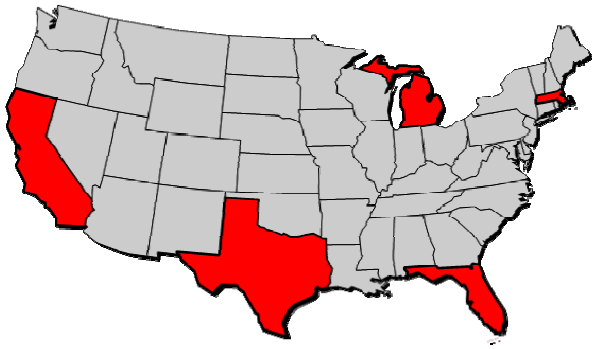
PERFORMANCE AND PRACTICE

CASE STUDY

Core Practices in Math & Science:
An Investigation of Consistently Higher Performing Schools in Five States

William H. Turner Technical Arts High School

Miami-Dade County Public Schools
(Florida)



Introduction

Since 1999, the National Center for Educational Achievement (NCEA) and its affiliated research teams have studied over 500 public schools across the country in an effort to identify and disseminate effective practices embraced by higher performing schools that distinguish their campuses from their average-performing peers. Building on the foundation established by this previous research, NCEA sought in the current study to focus specifically on educational practices in the areas of mathematics and science in five states: California, Florida, Massachusetts, Michigan, and Texas.

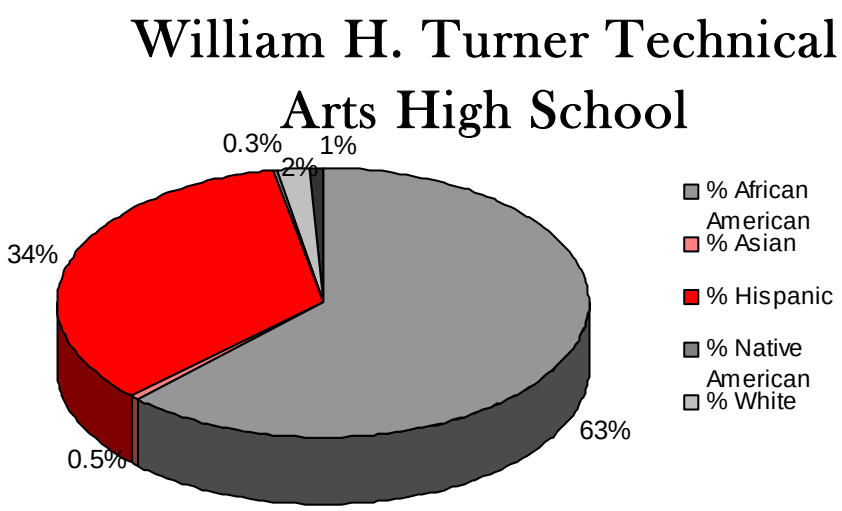
Criteria used in school selection in the current study included three years of state assessment data in mathematics and science (2004, 2005, and 2006), campus demographic make-up, percentage of economically disadvantaged students, school size, and geographic location. In addition, all of the schools selected for participation met the state and federal requirements for Adequate Yearly Progress (AYP) in 2006. Schools categorized as higher performing based on the selection criteria were those "beating the odds" with consistently better student achievement over three years, when compared to peer campuses with a similar student population. Therefore, a list of the state's highest performing schools may contain schools different from those selected for this study.[1]

In order to illuminate the roles of different members in a school community, for each selected school, NCEA researchers interviewed district-level administrators, school administrators, and classroom teachers. To supplement the interview data, researchers collected pertinent documents, observed

[1] For more detailed information about the school identification process and the list of higher performing schools included in the study, please see the full cross-case report at http://www.nc4ea.org.

NCEA
National Center for Educational Achievement

Figure 1: Student Demographics



secondary level algebra classes, and invited participants to take part in the NCEA *Self-Assessment* online.

District and School Profile

The Miami-Dade County Public School system is the fourth largest district in the United States. A finalist for the Broad Prize in Urban Education in 2006, 2007, and 2008, Miami-Dade serves a diverse population of more than 350,000 students in 378 schools. The majority (68%) of the students are eligible for free and reduced-price meals, and 16% are English language learners.

Over 1,700 students attend William H. Turner Technical Arts High School, known as Turner Tech. Approximately 63% of the students are African-American and 34% are Hispanic. Approximately 2% of the students are English language learners, and 89% qualify for free and reduced-price meals.

Turner Tech is a school of choice, but admissions are not selective. All students at Turner Tech are assigned to one of seven academies, each related to a particular career path:

- Construction Management and Architectural Technology
- Finance
- Health
- Industrial/Entertainment Technology
- Information Technology and Entrepreneurship
- Public Service
- Veterinary Science and Agriculture Technology

Each student selects a preferred academy when applying to the school. Students remain with the same academy for all four years of high school, allowing them to receive the individualized attention that comes from membership in a small learning community.

As a strong proponent of higher standards, NCEA recognizes school efforts to move more students to the state's higher standard of achievement by accounting for those students in the analysis of consistent higher performance. Tables 1 and 2 summarize performance at both the state's proficient and advanced standards attained by the students at Turner Tech for the years of 2004, 2005, and 2006. The state averages included in the tables represent student performance among

Table 1: Performance Trends based on Proficiency Standard

	2004			2005			2006		
Grade	**9**	**10**	**11**	**9**	**10**	**11**	**9**	**10**	**11**
Mathematics	57%	66%	Not Tested	59%	67%	Not Tested	61%	69%	Not Tested
Science	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	17%	Not Tested	Not Tested	19%
State Average for Similar Schools (Math)	33%	46%	Not Tested	37%	45%	Not Tested	38%	47%	Not Tested
State Average for Similar Schools (Science)	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	13%	Not Tested	Not Tested	16%

Table 2: Performance Trends based on Advanced Standard

	2004			2005			2006		
Grade	**9**	**10**	**11**	**9**	**10**	**11**	**9**	**10**	**11**
Mathematics	19%	30%	Not Tested	24%	30%	Not Tested	22%	31%	Not Tested
Science	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	1%	Not Tested	Not Tested	0%
State Average for Similar Schools (Math)	11%	19%	Not Tested	13%	18%	Not Tested	13%	21%	Not Tested
State Average for Similar Schools (Science)	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	1%	Not Tested	Not Tested	1%

schools with a student population similar to Turner Tech, particularly based on the percentage of economically disadvantaged students.

A detailed, vertically aligned curriculum gives students the knowledge and skills necessary for success in college and skilled careers.

- All schools in the Miami-Dade County Public Schools follow the district's Content-Based Curriculum, closely aligned with Florida's Sunshine State Standards. For each course, at each grade level, the district curriculum breaks the course content into knowledge components. The district identifies several learning objectives, each linked to a particular state standard, for each component. In addition, the curriculum links each component to a set of skills or competencies that students must demonstrate in order to attain content mastery. School and district administrators reported that the standards-based curriculum enables them to maintain a rigorous standard of instruction across all grades and subjects. A district administrator explained, "Recent revisions of the math and science standards have resulted in standards that are fewer in number, but much more focused on essential knowledge. This helps prevent the 'mile high and inch deep' problem, where teachers must rush through the curriculum in order to cover everything. The standards and content-based curriculum together do an excellent job of explaining what needs to be learned at each grade level." Observed a school administrator at Turner Tech, "Looking at the district curriculum, it is clear that Miami-Dade is looking closely at the research about moving students to higher levels of achievement, and closing achievement gaps. This is our priority at Turner Tech as well, so the school and district curricula align well with each other."

- District curriculum directors work closely with school administrators and teachers to align curriculum and instruction across feeder patterns. As one school administrator explained, this alignment focuses on the district's pre-Advanced Placement (AP) program, in order to make sure that pre-AP classes contain the level of rigor necessary to prepare students for AP coursework in high school. District administrators encourage department heads at the high school level to meet frequently with the pre-AP middle school teachers in their feeder pattern to align instruction, both between pre-AP and AP classes, as well as with the district curriculum. A district administrator explained, "This school-to-school communication is really helpful, because in a large, diverse district like Miami-Dade, each feeder pattern is dramatically different. School leaders and teachers within feeder patterns are often in the best position to spearhead curriculum alignment efforts."

- Turner Tech High School promotes college and career readiness for all

students by integrating academic and technical learning. The school's stated mission is to fulfill the "Two for One" requirement: graduates of Turner Tech earn both a high school diploma and industry certification for jobs related to their academy's theme. Students graduate with skills valued by employers, but they also graduate prepared to complete advanced coursework in college. Each academy program requires students to complete internships at actual work sites, such as banks, hospitals, community agencies, stock brokerage firms, or government agencies. All students also complete an academically rigorous core curriculum. In addition to the vocational courses related to her academy's theme, each student takes four years of English, four years of math (including Algebra I and Geometry), three years of science and social studies, and two years of a foreign language. Core subject-area teachers work together to ensure that core courses draw strong connections to each of the academy's themes. Explained an administrator, "Transference of knowledge and connections to the real world are an important scaffolding technique used at the school." She continued, "Sometimes, students choose to enroll at Turner Tech because they think that they don't have any hope of going to college, so they figure that they will learn a trade instead. Once they get here, however, they do so well that they end up getting accepted to and attending a four-year college. At least 87% of last year's graduating seniors went on to some type of post-secondary education. The school allows students to realize their potential."

Curriculum documents add clarity to the district curriculum, helping teachers understand what is to be taught and learned in each grade and subject.

- District-developed pacing guides help teachers align instruction to the district curriculum and curriculum benchmarks. "Pacing guides are only effective when there is fidelity of implementation" a district administrator noted. "We always communicate this to teachers and school leaders." Teachers at Turner Tech explained that district-provided pacing guides help teachers "drill down" from the state standards to identify each day's teaching and learning objectives. A science teacher observed, "The state standards are good, but they are pretty general. They don't tell us what content needs to be taught in each course and grade. The pacing guides, on the other hand, can actually be used as lesson plans, because they are so detailed. Each online pacing guide has hyperlinks to lots of hands-on experiences and labs developed by the districts. This really helps science teachers."

- Vertical teams of teachers at Turner Tech regularly review their pacing guides to make sure that each course gives students the skills and knowledge they need to complete the next course in a given sequence. A math teacher explained, "Every summer, the math team attends a retreat to plan for the upcoming school year. On the retreat, we revise the curriculum documents to

make sure that they're aligned across subject areas, so, for example, a student who completes Algebra I will be ready to succeed in Geometry the following year."

- In addition to pacing guides, other district-provided curriculum documents give teachers further instructional guidance, allowing the district to align course content and instructional practices across classrooms and schools. District curriculum documents for science include a list of essential labs, designed to make sure that all students get the experiential, hands-on instruction they need. A list of seven "Power Writing" standards helps students learn how to write effective scientific conclusions to scientific lab reports. District curriculum documents for math include a list of essential graphing calculator activities, similar to the essential labs list. In addition, both math and science teachers receive crunch-time guides, which tell them how to cover key material in a few

Theme 2
Staff Selection, Leadership, & Capacity Building

weeks. Teachers can use these guides in the weeks before the state assessments, just in case they fall behind the schedule defined in the pacing guides.

The district aggressively recruits and develops effective, highly qualified teachers and school leaders. District administrators and school leaders collaborate to select and allocate staff based on specific academic goals.

- To fill hard-to-staff positions in math, science, special education, and bilingual education, district administrators in Miami-Dade rely heavily on teachers who come to the profession through alternative routes. To help recruit these teachers, the Human Resources staff takes advantage of its strong partnerships with both Teach for America and the New Teacher Project. With partner organizations helping to pre-screen candidates, Miami-Dade administrators build a pipeline of talented recent college graduates and career-changers to fill open teaching positions in high-need subjects. Explained a district administrator, "The New Teacher Project focuses more on hiring career changers who will be with the district for a while and want to make teaching their career, while Teach for America focuses on recruiting very high achievers just out of college, who will probably only spend a few years teaching but make a big impact right away, and also have a big role in education beyond teaching. Principals tend to really love Teach for America teachers, and they'll take them for the two or three years that they're there. But they also appreciate that New Teacher Project teachers are more likely to stay in their school for a while."

- Even though Miami-Dade hires an average of 2,500 teachers each year,

district Human Resources staff members pride themselves on their ability to work within a huge school district and still develop a personalized recruitment and staffing approach for each applicant and vacancy. For example, employees at six regional staffing and recruitment centers work closely with schools. The Human Resources office also maintains a web-based recruitment tool to help teachers select applicants to interview, though some principals, having developed professional friendships with district recruiters over the years, prefer to call the recruitment office directly for assistance in finding the candidates who would be a good fit for their school culture. The principal of Turner Tech explained that she always picks up the phone and calls district recruiters when she has a teacher opening. “My friends in the Human Resources department do a wonderful job of recruiting new teachers through teacher fairs, or through Teach for America, and they often alert me to good candidates” she observed, “It is important that the district know the school culture at Turner Tech, and know the kind of teachers we need here.”

- Principals in Miami-Dade are given freedom over teacher-hiring decisions and can select teachers who fit their schools’ academic needs. The district recommends particularly impressive candidates who pass through the district’s recruitment office, but final interviewing and hiring decisions are left to school administrators. According to a Turner Tech school leader, when she meets with teaching candidates, she uses a variety of interviewing techniques to assess whether or not each person is a good fit for the school. She explained, “I really need to figure out if candidates really want to teach challenging students. I need to know that they care about and want to teach all students, no matter where the students come from, no matter what their ability level.” As part of the interview process, school leaders at Turner Tech bring teaching candidates to the classroom and ask them to demonstrate their teaching. “We always look at resumes and references,” a Turner Tech administrator explained, “but we care most about the sense of fit, and how comfortable an applicant feels in the high school setting. We always bring an applicant to visit classrooms. We have them sit in on a class, and often ask them to get up and teach a mini-lesson or teach a concept, just to see their comfort level in the front of a classroom.”

- The majority of school leaders are internal hires, drawn from among the district’s ranks of teachers. The district’s Leadership Development Program offers preparation programs for assistant principals and principals. Participants complete formal professional development courses in the summer and then meet monthly in learning-community cohorts during the school year. After participants complete summer professional development activities, each keeps a portfolio with a “competency checklist” that he or she

fulfills by completing school-based projects during the school year. Supervisors and regional district administrators assess the participants. Once candidates complete the items on the checklist, they interview with district administrators for placement on the eligible candidates roster.

District and school leaders offer ongoing, job-embedded professional development aligned with college and career readiness goals.

- District and school stakeholders understand that preparing students for success in college requires teachers who can deliver academically demanding coursework across grade levels. District administrators build professional development collaborations with local colleges and universities in order to help teachers understand the level of rigor demanded in college-level classes. The ultimate goal of these partnerships is for teachers and school leaders to align the curriculum backwards from college-level requirements. For example, Turner Tech maintains a strong partnership with Miami-Dade College. The College provides math and science training to teachers. Reported a school administrator, “Miami-Dade College looks at this as a way to ensure that students are well-prepared for college-level work when they enroll at Miami-Dade after high school. The college really wants to reduce the number of freshmen who have to take remedial coursework, so they have a vested interest in helping us make the school curriculum more rigorous.” Currently, district leaders are expanding these partnerships to include training for elementary school teachers. “Too many elementary teachers don’t understand how rigorous college-level math and science can be,” a district administrator observed. “Most elementary teachers took their coursework in the school of education. They need to know how to start preparing elementary school students to succeed in college science.”

- At the beginning of the school year, school administrators at Turner Tech survey all teachers about their professional development needs. Administrators analyze the survey results and identify the professional development areas that interest teachers the most, such as designing rigorous math and science lab experiences and developing higher level questioning strategies. School leaders then organize teachers in Critical Friends Groups (CFGs) designed around these areas. Each CFG meets 2-4 times per month. Teachers may choose to participate in more than one CFG each year. All beginner teachers at Turner Tech join a New Teacher CFG. The purpose of CFGs is to discuss student work and come up with ideas and strategies to make instruction more effective. “The Critical Friends Group is wonderful,” a teacher observed, “because when teachers are part of a team, we can share dilemmas and receive lots of support to become better instructors.”

- Faculty meetings are entirely devoted to issues of teaching and learning. School leaders communicate administrative details through e-mail instead of

using the designated twice-monthly faculty meeting times. Noted a school leader, “All faculty meetings are professional development meetings.” For example, during the 2007-08 school year, when Turner Tech asked teachers to integrate literacy-based activities across the curriculum, each faculty meeting contained training on how to teach reading strategies and vocabulary. New teachers also receive special attention during meetings, often meeting in breakout groups to share instructional ideas and strategies. In addition, veteran teachers and administrators always devote some faculty meeting time to answering questions from new teachers.

New teachers receive ongoing mentorship from veteran teachers. All teachers have access to extensive instructional support systems designed to support rigorous instruction in every classroom.

- Instructional support is immediately available to any teacher, at any time. Turner Tech teachers and administrators call this support “point-of-need assistance.” A school leader observed, “I always tell my teachers, ‘the best thing you can do is admit what you do not know, so that I can help you.’ I try to model this behavior myself, and admit something I am learning about or growing in at each faculty meeting.” She explained that she does not ever want teachers to feel embarrassed about asking questions. “Many non-English Language Arts teachers don’t know a lot about reading strategies,” she noted, “but these teachers know that if they have a question in the middle of a literacy-related activity, they can call the reading coach and the coach will come and help them immediately.”
- New teachers participate in highly structured mentorship programs. Each district teacher who is new to the profession is assigned a mentor at his school. Over the course of the school year, these mentor-mentee teams spend four professional development days working on activities such as lesson planning. In addition, many teachers work with join New Educator Support Teams. These teams are organized campuses and feeder patterns with high populations of new teachers, especially teachers who are non-

education majors. A math teacher reported that these district programs provide excellent support for new teachers and make it easy for teachers to talk to one another. “I feel like I can ask questions, and I know where I need to go to get additional support,” he said.

Evidence-based instructional practices are institutionalized across grades and subjects. All teachers are skilled in the use of these practices.

- In the classroom, math and science teachers use labs, manipulatives, and

other hands-on, multimedia activities to keep students engaged in the day's lesson. In both math and science, district curriculum coordinators encourage teachers to employ an inquiry-based model of instruction. A district administrator explained, "It is important to guide the student towards the 'meaningful moment' not just tell them what they need to know." In the classroom, this approach translates into the use of a four-step instructional model for each class session, designed to help the child develop meaning first; then look at content; then complete a practice-based activity; then communicate, reason, or prove what they have discovered. Within this four-step instructional model, teachers use a combination of strategies, including cooperative learning, direct instruction, and hands-on activities. Math and science teachers at Turner Tech report they use technology frequently to conduct simulations and give students what one teacher called "the feel of real life." A science teacher observed, "In the past, before taking the state assessments, , 9th-grade science students could learn something today, forget it tomorrow and no one would care. But now, they must retain what they learn until the 11th grade when they take the state exit exam. The teachers really use innovative techniques to get this knowledge ingrained in the students' minds: lots of multimedia, lots of technology, and frequent labs."

- Teachers at Turner Teach integrate literacy activities into all courses. According to a school administrator, "Students need to read more, and need more exposure to academic vocabulary. The school needs to speak loudly to them about the importance of reading. All teachers need to be reading teachers." To increase students' reading and writing skills, the school adopted a program known as "15 + 5." Every class includes least 15 minutes of literacy-based activity every day, followed by a 5-minute assessment. School leaders also encourage teachers to give students constructive feedback and criticism on their writing assignments. "I don't just want to have teachers give students 'checks' or 'check plusses' or rubric scores," explained a school administrator. The school's full-time reading coach works with all teachers in the school to deliver professional development on vocabulary building. Math teachers reported that they use the literacy time to teach students how to decipher word problems. "Students often get really scared of math problems" a teacher explained, "and this has helped them seem less intimidating." In addition to the "15+5" requirements, each morning between 7:35 and 8:05 AM, the students, administration, faculty, and staff at Turner Teach all stop to read for 30 minutes. Teachers encourage students to select challenging materials such as novels for their silent sustained reading time.

Differentiated instructional practices maintain academic rigor, while adequate scaffolding ensures that all students can access higher levels of instruction.

- Teachers and school leaders encourage all students to pursue rigorous

coursework. A school administrator noted, “We intentionally recruit average students, rather than high performers. This is part of our school’s mission. Our idea is that we take average students and teach them just above their comfort zone. We push them out of their comfort zone, but not to the point of frustration. Safety nets are in place, so that they can fail and still get back up and try again.” The math department at Turner Tech uses heterogeneous grouping practices, enrolling all students in the honors version of Algebra I and Geometry. In the past, the department offered separate honors and regular classes. Now, Algebra I and Geometry students choose to either complete honors-level projects and receive honors credit or complete the non-honors projects and receive credit for a regular course. In their CFGs, teachers discuss how to implement these differentiated instructional practices. According to a math teacher, all the teachers really like the heterogeneous groupings. “The higher achieving students motivate the lower achieving students to work harder” he said. “We’ll often encourage higher and lower achieving students to work together on in-class assignments and projects. This also helps the higher achieving students, because they learn a lot by re-teaching something to another student.”

- Teachers at Turner Tech encourage cooperative learning to meet the needs of English language learners. Turner Tech enrolls many “recently exited” students who used to be eligible for separate classes in their native language, but who now are being mainstreamed, even though many still struggle with their English skills. Math and science teachers reported that they often ask students to work in small groups, with native and non-native speakers in each group. A science teacher explained that he permits students with limited English proficiency to sit next to bilingual students. He allows these parties to converse in their native language during class, and even during tests. “In the past I never would have let students talk to each other during a test,” he said, “but I’ve discovered that it really helps English language learners understand the questions and understand what they need to accomplish.”

Theme 4
Monitoring: Compilation, Analysis, & Use of Data

District and school leaders develop and administer frequent benchmark tests and other assessments.

- Educators administer district-wide benchmark assessments four times a year in core content areas (one baseline pretest, followed by three tests during the year). The district tests struggling schools more frequently, either weekly or biweekly. All district assessments align with the state standards and the district’s pacing guides.
- School leaders encourage teachers to employ frequent formal and informal

assessments, in addition to district benchmarks and final exams. Math teachers at Turner Teach use common midterms and finals and assign the same major projects, so all teachers in the department understand how they are doing relative to one another. A school administrator noted that teachers sometimes struggle with administering frequent assessments. “Too many teachers think that assessing students means giving them a formal test” she explained. “I’m pushing teachers to see that assessments can take many forms, and don’t need to be lengthy. An assessment can involve asking one student to teach another student the concept they just learned, or write a quick paragraph.” A science teacher at Turner Tech reported that he uses a variety of assessments to monitor student progress. “In addition to quizzes and tests and presentations, I’ll have students complete practicums,” he said. “For example, if we are studying rocks, I’ll give an assessment where each student has to look at a collection of rock specimens and identify them.”

Teachers and school leaders use benchmark and state assessment results to identify significant learning gaps and develop plans for moving individual students toward mastery of academic objectives.

- School leaders at Turner Tech ensure that all teachers are well trained in the application and analysis of data. For example, the math department chair is an expert in EduSoft, the student data analysis software employed district-wide. He works closely with each of his math teachers, training them to use data. Teachers use software to analyze student performance on formative assessments. They can identify areas where students are weak and require additional remediation. “This school is really effective at gap-closing,” a school administrator observed. We have so many low-performing students that come to us in ninth grade, yet four years later most of these students are graduating. This happens through collaboration and collegial support, not through teachers turning students around single-handedly.”

- Teachers meet with the principal for regular “data chats.” In these meetings, they look at student-level data from benchmark assessments, identify trends, and discuss ways that they can close gaps in student knowledge and skill levels. Observed a school administrator, “Teaching has really evolved into moving students from where they are to where they need to be. The availability of data forces all teachers to pay attention to moving students, which is a real positive for everyone. Everyone is much more focused now.” A math teacher reported, “The district has good software to help them track student-level data over time, across schools. I can look at my students’ state assessment results in middle school, and know what to expect when they arrive in my class.”

School leaders and district administrators monitor instruction to ensure that teachers deliver rigorous academics and implement recommended

instructional practices.

- Curriculum directors and district instructional specialists frequently visit schools for monitoring. During these monthly visits, a district team observes classes and offers feedback about the degree to which teachers are implementing recommended instructional practices such as inquiry-based learning. Team members target their visits to schools that seem to be falling behind on their interim assessment results. These schools are struggling, but not yet "failing." After the visits, teams meet with school leaders, both for feedback about what teachers are doing well and to identify gaps in instruction. According to a Turner Tech administrator, "It's really valuable to get the input of an 'objective eye' from the district."
- The principal uses the formal process mandated by the district to evaluate teachers. She observes classroom instruction for at least 20 minutes, then examines folders of student work, instructional materials, and lesson plans. She always gives teachers some advance notice, though they do not know

Theme 5
Recognition, Intervention, & Adjustment

exactly what day they will be observed. New teachers are evaluated twice a year, and teachers who may be struggling are evaluated more often. "In observations, I really look at the teachers' questioning techniques, and examine whether they are pushing students to do more higher-level thinking," she explained.

Teachers and school administrators are quick to intervene with struggling students, providing tutoring, counseling, and other services to ensure that they do not drop out of school.

- District policies state that students who fail reading and math on state assessments must receive remediation. Turner Tech offers a variety of targeted interventions to help struggling students close gaps in their skills. Teachers volunteer to tutor before school, after school, and during lunch. More than 100 Turner Tech students attend "Saturday School" tutoring programs, for which the school provides transportation, on the weekend. The school established a computer lab with a many educational software programs, and the reading and math coach meet students there after school to offer extra help. During the school's daily 30-minute advisement period, teachers offer "training camps" in core subject areas. They pull high-performing students out of advisement and have them provide peer tutoring to struggling students.
- Turner Tech works closely with parents to keep struggling students from dropping out of school. Once a student is performing poorly in class or getting in trouble, school administrators contact the parents right away. The school employs a parent liaison who communicates with individual parents and even

makes home visits, if necessary. The school invites parents to meet with their children's teachers and guidance counselors to review strategies for improvement and get students the help they need with academic or emotional issues. Explained a guidance counselor, "Everyone—teachers, counselors and administrators—will continue to follow up on the student and the parents."

- To keep students engaged with their education, teachers and administrators at Turner Tech encourage them to develop specific career goals. Explained a guidance counselor, "If a student doesn't have a goal, their chances of dropping out are much higher. When I see [a student] who is struggling or might be thinking about leaving school, I immediately connect [him] with people on staff who can give [him] information about college and careers." Counselors encourage students to meet with Turner Tech's career specialist, who can have students take interest inventories and other career aptitude tests. This prompts students to think about the kinds of careers for which they might be suited. The career specialist talks to students about education and training requirements for particular careers, and even how much money they can expect to make in those fields. Noted the counselor, "I really want students to feel like they're choosing a particular career path or a future educational goal, not just fulfilling graduation requirements. For example, many students struggle with math, and hate that the school requires four years of math. However, I tell them that it is important that they get a good foundation in math in high school so that they can stay out of remedial classes in college and complete their major in four years."

Teachers and school administrators continually use student data and feedback from colleagues to evaluate and adjust instructional programs, practices, and arrangements.

- Teachers frequently use data to adjust instruction, reporting that student data from formative assessments and state tests help them to identify gaps in instruction. Explained a math teacher, "Sometimes I'll teach students a concept, and during class they will all seem to understand it. Then, later on, almost none of them demonstrate mastery of the concepts on their benchmark assessments. I'll look at my lesson plans and figure out a way to teach the concept differently, so that it aligns more with the way the subject is presented on the benchmarks and on the state assessments." Similarly, a science teacher reported that she writes her final exam at the beginning of the semester. "That's the vision or goal of where I want to get my students. I plan backwards from there. Then I track each individual student's performance on quizzes and assignments to make sure they're on track to meet the learning goals set out in the final exam. If I see that students are falling behind on particular objectives, I'll re-teach those objectives and keep tracking students until they show mastery."

- The entire staff at Turner Tech uses a continuous improvement model to

critically re-evaluate and assess their work throughout the year. Stakeholders do not wait until the end of the school year to develop plans for school improvement, but instead reflect on their practice constantly during CFG and other collaborative team meetings. Teams of teachers and administrators frequently look at student work to determine if instruction is effective. For example, during each meeting of the beginning teachers' CFG, one of the new teachers brings in a piece of student work and her lesson plan related to that assignment. She discusses what she taught, what she wanted students to accomplish in the assignment, and how she feels the lesson went. Everyone in the group analyzes and discusses the lesson plans and student work and gives her feedback about how she could have improved the lesson plan to bring the student work up to the desired level of quality. Reported a school leader, "These discussions of student work involve lots of drilling down to the question of 'What can I do to be better at what I do?' It's not about criticizing each other, but about every single staff member striving to see how they can improve, and how administrators can better support the work of teachers so that together we can increase student achievement."

Summary of Findings

Student Learning: Expectations & Goals

All schools in Miami-Dade teach a detailed, vertically aligned curriculum designed to help all students graduate with the knowledge and skills necessary for success in college and skilled careers. Curriculum documents add clarity to the district curriculum, helping teachers understand what is to be taught and learned in each grade and subject. At the school level, vertical teams of Turner Tech teachers regularly review district-developed pacing guides to ensure alignment across courses and grade levels. The school's curriculum integrates academic and technical learning, producing students who graduate with specific job skills and the capacity to complete advanced coursework in college.

Staff Selection, Leadership, & Capacity Building

District leaders recruit and develop effective, highly qualified teachers and school leaders, with staff selection aligned to school-specific academic goals. Teachers and administrators participate in ongoing, job-embedded professional development aligned with college and career readiness goals. New teachers receive ongoing mentorship from veteran teachers. All teachers, new and veteran, have access to extensive instructional support systems designed to support rigorous instruction in every classroom.

Instructional Tools: Programs & Strategies

All teachers at Turner Tech are skilled in the use of evidence-based instructional practices such as hands-on learning and literacy-based activities. Use of these practices is institutionalized across grades and subjects. Differentiated instructional practices maintain academic rigor while providing adequate scaffolding so that all students can access higher levels of instruction.

Monitoring, Compilation, Analysis, & Use of Data

Educators administer district- and school-developed assessments frequently. Teachers and school leaders use benchmark and state assessment results to identify significant learning gaps and develop plans for moving individual students towards mastery of academic objectives. School leaders and district administrators regularly monitor instruction to ensure that teachers deliver rigorous academics and implement recommended instructional practices.

Recognition, Intervention, & Adjustment

Teachers and school administrators are quick to intervene with struggling students, providing tutoring, counseling, and other services to ensure that students do not drop out of school. To keep students engaged in their education, teachers and administrators at Turner Tech encourage them to develop specific career goals. Teachers and school administrators use student data and feedback from colleagues to evaluate and adjust instructional programs, practices, and arrangements.

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