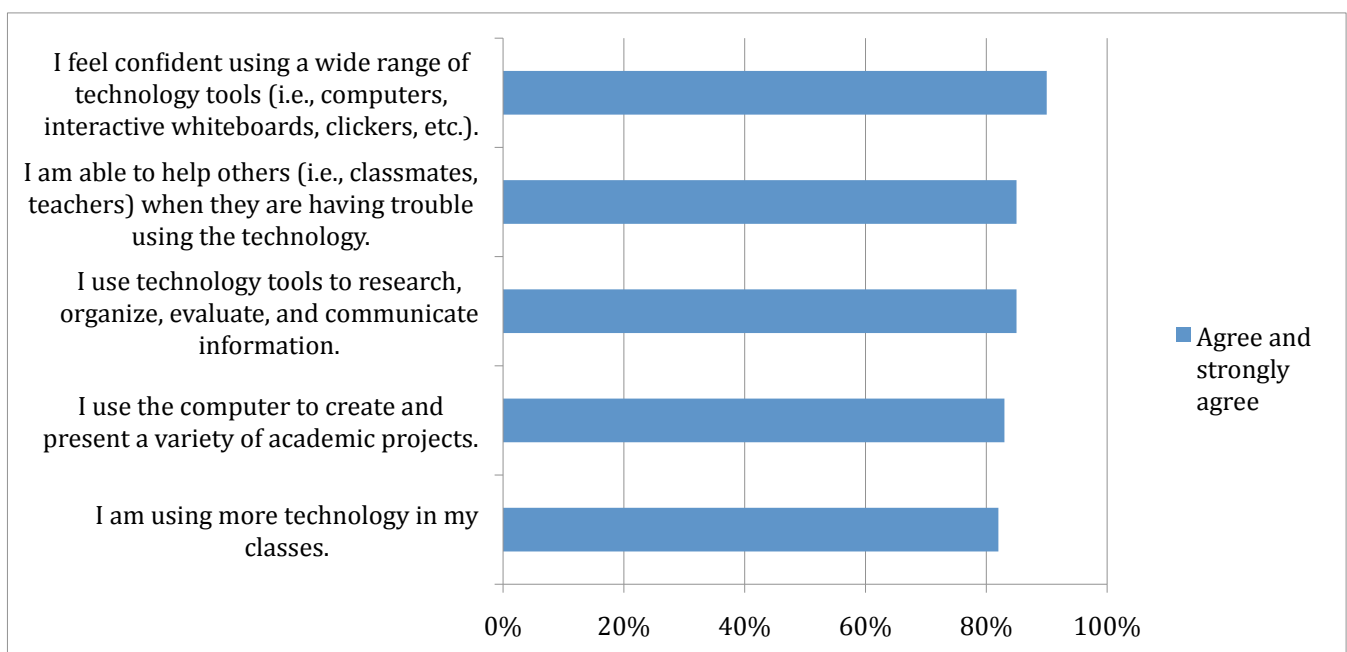
The district leadership underscored the increased role of technology in the everyday lives of students and the importance of keeping students engaged in the classroom. She explained:

It has changed a culture, and I use the term “culture of engagement” of students, because we realize—and it has helped to realize—that student engagement is critical to learning, no matter what you have out there. If the kids are not with you, it doesn't matter, and it's given us an opportunity to really begin to teach these, as they call, the digital natives, in the style that they've come to me. I mean, this is the way they know. (District Administrator)

Like teachers, students use a variety of technology tools in their classes. The ones that most students used on a daily basis included computers (77 percent) and interactive whiteboards (67 percent). In 2008, 66 percent of students reported using computers daily, so there was an increase of 11 percentage points over the two years. While students reported using technology in a number of their classes, students cited science (70 percent) and math (50 percent) as classes in which technology was used on a regular basis. In 2008, only 59 percent of students said they use technology in their science classes as compared to 2009, which reveals an 11 percentage point increase between the two school years.

In general, students agreed in 2009 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. Over 80 percent of students in all categories indicated that they have a wide range of competencies with technology. In addition to what students report about themselves, all administrative respondents (100 percent) agreed that students have become more ICT literate since the 21S Initiative began. Figure 17 outlines more specific student ICT competencies.

Figure 17: Student ICT literacy



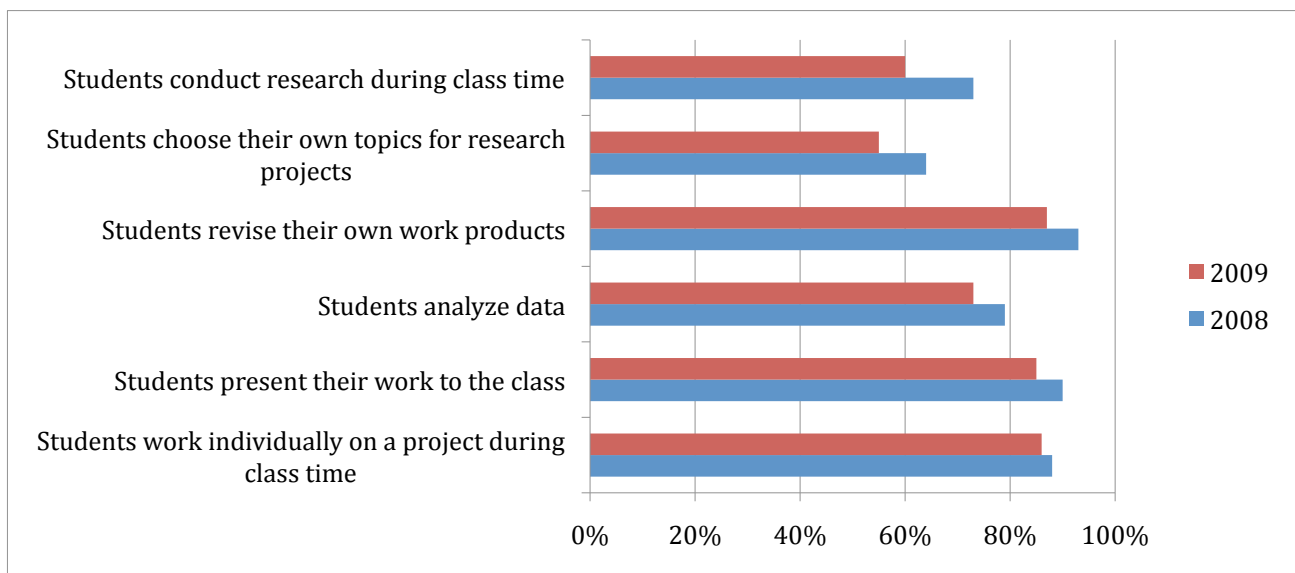
Pedagogical Practices

The Connected Learning program component of the Cisco 21S Initiative aimed to influence teacher pedagogy and teaching styles. The goal was to shift teachers towards a constructivist teaching methodology. 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.

Most Hattiesburg administrators (80 percent) agreed that there had been significant changes in the overall quality of teachers in the Hattiesburg district. On average, teachers scored a 2.92 on the pedagogy scale (0= traditional versus 5=constructivist), indicating a slightly more traditional than constructivist pedagogy. Four percent (4 percent) of teachers received a 0 on the pedagogy scale indicating that they endorsed all five traditional pedagogy statements. Twenty percent (20 percent) of teachers received a 5 on the pedagogy scale indicating that they endorsed all five constructivist pedagogy statements. Twenty-six percent (26 percent) of teachers scored a 4 and 23 percent scored a 3 on the pedagogy scale.

The use of a variety of constructivist teaching methods has decreased across the district in the past two years. Most notably, 73 percent of teachers reported having their students conduct research during class in 2008, and that figure dropped to 60 percent in 2009. There was also a decrease in the percentage of teachers who let their students choose their own research topic or revise their own work plans. Figure 18 shows the change in percentage over time for a number of other teaching practices.

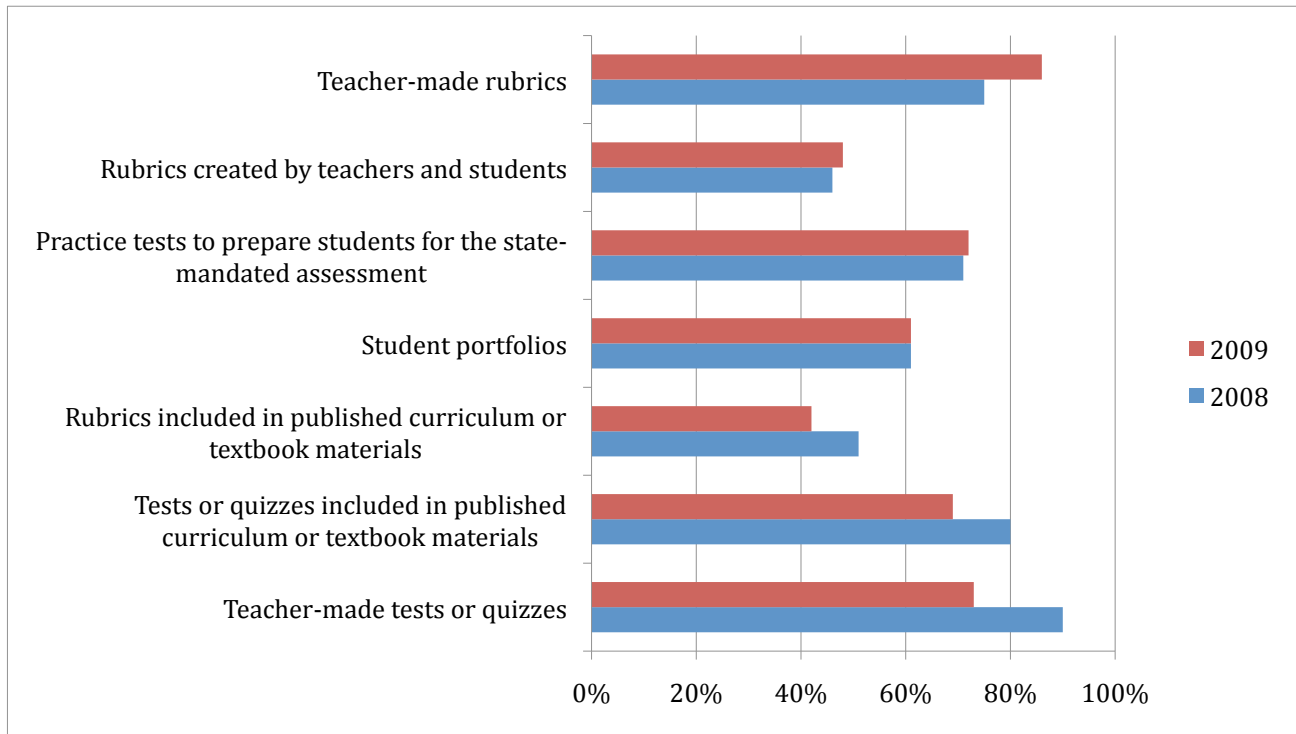
Figure 18: Teaching practices over time



Note: Table shows percentage of teachers who reported using the teaching practice at least once over the course of a two-week period.

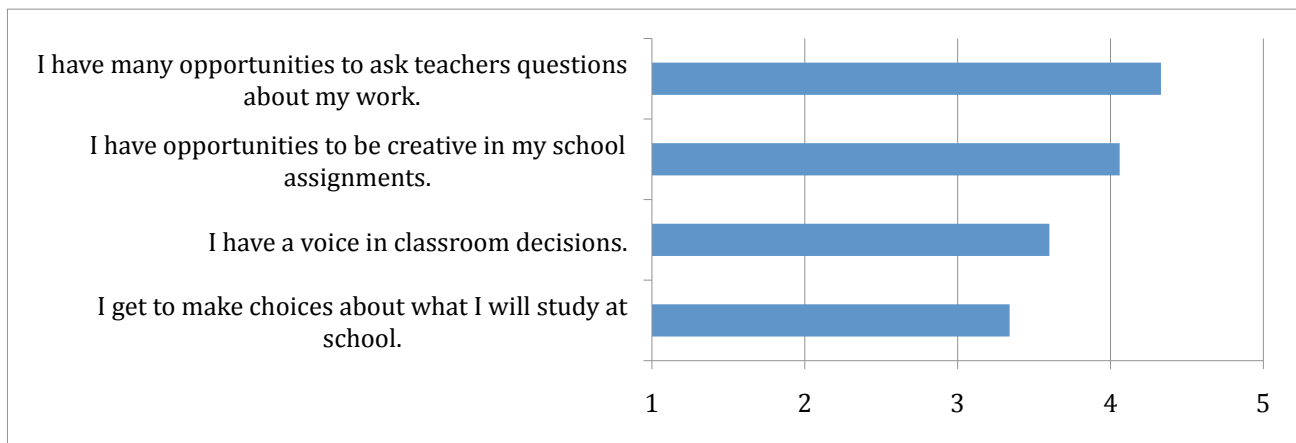
Teachers in Hattiesburg have begun using more teacher- and student-developed rubrics. There has been no change in the frequency of student portfolios, but fewer teachers say they use tests, quizzes, or rubrics from textbooks. Figure 19 shows the change over time for a variety of assessments.

Figure 19: Teacher assessment practices over time



Hattiesburg students were also asked several questions about the role they play in their classrooms. Overall, students agreed 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 agreed that they have a voice about what happens in the classroom and about what they want to study (see Figure 20).

Figure 20: 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

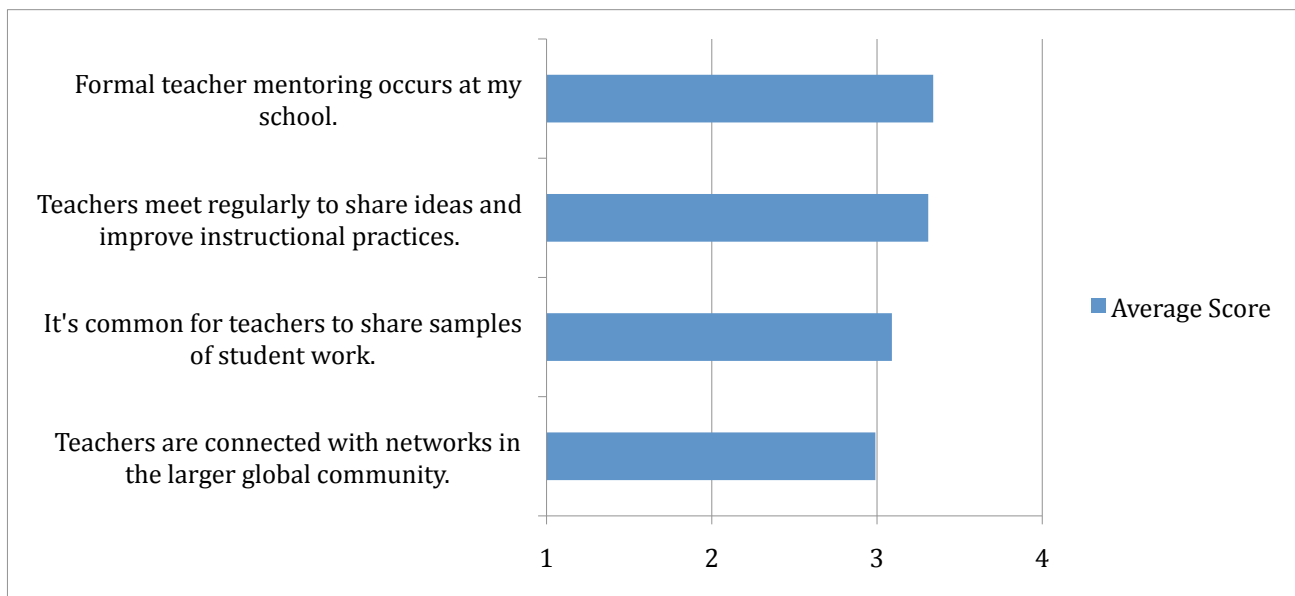
The ability of teachers to integrate technology into their daily lesson plans is a vital component of the 21S Initiative. One of the impacts of professional development in the district is that 41 percent of teachers said they were highly efficient, or approaching highly efficient, in their ability to integrate technology into their teaching practices. Both technology personnel agreed that there has been significant change in the amount of technology being integrated into the curriculum and that technology integration is on target with where it should be. In 2008, only 1 out of 3 respondents felt that way.

Two contributing factors that enable smooth integration are time and visible mentors. Half of teachers in Hattiesburg (50 percent) said that they have time to integrate technology into their curriculum and 65 percent of teachers feel like they have role models in the school to emulate.

Communication and Collaboration

Most administrators (69 percent) and both technology personnel surveyed agreed that there has been significant change in teacher collaboration over the course of the Initiative. Teachers agreed that collaboration is part of their school culture. Teachers reported a high level of agreement on four unique measures of collaboration indicating that they frequently mentor each other, meet, exchange ideas, share student work, and interact with global networks. In addition, the percentage of teachers who said they had role models in their school for integrating technology into their teaching more than doubled from 30 percent in 2007 to 65 percent in 2009 (see Figure 21).

Figure 21: Teacher communication and collaboration



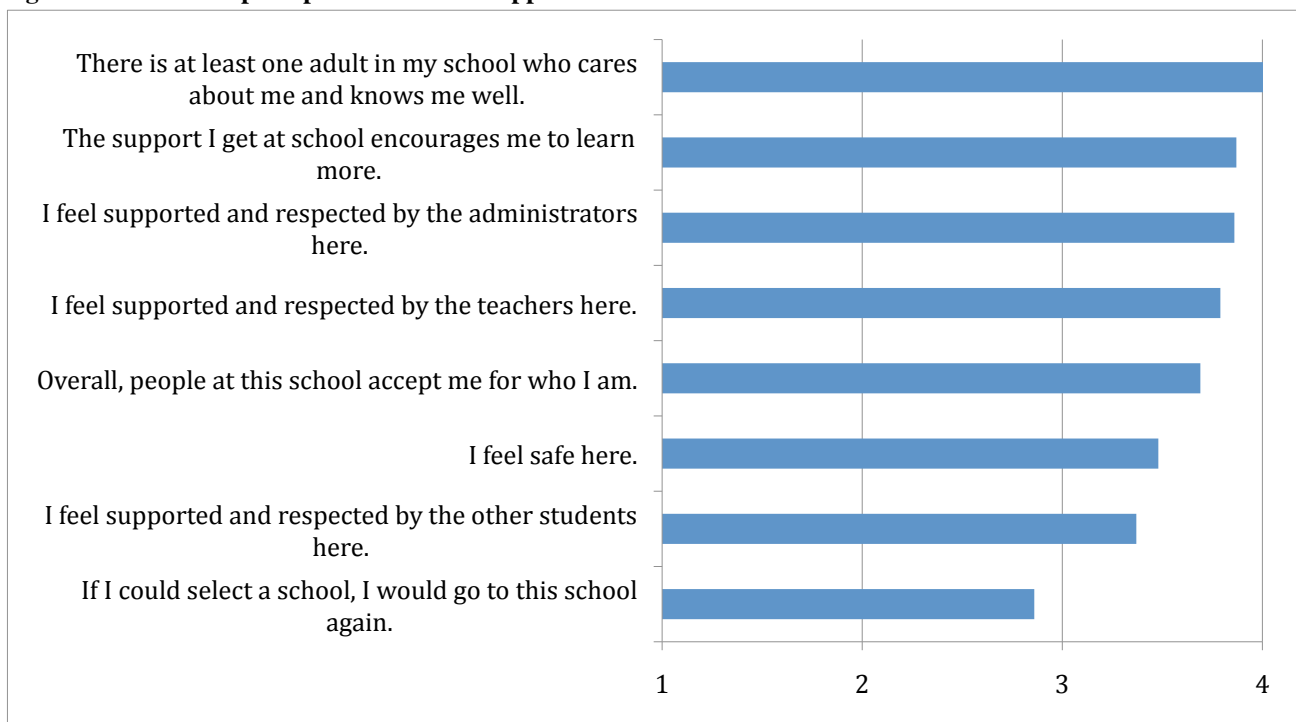
Note: Participants indicated how much they agreed or disagreed with statements on a scale from 1 (strongly disagree) to 4 (strongly agree). Higher scores indicate greater agreement.

Increased professional development has also affected communication between teachers and students positively. 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 forms of communication include using the Internet to post lesson plans (64 percent) and using the Internet to post student lessons (34 percent). In Hattiesburg, however, it is still a rare practice for

teachers to use Skype, blogs, or e-mail to communicate with their students, with only 3 percent, 6 percent, and 9 percent, respectively, doing it.

The amount of communication and collaboration present in the learning environment can impact students' perceptions of support. Hattiesburg students were asked to respond to eight statements about the amount of support available to them in their schools. Overall, students reported experiencing high levels of support. The largest number of students agreed that they have at least one adult in their school who cares about them. Students also agreed that their school encourages them to learn more and that teachers and administrators respect them. Figure 22 outlines more specific measures of student perceptions of school support.

Figure 22: Students' perceptions of school support



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.

Impact on Students

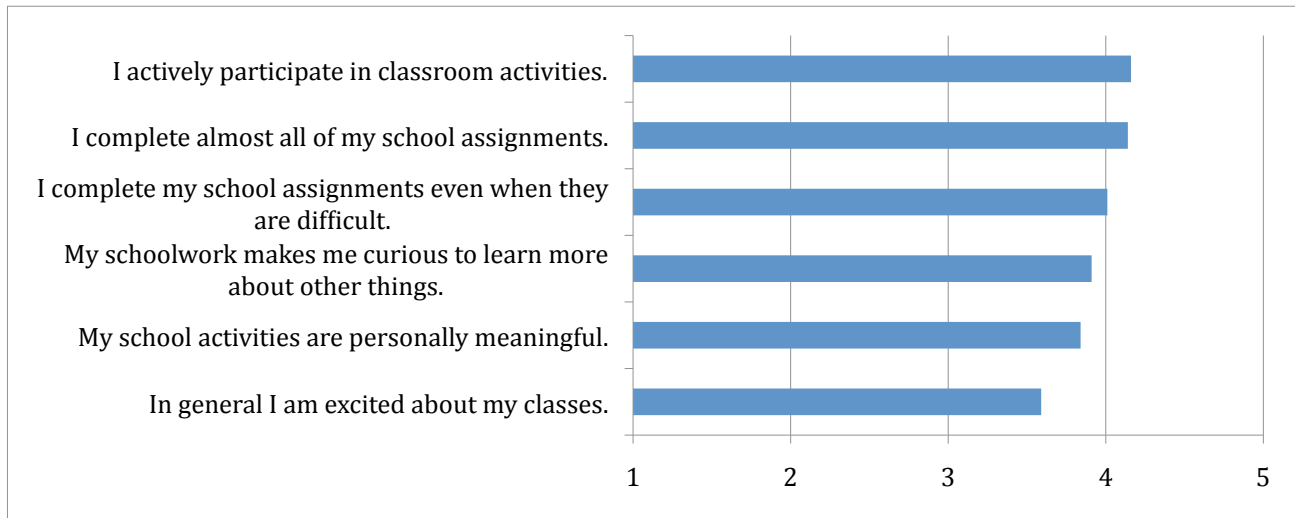
To assess the impact of the Initiative on students, EDC researchers looked at student engagement and motivation, student test scores, grade promotion and graduation, and college and workforce readiness.

Student Engagement and Motivation

The majority of administrators (93 percent), teachers (88 percent), and students (85 percent) agreed that students have become more engaged in their classes. In addition, 86 percent of students said they were learning more on their own.

Students were also asked a series of statements assessing their engagement in classroom activities. Overall, Hattiesburg students report high levels of engagement in their classes and schoolwork. More specifically, they participate actively in class and complete their school assignments (see Figure 23).

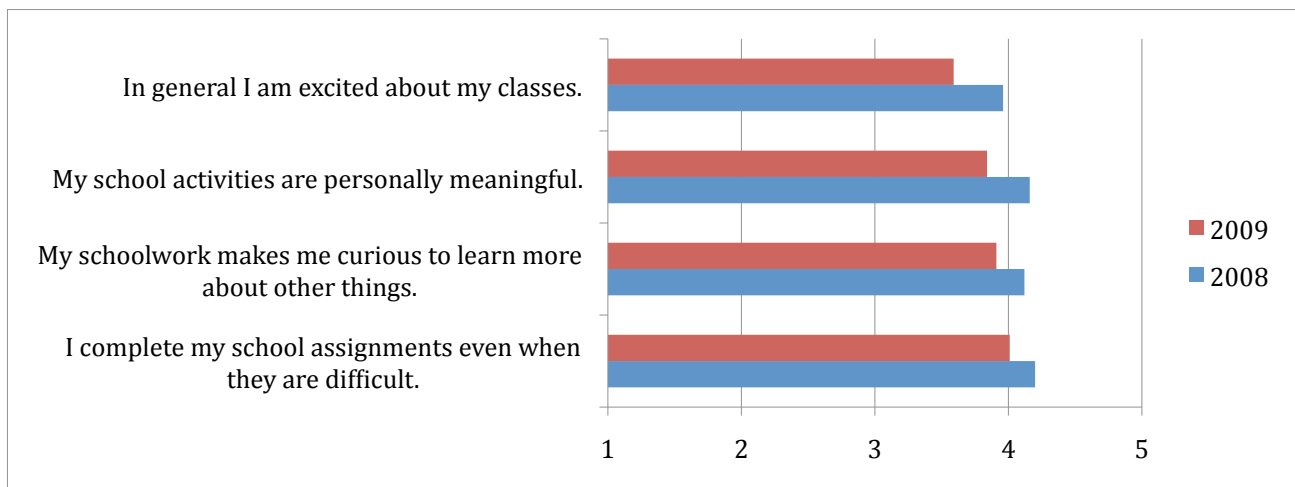
Figure 23: Student engagement



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.

While students in Hattiesburg reported high levels of engagement in both 2008 and 2009, there was a decrease in the strength of agreement over time. The largest drop was on the measure that indicated student’s excitement about their classes. In 2008, students averaged a 3.96 out of 5 on the scale; in 2009 that figure dropped to 3.59. Figure 24 shows other measures of student engagement over time.

Figure 24: Student engagement over time

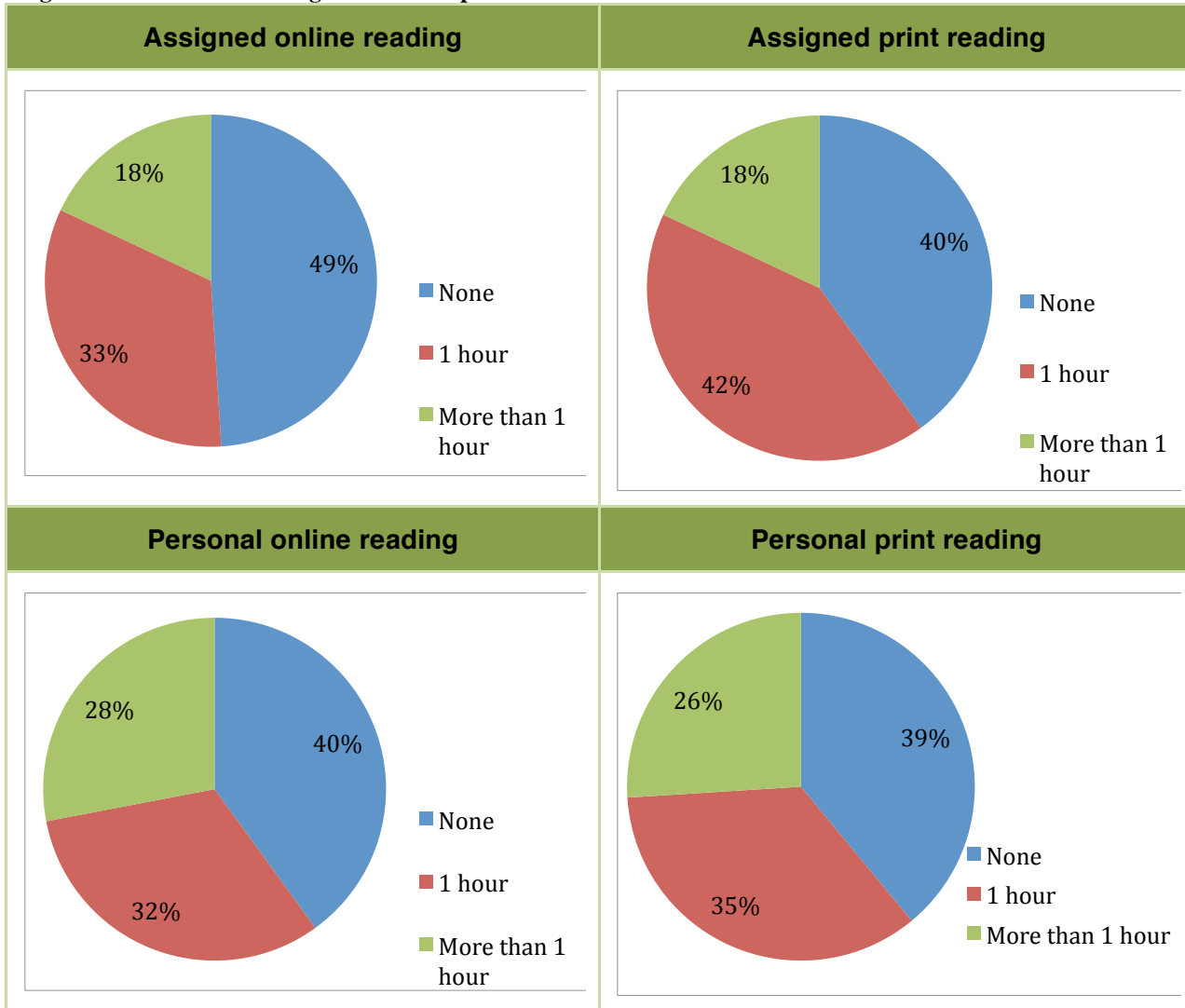


Note: Participants indicated how much they agreed or disagreed with statements on a scale from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicate greater agreement.

EDC researchers used students’ interest in reading as an indicator of student’s engagement and motivation in learning. There has been an increase in the amount of time that students spend reading in the Hattiesburg district. In 2008, 31 percent of students said they spend one hour or more reading each day; in 2009, that number rose to 48 percent. The following charts show, on average, how much assigned and personal reading students do each week. It also distinguishes print from online reading. It

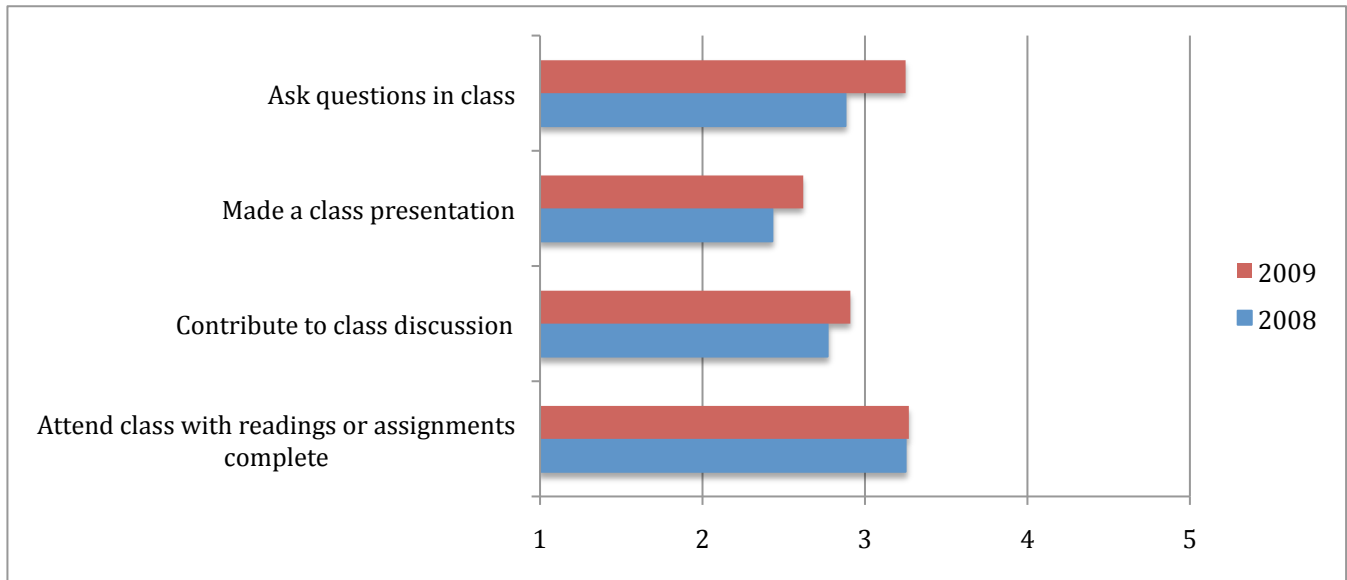
is most common for students to spend about an hour a week on assigned print reading. On average, students do the same amount of personal reading both online and in print (see Figure 25).

Figure 25: Students’ reading interest and practices



Classroom participation was another measure of students’ engagement and motivation to learn. On average, teachers noted that between 60 percent and 70 percent of their students ask questions in class. Similarly, they reported that between 70 percent and 80 percent of their students arrive to class prepared to engage in the lesson. Further, class participation has increased in a number of categories in the past two years. More students report asking questions, making presentations, and contributing to class discussions than they had done previously. Figure 26 depicts how students’ ratings of participation have changed over time.

Figure 26: 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.

Behavior Incidents

EDC researchers used absenteeism and behavior incidents as indicators of students' engagement and motivation. Student attendance has improved in the Hattiesburg district, with the average number of absences per day decreasing from 299.7 in 2005–2006 to 240.9 in 2007–2008. When compared to the total student population, the percentage of students absent each day dropped from 6.6 percent in 2005–2006 to 5.4 percent in 2007–2008. On average, teachers report that between 80 percent and 90 percent of their students arrive to class on time. One-fifth of students (20 percent) said they had not missed a day of school in the past year, an increase from 8 percent in 2008. Over half of students (55 percent) said they had only missed between one and five days—a drop from 2008 when 70 percent had missed between one and five days. Additionally, 54 percent of students said they had not been late to class in the past month, while 35 percent of students admitted to having been late between one and five times.

Teachers report that, on average, only a small percentage (about 20 percent) of students receive discipline referrals for inappropriate behavior. In addition, 73 percent of administrators and 60 percent of teachers say that they are seeing fewer discipline problems among their students since the inception of the 21S Initiative. Students agree, with 77 percent claiming they are having fewer discipline problems since their experience with the 21S Initiative.

Although there were declines in the number of detentions and suspensions in 2009, the Hattiesburg district had seen an increase in the number of detentions, suspensions, and expulsions between the 2005–2006 and 2007–2008 school years. The number of classroom behavior incidents reported has also risen steadily from 7,816 in 2005–2006 to 9,083 in 2007–2008. Table 9 provides more information about students' behavior incidents.

Table 9: Behavior incidents

	2005–2006	2006–2007	2007–2008	2008–2009
Number of classroom behavior incidents	7,816	8,667	9,083	8,657
Number of absences per day (average)	299.7	232.8	240.9	232.4
Number of detentions	449	702	1,930	1,738
Number of suspensions	2,061	1,998	3,535	3,028
Number of expulsions	9	16	21	45

Participation in Contests and Fairs

HPSD students' participation in math and science fairs at the state level has increased significantly between 2007–2008 and 2008–2009. Students participated slightly less in math and science fairs at the regional level during the same period. Table 10 shows more details on student participation in contests and fairs.

Table 10: Participation in contests and fairs

	2005–2006	2006–2007	2007–2008	2008–2009
Number of students participating in math/science fairs at the state level	***	***	3	18
Number of students participating in math/science fairs at the regional level	***	***	132	119

*** Data not available.

In addition, HPSP students have participated in a variety of contests and fairs over the past four years. All 3rd to 8th grade students participated in the district science/math fair between 2006–2007 and 2008–2009. In addition, all kindergarten through 8th grade students participated in the district reading fair.

Student Test Scores/Academic Performance

Stakeholder groups unanimously agree that student academic performance on a number of measures has increased since the start of the Initiative. Eighty-nine percent (89 percent) of students, 70 percent of teachers, and 60 percent of administrators agree that test scores have increased. Most students (85 percent) believe they are writing more effectively and thinking more deeply and critically than they were before the Initiative began. Finally, 64 percent of teachers indicate that their students' abilities are comparable to those of other students across the nation.

In order to understand how students' scores on standardized tests may have been positively affected by the 21S Initiative, EDC researchers collected and analyzed state and national 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.

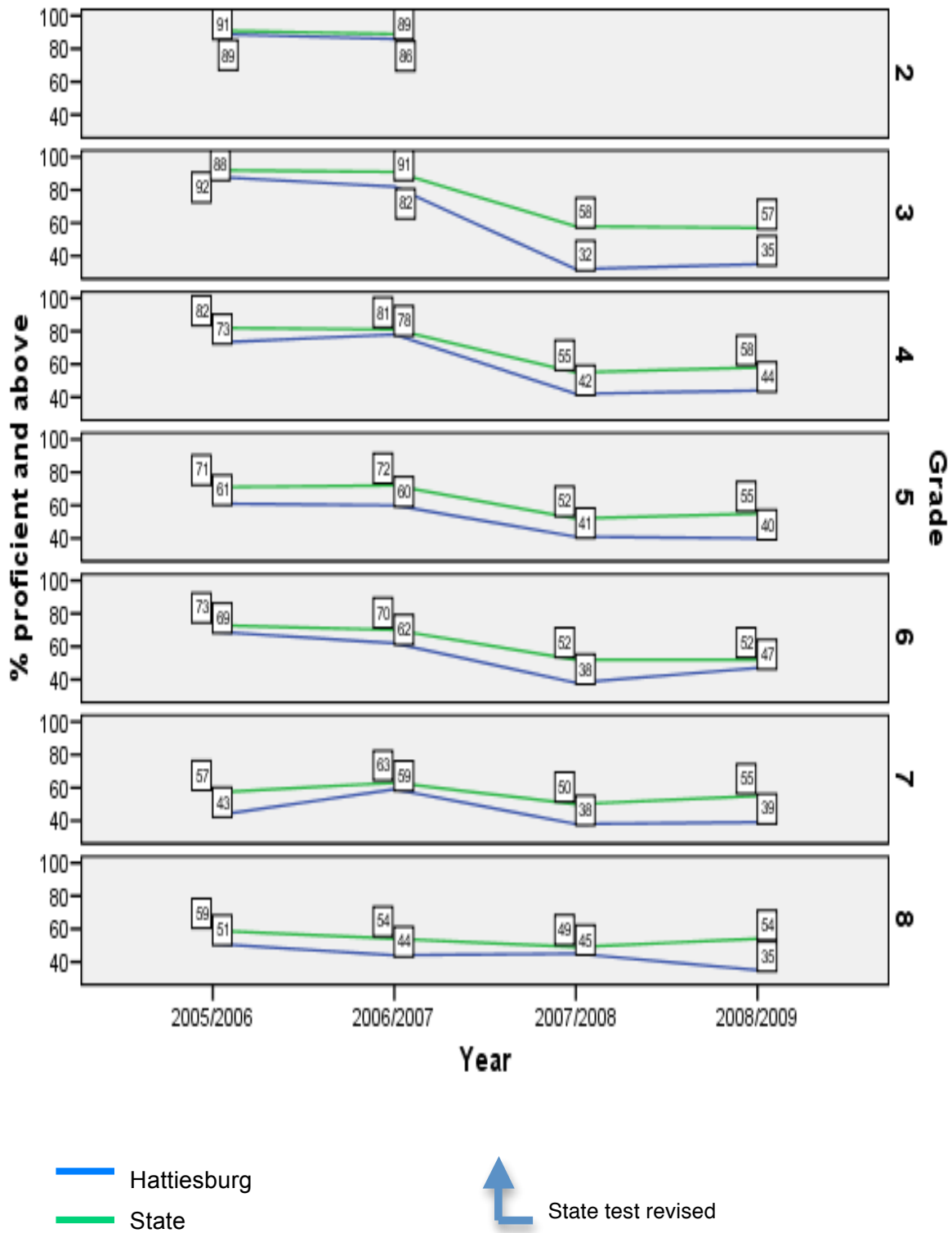
SATP results are scored between 0 and 500, with 300 and above considered to be a passing score.

EDC researchers examined patterns of change across testing years for both HPSD and the state overall. The MCT and 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 HPSD's test scores relative to state scores, the state scores were subtracted from the district scores to create a measure of difference between the district and the state. A positive score indicates that the district has a higher percentage of students at that level compared to the state while a negative score indicates the opposite.

Mathematics MCT/MCT2

Between 2007–2008 and 2008–2009 there have been increases in the percentage of Hattiesburg students scoring proficient or above in four of the six grades tested. The largest increase was for sixth grade students, where the percentage of students scoring proficient or above increased by 9 percentage points. While the percentage of Hattiesburg students scoring proficient or above is lower than the state as a whole, the distance between district and state scores narrowed for grades 3 through 6 between 2007–2008 and 2008–2009 (see Figure 27).

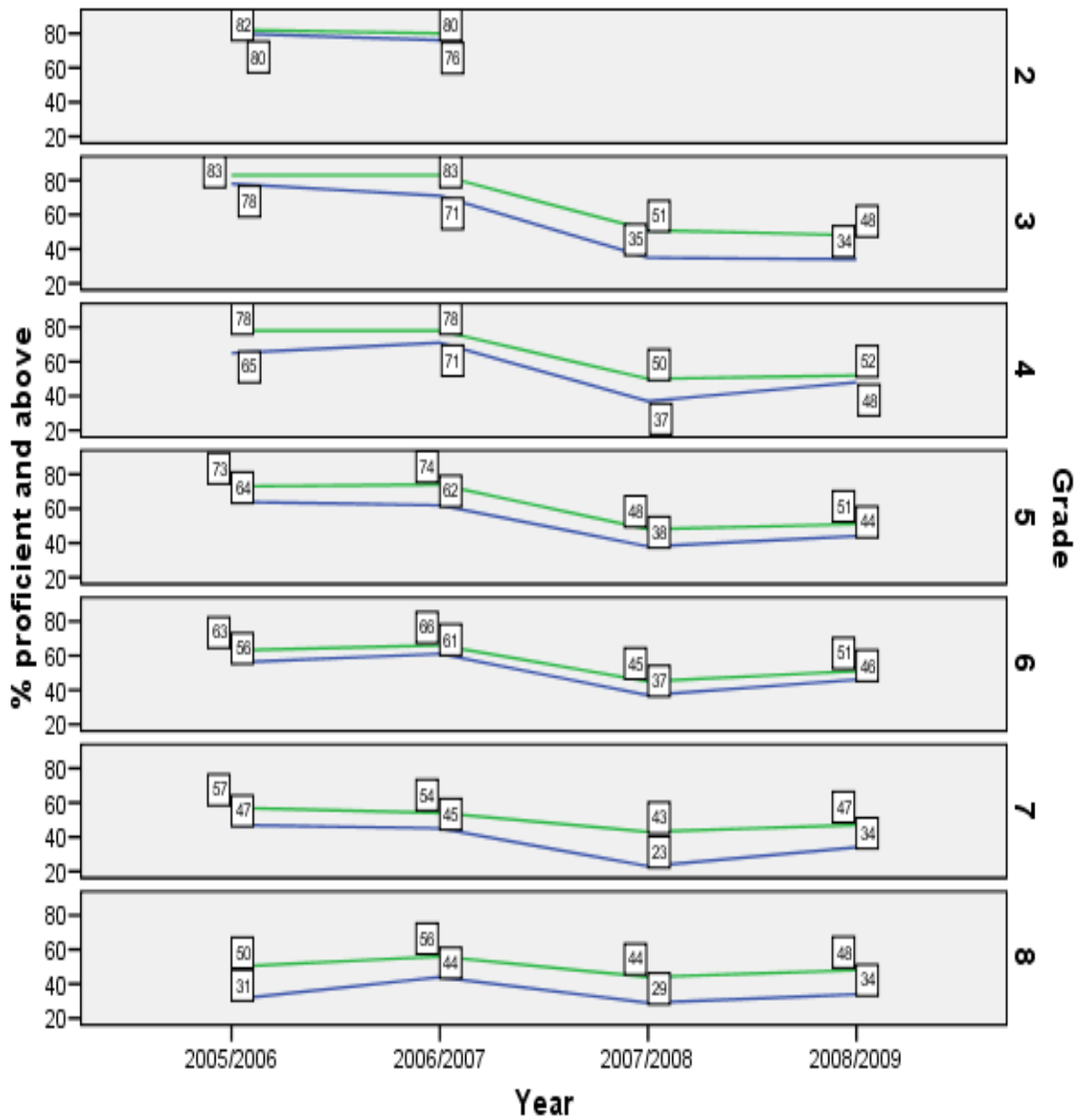
Figure 27: Mathematics MCT and MCT2 (Percent proficient and above)



Language Arts MCT/MCT2

Between 2007–2008 and 2008–2009 there have been increases in the percentage of Hattiesburg students scoring proficient or above in five of the six grades tested. The largest increase was for fourth and seventh grade students, where the percentage of students scoring proficient or above increased by 11 percentage points. Although the percentage of Hattiesburg students scoring proficient or above is lower than the state as a whole, the distance between district and state scores narrowed for across all six grades between 2007-2008 and 2008-2009 (see Figure 28).

Figure 28: Language Arts MCT and MCT2 (Percent proficient and above)



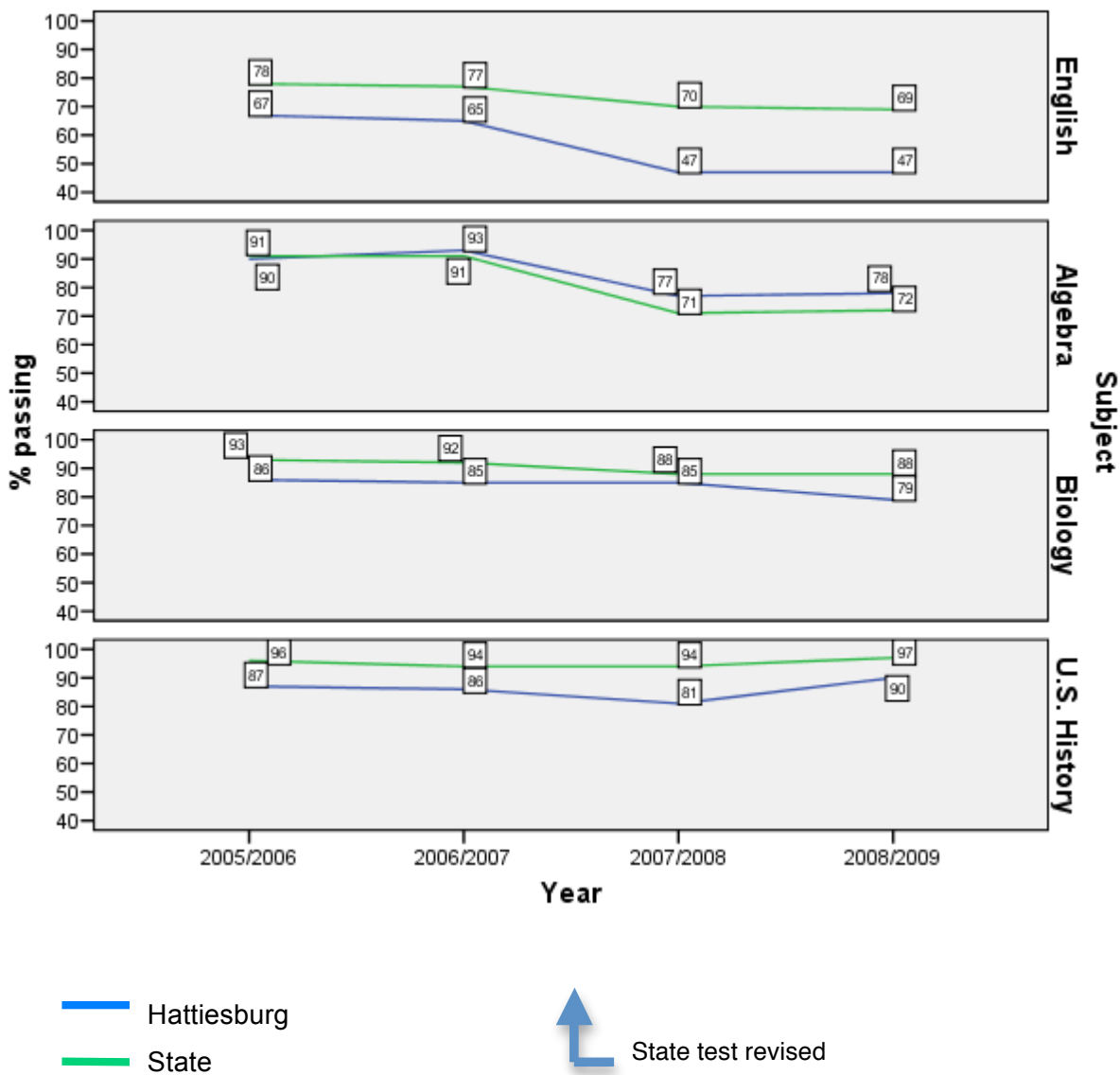
— Hattiesburg
— State

State test revised

SATP

There were increases in the percentage of Hattiesburg students passing the Algebra and U.S. History subject tests between 2007–2008 and 2008–2009. The largest increase was in U.S. History where the percentage of students passing the test increased by 9 percentage points. There was no change in the percentage of Hattiesburg students passing the English subject test. In most subjects, the percentage of Hattiesburg students with passing scores is lower than the state as a whole. The one exception to this pattern is in Algebra where the percentage of Hattiesburg students passing the test is higher than the state in 2006–2007 (see Figure 29).

Figure 29: SATP (Percent passing)



The ACT participation rate in HPSD has remained relatively stable over the years, though the average ACT score has fallen from 18.3 in 2006 to 16.7 in 2009 (the highest possible score on the ACT is 36). In addition, fewer students are taking Advanced Placement (AP) courses, but more of those taking AP courses are scoring 3 or above on the test. The AP tests are scored on a numeric scale from 1 to 5. In 2005–2006, 44 percent scored a 3 or above while nearly two-thirds (60 percent) scored at that level in 2008–2009 (see Table 11).

Table 11: College entrance exams

	2005–2006	2006–2007	2007–2008	2008–2009
Percent of ACT participation	62%	59%	68%	66%
ACT average score	18.6	17.6	17.6	16.7
Number of students taking AP courses	288	185	135	121
Percent of AP test participation	23%	29%	19%	13%
Percent of AP scores 3 or above	44%	44%	52%	60%

HPSD has seen major improvements in terms of the student dropout rate, with the number of students leaving school early decreasing by more than half since 2005. The high school graduation rate has increased steadily between 2006 and 2008. In addition, the percentage of students moving on to the next grade has increased, while the number of students receiving diplomas has decreased slightly (see Table 12).

Table 12: Grade promotion and graduation

	2005–2006	2006–2007	2007–2008	2008–2009
Number of students moving on to next grade level	95%	94%	97%	97%
Number of students that dropped out	70	77	32	35
Number of students receiving diplomas	256	232	236	230
Percent of high school graduation*	55.3%	57.2%	64.9	**

* As reported by the State of Mississippi—Change from NCLB report

** Data not available

The number of students receiving college scholarships has increased from 52 in 2005–2006 to 58 in 2008–2009. In addition, the percentage of students accepted to college and receiving scholarships has increased steadily. However, college acceptance has dropped at both vocational schools and two- and four-year colleges. Table 13 provides more information about the district’s college acceptance and scholarship rates.

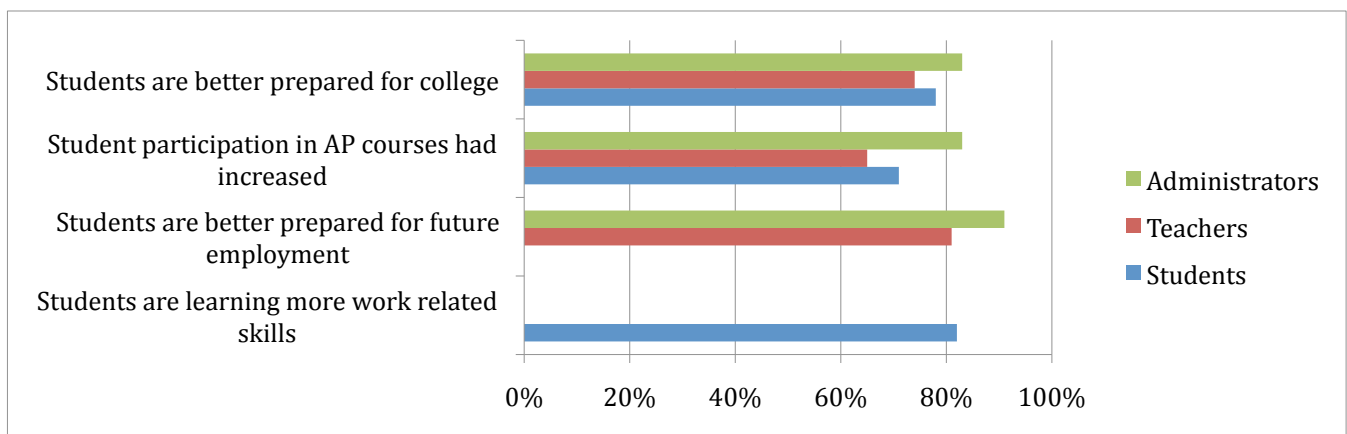
Table 13: College acceptances and scholarships

	2005–2006	2006–2007	2007–2008	2008–2009
Number of students receiving scholarships	52	45	66	58
Percentage of students accepted to college receiving scholarships	23%	22%	34%	31%
Number of students accepted to college (2 and 4 year)	198	183	189	186
Number of students accepted to trade or vocational school	26	14	8	9

Students also appear to have higher aspirations for themselves. In 2008, 67 percent of students said that they thought they would earn a college degree or higher and in 2009 that number grew to 80 percent.

The Cisco 21S Initiative aimed to better prepare students for college and the workforce. Over two-thirds of administrators, teachers, and students agree that students are better prepared for college and the workforce. Students are taking more AP courses and learning more work-related skills. Fifty-nine percent (59 percent) of students said they have gained work experience in the past year and 46 percent indicated that they had participated in community service or volunteer work. Figure 30 outlines administrator, teacher, and student responses to various impacts relating to college and workforce readiness.

Figure 30: College and workforce readiness



Note: Participants indicated how much they agreed or disagreed with statements. Not all questions were asked of all groups. If a bar is missing, it is because that question was not asked of that group.

Connected Learning Challenges

While there has been significant positive change in the Connected Learning component of the 21S Initiative in HPSPD, there are still some areas that need improvement: professional development, teacher’s practices around technology use and instruction, planning time for teachers, data use, and student behavior.

“What I fail to see so far is the redoing of the instruction piece to match what we have in place.”

(Technology Staff)

Consistently about one-third of teachers felt they did not receive sufficient professional development around using technology tools and software. In both 2008 and 2009, 36 percent of teachers said that they did not receive enough professional development support regarding technology. About 34 percent of teachers said the same thing in 2007. More than two-thirds of administrators (69 percent) felt that providing sufficient technical professional development was a challenge. The technology personnel agreed that they had only seen minor change in teacher training and professional development and administrator efficiency.

Sixty percent (60 percent) of Hattiesburg education leaders agreed that getting teachers to change their teaching philosophy and integrate more technology into their lesson plans was a challenge. Teachers say there is a lack of adequate planning time to use and integrate technology into their practices. One-third of administrators (36 percent) believe that teachers’ ability to integrate technology into their curriculum is below where it should be, and 43 percent said they have only seen minor change in technology integration into the curriculum. No administrator’s expectations had been exceeded in the area of technology integration. The leaders believe that to some degree teachers lack technology skills and interest in the technology. Further, only 11 percent of teachers reported that they were frequently expected to use data to inform their instruction.

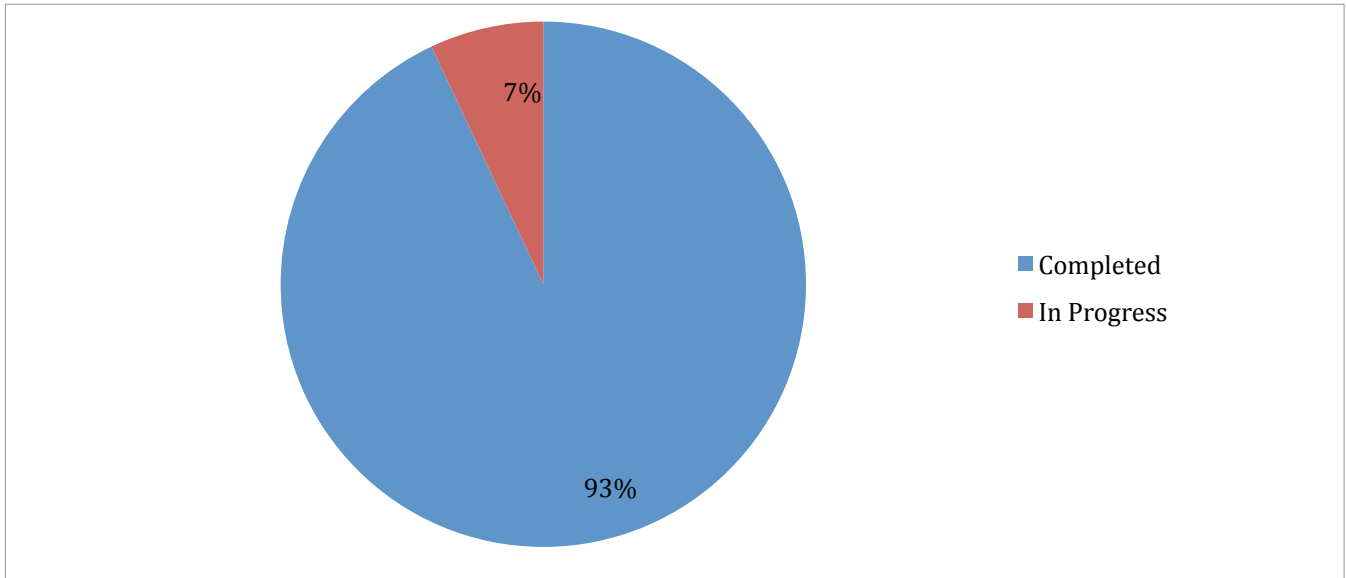
“I think that one school is actually, from what I've seen, a little bit further along. The teachers are further along with the usage of the technology than any other districts that we have out there. Still has a long way to go because we still have teachers that are stuck in direct instruction. It's hard for them -- this is my observation -- it's hard for them to go from not having to worry about what they're doing because they had a script [to something so new].” (Technology Staff)

On average, schools in the Hattiesburg district have seen an increase in student behavior problems since the inception of the Cisco Initiative. The number of detentions, suspensions, and expulsions has increased between the 2005–2006 and 2007–2008 school years. The number of classroom behavior incidents reported has also risen steadily from 7,816 in 2005–2006 to 9,083 in 2007–2008.

Connected Community

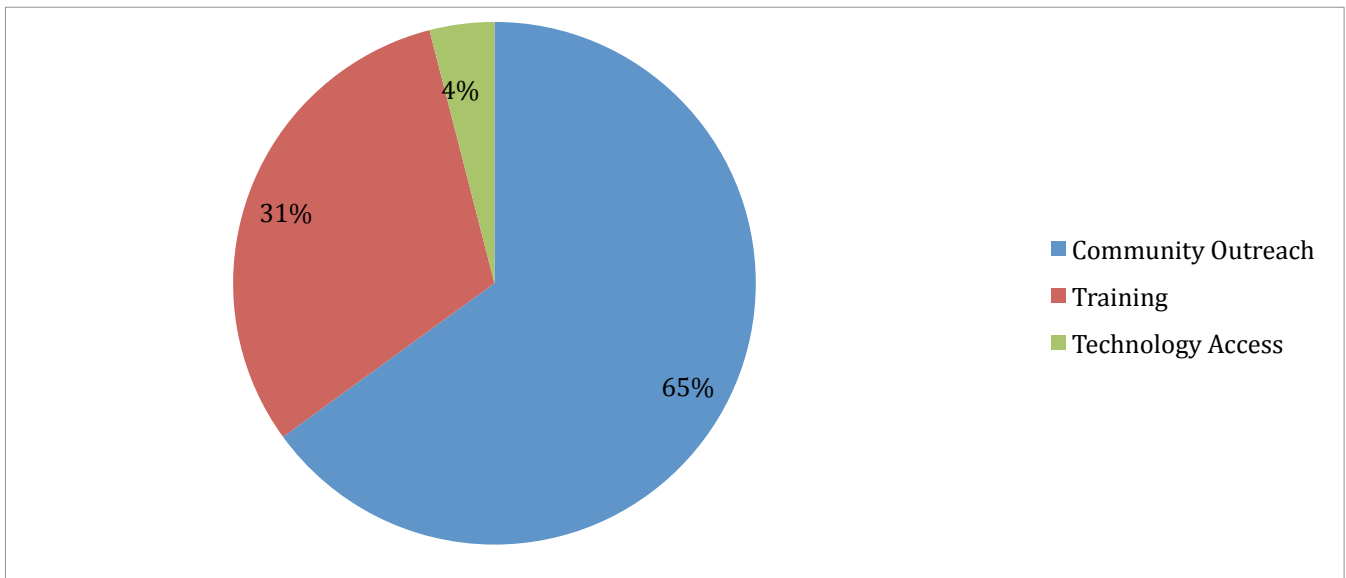
An integral piece of the connected community program component is the positive promotion of the relationship between the school/district and parents and the community. HPSD’s approach to the connected community component of the 21S Initiative is multifaceted and includes reaching out to businesses and faith-based groups, as well as parents and other community members. As of June 2009, the district has made great strides in completing 93 percent of its connected community inputs and is still working to complete the rest (7 percent) (see Figure 31).

Figure 31: Community input completion rate 2008–2009



The majority of connected community activities (65 percent) are related to community outreach including weekly newsletters, home visits, drop-out prevention programs, and health initiatives. Training has also been an important focus at HPSD, with an emphasis on dual enrollment programs, tutoring, and community computer classes (see Figure 32).

Figure 32: Connected community activities completion rate 2008–2009



Outreach to Community

The district uses outreach efforts to strengthen partnerships and increase parent involvement. The district leaders have initiated community forums, held at homes or community centers, to share information about what's happening in the district and to address any questions or concerns from community members.

“Last year we had 7 meetings and this year my goal is 20. We want people who are fans of the district and especially those who are not. Home-schoolers, private schoolers, those with kids, and those without. Everyone is welcome. The idea is to reach people whom we don’t normally communicate with and share with them some of the great things we are doing in HPSD.”
(District Administrator)

In addition to the great support from the 21S Initiative, HPSD has developed diverse community partnerships with approximately 40 religious institutions, 8 charitable and service organizations, 6 health organizations, 4 businesses, 3 institutions of higher education, and 3 youth organizations (see Table 14).

Table 14: HPSD community partnerships

Religious	Charitable/Service
Antioch Baptist Church	Alpha Kappa Alpha
Beautiful Zion Baptist	Alpha Phi Alpha
Crosspoint Community	Junior Auxiliary
East Jerusalem Baptist	Kiwanis
Ebenezer Baptist	Lions Club
Ekklesia of Hattiesburg	Rotary Club
Faith Baptist	Salvation Army
First Baptist Church	United Way
First Church of the Nazarene	
First Presbyterian	Health
Grace Temple Ministries	Blue Cross/Blue Shield
Greater Antioch Baptist Church	Forrest General Hospital
Holy Rosary Catholic	Hattiesburg Clinic
House of the Lord F.G.B.	Pine Grove Mental Health
Kensington Woods	South East Mississippi Rural Health Initiative
Main Street United Methodist	Southern Bone and Joint
Mt. Carmel Baptist	Business
Mt. Olive Baptist Church	Bancorp South
Mt. Vernon Baptist	Coca-Cola Bottling
Mt. Zion Baptist Church	Sam's Club
New Covenant Baptist	Wal-Mart
Parkway Heights United Methodist	Higher Education
Pathway Christian Fellowship	Pearl River Community College
River of Life	University of Southern Mississippi
Rock of Ages M.B.	William Carey University
Sacred Heart Catholic	Youth Programs
Shady Grove Baptist	First Priority
St. James CME	Junior Achievement
St. John Lutheran	Youth Challenge Program
St. Paul United Methodist	Other
St. Thomas Catholic	Camp Shelby
Surehouse Covenant	City of Hattiesburg
Sweet Pilgrim Baptist	National Aeronautics and Space Administration
Temple Baptist Church	Office of the Mayor of the City of Hattiesburg
Temple B'Nai Israel	
Trinity Episcopal	
True Light Baptist	
West Point Baptist	
Westminster Presbyterian	
Word of Faith Christian Center	
Zion Chapel AME	

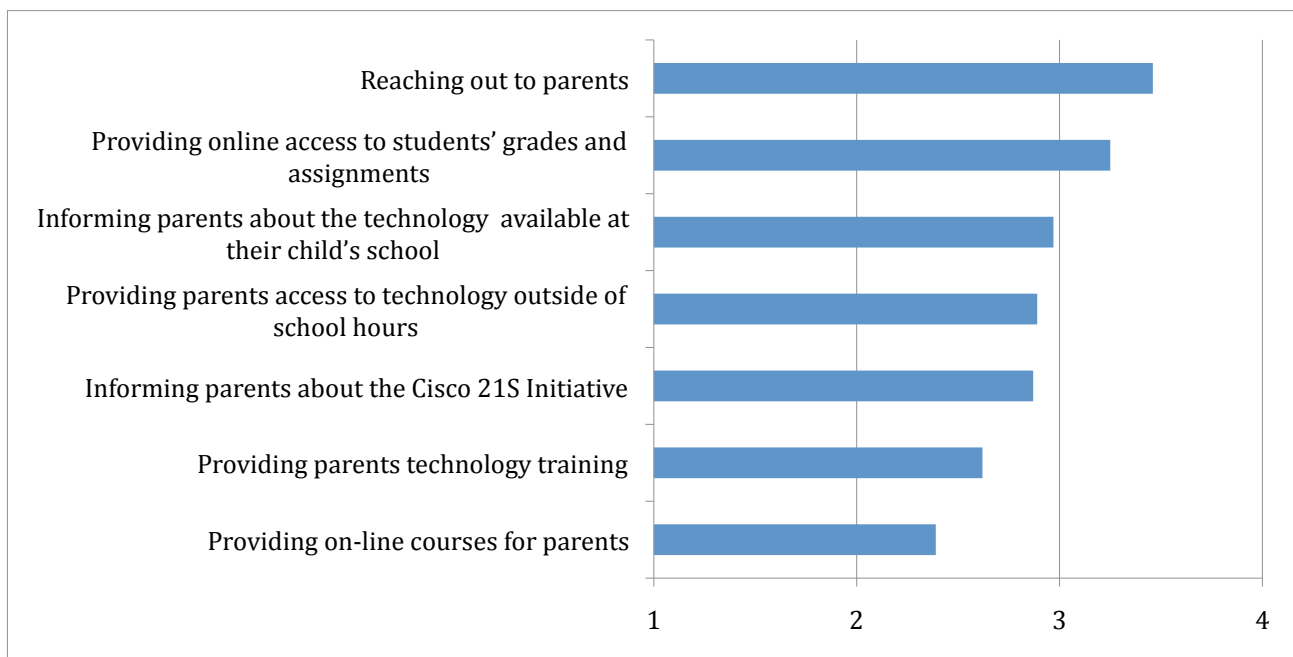
Outreach to Parents

Parents are an important part of the school community and Hattiesburg teachers and administrators have made a concerted effort to ensure their involvement at multiple levels. The goal of the HPSD leadership is to continue to improve community and parent perception of the school system. The district leadership has conducted 14 home visits this year to explain the district’s vision and to answer any questions or concerns parents might have.

All administrative respondents (100 percent) and 88 percent of teachers agreed that parents’ ideas and opinions are actively sought out to inform decision-making when appropriate. The schools also use a variety of methods to keep parents informed about what is happening on their campuses. Teachers communicate with parents via a variety of mediums including over the phone, face-to-face, printed newsletters, and e-mail. Ninety-five percent (95 percent) of teachers said they communicate with parents at least once in a two-week period and 88 percent said they meet with parents at least once in that same time frame. Parents reported that the communication methods used most frequently by their children’s schools include phone calls (78 percent), letters (72 percent) and meetings or conferences (57 percent). Half of parents (50 percent) said their child’s school used its website to share information about school activities and events.

Parents also rated the success of the various outreach techniques used by their children’s schools. Besides generally reaching out to parents and keeping them informed about the technology available, Hattiesburg schools are also successful at providing parents online access to student grades, as well as access to technology after regular school hours. Figure 33 shows how parents rated the success of their child’s school on various outreach measures.

Figure 33: Success of school outreach

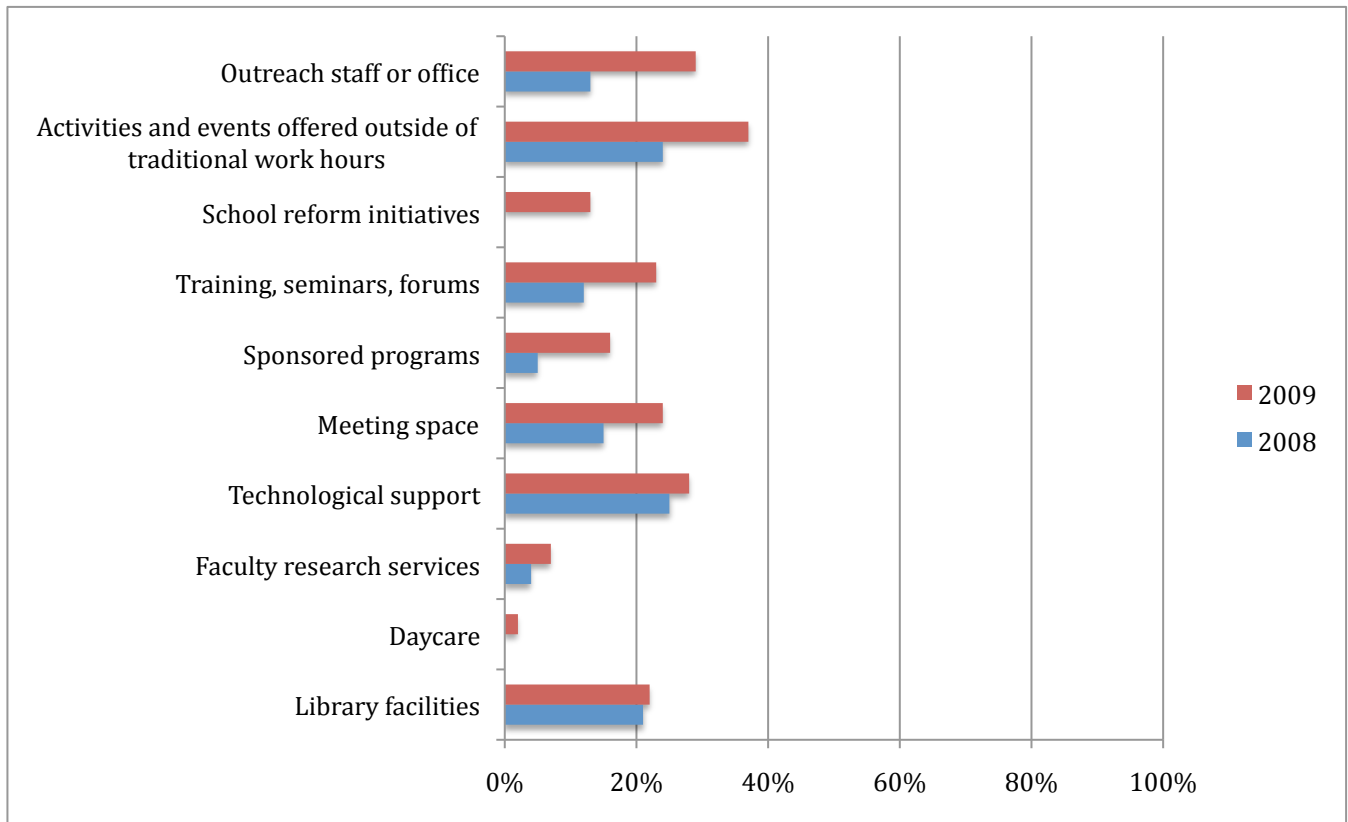


Note: Participants indicated how much they agreed or disagreed with statements on a scale from 1 (strongly disagree) to 4 (strongly agree). Higher scores indicate greater agreement.

Resources provided to support parental involvement have also increased. Though still available to less than half of the parental population, the percentage of parents with access to an office with outreach

staff jumped from 13 percent in 2008 to 29 percent in 2009. In addition, more parents noted having access to activities and events offered outside of traditional hours increasing from 24 percent in 2008 to 37 percent in 2009 (see Figure 34).

Figure 34: Resources provided for parents



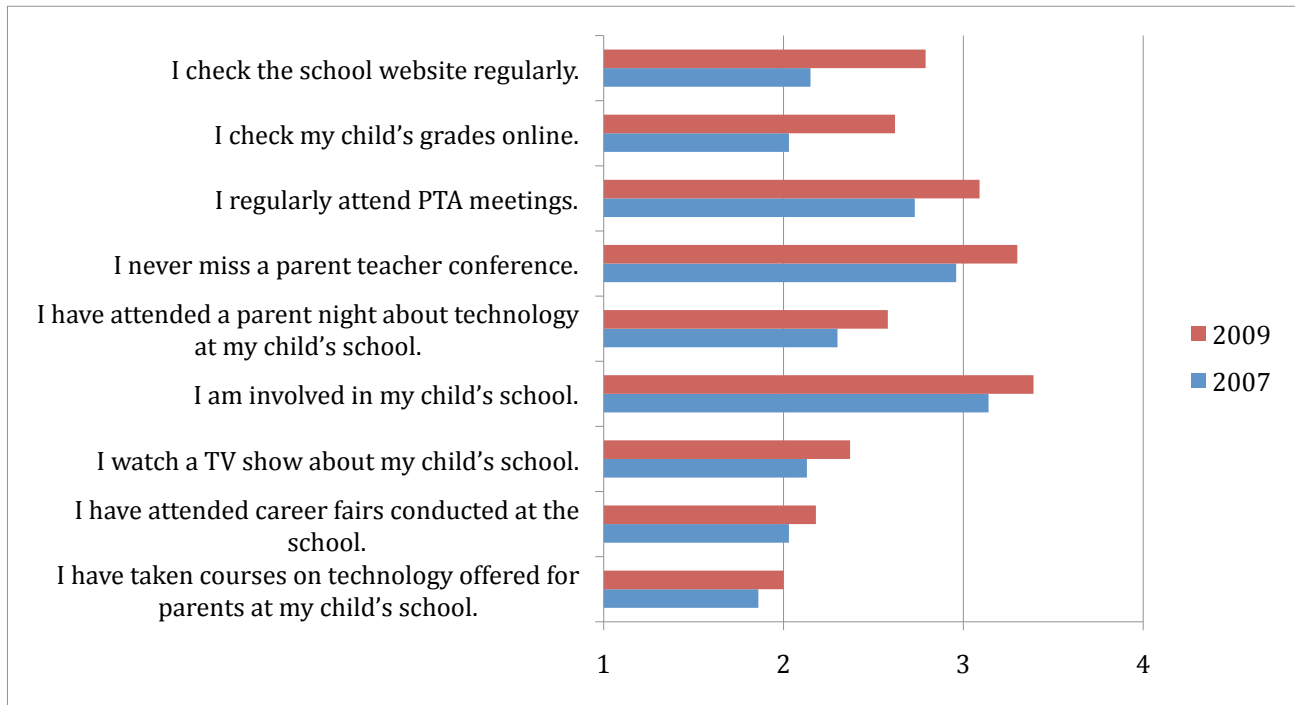
With enhanced outreach efforts, it is logical that increased community and parental involvement would follow. Nearly all administrators (93 percent) said that local community members as well as businesses are more likely to be involved in the schools than they were before. Two-thirds of administrators (64 percent) said they had seen significant change in the partnership between the district and the community.

According to all administrators (100 percent), HPSD has also strengthened its relationships with local colleges and universities. Some administrators (40 percent) said that the support provided by local universities to the district was very helpful.

Parental Involvement

The approximate number of families living in Hattiesburg has risen from 1,788 in 2006–2007 to 1,796 in 2008–2009, but has yet to reach its pre-Katrina level of 1,816. Parent involvement has increased over time in a variety of areas. Most notably, more parents agreed that they are checking their child’s school website and reviewing their child’s grades online. More parents also said they regularly attend PTA meetings and teacher conferences. Two-thirds of teachers agreed that parental involvement has improved over the course of the Initiative. Ninety-three percent (93 percent) of administrators and 65 percent of teachers agreed that parents are more interested in their children’s schoolwork. Eighty-seven percent (87 percent) of administrators and 60 percent of teachers said parents are more involved at the school in general. Figure 35 shows the change over time of parents’ involvement.

Figure 35: 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.

Parents in HPSD have become increasingly more involved in their children's schools since 2005. Many more parents are volunteering and twice as many parents are attending parent-teacher conferences and open houses. In addition, attendance at Parent Teacher Association/Organization (PTA/PTO) meetings has increased twenty-fold from 147 parents in 2006 to 3,256 in 2009. Table 15 shows more information about parental involvement.

Table 15: Parent involvement

	2005–2006	2006–2007	2007–2008	2008–2009
Number of parents volunteering	152	182	393	443
Number of parents attending PTA/PTO meetings	147	243	1,924	3,256
Number of parents attending parent-teacher conferences and open houses	837	1,077	2,545	2,983
Number of parent centers/offices/spaces	4	4	7	8

When asked what would bring them into their children's school more often, parents most frequently mentioned parent-teacher conferences (52 percent), activities related to their children (50 percent), and awards ceremonies (45 percent).

HPSD reported an increase in the usage of phones and e-mail to communicate with parents. The district’s website has also become a more popular communication tool. Respondents were asked to indicate how often the modes of communication shown in Table 16 were used in communications between the school/district and home.

Table 16: Communication between school/district and home

	2005–2006	2006–2007	2007–2008	2008–2009
Use of phone	sometimes	frequently	frequently	frequently
Use of e-mail	sometimes	sometimes	sometimes	frequently
Use of website	sometimes	sometimes	frequently	frequently

In 2008–2009, there were a total of 321,338 hits on the district website. More specifically, there were 26,776 hits on student information, 2,214 hits on the district calendar, and 772 hits on after-school activities. The remaining hits were to other sections of the district website.

In 2008–2009, nine of the district’s eleven schools had school websites. There were a total of 20,225 hits on school websites. Specifically, there were 772 hits on extracurricular links, 2,214 hits on school calendar links, and 17,203 hits on personnel links. In addition, there were 756 ActivParent accounts that provide parents access to student grades. The remaining hits were to other sections of the district website.

Challenges of Connected Community

Despite all its successes with community and parental involvement, HPSP continues to experience challenges getting parents involved. While the district has enhanced involvement by providing support services and improving teachers’ expectations about parental involvement, more could be done to connect the parental community to the schools and district. Only 10 percent of teachers said they were expected to meet with parents frequently.

Half of administrators (50 percent) said it is a challenge to get more community members involved. Eighty-one percent (81 percent) of administrators said that it is a challenge to get more parents involved in the schools. According to parents, schools do not seem to offer a wide variety of services to support their involvement. Only about one-quarter of parents reported that their child’s school offered support like outreach staff (29 percent), technological support (28 percent), meeting space (24 percent), or training seminars (23 percent).

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 outcomes³. 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 outcomes⁴. This section of the report is organized around the following implementation inputs: Connected Schools, Connected Learning, and Connected Community.

Connected School Inputs: The Connected School inputs that are correlated with the most outcomes are: (1) access to software, (2) access to Web 2.0 tools, and (3) access to hardware.

Access to Software: Teachers' ratings of access to software are positively correlated with 18 of 19 outcomes examined. Access to software is most strongly correlated with students being better prepared for future employment.

Access to Web 2.0 Tools: Teachers' ratings of access to Web 2.0 tools (e.g., blogs, wikis, podcasts, Skype) are positively correlated with 18 of 19 outcomes. Having access to Web 2.0 tools in the school is most strongly correlated with parents being more interested in students' work. Therefore, teachers who report having higher levels of access to Web 2.0 tools also report that parents are more interested in students' work.

Access to Hardware: Teachers' ratings of access to hardware are positively correlated with 14 of 19 outcomes examined. The strongest correlations for access to hardware are with the outcomes "students are better prepared for future employment" and "student participation in AP courses has increased." In fact, both of these outcomes are highly correlated with all three of the above-mentioned inputs, suggesting that these are outcomes that teachers perceive as having particularly benefited from the Connected Schools inputs.

Connected Learning Inputs: The Connected Learning inputs that have the strongest relationships with outcomes include: (1) technical integration support, (2) instructional technology support, (3) technical support, and (4) communication and collaboration among teachers.

Technical Integration Support: Teachers' ratings of technical integration support are positively related to 18 of the 19 outcomes examined. These ratings are most strongly related to the outcome "Students are more likely to go to college." In addition, the outcome "Students are more likely to go to college" is highly correlated with all four of the above-mentioned inputs, suggesting that this is an area that teachers believe has been affected the most by the Connected Learning component of the Initiative.

Instructional Technology Support: Teachers' ratings of access to instructional technology support are positively related to 17 of the 19 outcomes. The outcome that is most strongly

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 were a sufficient number of responses (N > 30) 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.

correlated with this input is “Students are better prepared for future employment.” This finding suggests that teachers who reported having greater access to instructional technology are more likely to indicate that students are better prepared for college.

Technical Support: Teachers’ ratings of access to technical support are positively related to 16 of the 19 outcomes examined. The outcomes that are most strongly correlated with access to technical support are an increased likelihood for students to go to college and increased collaboration with other districts.

Communication and Collaboration Among Teachers: Ratings of the amount of communication and collaboration that occurs between teachers are positively correlated with 15 of the 19 outcomes. Communication and collaboration is most strongly correlated with increased student participation in AP courses. This suggests that teachers who report higher levels of communication and collaboration between teachers are more likely to indicate that student participation in AP courses has increased.

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 an increase in student participation in AP courses.

Community Inputs in Decision Making: Teachers’ ratings of “Community members are included in the decision-making process” are positively related to 17 of the 19 outcomes examined. Teachers’ ratings of the inclusion of community members in the decision-making process are most strongly related to an increase in student participation in AP courses and better preparation for future employment.

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 sufficient hardware and software
- Access to Web 2.0 tools
- High-quality technical professional development
- Effective communication and collaboration strategies for teachers
- Inclusion of parents and community members in decision-making processes

Researchers conducted additional correlation analysis to determine which outcomes were most closely related to inputs associated with Connected School, Connected Learning, and Connected Community. 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:

- Increased number of students passing AP exams
- Increased number of students who are better prepared for future employment
- Increased number of students who are better prepared for college
- Increased number of students who are more likely to go to college

- Increased community involvement
- Increased interaction with local institutes of higher learning
- Increased cooperation within the district
- Improved community perception of the school or district

Hattiesburg Public School District has seen great improvement of its education system and has scaled up the Initiative into all its schools. The leadership has promoted the 21S Initiative's vision of education reform throughout the district and community. They encouraged and modeled a culture for change. The 21S Initiative has become part of everyday life in Hattiesburg Public School District. To get a glimpse of the Initiative at the school and classroom level with regard to how it has affected the experiences of the principals, teachers, students, and parents, the last section of this report presents an in-depth study of Rowan Elementary School.

School-Level Change: Rowan Elementary School

Located in the city of Hattiesburg, Rowan Elementary School is one of nine schools that make up the Hattiesburg Public School District. A kindergarten through grade six school, Rowan Elementary has been the case-study school for the Hattiesburg Public School District and the model school⁵ for the Cisco 21S Initiative since the Initiative’s inception. For the 2008–2009 school year, the total student enrollment at Rowan Elementary was 425 students. Essentially 100 percent African American, 48 percent of students were females and 93 percent of the school student population was eligible for free or reduced-priced lunch. With a total of 32 teachers, Rowan’s teacher to student ratio of 1:13 is slightly higher than that of the district at 1:12. Two administrators, the principal and assistant principal, an instructional technologist, and a DOT intern complete the roster of school academic staff.

Participation

The 21S Initiative in Rowan began in the 2005–2006 school year. The number of teachers employed by Rowan over the life of the Initiative has fluctuated, rising in one year then declining in the next. The current number of 32 teachers at Rowan is almost consistent with previous years, except in 2006–2007 when the number of teaching staff was at its highest at 34. Overall, the number of students attending Rowan has declined over the past four years. While there were no technology personnel at Rowan in the first year of the Initiative, in the final year two technology staff were both involved with the Cisco 21S Initiative. In 2007–2008 and 2008–2009, all Rowan administrators, teachers, and students were part of the 21S Initiative. Table 17 provides more detail on the number and percentage of Rowan participants in the 21S Initiative.

Table 17: Rowan Cisco 21S participation 2005–2009

Rowan Elementary	Year	Administrators		Technology Staff		Teachers		Students	
		#	% Involved	#	% Involved	#	% Involved	#	% Involved
	2005–2006	2	***	0	***	30	***	438	***
	2006–2007	2	***	1	100%	34	***	379	***
	2007–2008	2	100%	1	100%	31	100%	458	100%
	2008–2009	2	100%	2	100%	32	100%	425	100%

***Data not available.

Rowan’s ability to bring new teachers and students up to speed has been a challenge. The number of teachers and students fluctuated over the last four years requiring Rowan to accelerate professional development training. For example, the 2008-2009 year’s newly hired teachers, along with the previous

⁵ Rowan was selected as the Initiative’s model school in Mississippi. The idea of a highly funded, well-resourced school grew out of initial planning for the 21S Initiative. Over the course of the implementation of the Initiative one of the lessons learned is that a model school is not replicable because it is costly and leads to resource inequities in a district.

year’s new hires, meant that a group of 12 teachers needed to be trained. Table 18 shows Rowan’s teacher retention over the course of the Cisco 21S Initiative.

Table 18: Rowan teacher retention rates

School Year	2005–2006	2006–2007	2007–2008	2008–2009
Total number of teachers employed	30	34	31	32
Total number of teachers returning the following year	N/A	30 (lost 4)	26 (lost 5)	25 (lost 7)

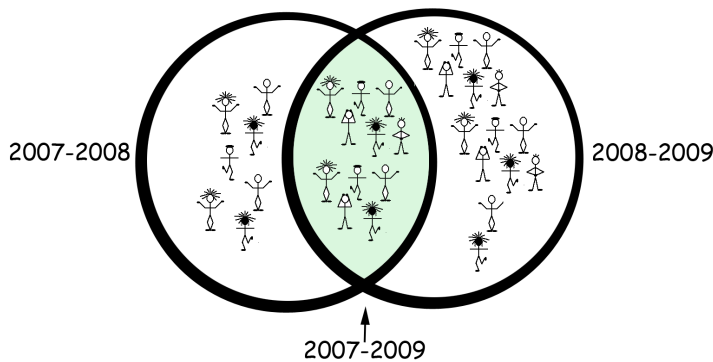
The Specifics of the Rowan Evaluation

Documenting Implementation and Impact

Over the course of two academic school years (2007–2008 and 2008–2009), Rowan Elementary School teachers participated in a series of observations and in-school interviews conducted by the Center for Children and Technology at the Education Development Center (EDC). University of Southern Mississippi (USM) graduate students were contracted and supported the research as EDC evaluation interns. In the 2007–2008 school year, 18 of the 31 Rowan teachers (approximately 58 percent) were observed and/or interviewed by a USM intern. In the same school year, USM interns conducted 20 classroom observations and 13 teacher interviews with the 18 participating teachers. Slightly more than half of the participating teachers (n=10) were both interviewed and observed. Five (5) of the teachers were observed only and 3 teachers were interviewed only. Of the 15 observed teachers, 5 were observed twice and the remaining 10 were observed once.

In the 2008–2009 school year, 26 of Rowan Elementary School’s 32 teachers (approximately 81 percent) participated in the year’s series of observations. In that year USM interns conducted 69 classroom observations at Rowan Elementary. Eleven (11) Rowan teachers participated in observations and/or interviews in both academic years. A total of 89 observations and 13 interviews helped to document 33 Rowan teachers over the course of the final 2 years of the Cisco 21S Initiative. Each participating teacher gave written consent to participate in the observations and/or interviews and was assigned an “alias” to preserve confidentiality and to protect privacy. The 33 teachers spanned the range of grades at the school and observations/interviews included teachers with both specific grade as well as subject or specialty assignments (e.g., math or interventionist). In the 2008–2009 school year, of the 26 teachers, 3 were observed over extended observations (11 to 13 observations), 5 were observed more than once (2 to 3 observations), and the remaining 17 were singular observations; in addition, 1 observation documented an all-school event. The interviews focused on teachers’ background, experience with technology tools (hardware and software), and their involvement with the 21S Initiative. The observations were focused on gathering data about classroom activities (e.g., teacher and student practices), classroom layout, available technology and teaching tools, and the observer’s reflections and impressions about the implementation of the Initiative at the classroom level. The data collected from the observations helps to specify the implementation and impact of the 21S Initiative at Rowan Elementary School. Figure 36 visualizes the distribution of Rowan teachers who participated in the observation/interview series at their school over the final two years of the Cisco 21S Initiative.

Figure 36: Rowan participating observation teachers



Talking to Stakeholders

In February and April 2009, an EDC research team made site visits to Rowan Elementary School. During the visits, researchers conducted interviews and/or focus groups with the school’s principal, instructional technologist, and Design Team; 5 teachers representing grades 2 through 6; 8 students, all in the sixth grade, who volunteered themselves to be the school’s Student Council; and 11 parents, caretakers, and guardians of students. The questions asked of site-visit participants focused on six main areas, when applicable:

1. The 21st century educational vision articulated and communicated by school leaders.
2. The implementation of the Initiative components that include Connected School (CS), Connected Learning (CL), and Connected Community (CC).
3. The trajectory of personal and professional data and technology use.
4. The perceived impact of the Initiative on participants over the course of the Initiative.
5. The articulated sustainability plan for continual assistance for 21st century educational tools and supports.
6. Lessons learned to share with other educators who may be involved in a similar initiative in their local area.

Table 19 details the number and type of Rowan participants that researchers talked with during the site visits.

Table 19: Number of Rowan site-visit respondents

Admin	School Design Team	Tech	Teachers	Parents	Students
2	1 (10 members)	1	5	11	8

Stakeholder Survey Data

Survey data collected from key stakeholders (administrators, technology personnel, teachers, students, and parents) at Rowan further helps to detail the implementation and impact of the Cisco 21S Initiative at Rowan Elementary School. For the most part, response to the surveys has remained relatively consistent across the years, although parent participation in the third year more than doubled. Student

participation in both 2008 and 2009 was confined to children in grades 4 and above. Table 20 below details the number and percent of stakeholders who were part of the Rowan survey studies.

Table 20: Rowan survey respondent data 2007–2009

Year	2007	2008	2009
Administrators	1 (50%)	2 (100%)	1 (50%)
Technology Personnel	1 (100%)	1(100%)	1 (50%)
Teachers	34 (100%)	30 (97%)	31 (97%)
Students	N/A	78 (17%)	101 (24%)
Parents	39 (% unavailable)	30 (% unavailable)	75 (% unavailable)

Education Vision for Rowan Elementary

Section Contents

The section that follows is a case study of Rowan Elementary School. It is organized into 5 main themes: 1) the education vision, 2) implementation of the Cisco 21S Initiative at Rowan Elementary School, 3) technology and data use at Rowan Elementary School, 4) the impact of the Cisco 21S Initiative at Rowan Elementary School, and 5) lessons learned about 21S at Rowan Elementary.

Impacting Student Achievement

As one of the first schools to begin benefiting from the Cisco 21S Initiative, Rowan Elementary has been the case study school for the Hattiesburg Public School District. Rowan is proud of its status as the model school for the Initiative. A dynamic principal has led Rowan Elementary School over the four years of the Cisco 21S Initiative and has helped to define the school’s 21st century learning environment, while also meeting the challenges of shifting from direct instruction⁶ to student-centered learning. When asked how the vision for Rowan had changed since the beginning of the Initiative, the principal responded:

I don't think there's been too much change once we actually created the vision, the dreaming part, before we actually got realistic... Once we identified exactly what direction we were planning to go with the project, and what we wanted to accomplish, the vision has stayed pretty much the same. We wanted to transform our teaching so that, using all available technologies, student achievement could soar as high as possible, incorporating how to use technology into students' everyday lives, as well as their academic lives. That's been our broad vision. Using

⁶ A general term for the explicit teaching of a skill -set using lectures or demonstrations of the material (often guided by a prescribed script), rather than exploratory models such as inquiry-based learning.

data to allow teachers and administrators to maximize their time and our resources, again, to positively impact achievement. That's been the overall vision, and that hasn't changed. It's still our vision.

The leadership's vision is reflected in the goals set for Rowan in the 2008–2009 school year. Those goals were to: improve the whole child by being proactive on discipline issues; improve student achievement reflected in test scores for grades three to six and improve early childhood literacy; create challenging and engaging lessons; increase teacher collaboration through the sharing of best practices; close the chasm between new and veteran teachers, especially the gap in technology proficiency; improve community involvement; and increase the quality of parental involvement.

Sustainability

The administrators at Rowan have been thinking about project sustainability since the beginning of the Initiative. The principal shared, “I had a full-time instructional technologist from the beginning. Each year, the grant covered less of her salary, and the district picked up more. Next year, it will be 100 percent.” Additionally, the biggest expenditure—the infrastructure—was funded using Cisco grant money, so now, according to the administration, the major costs left will be renewing various licenses and upgrading equipment. The school administration expressed confidence that money could be procured through the already established budget, Title I funds, and smaller grants to sustain the 21S Initiative into the future.

Implementation of the Cisco 21S Initiative at Rowan

Connected School

A 21st century education environment must support the development of well-rounded, self-reliant, knowledgeable citizens who appreciate the value of diversity and collaboration. Children need to be engaged by an inclusive, relevant, and interesting curriculum that is implemented by competent, caring, and supported adults who have been sufficiently trained to manage their share of the preparation of today's and tomorrow's leaders.

At Rowan, the contemporary education environment is providing ubiquitous tools for learning, with technology included as part of all aspects of the education community. Physical classrooms are equipped with new technology to potentially maximize learning outcomes for all students. For Rowan, the 21st century education environment must also help to minimize discipline problems, support student achievement, and have that support reflected in students' test scores and improved early childhood literacy. The Rowan 21st century education environment creates and supports teachers who can and do construct challenging and engaging lessons for learning and who collaborate with colleagues and share their best practices. Their willingness to engage in these creative and collaborative techniques quickly and efficiently makes it possible to narrow the gap between new and veteran teachers, especially the gap in technology proficiency.

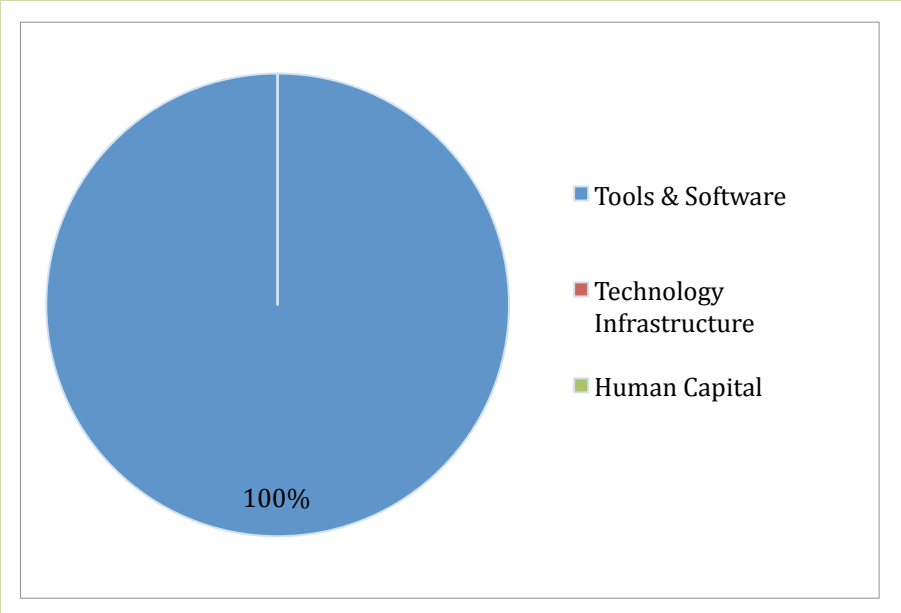
To capture implementation efforts at Rowan Elementary School in the school years from 2007 through 2009, an exploration of the physical, technological, and pedagogical environments that came into existence were identified, described, and assessed based on the evaluation data collected. As the Cisco 21S Initiative's model school, Rowan has been the beneficiary of additional financial and technical resources. Located in a former high school building, the wide hallways are adorned with student work and inspirational posters, and photographs of the year's events are proudly displayed throughout. The building is protected by a security system—located in the school office—that keeps

track of school visitors, provides background checks, and supplies each visitor with a building pass that includes a photo. The building has a new intercom system and a flat screen digital signage monitor located high inside the main entrance of the school that displays images of teachers, staff, and students and is one indication of school pride.

In the school year 2008–2009, Rowan’s kindergarten through grade 2 classes were all self-contained with each classroom teacher responsible for all subject areas. Some of these classes were still taught using an instructional strategy know as “direct instruction” (see footnote 6 above); grades 3 through 6 were departmentalized, meaning that each class had several teachers, each of whom taught one subject area or was responsible for a specialty (e.g., math, interventionist). Grade 3 was departmentalized in time for the 2008–2009 school year. Prior to that, departmentalization was for grades 4 through 6 only. At the classroom/teacher level, by the close of the 2008–2009 school year, all Rowan teachers had a laptop computer; each classroom was equipped with an interactive whiteboard with accompanying projector, student response system, and slate (a portable device that can control the interactive whiteboard from anywhere in a classroom); an IP phone with a camera; and a bank of computers purchased specifically for science teaching and learning. In the 2008–2009 school year, a bank of Apple computers was installed in Rowan’s computer lab.

All of Rowan’s Connected School inputs were related directly to acquiring advanced tools and software for classrooms and offices (see Figure 37). Hardware such as interactive whiteboards, student response systems, math manipulatives, and audio books helped to promote student engagement in the Rowan classrooms. Software such as Compass Learning, Wireless Generation, and the Lesson Plan database helped to support instruction and data management by teachers.

Figure 37: Rowan connected school input distribution



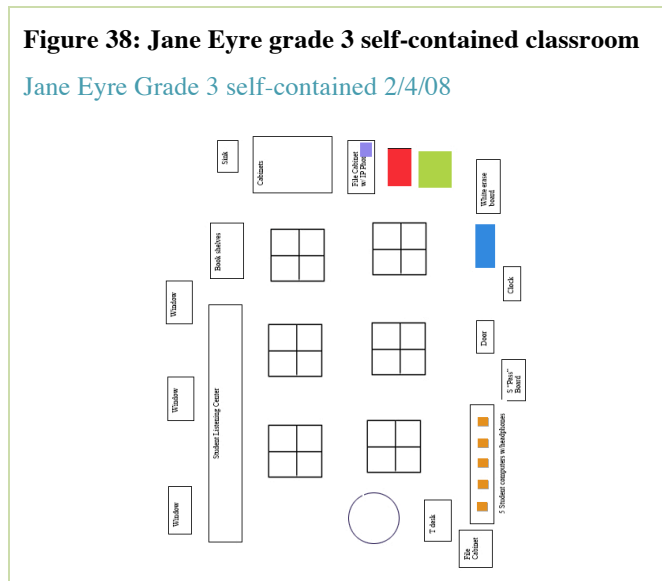
A Teacher’s Domain

While the school district is the domain of district leadership, and the school is the principal’s domain, the classroom is typically a teacher’s domain. Organized and arranged by its immediate teacher resident, a classroom reflects a teacher’s perspective on teaching and learning, from the configuration of student seating to the location of the teacher’s desk and the location and availability of the technology (Butin, 2000). By exploring a teacher’s classroom layout, it is possible to get a good sense

of what she knows or fails to take into consideration about the potential impact of the physical arrangement on classroom management, student engagement, and opportunities for independent and collaborative group work. Are desks arranged in clusters to support student-to-student interaction or in columns and rows to help increase the amount of time students spend “on task”? Whether the room is populated primarily with tables or desks; whether desks are arranged in “traditional” columns and rows or in clusters or groups; whether students have assigned seats or are allowed to sit wherever they want, all tell something about the educational atmosphere that is being supported and encouraged. Since the goals of the Cisco 21S Initiative are to create 21st century learning environments that are student-centered rather than teacher-centered; that are flexible and can accommodate change based on the tasks/activities to be encountered; that support project-based work as well as individual study, it is judicious to take a look at the domain of teachers—the classroom.

Figure 38: Jane Eyre grade 3 self-contained classroom

Jane Eyre Grade 3 self-contained 2/4/08



The following section looks specifically at the arrangement of the classroom, including the configuration of student seating; the location, type, and amount of technology; and the location of the teacher’s desk. Relevant classroom components have been color coded as a guide to the room’s technology and seating arrangement, as captured by the assigned USM intern.

A Glimpse into Rowan’s Connected Classrooms

One consistent task of the USM intern as classroom observer was to sketch the layout of the classroom being observed. Some interns relied on hand sketches; some translated those hand sketches into computer-drawn layouts. In this section of the case study, examples of those maps are incorporated to help visualize the classroom setting from the perspective of the observer; therefore, each representation was dependent on an intern’s ability to capture a setting over the course of one observation or more. Full versions of the included classroom maps are available in the Appendix.

One of the teachers observed and interviewed over the two years that USM interns were in Rowan classrooms is Jane Eyre⁷ (an alias, not her real name). As of the 2007–2008 school year, Jane Eyre had been teaching for all of her eight years at the same school—Rowan.

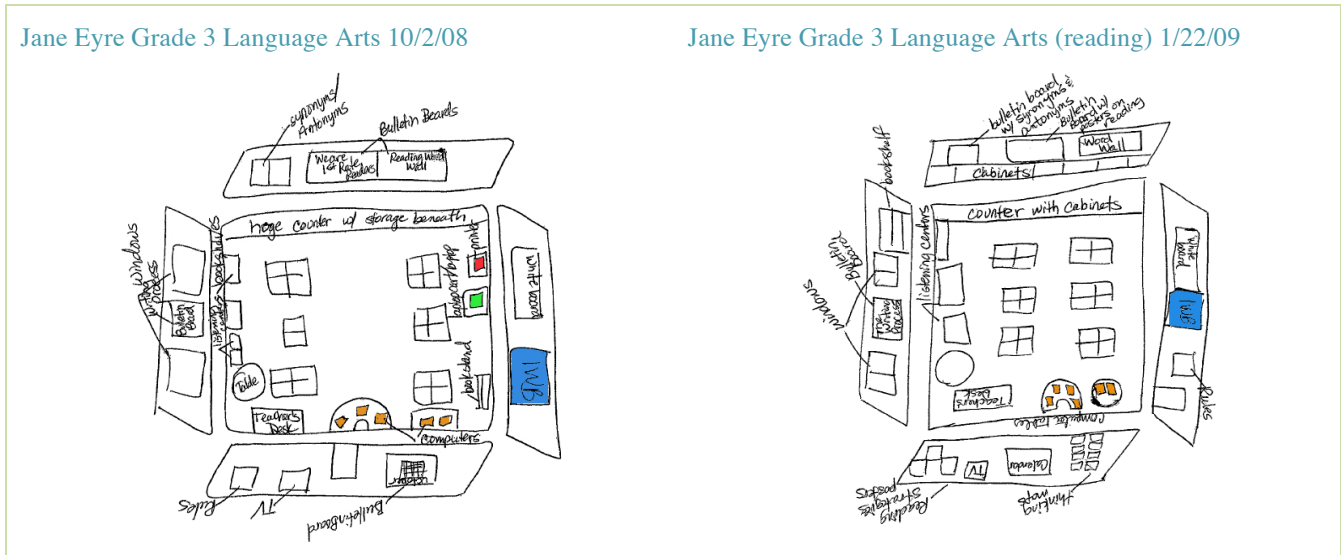
In Jane’s classroom—represented in Figure 38—the IP phone (lavender) and printer (red) had been added in the 2007–2008 school year as a result of the Cisco 21S Initiative. The classroom was also equipped with five desktop computers and an interactive whiteboard. On the day of the observation, a laptop cart was also present in the room. The students’ desks are arranged in clusters of four representing a variation of social grouping. Cluster arrangements help to promote student-to-student interaction and can support collaborative group work (McCorsey & McVetta, 1978, Higgins, et al., 2005). The teacher’s desk, located by the student desktop computers, seems relatively unobtrusive and out of the way (See Appendix for a full version of this classroom map). When asked which technology she used most often, Jane Eyre said the interactive whiteboard and the laptop. In an interview

⁷ All participating teachers were assigned an alias or pseudonym to preserve confidentiality and protect teachers’ privacy.

conducted by the USM intern, Jane Eyre described the students in her self-contained third grade class in the 2007–2008 school year as, *“Some are bright, and some have to have modifications because they need extra help. Cheerful kids. They express themselves well.”*

When the third grade was departmentalized in the 2008–2009 school year and students were taught by subject-area teachers, Jane Eyre became a third grade language arts teacher. Observed by a different USM intern, on careful examination of the two layouts sketched in 2008–2009 (as illustrated in Figure 39), the language arts classroom appears to be arranged in almost the same configuration as the non-departmentalized year. In addition to detailing the layout of the classroom, the hand-drawn sketches by this intern also specify what is on the classroom walls. On closer inspection (see Appendix), both sketches locate the classroom rules, the writing process, the word wall, synonyms, and antonyms. The earlier 2008–2009 sketch includes a “We are 1st Rate Readers” bulletin board. The later 2008–2009 sketch visualizes a “Reading Strategies” poster, as well as an additional bulletin board with posters on reading.

Figure 39: Jane Eyre grade 3 language arts classroom in October 2008 and January 2009



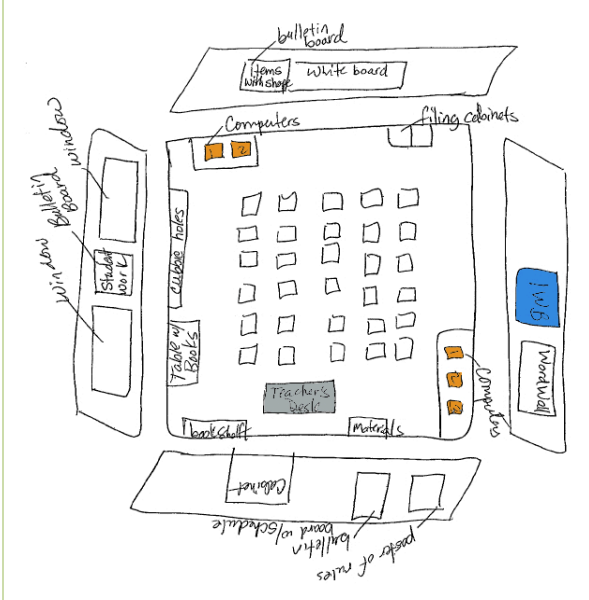
Early in the 2008–2009 school year, Jane Eyre was observed teaching three third graders letter sounds and prefixes using direct instruction. (The teacher read a “script” to teach both skills.) She explained to the observer that the students present needed remedial help in reading. During this observation, no technology was used.

During classroom observations by USM interns in the 2008–2009 school year, all 26 teachers observed had interactive whiteboards, a bank of four to six computers, and remnants from another century—televisions. In all but one classroom there were IP phones. Other technology present in some classrooms included cameras, Personal Digital Assistants (PDAs), and music hardware and software in the music room.

Like Jane Eyre, Harriet Tubman was observed in both the 2007–2008 and 2008–2009 school years. In the earlier school year, Harriet was observed once and interviewed by the USM intern assigned to Rowan Elementary. With eight years of teaching experience, all at Rowan Elementary School, she is a self-proclaimed technology enthusiast. She recalled presenting at the Mississippi Educational Technology Leaders Association (METLA) conference in Jackson, Mississippi, that year where, she said, “I pretty much sold interactive whiteboards.” She admitted using her interactive whiteboard, student response system, and slate daily while acknowledging the positive impact the new technologies had on the students she taught.

Figure 40: Harriet Tubman’s grade 6 math classroom

Harriet Tubman Grade 6 Math 8/26/08



In the 2008–2009 school year, Harriet Tubman and the other teachers in her academic team “looped” with their students, taking them from the fifth grade up to the sixth grade. In the last year of the Cisco 21S Initiative, Harriet Tubman taught sixth grade math to the same students she had taught in the previous year. The hand-drawn sketch in Figure 40 is a representation of Harriet Tubman’s classroom early in the 2008–2009 school year. The arrangement of student desks is “traditional.” The “traditional” layout typically consists of a number of straight columns and rows of multiple desks, all oriented in the same direction and all situated about the same distance from one another. This layout supports increased time on task and is also a space saver, using the allotted space most efficiently (McCorsey and McVetta, 1978). Harriet Tubman’s desk (grey) has been located in what appears to be the side of the classroom and is relatively inconspicuous.

During the observation, Harriet Tubman used a self-created flip chart on the interactive whiteboard to review exponents with her students. Though the room was equipped with five computers for student use, they were not used on the day of the observation. The IP phone in her room was not captured in the drawing.

Figure 41: Two first grade classrooms observed

Pocahontas Grade 1 self-contained 9/18/08

Snowflake Bentley Grade 1 self-contained 12/2/08



Pictured in Figure 41 are two first grade classrooms observed in the 2008–2009 school year. Both classrooms have student desks arranged in clusters or groups, a layout said to be most prevalent in

specialty and early elementary classes. The arrangement supports group work by promoting student-to-student communication (McCorsey and McVetta, 1978; Higgins, et al., 2005). Groups or clusters of students may be involved in the same or different tasks or activities simultaneously. In both first grade classrooms observed, the front and back of the classrooms are not easily distinguished. In Pocahontas' classroom, the observer has included two teacher desks. The assistant teacher used the second desk indicated on the right. In Snowflake Bentley's first grade classroom, the teacher's desk was not indicated.

The glimpse into Rowan Elementary School classrooms focused on four teachers and the variety of classroom arrangements they choose to use. While one of the four teachers was observed twice in the 2008–2009 school year, the remaining three were each observed once. A teacher's goals for her teaching and her students' learning are reflected in the classroom environment that she supplies for herself and her students. The drawings allow researchers to describe what was found in these rooms, but to do any more without input from the teacher whose classroom was observed would just be speculation. As the significance of student engagement to the learning process is affirmed, and digital technologies are integrated into the physical environment in increasing numbers of classrooms, how teachers teach and students learn is affected. These data provide a glimpse into a few of the 21S Initiative connected classrooms. As pedagogical practices change and adapt to 21st century environments, the longer-term effects of classroom layout and design will need to be revisited (Butin, 2000).

Connected School Challenges

Rowan was very proud of its status as the Initiative's model school. Parents, teachers, students, and leaders alike acknowledge how fortunate the school has been to be the beneficiary of so much technology and so many professional development opportunities. One of the challenges faced as a result of its fortune was the frustration expressed by other district schools as they tried to shape their own 21st century education environments. The district's implementation of a grant request system to initiate the roll-out of the technology in other schools helped to allay some of the "hard" feelings that might have developed towards Rowan. As the Rowan education community continues to move forward with the implementation of its 21st century education environment, other challenges remain that need to be considered and addressed.

When the Technology Doesn't Work

As in all settings that rely on technological tools, there are occasions when the tools just don't work, which can and often does create challenges for teachers who planned on using it. Teachers discussed technology difficulties at Rowan. They said that sometimes the technology didn't work, but teachers interviewed remarked that whenever it happened they were able to quickly revert to technology-free lesson plans.

Compatibility

The music teacher at Rowan was challenged to find a solution to seemingly incompatible technology. The existing difficulty is to find a way to integrate the interactive whiteboard tools with other music technology. Currently, the two conflicting technologies cannot be used together.

At-Home Access

Parents and teachers agree that approximately 25 percent of Rowan students have computer access at home, with only 12 percent having access to the Internet. Parents revealed that the lack of available

community wireless access made the fact that the Cisco 21S Initiative did not develop a community-wide wireless network as originally promised even more “heartbreaking.”

Additionally, some teachers who don’t have Internet access at home struggle because they aren’t able to practice with the tools unless they are at school.

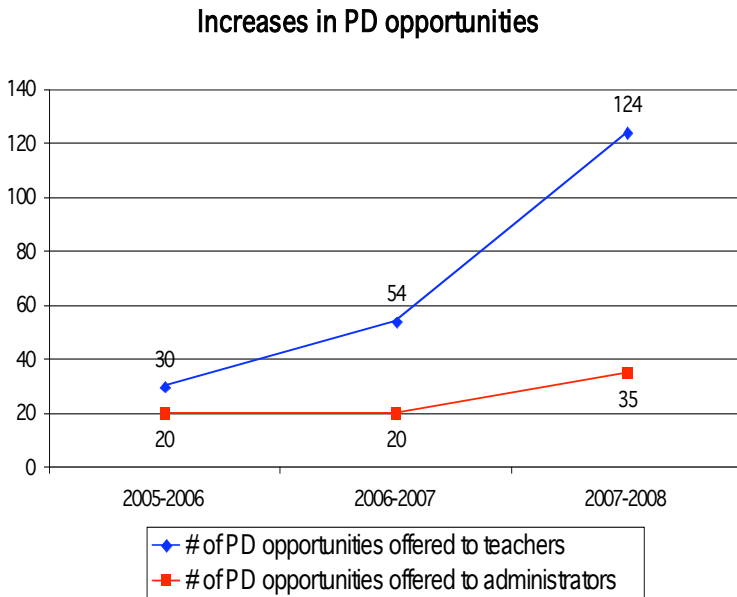
Connected Learning: Training and Professional Development

In the 2008–2009 school year, more than one-third of Rowan’s 32 teachers were new or nearly new to the school. (Rowan had hired five new teachers in the 2007–2008 school year and seven in the 2008–2009 school year.) Training and orienting those new teachers was a major administrative focus. The principal played a major role in creating the framework for bringing on the new staff, while the instructional technologist and the design team (a collaboration with the Schlechty Center for Leadership in School Reform and a collection of teachers across grade levels and subject areas) were in charge of delivering the technical training, sharing the school culture, and explaining the teaching philosophy.

Weekly professional development sessions were provided based on areas in which teachers expressed interest, namely, efficiency tools and multimedia projects. Some of those tools included software such as Compass Learning and My Reading Coach. In addition, the design team promoted the design of engaging work across the school through a variety of tasks that generally involved building school culture, such as providing support to struggling teachers to improve lesson plans, designing professional development for teacher assistants, the creation of a new teacher induction day, and the planning of campus events.

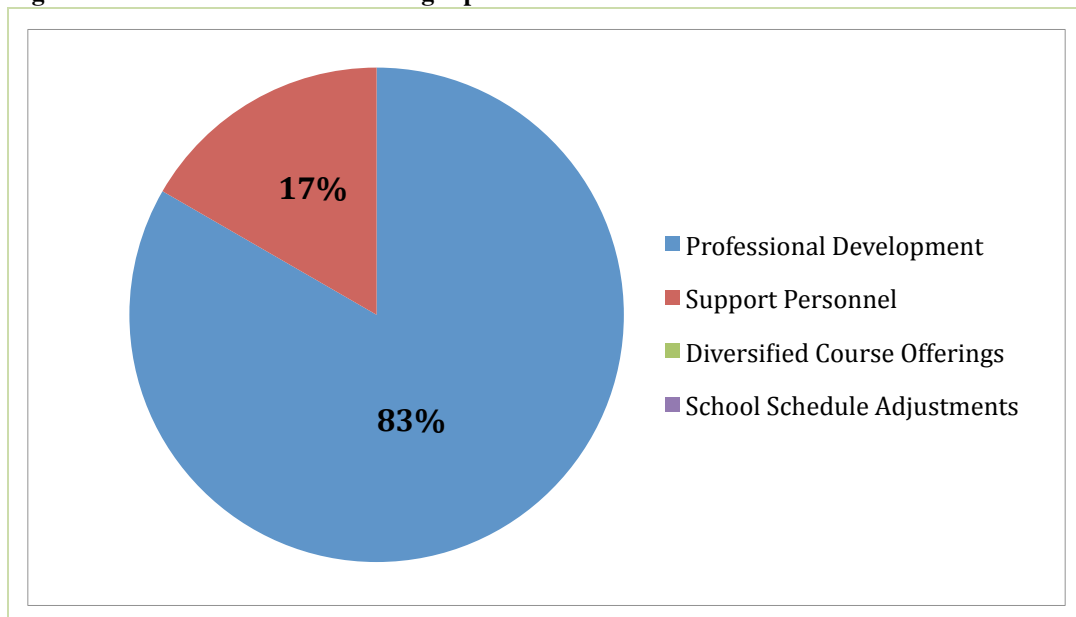
Early in the Initiative (May 2006), EDC researchers talked with Rowan and Hattiesburg stakeholders for the express purpose of identifying the professional development needs of the school and district. As the model school for the Initiative, it was very important that Rowan be positioned to succeed with the implementation of the new Cisco 21S Initiative. At the time, the school was in the process of adapting to the additions of new technology that seemed to arrive daily; working on identifying pedagogical strategies to replace the direct instruction that had been a staple in the school; and learning about the effects of the implementation of 21st century tools on the Rowan education environment. Since those initial meetings, the number of professional development activities offered to teachers and administrators at Rowan over the course of the Initiative has increased by 300 percent and 75 percent, respectively (see Figure 42).

Figure 42: Rowan professional development opportunities 2005–2009



In 2008, Rowan had completed 100 percent of its Connected Learning inputs. Cumulatively over the course of the Initiative, 83 percent of Rowan’s Connected Learning inputs were related directly to providing professional development for teachers, administrators, and technology personnel. The professional development offered ranged from technology training for Wireless Generation software and the interactive whiteboards, to change management and leadership development through the International Business Machines (IBM) Corporation’s Change Toolkit training and the Harvard Wide World series. The other 17 percent of inputs were related to hiring additional technology support. (See Figure 43.)

Figure 43: Rowan connected learning input distribution



One assessment system teachers reported specifically using is Edusoft. Using the Edusoft system, teachers at Rowan usually implemented assessments weekly or biweekly for all subjects. The teacher prepared the test; an interventionist then aligned the test to state standards and returned the test to the teacher for administration. The interventionist then assisted teachers with the compilation and analysis of student data captured during the testing by running bubble sheets containing student answers through a special reader. The data was then used by teachers, as one teacher said, “to plan for lessons, remediation, or enrichment from that point.” One teacher shared that results were instantaneous, making information about students available immediately without needing time to grade each student’s assessment. Teachers said that data reports included individual student information, such as what skills had been mastered and what skills needed remediation.

Other Professional Development Supports

Teachers reported having both external professional development to learn how to use the technology as well as access to a DOT intern and peer training. They noted that external trainings, collaborative studies and peer training had really “helped a lot.” Teachers also reported having a technology squad consisting of an informal group of students who helped out with the technology in the school. They added that the DOT intern worked with the student technology squad.

Connected Learning Challenges

One of Rowan’s goals as well as challenges was to “close the chasm between new and veteran teachers, especially the gap in technology proficiency.” In the last two years of the Initiative, Rowan hired 12 new teachers and brought in 100 new students due to district rezoning. The teachers that had been at Rowan less than two years reported that Rowan had a lot more technology than they had seen in their previous schools and districts. One teacher who came from Forrest County School District echoed the sentiments of the group. Another teacher, fresh out of college with 2008–2009 being her first year at Rowan, mentioned that technology training was not a major part of her teacher education. She talked about having one computer class in college, which focused on basic use of the Windows operating system. Providing opportunities for both new students and teachers was one of the main Connected Learning challenges addressed by Rowan.

Providing Differentiated Opportunities for Teachers

It was hard to figure out how to empower those who supported the 21st century education changes taking place in the district. Since the enthusiasts came with a diverse array of interests and ability in relation to the technology, administrators invested considerable time keeping everyone engaged, while troubleshooting technology and providing individualized instruction for teachers.

Connected Community: School Outreach and Parent Involvement

Interacting effectively with parents, local businesses and community members is a primary objective of the Cisco 21S Initiative. The addition of IP phones and a school website have been two vehicles in support of that objective at Rowan Elementary.

IP Phones

The availability of IP phones as well as Connect Ed software made effective communication between Rowan and parents more feasible. With IP phones in every classroom, parents could potentially call teachers directly when they had a question or issue, and teachers could potentially head off discipline

problems by calling parents in the moment. Currently, Connect Ed is used to send voice messages to parents.

School Website

As of the 2008–2009 school year, Rowan has its own website providing parents access to student data, such as the number of students who attended during the week. Parents commented that the website is beneficial because it offers a space for interaction among parents. Parents who don't use the school website admitted that they perceived that information was not available to them unless they were able to check the website.

Connected Community Challenges

The school administration is aware of the importance of parental engagement and has aspirations to involve more parents wherever possible. It has developed several strategies to increase parents' exposure to and use of the technology. While short lived, Rowan did make an effort to provide a Parent Center for parents of students who wanted to come after school to access the computers and/or the Internet. The response was lower than hoped, and because it required an administrator to be on duty, the practice has been put on hold until more efficient recruitment efforts are developed. To address the issue of parents who can't travel across town to take advantage of the current Parent Center site, the school administration is planning to create an additional Family Education Center at a more centralized location.

Technology and Data Use at Rowan Elementary

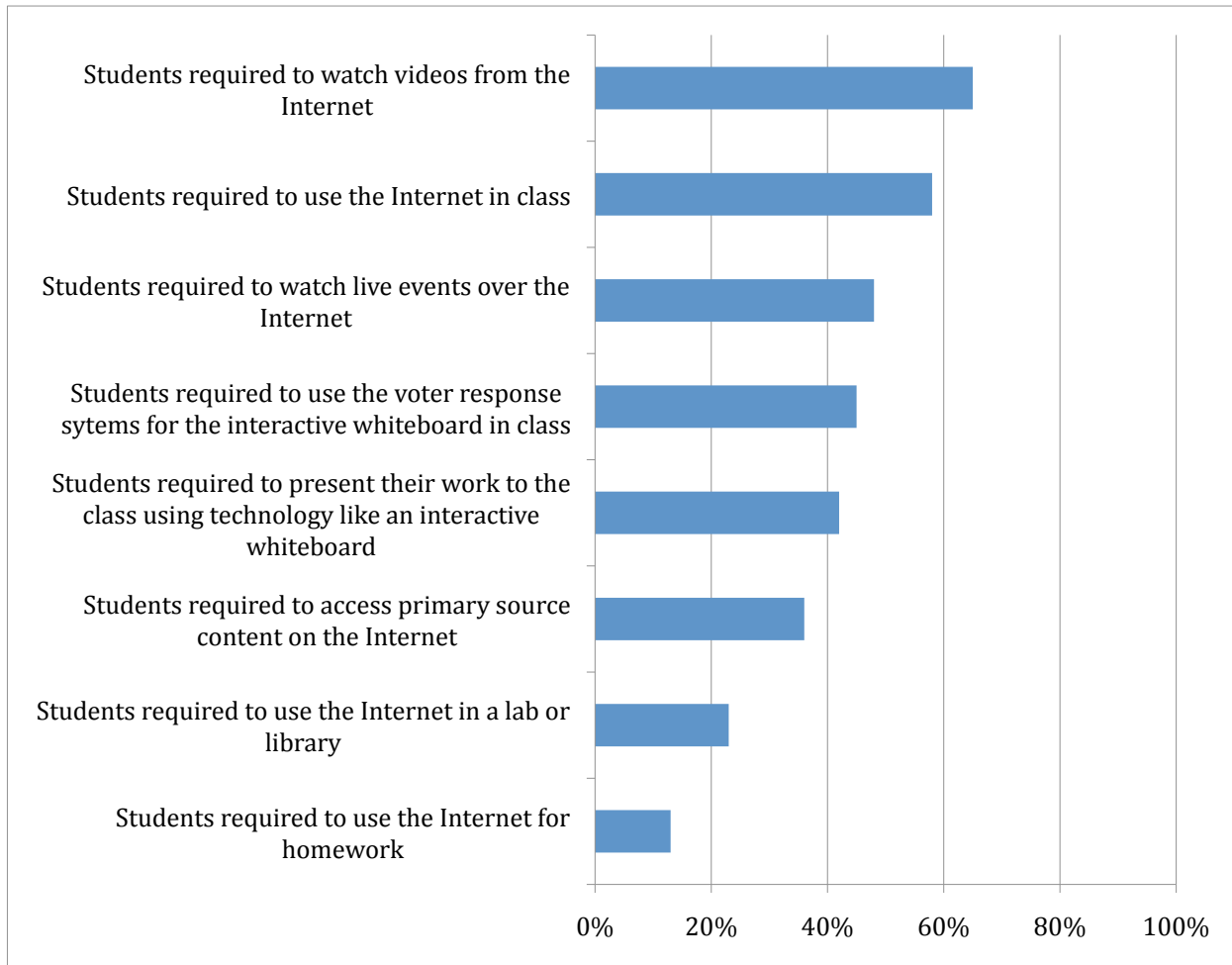
Interactive Whiteboards

Rowan leadership reports that teachers have become more comfortable with the technology tools available to them and are experimenting with the technology to address their students' needs. They indicate that teachers have been able to integrate the new technologies into their pedagogy and their use and integration of technology has improved in quantity and quality. Teachers have gotten better at using the interactive whiteboards since they were first installed three years ago. In the last year of the Cisco 21S Initiative, USM interns observed 23 of the 26 Rowan teachers participating in classroom observations (88.5 percent) using the interactive whiteboard. When asked to reveal their favorite classroom technology, teachers responded with a variety of tools but more often than not the interactive whiteboard was included.

Increased Internet Use and Integration

Ninety-seven percent (97 percent; n=32) of Rowan's teachers participated in the survey studies. Survey participants reported requiring their students to engage with a variety of Internet tools both at home and in the classroom. The highest percentage of teachers required their students to watch videos (65 percent) and other live events from the Internet (48 percent). Fifty-eight percent (58 percent) of teachers also required their students to use the Internet in class. Figure 44 shows the percentage of teachers at Rowan that require Internet use and what the specific use is for students.

Figure 44: Percentage of required student Internet use



Access To and Use of Data to Inform Instruction

Immediate access to data has helped teachers to focus lessons for students. Teachers reported improved efficiency in teaching. “A lot of things we can just pull up [on the interactive whiteboard] and don't have to actually print off; just have the students copy or do the work from the board. It also saves some time as in you can pull some things that you've used last year; although they may need to be tweaked, you don't have to start all the way over.” Teachers in grades with similar benchmarks noted that the technology enabled them to share lessons plans for increased consistency across content areas. Further, quick and easy access to data has also helped teachers better communicate with students’ parents. With data immediately available, teachers had immediate resources to draw on to prepare reports for parent conferences. One of the school’s leaders commented on teachers’ adoption of the technology:

You see those that really latched on, and you see different ways of teaching. ... You see them [teachers] using students' input and actually hearing their students and addressing what they

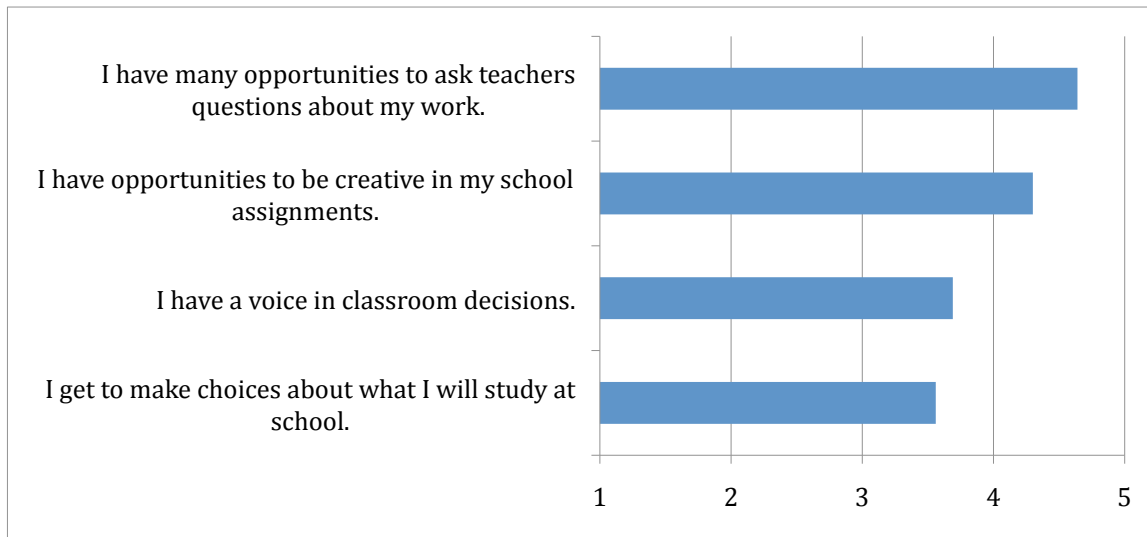
hear. You see them actually designing work that engages students, which means they're looking at why they're doing it, who they're doing it for, and changing as they go.

Despite the full adoption of technology by some teachers, there remains a lot of entry-level technology use, and then you see those who are still holding on to the easy way, the old way.

Student Technology Use

The 101 Rowan students surveyed represented approximately 24 percent of the Rowan student body. These survey participants were asked several questions about the role they played in their classrooms. Overall, students agreed that they were active participants in their learning, indicating that they had opportunities to ask teachers questions and to be creative in their schoolwork. They also agreed that they had a voice about what happened in the classroom and about what they wanted to study (see Figure 45).

Figure 45: Student agency



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.

According to surveyed students, they used the Internet on a weekly basis in most classes, but computers were used every day. They described using the computers most often in math and science, though they also used them to do Accelerated Reader tests in English language arts. During classroom observations by USM interns, 20 of the 26 teachers (approximately 80 percent) were observed using laptop or desktop computers with their students. Some activities that students described included: looking up words on dictionary.com, doing math problems, taking notes off the board, watching videos, creating PowerPoint presentations, and using YouTube as a research tool. Computers were used for special projects, such as the science fair and in the Drug Abuse Resistance Education (D.A.R.E.) program. Often students were directed to use certain software, such as Compass Learning, Fun Brain, Accelerated Reading, or Peers in Education.

During interviews, teachers talked about increased engagement in student learning since the introduction of the technology. They reported that students more readily retained information when they gathered it on their own. One teacher provided an example. “A long time ago, if you had a question or something, [the teachers would] say, ‘Go look it up.’ But now I can say, ‘Google it.’ And they run over there, Google it, and find the answer. When they do that on their own, volunteer, they remember it. So that's showing more engagement...” One student commented, “I'm understanding better on the whiteboard and the chalk board.”

Although surveyed students agreed that they were active participants in their learning, and approximately 80 percent of participating teachers were observed using computers with their students, computer use was evident in only 40 percent of the total classroom observations. Student use of the interactive whiteboard was observed to be minimal or non-existent. Rowan students are clearly eager to use the technology and to try new things with it. In fact, when prompted, a number of them mentioned creative inventions that they believed would make learning more interesting and fun. School leadership described the students as being “more aware of why they need to do certain things. They're more aware of the teachers who are doing it and the teachers who are not. They expect certain things. They have gotten used to technology. They have gotten used to doing things in an interesting way. They have gotten used to innovative things, and they look forward.”

Students' high expectations to use technology in school more fully should be understood in the larger context. Many of these young people lack access to computers and the Internet in their homes, as well as in their communities. Only a small percentage of students have computer or Internet access in their homes. When asked where they might use a computer and the Internet, students mentioned the public library and afterschool centers, though one student added that not everyone has transportation to get there. Thus, a great opportunity exists for Rowan to continue to increase students' access to technology both during school and regular afterschool hours.

Access To and Use of Other Technology

To get a sense of the extent of participants' involvement with, use of, and reliance on technology, researchers asked administrators, teachers, students, and parents about how they used technology to support their personal, professional, and academic endeavors. In terms of personal technology use, teachers reported using more technology as a result of the Cisco 21S Initiative. Teachers reported working more at home, if they had access to a wireless network. One teacher reported learning how to “text.” Students talked about their in-school technology use including the interactive whiteboard computers and some of the software they used, including Accelerated Reading and PowerPoint.

Technology and Data Use Challenges

In the context of students' increased expectations and heightened awareness of the potential of technology in their education, students at Rowan had few opportunities to interact with the technology in more than a cursory way. Students' interactions with the technology tended to be more cautious than innovative and more basic than progressive. The way teachers described student use of technology in the classroom often appeared limited and constrained. For example, students used the Internet infrequently because their teachers were afraid of inappropriate content and pop-ups. One student speculated, “I don't think we use the Internet that much because ... some people get on the Internet on different things that they're not supposed to be on.” Unfortunately, student ownership of the technology seems to have been compromised because most of it is in the hands of the teachers who allowed students to use the tools only on a limited basis. Students' descriptions brought to life what the district administrators acknowledge as a different, but related, issue: teachers are afraid that students will harm or damage the equipment.

Home Access

Technology use cannot always be extended to the home. Teachers reported that at-home technology use was difficult because so many students did not have Internet access at home. A teacher articulated, “They don’t have computers, they don’t have the Internet, and that’s been the biggest challenge when it has to end in the classroom.”

Impact of the 21S Initiative on Rowan Elementary School

Increased access to technology has affected the education environment at Rowan Elementary impressively. Administrators, teachers and parents alike weighed in on the effects they’ve noted since the beginning of the Initiative.

Connected School/Connected Classrooms

Rowan teachers reported that the biggest impact of the technology implementation is that concepts could be better exemplified by teachers and visualized by students. USM interns observed all teachers focusing on skills and concept development as well as content. Two-thirds of the observations had a primary focus on skills and concept development, while just more than half had a primary focus on content development. One teacher talked about the impact she sees the technology having on her students:

I have an older group. I’m the sixth grade teacher. The kids are already computer savvy and they’re used to technology. They’re more engaged in the lessons and they’re eager to learn now that we have access to technology and they don’t have to wait for a computer any more because we have classrooms that are equipped with computers. They can do things on their own. I’m acting as a mediator or a moderator instead of just at the podium teaching them, lecturing them all the time.

Access, Data Collection, and Student Achievement

Increased access to technology has had a profound effect on administrative practices, instructional decisions, and overall accountability. The most notable impact is the ways in which the technology has allowed for access to various sources of data at all levels of the school. As a result of attending national and state technology conferences, Rowan has gained a better understanding of, and increased exposure to, many cutting-edge technology tools, and it is more capable of making more informed decisions about what technology would be best for the education environment, the children, and the budget.

Data collection software packages were chosen that are grade- and subject-area appropriate, such as Wireless Generation, EduSoft, and Star Testing. Data could be analyzed from the beginning to the end of the school year to monitor change and progression. Armed with a robust set of data from the individual student, classroom and school levels, Rowan administrators and teachers became more equipped to make decisions about appropriate interventions for individual learners. The leadership noted, “We have meetings now with teachers monthly where they’ll sit down and bring that data, and talk to us about what the data is saying about the children, are they improving, what’s the percentage of their improvement? We’re actually looking at that with real numbers. Real figures.”

In addition to individual teacher meetings, administrators can now come together with the Teacher Support Team to look at one student from multiple angles supported by numerous layers of data. All of the data is available through the school website and teachers gain access to the information through their laptops. For example, the EduSoft software provides student’s strengths and weaknesses and places him or her in an appropriate intervention group. The ability to offer differentiated interventions for individual students is a direct result of increased access to robust data.

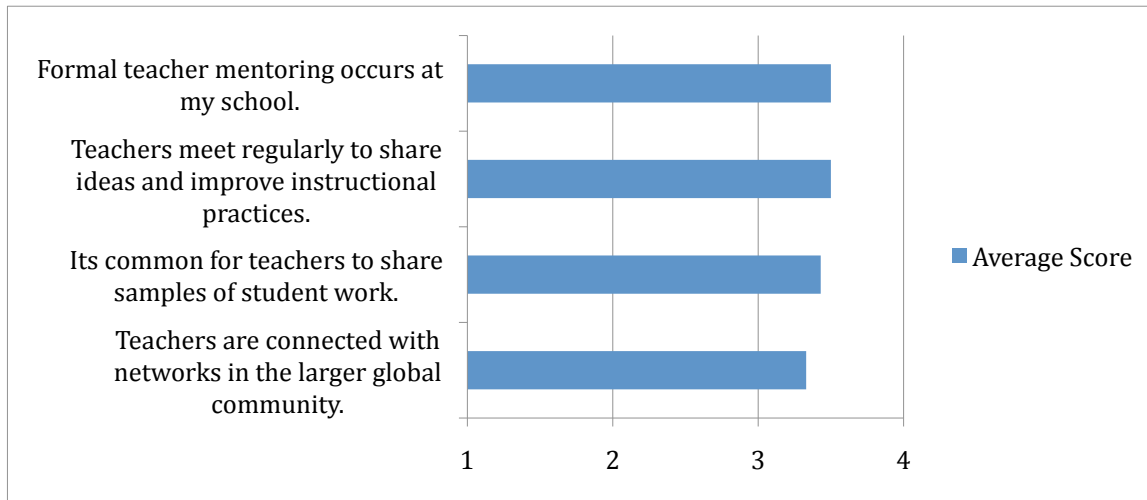
Parents noted that many of the students at Rowan use the public library in lieu of not having Internet access at home. One parent expressed this,

“My computer was having problems during the Science Fair, but when I went to the library I was actually surprised that the library was filled with kids from Rowan. We had to actually leave and come back... But I hear a lot of kids ask to be taken to the library, whereas a few years ago I didn't hear kids even wanting to go.”

Connected Learning/Connected Learners

Surveyed teachers reported a high level of agreement on four unique measures of collaboration indicating that they frequently mentor each other, meet, exchange ideas, share student work, and interact with global networks. Figure 46 shows where Rowan teachers fall on the four-point scale.

Figure 46: 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.

Connected Community/Connected Parents

The impacts of the Cisco 21S Initiative on the community have, on the whole, been positive. Since the inception of the Initiative in Rowan, the community’s overall perception of the school has improved along with increases in community involvement and parental participation. Teachers noted that, as they watched children become increasingly technology savvy, the community was in “awe.” Teachers also noted that parents were coming to the school more to volunteer their time. One teacher mentioned that

prior to the technology infusion there were a couple of break-ins at the schools, but since the technology infusion there had not been any. This teacher believed that the values of the community had changed; that they were more interested in protecting the school than damaging it in any way.

Parents and students also exhibit a greater sense of pride in the school. “For a lot of our parents, as well as our students...[there is] just a sense of pride, that this is what our school has, and ‘I want my child to go here.’...I’ve sat in on parent meetings, I have heard things like that, that, well, ‘we have all this, and this is wonderful, and I want my child to be able to use that” (Technology Staff).

The use of IP phones as well as Connect Ed software has also helped improve communication between the school and parents. With IP phones in every classroom, parents can call teachers directly when they have a question or issue.

Community Involvement

Thirty-five community businesses and organizations have been involved in the 21S Initiative. The majority of these (40 percent) are charitable or service organizations. Community involvement in the 21S Initiative has also come from businesses, health service providers, higher education institutions, and youth programs. The distribution of types of organizations involved in the 21S Initiative is depicted in Figure 47. A list of all involved businesses and community organizations is provided in Table 21.

Figure 47: Types of organizations involved in the 21S Initiative

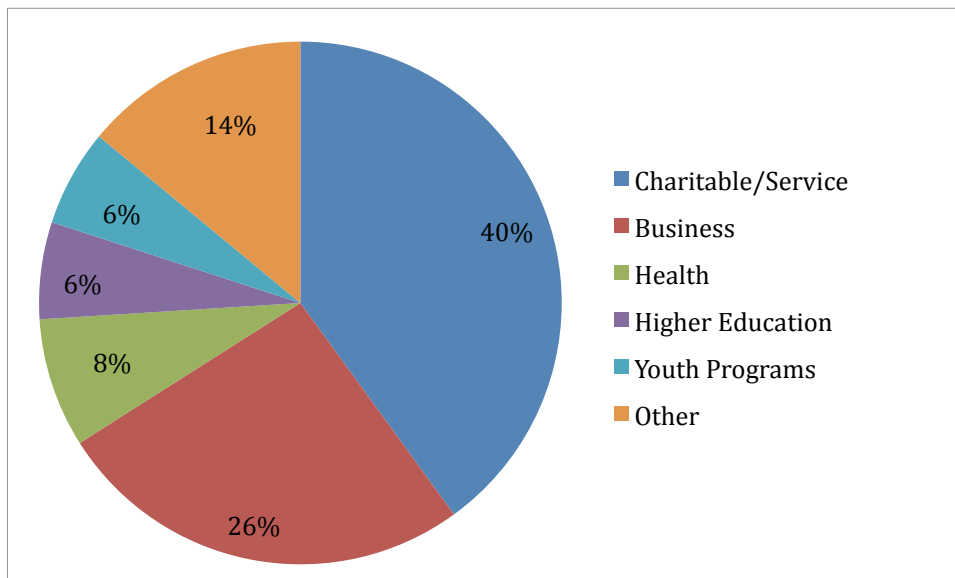


Table 21: Rowan community partnerships

Business	Charitable/Service	Health	Higher Education	Youth Programs
Bancorp South	Alpha Kappa Alpha	Blue	University of	Junior
Cisco Systems	Alpha Phi Alpha	Cross/Blue	Southern	Achievement
Coca-Cola	Big Brothers/Big	Shield of	Mississippi	PACE Headstart
Bottling	Sisters	Mississippi	William Carey	
IGA Grocery	Family Network	Pine Grove	University	
Sam's Club	Partnership	Mental Health		
Subway	Hattiesburg Alumnae	South East		
Target	Chapter Delta Sigma	Mississippi		
Department	Theta	Rural Health		
Stores	Junior Auxiliary	Initiative		
Wal-Mart	Kiwanis			
York	Lions Club			
International	Mu Nu Chapter Delta			
	Sigma Theta Sorority			
	Rotary Club			
	Salvation Army			
	United Way			
	Watch DOGS			
	World Visions			
	Charity			

Lessons Learned in Rowan Elementary

During site visits to Rowan Elementary School, EDC researchers asked participants to reflect on the technology integration experience at their school and to consider what recommendations they might offer to another school getting ready to go through the same or a similar process. Administrators, parents, teachers, and students all weighed in and acknowledged a number of lessons learned. Rowan’s educational community’s most cogent lessons learned have been captured and intertwined with lessons arising as a result of the Rowan Elementary case study. They are enumerated here:

Connected School/Connected Classrooms

1. Develop an implementation strategy that can be realized in incremental steps.
2. Allow your school and participants enough time to figure out what can and will work best for them.

Connected Learning/Connected Learners

1. Professional development for teachers should not occur at the beginning of the school year, but prior to the beginning of the school year.
2. Teachers should be provided any equipment early so that they can become acquainted with it.
3. Teachers need to keep an open mind, even though learning how to use all the new technology may be frustrating.
4. Teachers should know that with practice, dexterity will come.
5. Teachers should explore their options and think of the technology as a tool. The technology shouldn't be implemented just for the sake of using it. They need to think about alternate ways of doing things and talk to teachers experienced in the technology to learn about their options in using the technology.
6. Each school should have a strong full-time technology person to provide one-on-one training.

Connected Community/Connected Parents

1. Parents should attend initial meetings to ensure they know what is going on at their child's school. If they cannot attend, they should seek out another parent who can attend and share information.
2. Parents need to look through any and all information they may receive that pertains to their district or school.

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 HPSPD's educational vision, any changes in culture, and the implementation of the structural components of the Initiative and their impact on all participants.

Vision and Leadership

Effective leadership is among the most powerful factors in the district's transformation. The hiring of a new superintendent, who exhibited strong leadership qualities, collaboration and communication skills, an action-oriented approach to bureaucratic tasks, and a sense of urgency for transformation was critical in the implementation of the Initiative in Hattiesburg. To transform the district, Hattiesburg Public School District leaders formulated and carried out the following strategies:

- Articulated a clear and compelling vision for creating a 21st century learning environment
- Developed leadership teams at both district and school levels
- Fostered generative partnerships with local and national organizations
- Improved communication and collaboration throughout the district
- Promoted a culture of innovation and experimentation
- Organized budgets and staffing to sustain the 21S initiative once Cisco's participation and support ends

21st Century Learning Environment

Technology played a central role in HPSPD's transformation efforts. Access to technology has improved greatly over the term of the 21S Initiative. The implementation of the Initiative is on target. Administrators and teachers have greater access to professional development support. As a result, HPSPD has made positive improvement in the following areas: leadership, management, technology use and integration, instructional practices, and community and parental involvement.

To understand better the impact of the initiative in Hattiesburg Public School District, EDC researchers looked at the relationship between programmatic inputs and student outcomes. The analysis revealed that access to a reliable technology infrastructure and tools, high-quality technology support, effective communication and collaboration strategies for teachers, and parental and community involvement 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:

- Increased number of students passing AP exams
- Increased number of students who are better prepared for future employment
- Increased number of students who are better prepared for college
- Increased number of students who are more likely to go to college
- Increased community involvement
- Increased interaction with local institutes of higher learning
- Increased cooperation within the district
- Improved community perception of the school or district

Remaining Challenges

Although Hattiesburg Public School District leadership and staff have worked hard to achieve a dramatic transformation of their schools, a number of outcomes are as yet unrealized. The remaining challenges include:

- More closely align leaders' and teachers' expectations regarding 21st century pedagogies. There has been a decline in the use of student-centered instructional practice, such as encouraging student-led research, student-led revision, analysis, and student presentation of work products.
- Increase classroom access to Web 2.0 tools and computers for all students.
- Enhance further the following areas: professional development, teachers' practices around technology use and instruction, planning time for teachers, data-driven instruction, and student behavior.
- Assist teachers in integrating technology into their teaching.
- Increase student achievement as measured on college entrance tests, which have shown mixed results. While passing rates on AP tests are higher (up 15 percentage points in the past year), participation in AP courses has declined (down 6 percentage points). Average ACT scores have fallen slightly as well (from 17.6 in 2008 to 16.7 in 2009).
- Continue to increase parental and community involvement.

Recommendations

Building on the gains in leadership, teaching, and learning that Hattiesburg Public School District has accomplished, we suggest that the recommendations below be taken into account in future district improvement plans:

- Leaders should more clearly articulate what they want teachers to prioritize in their day-to-day teaching. Teachers would benefit from clarity regarding ideal student behavior and the frequency with which teachers are expected to use the Internet to post lessons and communicate with parents. Setting and communicating these expectations would help ensure that teachers know what to prioritize in their day-to-day teaching.
- In order for the affordances of technology to reach their full potential, the district should make efforts to provide teachers with enough computers for all of their students. Increasing teachers' access to Web 2.0 tools also will enable them to employ the approaches to pedagogy and communication that are in line with the goals of the Initiative. In addition to expanding technology access in these ways, the district should establish a plan for dealing with technical malfunctions, as well as a plan for addressing the needs of teachers who remain reluctant to use their technology.
- To address the decrease in teachers' use of constructivist approaches in recent years, teachers may benefit from an increased focus on promoting teaching methods during professional development sessions. In particular, professional development sessions may focus on helping teachers revise their own work plans, or giving students more freedom to explore their own interests and choose their own research topics. The integration of more constructivist approaches may help increase students' level of excitement about their classes, which decreased from 2008 to 2009.

- Teachers may benefit from professional development that focuses on the effective uses of technology tools and software. More substantial changes to teacher training and professional development for teachers may result in subsequent changes to their teaching philosophy, which has been resistant to change thus far. These enhancements to professional development must not only focus on how to use the tools and software, but how to integrate the resources into the curriculum and how to use data to inform changes to instruction.
- The district must establish a plan to address the troubling increases in student behavior problems in recent years.
- The district should appeal to the request from parents and community members for a wider variety of services to support their involvement in the schools. Increasing outreach staff, technological support, meeting spaces, training seminars, and parent-teacher meetings may inspire and enable them to become more involved.

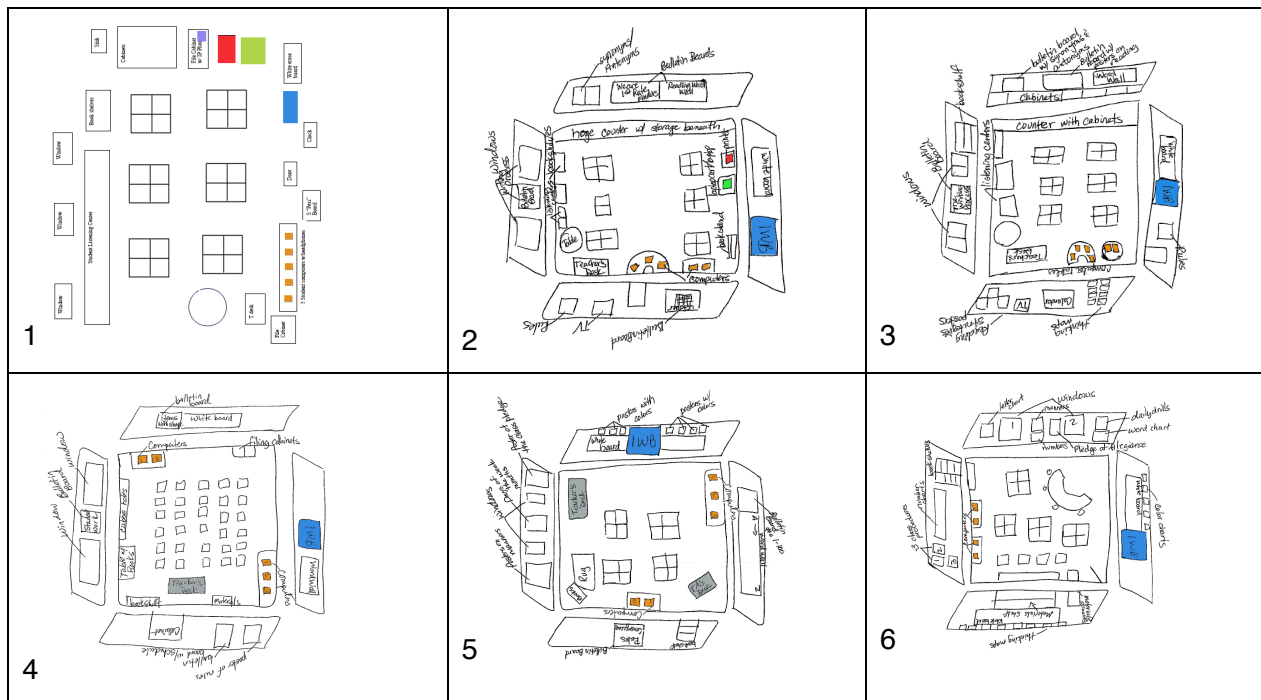
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Appendix

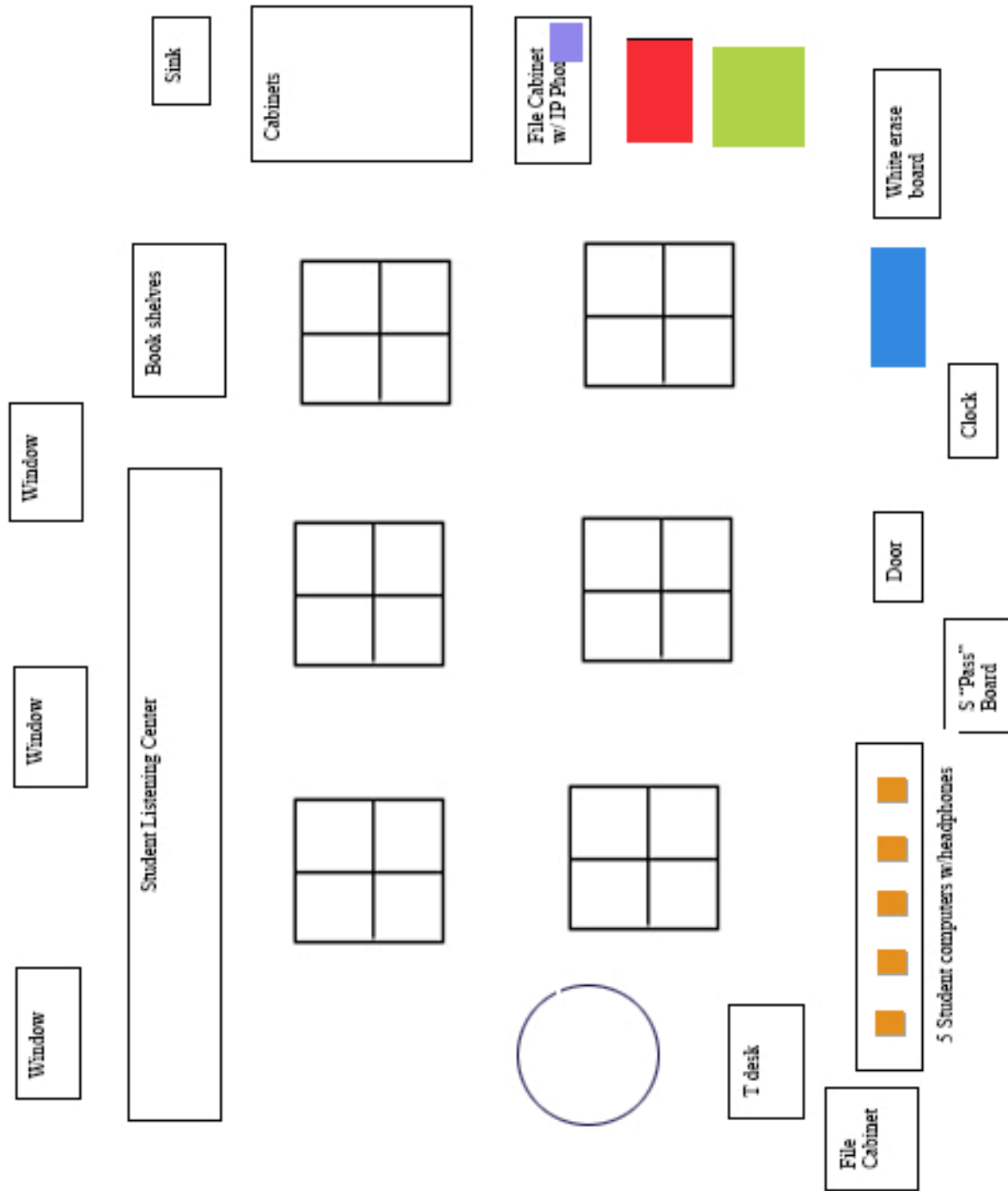
Note: EDC researchers will deliver the rest of the Appendix section to Cisco in a separate document.

Rowan Elementary School Classroom Maps



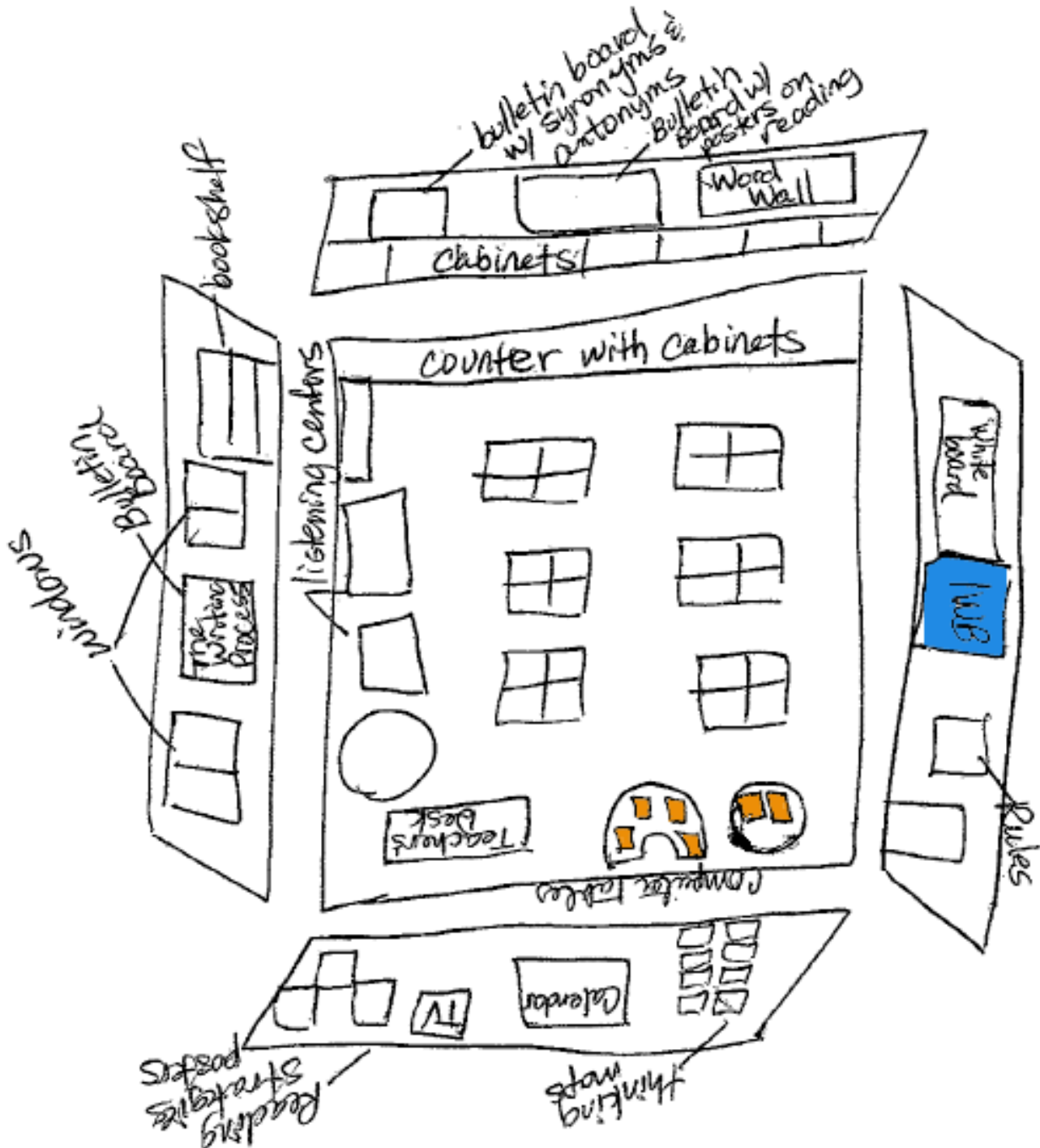
1. Teacher Jane Eyre—grade 3 self-contained—observed on 2/4/08
2. Teacher Jane Eyre—grade 3 language arts—observed on 10/2/08
3. Teacher Jane Eyre—grade 3 language arts—observed on 1/22/09
4. Teacher Harriet Tubman—grade 6 math—observed on 8/26/08
5. Teacher Pocahontas—grade 1 self-contained—observed on 9/18/08
6. Teacher Snowflake Bentley—grade 1 self-contained—observed on 12/2/08

Teacher Jane Eyre—grade 3 self-contained—observed on 2/4/08

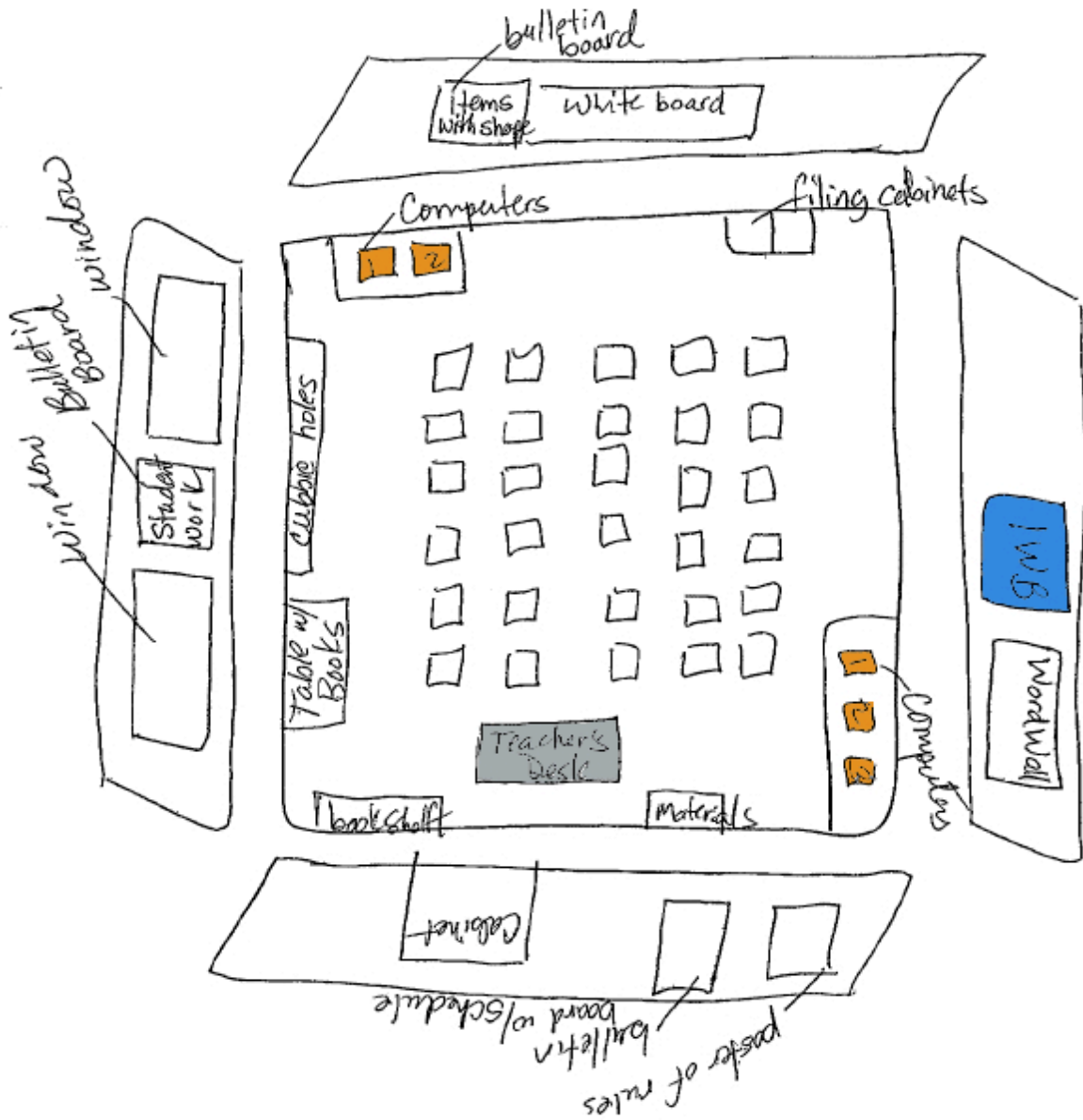


Teacher Jane Eyre—grade 3 language arts—observed on 10/2/08

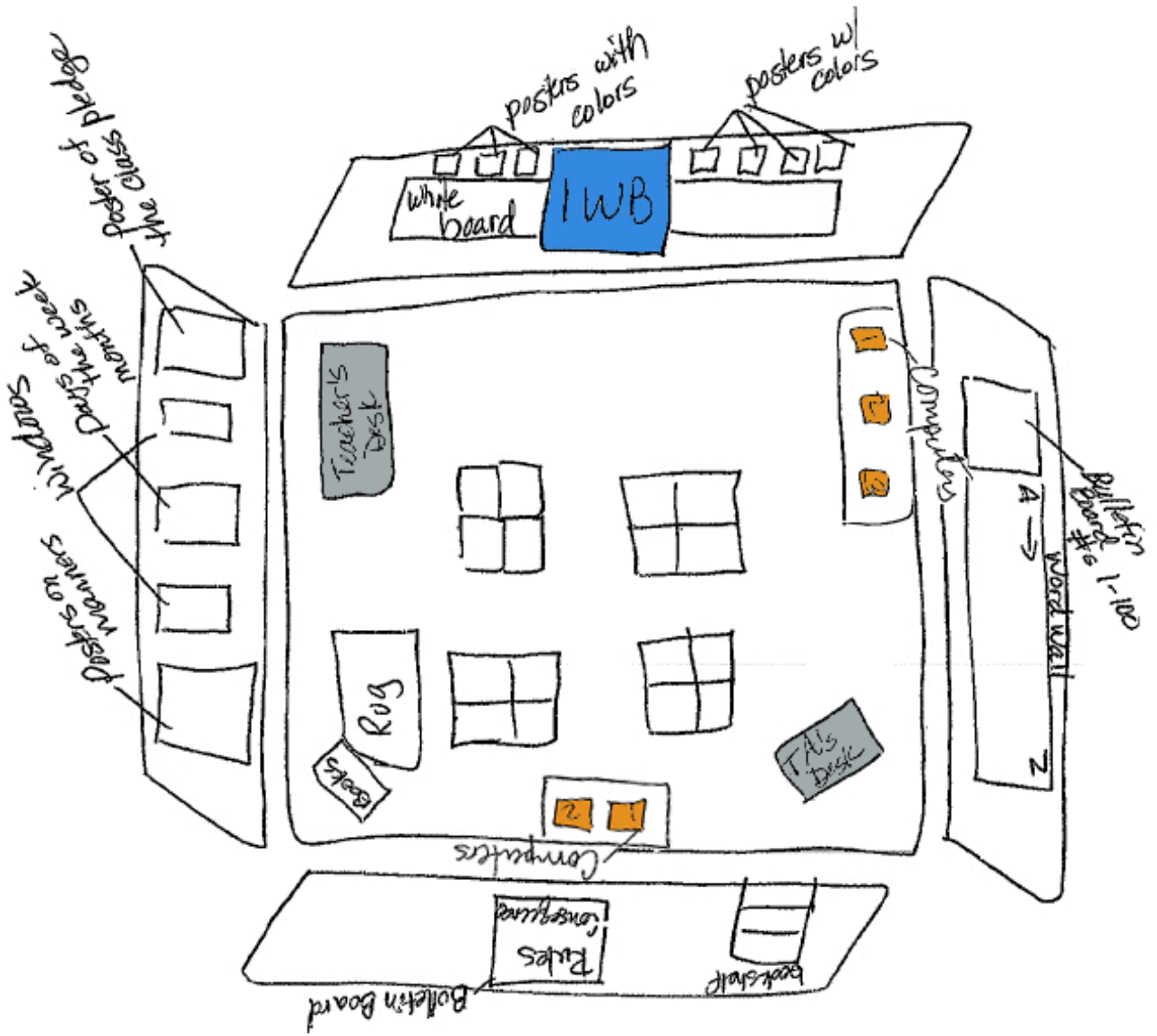




Teacher Harriet Tubman—grade 6 Math—observed on 8/26/08



Teacher Pocahontas—grade 1 self-contained—observed on 9/18/08



Teacher Snowflake Bentley—grade 1 self-contained—observed on 12/2/08

