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Relevance Strategic Designs
TechBoston Academy



Case Studies of Leading Edge Small Urban High Schools

Education Resource Strategies

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Case Studies of Leading Edge Small Urban High Schools

This report is one of nine detailed case studies of small urban high schools. Each case study can be accessed individually or in one complete document at www.educationresourcestrategies.org.

Core Academic Strategic Designs

1. Academy of the Pacific Rim
2. Noble Street Charter High School
3. University Park Campus School

Relevance Strategic Designs

4. Boston Arts Academy
5. Life Academy of Health and Bioscience
6. Perspectives Charter School
7. TechBoston Academy
8. High Tech High School

Personalization Strategic Designs

9. MetWest High School

Also available on our Web site, www.educationresourcestrategies.org:

- Executive summary and full report: "Strategic Designs: Lessons from Leading Edge Small Urban High Schools"
- Detailed methodology
- Data request and interview protocol
- Introduction to the "Big 3" framework
- Comparative Leading Edge School data on diagnostic resource indicators (by school)

Thirty years ago, urban high school organization looked similar from one school to the next. Today, rising dropout rates and persistent achievement gaps have generated an urgency around redesigning the urban high school. Creating small high schools has become a central element of this redesign movement, with reformers envisioning improving instruction and, through the schools' "smallness," creating a supportive community of adult and student learners.

At Education Resource Strategies (ERS), in our work with school and district leaders, we have found that many school districts begin creating small high schools without a clear sense of how much they will spend or how to ensure that small schools organize in ways that will promote high performance. In response, the Bill & Melinda Gates Foundation supported ERS in a three-year effort aimed at building understanding and tools to support districts in creating cost-effective systems of high-performing urban high schools.

This report is one of nine detailed case studies of small urban high schools that served as the foundation for our report "Strategic Designs: Lessons from Leading Edge Small Urban High Schools" (available at www.educationresourcestrategies.org). We dubbed these nine schools "Leading Edge Schools" because they stand apart from other high schools across the country in designing new ways to "do school" while outperforming most high schools in their local districts.

We found that Leading Edge Schools deliberately create high-performing organizational structures, or Strategic Designs, that deliberately organize people, time, and money to advance their specific instructional models — the set of decisions the schools make about how they organize and deliver instruction. They create these Strategic Designs through four interconnected practices:

1. Clearly defining an instructional model that reflects the schools' vision, learning goals, and student population.
2. Organizing people, time, and money to support this instructional model by (a) investing in teaching quality, (b) using student time strategically, and (c) creating individual attention for students.
3. Making trade-offs to invest in the most important priorities when faced with limits on the amount, type, and use of people, time, and money.
4. Adapting their strategies in response to lessons learned and changing student needs and conditions.

Reviewing the case studies, readers will find that teacher characteristics, staffing patterns, schedules, and budgets look very different across the nine schools. Their instructional models reflect three broad approaches to teaching and learning:

1. **Core academics:** a rigorous core academic college-preparatory program for all students;
2. **Relevance:** a curriculum that is relevant to student interests and/or the world in which they live; and
3. **Personalization:** personal relationships between adults and students are fostered to ensure all students are known well by at least one adult.

All Leading Edge Schools incorporate some aspects of each approach, while tending to emphasize one over the others.

We also found that although no school organizes resources exactly the same, high-performing schools organize people, time, and money to implement three high-performance resources strategies. They:

1. Invest to continuously improve **teaching quality** through hiring, professional development, job structure, and collaborative planning time.
2. Use **student time** strategically, linking it to student learning needs.
3. Create **individual attention** and personal learning environments.

Using these strategies as our framework, we assessed case study school practices and quantified their resource use. We did this by creating a set of *diagnostic indicators* that describe how schools best use their resources for improving student performance. They are used throughout the case studies to illustrate resource use.

A detailed methodology, an in-depth introduction to the “Big 3” framework, and a full list of the diagnostic indicators can be found at www.educationresourcestrategies.org.

Education Resource Strategies hopes that these case studies will serve multiple purposes: to generate ideas about implementing strategies in schools; to help develop new small schools and reform existing schools; and to engage colleagues, principals, and teachers in conversations about what is possible in their districts. By detailing how these nine Leading Edge Schools organize their resources — people, time, and money — to improve student achievement, it is our hope that readers will be able to apply the findings to their own context and contribute to changing the national conversation around resource use from “how much” to “how well.”

Relevance Strategic Designs

7. TechBoston Academy

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Located in Boston, TechBoston Academy, a grade nine through 12 high school in Boston Public Schools, integrates technology throughout a college-preparatory curriculum to prepare students for college and technology-related careers, such as computer science and engineering.

TechBoston's mission

TechBoston Academy's essential belief is that every student can learn and develop into a responsible citizen by providing an environment that is both nurturing and challenging. TechBoston offers a college-preparatory curriculum, which includes interdisciplinary project-based learning where technology is the bridge that connects the student to their learning experiences.

www.techbostonacademy.org

TechBoston opened in 2001 with 75 ninth graders, and it now serves 340 students, all of whom are selected randomly by lottery from a pool of applicants.¹ TechBoston shares space in the Dorchester Education Complex with two other small schools. TechBoston was created from scratch, and the other two schools were reconstituted from a comprehensive high school known as Dorchester High. As a "pilot" school within the Boston school system, TechBoston has flexibility over staffing, budget, curriculum, calendar, and governance, unlike traditional Boston high schools.

Personalization

TechBoston's bedrock principle is that every student can learn when supported by a nurturing and challenging environment. To achieve this end, TechBoston promotes personal connections among students, teachers, and administrators. Everyone abides by the school motto: "We rise and fall together."

"Everything we do here is about relationships," says Principal Mary Skipper. "We demand a lot from each other and hold each other accountable." The school's small class size average of 19 students helps further the personal connections between staff and students. In addition, TechBoston leaders draw on multiple data sources to individualize student schedules to best meet student needs. At TechBoston, the focus is on prevention, not remediation. Students at TechBoston devote a significant amount of time during their school day to academic support activities, such as Project Room, in which they receive additional help from classroom teachers.

TechBoston invests heavily in high-quality teaching to relentlessly support student success. Most of TechBoston's teachers (86 percent) have master's degrees, and all are willing to be flexible and work in TechBoston's culture of high expectations. More than one-third of the school's teachers have three or fewer years' teaching experience. To support new teachers, TechBoston has a two-day orientation before the school year starts, and the school provides a mentor for each teacher. All teachers participate in 149 hours of professional development each year in addition to 180 minutes per week of collaborative planning time in teams.

Technology and rigor

TechBoston is unique among Boston Public Schools in its extensive use of technology as a tool for learning and how it integrates technology into every aspect of its project-based, college-preparatory curriculum. Every facet of a student's school day involves technology. All TechBoston students have laptops they use for their coursework and homework, which include creating PowerPoint presentations, constructing Web sites, and more.

TechBoston's graduation requirements are more rigorous than most Boston public schools. TechBoston students take four years of science, math, English, and technology (including Web and information technology, digital art, and media seminars), three years of history, and two years of a foreign language. In addition to coursework, students must complete community service and internships at local companies to graduate. This experience allows them to develop and hone business and social skills. TechBoston students also work on individual and group projects with high-tech mentors from the Boston area, and they take classes at a local college.

TechBoston believes this combination of a rigorous curriculum, work in the community, and a focus on relationships gives its students the academic, technological, and social skills they need to be successful in college and beyond.

Student demographics

Students interested in attending TechBoston apply and are randomly assigned via the Boston Public Schools lottery system. TechBoston only accepts students in the ninth grade at the beginning of the year and therefore does not face the same challenges as most district schools that add new students throughout the school year. TechBoston's students resemble the Boston Public Schools system's overall student population, as shown in Figure 7.1.²

FIGURE 7.1

Student demographics: TechBoston and Boston Public Schools district average, SY2004–05

	TechBoston	Boston Public Schools district average
Race/ethnicity		
African American	52%	46%
Hispanic	30%	31%
Caucasian	11%	14%
Asian	6%	9%
Other	1%	1%
Socioeconomic status		
Free and reduced-price lunch	69%	71%
Program		
Special education		
Resource	8%	10%
Self-contained	4%	9%
English language learners	3%	17%

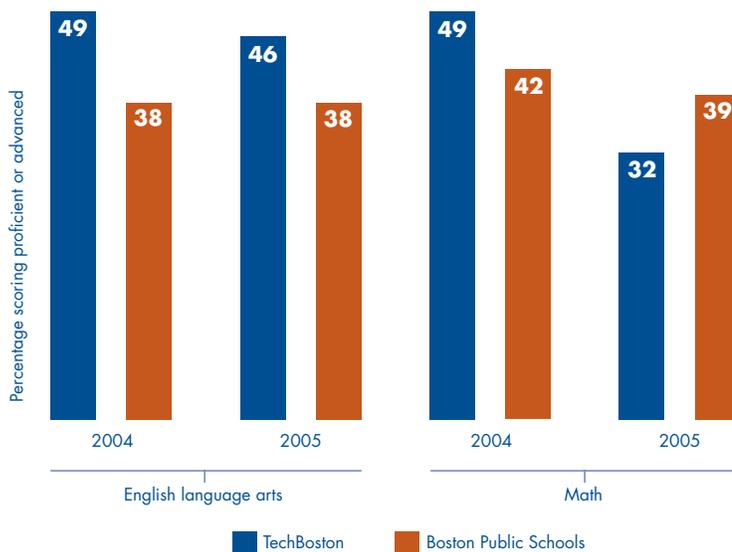
Source: Boston Public Schools, <http://boston.k12.ma.us/schools>, and Massachusetts Department of Education, <http://profiles.doe.mass.edu/>; percentages are rounded to the nearest whole number.

Student performance

TechBoston compares favorably to Boston public high school students overall on the Massachusetts Comprehensive Assessment System (MCAS), a criterion-based test that all public school students must pass to receive a high school diploma. As shown in Figure 7.2, TechBoston students outperformed 10th grade students in Boston Public Schools in English language arts and were about the same in math. Notably, the Boston Public Schools data include students at district exam schools for which students are selected based on their achievement. In 2005, 46 percent of TechBoston students received a score of proficient or advanced on the English language arts MCAS, and 32 percent of TechBoston students received a score of proficient or advanced on the math MCAS.

FIGURE 7.2

Percentage of students scoring proficient or advanced on MCAS: TechBoston and Boston Public Schools, 2004 and 2005



Source: Massachusetts Department of Education, <http://profiles.doe.mass.edu/>. Boston Public Schools data include all 10th graders who took the MCAS.

On other dimensions of performance, such as attendance and college-going rates, TechBoston exceeds the Boston Public Schools district average (see Figure 7.3).

FIGURE 7.3

Other indicators of student performance, SY2004–05

	TechBoston	Boston Public Schools district average
Attendance rate	95%	92% ⁱ
Promotion rate	91%	93%
Out-of-school suspensions	0%	8%
Dropout rate	10%	8%
College-going rate ⁱⁱ	77%	55%

Source: Boston Public Schools, <http://boston.k12.ma.us/schools>, and Massachusetts Department of Education, <http://profiles.doe.mass.edu/>; percentages are rounded to the nearest whole number.

ⁱ. Comparison may be slightly inflated, as district average includes elementary, middle, and high school attendance rates.

ⁱⁱ. Includes two- and four-year private and public colleges. TechBoston college-going data are for SY2005–06, the first year the school had a graduating class.

Per-pupil spending

As a pilot school, TechBoston receives a lump-sum per-pupil budget from Boston Public Schools over which the principal has discretion. The school can choose to purchase certain identified services from the district or receive the dollar equivalent and purchase those services from other vendors. TechBoston raises 5 percent of its total operating budget from external funds and also generates partnerships to further support its mission and provide additional learning opportunities for students. Says Principal Mary Skipper: “I don’t need a lot of money. The freedom I have to direct money where it’s needed is what schools need more than more money I like the fact that I can plan based on what I need rather than what someone downtown thinks I need.”

FIGURE 7.4

Per-pupil operating expenditures, SY2004–05

	TechBoston	Boston Public Schools comparison schoolⁱ
Total fully allocated operating budget ⁱⁱ	\$2,825,871	\$14,022,980
General education per pupil (unweighted, fully allocated, including private, no geographic adjuster)	\$11,149	\$8,169
Percentage above that is privately funded	5%	N/A ⁱⁱⁱ
Percentage spent on instruction	50%	48%
Student-Teacher ratio	13:1	18:1
Percentage spent on leadership ^{iv}	14%	8%
Percentage spent on pupil services ^v	8%	10%

Note: TechBoston’s per-pupil numbers have been adjusted to reflect full enrollment numbers in SY2004–05.

^{i.} Comparison schools are the highest-performing, nonexam schools in the district that were selected to provide a comparison to the Leading Edge Schools’ per-pupil cost.³

^{ii.} Fully allocated operating budget includes the costs of running a school on a daily basis.⁴

^{iii.} Data on private funding were not collected for the comparison schools.

^{iv.} Leadership coding includes all functions associated with governance, school administration, secretaries and clerks supporting school leaders, and accountability (research, evaluation and assessment, community relations, attendance tracking, student assignment, etc.).

^{v.} Pupil services coding includes all functions associated with noninstructional programs.⁵

As noted in Figure 7.4, TechBoston’s general education per-pupil spending is \$11,149, compared with \$8,169 for the district comparison school. With private funds, TechBoston spends about \$3,000 more per pupil than the highest-performing nonexam comprehensive high schools in Boston. This difference may be slightly inflated as data on private funding were not collected for the comparison school.

Much of the difference is due to higher leadership costs. TechBoston invests 14 percent of its operating budget on leadership — 6 percent more than the district comparison school. The four leadership positions at TechBoston include the headmaster (CEO), the chief academic officer, the supervisor of support and enrichment, and the supervisor of technology and professional development. These positions are all related to the school goals of nurturing a professional learning community.

Flexibility dimensions⁶

As noted previously, TechBoston’s pilot status gives the school flexibility over staffing, budget, curriculum, calendar, and governance, unlike traditional Boston high schools (see Figure 7.5). For example, TechBoston uses its autonomy as a pilot school to hire staff that aligns with its philosophy, collaborative culture, and needs.⁷ School leaders can control the length of the school day, class size, and staff composition as long as it complies with all special education requirements. TechBoston does not control salary — it pays on the union salary schedule — but it does have autonomy over its budget — particularly over staffing composition, with the ability to carry over external funds.

FIGURE 7.5

Flexibility dimensions

Flexibility dimension	TechBoston
Hiring and firing	Yes (except when there are layoffs in the district)
Teacher time	Yes (some limitations as of 2007–08)
Class size	Yes
Student time	Yes
Staffing composition	Yes (within special education requirements)
Salary	No (must pay at least union salary schedule)
Option to opt out of district services	Yes
Discretion over nonsalary budget	Yes

Resource strategies

TechBoston strategically uses resources across several indicators to support student success. The following sections highlight TechBoston's practices around three resource strategies of high-performing high schools: the school's investment in teaching quality, its strategic use of student time, and the provision of individual attention to students.⁸

TechBoston resource strategy highlights

- 1. Invest to continuously improve teaching quality through hiring, professional development, job structure, and collaborative planning time*
 - Multistep hiring process focused on teachers who are collegial and comfortable with technology
 - Significant investment in professional development time and collaborative planning time, totaling 257 yearly hours (approximately 40 days)
 - Mentoring program for new teachers
- 2. Use student time strategically, linking it to student learning needs*
 - Significant investment in academic support and enrichment
 - Individualized student schedules based on needs
 - Strong partnerships with business and higher education to provide technology, internships, and college-level coursework for students
- 3. Create individual attention and personal learning environments*
 - Use of ongoing assessments to focus on prevention before remediation
 - Personal relationships through small class sizes and low teacher loads
 - Other structures including looping (grades nine through 10), part-time counselors, morning greeting, and so on

■ Resource strategy 1

Invest to continuously improve teaching quality through hiring, professional development, job structure, and collaborative planning time

- *Multistep hiring process focused on teachers who are collegial and comfortable with technology*
- *Significant investment in professional development time and collaborative planning time, totaling 257 yearly hours (approximately 40 days)*
- *Mentoring program for new teachers*

Multistep hiring process focused on teachers who are collegial and comfortable with technology

As a pilot school, TechBoston is able to hire staff that aligns with its philosophy and needs. Most of its teachers have master's degrees (86 percent), and all are willing to work in TechBoston's culture of high expectations and collaboration. TechBoston also looks for teachers who are comfortable with technology and who either bring technology expertise or are willing to learn.

TechBoston's hiring process is critical to supporting the school's program because all staff members are required to play multiple roles: experts in their content area, knowledgeable with technology, providers of student support, and members of a professional learning community. As part of the interview process, prospective faculty members teach classes at TechBoston and meet the students. "We look at the hiring process like [New England Patriots coach] Bill Belichick," says a content-area lead teacher. "You hire people who can fill multiple positions. It is important for teachers to have multiple certifications because it enables us to meet students' needs more flexibly."

Another teacher notes, "People who gravitate to working here like to be collaborative and work as team members. It takes a lot of energy to work here because we all wear about 100 hats. That is not a piece of the puzzle that is obvious to people who have not worked in a small-school environment." All staff members take responsibility for Project Room, a period in which teachers provide academic support. Teachers have Project Room two to three times per week in lieu of a "duty period." This means that teachers spend a relatively large percentage (63 percent) of their time on instruction (including 15 percent on academic support and enrichment, primarily through Project Room) and a relatively small percentage (18 percent) of their time on administration and preparation, as compared with the other schools in this study.

Ten percent of staff members at TechBoston serve administrative and leadership roles as well as other functions. For example, the administrator responsible for technology integration and professional development also teaches an English course, and the dean of students teaches Project Room and freshman seminar in addition to providing student support. Additionally, 15 percent of staff members at TechBoston serve an instructional leadership role as teacher leaders, taking on responsibilities for internal professional development, integrating technology into the curriculum, and supporting other staff.

TechBoston also uses other nonstaff adults to support students. In SY2004–05, there were four full-time interns, a math coach, and volunteer tutors from local universities. TechBoston also uses part-time teachers to provide coverage, giving core academic teachers two periods per day to devote to collaborative planning time.

Significant investment in professional development time and collaborative planning time, totaling 257 yearly hours (approximately 40 days)

TechBoston invests significant resources in a variety of professional development experiences for teachers:

- Formal time for the full staff built into the weekly schedule for professional development and collaborative planning time;
- Informal professional development time during which teachers work together; and
- Individual professional development in which teachers can pursue professional development opportunities to support their own professional development plans and bring the lessons they learn back to the full staff.

According to the principal, 75 percent of the school’s professional development takes place in house by teacher leaders. Says one teacher leader, “We have tons of [professional development]. Professional development is a theme of the school.”

Formal professional development time

In addition to five days in the summer, TechBoston staff spends approximately 150 hours on professional development per year, five times more than the 30 hours required by the Boston Teachers Union contract.⁹ This additional professional development represents a significant investment of time and money. TechBoston devotes \$13,154 per teacher to professional development each year (about half of that goes to teacher time). TechBoston has built professional development time into the teacher schedule by providing students with early dismissal (11:30 a.m. or 2:30 p.m.) on alternating Wednesdays. On 11:30 a.m. dismissal days, teachers have three hours of professional development, and on 2:30 p.m. dismissal days, they have faculty meetings and other forums for two hours.

The principal collaborates with two department heads/professional development coordinators to coordinate these after-school professional development sessions. “This is a school where we put everything out on the table and discuss it and work together to figure it out,” says Principal Skipper. “Leaders do not make decisions in isolation; the door is always open.” The biweekly faculty meeting (every other Wednesday afternoon) is one structure that enables the faculty to decide together issues of teaching and learning.

Informal professional development time

In addition to the biweekly schoolwide meeting, TechBoston teachers have an average of 180 minutes of collaborative planning time each week (108 hours yearly) that, according to the teachers, is “sacred” time. In fact, a minimum amount of collaborative planning time is guaranteed in the work election agreement all teachers sign before starting work at TechBoston. The agreement states that teachers will be given a *minimum* of 240 minutes of personal planning time each week and an additional 120 minutes of team, collaborative planning time per week.

According to teachers, the personal planning time is rarely used for individual planning because they frequently meet with students or colleagues or do other activities. This appears to be a challenge for the teachers. One teacher says, “I end up doing a lot of work at night and on the weekends. This is where the burnout happens ... I can’t imagine going full steam like this for more than five years.” According to teachers, they worry about turnover in future years and the effect that may have on the school.

TechBoston is strategic about giving ninth grade teachers more collaborative planning time to support those students in the critical transitional year. Ninth grade teachers have collaborative planning time first period every day for 45 minutes to discuss teaching and learning, curriculum planning, and student support. In the upper grades, teachers typically have collaborative planning time three days per week for one hour. Of those three days, one is devoted to student support and the other two are used to focus on curriculum, student work, and teaching and learning.

Additionally, each department head leads one monthly, hourlong collaborative planning time session. This meeting is focused on content-area issues and curriculum planning, and it takes place in addition to the collaborative planning time built into the school day and the regular Wednesday after-school professional development time discussed earlier. Teachers also frequently meet informally. Most teachers eat lunch together in a classroom, and the conversation tends to be about instruction and student needs.

Individual professional development time

All staff members at TechBoston have individual professional development plans that are linked to their evaluations. These plans are highly individualized and based on academic content and technology standards. “Teachers are responsible for taking on the training, and the school is amazingly responsive to helping teachers,” says one teacher. “Teachers here need to buy into the idea of professional development because it’s part of the school culture.”

Principal Mary Skipper emphasizes the internal accountability and support for ongoing professional development: “Evaluation here is used as a tool and a process to help all teachers improve ... For teachers who aren’t successful, it becomes everyone’s responsibility, not just the principal’s.”

Mentoring program for new teachers

With more than one-third of staff members in their first three years of teaching, the school’s veteran teachers are constantly in mentoring mode. All teachers who are either new to the profession or new to the building are assigned a teacher mentor for the year. Each mentor has one mentee and does not receive a stipend for this additional work. The mentors have found that the young teachers seek support on both classroom management and content-area issues. TechBoston also offers a two-day orientation for new teachers before the school year begins in addition to the professional development and collaborative planning time scheduled throughout the year.

■ Resource strategy 2

Use student time strategically, linking it to student learning needs

- *Significant investment in academic support and enrichment*
- *Individualized student schedules based on needs*
- *Strong partnerships with business and higher education to provide technology, internships, and college-level coursework for students*

Significant investment in academic support and enrichment

Pilot schools have the autonomy to determine the schedules and calendars that best meet the needs of their students. TechBoston lengthened its day, giving students an average of seven and a half hours of school each day versus six hours in traditional Boston public schools. This translates to 1,304 total yearly student hours at TechBoston, compared with 1,146 hours at other Boston public schools — giving TechBoston students an additional 26 days in school per year compared to district high school students.

A closer examination of how this extra time is used shows that although the amount of time spent on core academics at TechBoston is similar to other Boston public schools, the amount of time focused on support and enrichment activities is very different. TechBoston builds a significant amount of additional time into the student day for support and enrichment activities such as tutoring, Project Room, learning center, MCAS support, and seminar classes. Together, these activities give students an average of 255 hours per year for academic support and enrichment, with more in ninth and 10th grades and less in the upper grades.

Individualized student schedules based on needs

TechBoston created a Project Room period to provide extra support to students within the regular school day. Project Room is a flexible period that allows teachers to work with students who need extra support in given areas. During this time, teachers either work with small groups or support individual students. Project Room provides students access to technology and additional time to complete their work, things they may not have at home. The amount of time any student spends in Project Room varies by student need, but on average, students at TechBoston have Project Room once a day for 45 minutes. Ninth graders attend Project Room every day, whereas upper classmen may attend Project Room only twice a week (see Appendix 7.2 for a sample schedule).

TechBoston crafts each student's schedule based on multiple data about each student's needs. For example, if a student is identified through his or her MCAS profile as needing math enrichment, English language arts enrichment, or tutoring, the student is placed in a small, targeted class and/or an extra Project Room. TechBoston assesses students at various points in the year

to identify strengths and weaknesses and provide extra support. Some courses also are available as honors courses. The trade-off associated with personalized schedules is that teachers have to be flexible as students move in and out of their classrooms and as Project Rooms fluctuate.

Although the general school day runs between 8 a.m. and 3 p.m., different students actually leave at different times, depending on their needs. For example, on Mondays, Tuesdays, and Thursdays, ninth and 10th grade students are required to stay until 4 p.m. for an extended period of MCAS preparation and tutoring. Students in the upper grades *earn* the right to leave at 3 p.m., but those students who are struggling academically and/or are not completing their homework are required to stay until 4 p.m. In their contract with the school, teachers commit to being in school between the hours of 8:15 a.m. and 4:30 p.m., Monday through Thursday, and 8:15 a.m. and 3:30 p.m. on Friday.

Strong partnerships with business and higher education to provide technology, internships, and college-level coursework for students

To extend the opportunities available to students, TechBoston has built partnerships with the Gates Foundation, Boston Foundation, Digital Bride Foundation, Intel, Dell, General Dynamics, Microsoft, Cisco, IBM, Toshiba, Lexmark, Infocus, HP, MIT, Harvard, and University of Massachusetts, Boston. “The easiest thing to do is raise money. The problem is, every time you accept money ... you have accountability to something, and it may take you away from your mission,” says Principal Skipper.

To maintain a strong focus on the mission and enhance existing work, the principal develops partnerships. For example, a law firm is donating its time to help the school establish a 501(c)(3). A local foundation is helping set up a scholarship program for college-bound TechBoston students based on a generous surprise \$250,000 donation from a retired district employee. TechBoston also has enlisted the help of a volunteer who comes in three days a week to advise students on college. Throughout all grade levels at TechBoston, students receive information about college, and in the 11th grade, students visit colleges.

In anticipation of graduating its first class of seniors in 2005–06, the school developed a partnership with the University of Massachusetts to prepare seniors for college. The principal describes the partnership as successful in two ways: (1) “It demystified what college was all about and gave students the confidence that they could do college-level work and be successful,” and (2) TechBoston gave students support on social and emotional issues as they began to transition from high school to college.

School leaders are continuing to look at how they can use resources from local universities and other venues (University of Massachusetts, Suffolk University, Harvard University Extension, virtual courses, and AP courses) to provide different opportunities for students based on their needs and goals. Currently, about half of the 12th grade students (30) are taking classes at the University of Massachusetts, Boston, at no cost and getting dual credit for their coursework.

■ Resource strategy 3

Create individual attention and personal learning environments

- *Use of ongoing assessments to focus on prevention before remediation*
- *Personal relationships through small class sizes and low teacher loads*
- *Other structures including looping (grades nine through 10), part-time counselors, morning greeting, and so on*

Use of ongoing assessments to focus on prevention before remediation

TechBoston uses formative assessments to focus on prevention before remediation, and it has systems in place for tracking and reviewing individual student progress. The principal and student support coordinator examine entering students' records for test data, attendance patterns, and behavior patterns. TechBoston also administers its own benchmark assessments in the ninth grade to collect baseline data and track students' progress over time. Student assessments at TechBoston include Stanford Diagnostic Reading Test (SDRT), Progress Toward Standards (PTS), MCAS, formative assessments, and benchmarks from Boston Public Schools.

The PTS benchmark exams are given in September and June of ninth grade and provide teachers with a snapshot assessment of students' strengths and weaknesses in math and English. In the early weeks of the school year, ninth grade teachers meet for up to three hours weekly to discuss students who are struggling or who might seek more challenging class placement. Administrators and student support providers share information and develop action plans for each individual student. The PTS exam informs student placement in 10th grade and summer school, and it identifies improvements in student performance. TechBoston maintains this focus on tracking student progress across all grades, with teachers meeting to examine the data and discuss them in student support meetings. Grade-level teams meet each quarter, and teachers discuss each student to determine interventions and design support.

Teachers also do an extensive item analysis of MCAS to look for patterns across student groups and identify specific needs of individual students. Students who do not pass the exam the first time they take it in 10th grade receive targeted assistance based on their individual strengths and needs.

Personal relationships through small class sizes and low teacher loads

TechBoston strives to personalize teaching and learning for all students. One way it achieves this goal is by lowering teacher loads and class sizes, especially in core academic classes. The class size averages are fairly consistent across subject areas and grade levels (average 19), but teacher load is a little smaller in English language arts (69) and math (58) than in the other

TechBoston: Mission for school climate and safety

Effective educators know that relationships in the school, and in the classroom, have a profound effect on learning. TechBoston's aspiration is to cultivate an environment that incorporates positive classroom management, rewarding relationships, personal responsibility and internal motivation, collaboration, a safe learning community, respect for diversity, and conflict resolution skills. It is the expectation that the school climate will allow for a supportive environment, which is one of high academic challenge, lofty personal expectation, and mutual respect. By fostering such an environment, the school will best promote the greatest academic and personal growth of the students.

TechBoston handbook

core and noncore subjects. The average teacher load in core subjects is 75, while the average overall teacher load is 87. This is a deliberate strategy based on student need.

TechBoston makes a concerted effort to nurture personal relationships with its ninth graders to help them transition into high school and be successful learners and community members. For example, once students are admitted via the district lottery, TechBoston hosts an open house for incoming ninth graders as well as an orientation in August when students come to the school, meet their teachers and classmates, and get oriented to the building. Ninth graders have a mandatory longer day, their teachers receive daily collaborative planning time, and based on student records (mobility, achievement), some ninth graders are automatically assigned to extra tutoring periods during the school day.

Other structures including looping (grades nine through 10), part-time counselors, morning greeting, and so on

TechBoston does not use the traditional advisory structure to foster relationships between adults and students. Instead, it relies on small class sizes and other structures and means, including

culture and climate. It creates ongoing relationships between students and teachers by looping grades nine and 10 so that students have about 75 percent of the same teachers from one year to the next.

TechBoston's small size also lends itself to creating strong student-staff relationships. This level of personalization is deliberate and palpable. Students are greeted by two administrators each morning as they enter the school building, and although there is no formal advisory period, advising and student support happens all day, from 8 a.m. to 4:30 p.m. "It happens from the moment kids are greeted at the door, to when they are working with a teacher in Project Room, to being in class," says the school's dean of students. "Our students are [happy], they respect being here, they feel cared for, and they like being in school."

In addition to support provided by teachers and administrators, there are five part-time counselors who work with approximately 25 students in the school, based on a referral process. The counselors meet with students once a week for 45 minutes. Student discipline (or student support, as it is referred to at TechBoston) is seen as the goal of everyone. According to a school administrator, "It is all about the little things that you don't see in a handbook It is all about culture and relationships."

NOTES

- ¹ When this case study began during SY2004–05, TechBoston was in its third year with grades nine through 11. In SY2005–06, it grew to grades nine through 12 and 340 students.
- ² Though TechBoston has a lower percentage of English language learners than the district overall, in SY2006–07, 35 percent of TechBoston’s student population had a first language other than English, similar to the district percentage of 39 percent. Similarly, in SY2006–07, TechBoston’s population of students with disabilities was close to the district percentage (17 percent for TechBoston; 20 percent for the district).
- ³ In Boston, our partnership with the district allowed joint identification of the comparison school and access to the detailed coded budgets. Boston Public Schools comparison school demographics: 1,286 students; 47 percent African American; 6 percent Asian; 6 percent Caucasian; 40 percent Hispanic; 81 percent free or reduced-price lunch; 19 percent students with disabilities; 12 percent English language learners (www.mass.doe.edu).
- ⁴ These costs include provision and support of the academic program; administration and support services; provision and maintenance of the physical plant; and auxiliary services such as food, transportation, and security. For district schools, some of these costs are administered at the district central office level. If a charter school has a charter management organization (CMO), some of these costs are administered at the CMO level.
- ⁵ These include social and emotional needs (social workers, character education, mentoring, parent programs, etc.), physical health (itinerant therapists, nurses, etc.), students with disabilities and English language learner evaluation/diagnostics, career/academic counseling, and other noninstructional programs (athletics, truancy, etc.).
- ⁶ Flexibility dimensions are a school’s ability to use its resources — people, time, and money — as it chooses. Schools can be limited by legal or administrative constraints, such as federal or state laws, union contracts, or district policies. The degree of school flexibility depends on both how much it has and whether the school can use the resource as it chooses.
- ⁷ Per agreement with the Boston Teachers Union, the only time pilot school autonomy in hiring is overridden is when there are layoffs within the district, forcing all schools to accept “permanent” (tenured) Boston Public Schools teachers who have been “bumped” from their previous jobs.
- ⁸ This framework for analysis, the “Big 3” resource strategies of high-performing schools, is more fully described in Appendix 7.1.
- ⁹ The 2003–06 Boston Teachers Union contract specifies 30 hours per year in professional development. Although the contract specifies that high school teachers will have administrative periods, the contract does not require these periods to be used for collaborative planning time.

APPENDIX 7.1

Resource strategies

Resource principles	What we see in the school	Diagnostic indicators
Invest in teaching quality		
Hire and organize staff to fit school needs in terms of expertise, philosophy, and schedule	<ul style="list-style-type: none"> • Multiple in-person interviews, including with students • Applicants teach classes • Focus on flexibility and collegiality, as well as technology expertise 	<ul style="list-style-type: none"> • Use of a rigorous, strategic hiring process • 38% of core academic teachers with three or fewer years' experience • 20% of core teachers teaching more than one subject • Leverage outside experts for noncore courses
Integrate significant resources for well-designed professional development that provides expert support to implement the schools' instructional models	<ul style="list-style-type: none"> • Five full days devoted to professional development in the summer • Weekly collaborative planning time and professional development time • Focus of professional development: curriculum planning, student support, technology skills, and integration 	<ul style="list-style-type: none"> • \$6,940 per teacher on professional development (not including teacher time) • 15% staff with instructional leadership roles
Design teacher teams and schedules to include blocks of collaborative planning time effectively used to improve classroom practice	<ul style="list-style-type: none"> • Teachers meet in grade-level teams each week and content teams at least once a month 	<ul style="list-style-type: none"> • 17% of teacher year in professional development (with collaborative planning time) • 257 total yearly teacher professional development hours (with collaborative planning time) • 180 minutes collaborative planning time per week • 22% professional development in content-based teams
Enact systems that promote individual teacher growth through induction, leadership opportunities, professional development planning, evaluation, and compensation	<ul style="list-style-type: none"> • Orientation and individual mentor for new teachers • Individual professional development plans linked to evaluation 	<ul style="list-style-type: none"> • Ratio of teachers to school-based evaluators is 8:1 • Regular review of teacher performance and growth • 0% of teacher compensation for leadership roles

(continued)

(continued)

Resource principles	What we see in the school	Diagnostic indicators
Use student time strategically		
Purposefully align the schools' schedules with their instructional models and student needs	<ul style="list-style-type: none"> Schedule provides noncore technology courses and integrates technology theme throughout all courses 	<ul style="list-style-type: none"> School schedules reflect instructional model and academic needs of students 90 total yearly hours in noncore academics 7% of student year in noncore academics 7% in theme-based courses
Maximize time on academic subjects, including longer blocks of uninterrupted time	<ul style="list-style-type: none"> Student schedules individualized based on academic needs 	<ul style="list-style-type: none"> 1,304 yearly student hours 771 average yearly hours in core academics 735 yearly hours in ninth grade core academics 59% of student year in core academics 3,084 total core academic hours over four years
Vary individual student time when necessary to ensure all students meet rigorous standards	<ul style="list-style-type: none"> Schedule includes 60–65-minute periods for core academic subjects and 45-minute periods for Project Room and noncore classes 	<ul style="list-style-type: none"> 20% student time in academic support 255 yearly hours spent in academic support Ratio of time in ninth grade math to average time in math: 1.0 Ratio of time in ninth grade English language arts to average time in English language arts: 0.99
Create individual attention		
Assess student learning on an ongoing basis and adjust instruction and support accordingly	<ul style="list-style-type: none"> Regular review and discussion of student progress, particularly in ninth grade 	<ul style="list-style-type: none"> Use formative assessments systematically to guide instruction throughout year
Create smaller group sizes and reduced teacher loads for targeted purposes	<ul style="list-style-type: none"> Small class sizes and teacher loads in core classes Very small classes in targeted math, reading, and writing support classes 	<ul style="list-style-type: none"> Average class size overall: 19 Average class size core: 19 Average class size English language arts: 19 Average class size math: 19 Average teacher load overall: 87 Average teacher load core: 75 Average teacher load English language arts: 69 Average teacher load math: 58
Organize structures that foster personal relationships between students and teachers	<ul style="list-style-type: none"> Looping grades nine and 10 No formal advisory structure 	<ul style="list-style-type: none"> Student to core academic teacher ratio is 15:1 0 total yearly teacher hours spent in social and emotional support 227 students in grades 9–11 Looping practices around strategically grouped students in core academic classes

APPENDIX 7.2

TechBoston grade nine sample student schedule

	Monday	Tuesday	Wednesday	Thursday	Friday
8:15–8:30	Homeroom	Homeroom	Homeroom	Homeroom	Homeroom
8:30–9:15	Digital Art	IT Essentials	Freshman Seminar	Learning Center	Web Development
9:15–10:15	World History	Physics	English Language Arts	Algebra	World History
10:15–11:15	Algebra	World History	Physics	English Language Arts	Algebra
11:15–12:00	Project Room ⁱ	Project Room	Project Room	Project Room	Project Room
12:55–2:00	English Language Arts	Algebra	World History	Physics	English Language Arts
2:00–3:00	Physics	English Language Arts	Algebra	World History	Physics
3:00–4:00	Support and enrichment ⁱⁱ	Support and enrichment		Support and enrichment	

ⁱ. Project Room is an academic support period when teachers work with individuals or small groups.

ⁱⁱ. MCAS preparation and tutoring is required for all ninth and 10th graders (and struggling 11th and 12th graders).

APPENDIX 7.3

TechBoston graduation requirements

Subject	Course	Number of years
English	English 9	1
	English 10	1
	English 11	1
	English 12	1
History	U.S. History I	1
	U.S. History II	1
	World History	1
	Social studies elective	1
Math	Algebra I	1
	Geometry	1
	Algebra II/Trigonometry	1
	Precalculus/Calculus	1

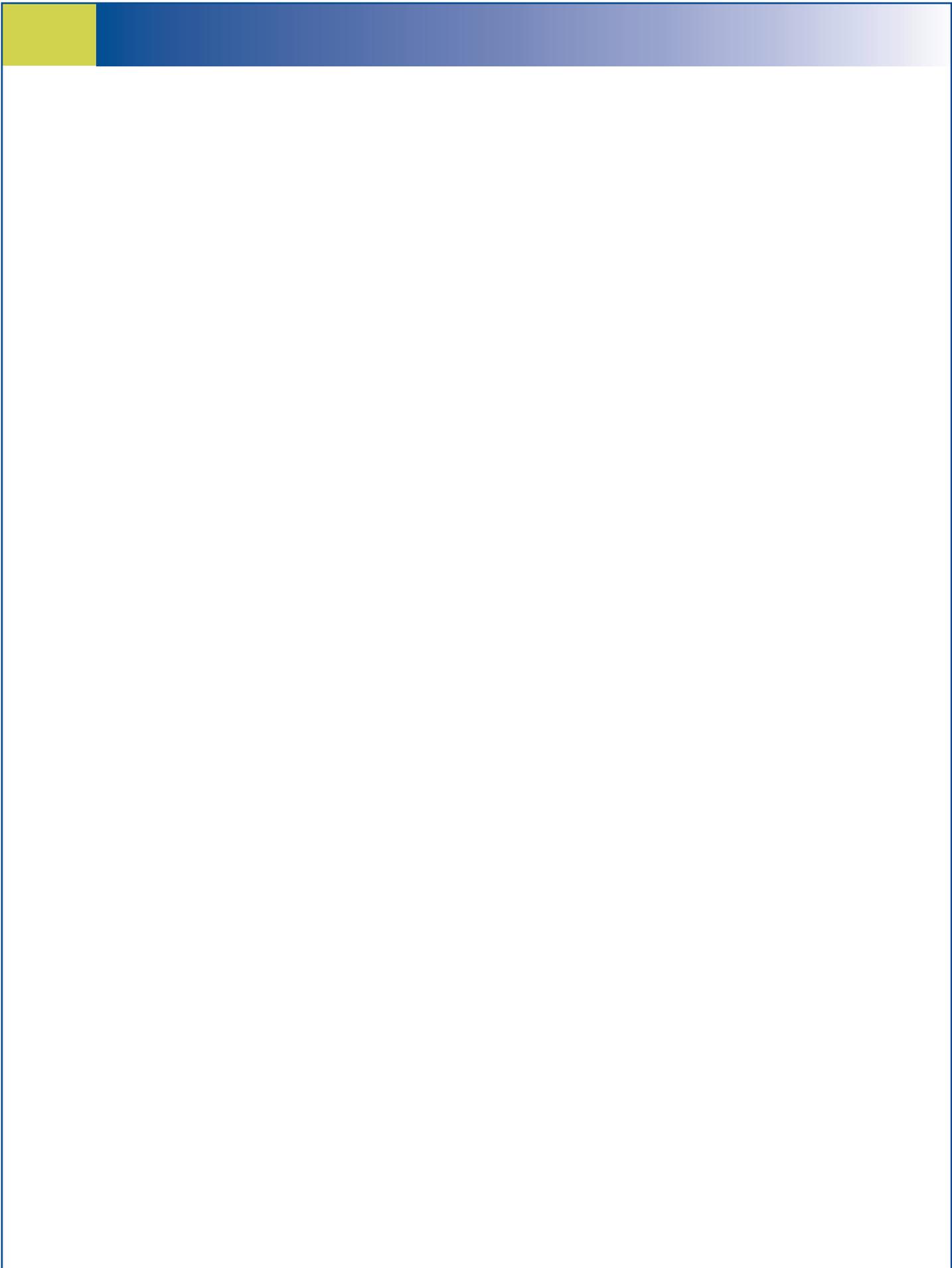
IT = Information Technology

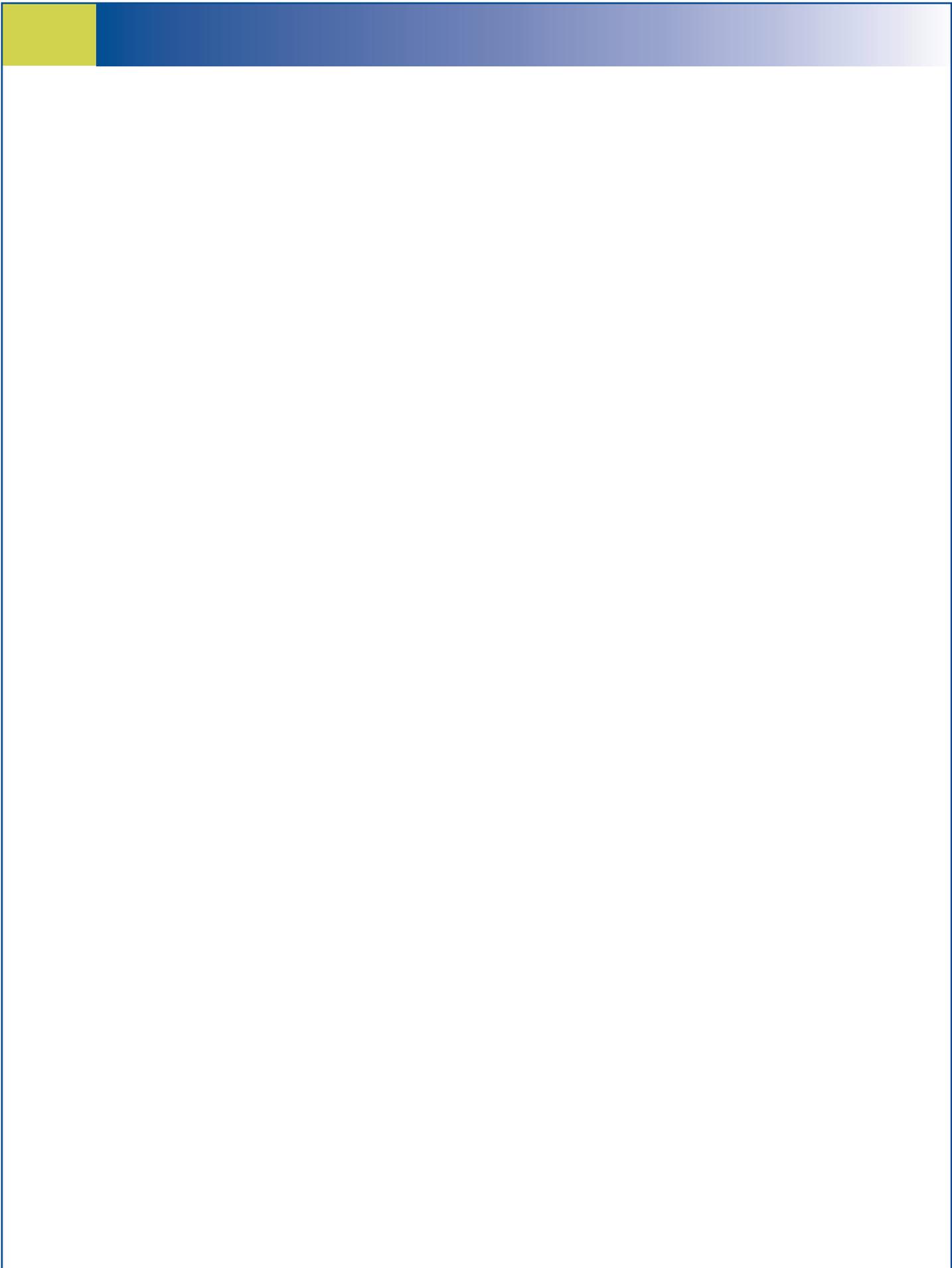
Subject	Course	Number of years
Science	Physics	1
	Biology	1
	Chemistry	1
	12th grade science elective	1
World language	Spanish/French	2
Physical education		1
Health	Competency based over four years	.5
Technology	Web Design	1
	Digital Art	1
	IT Essentials	1
	An elective every year	1

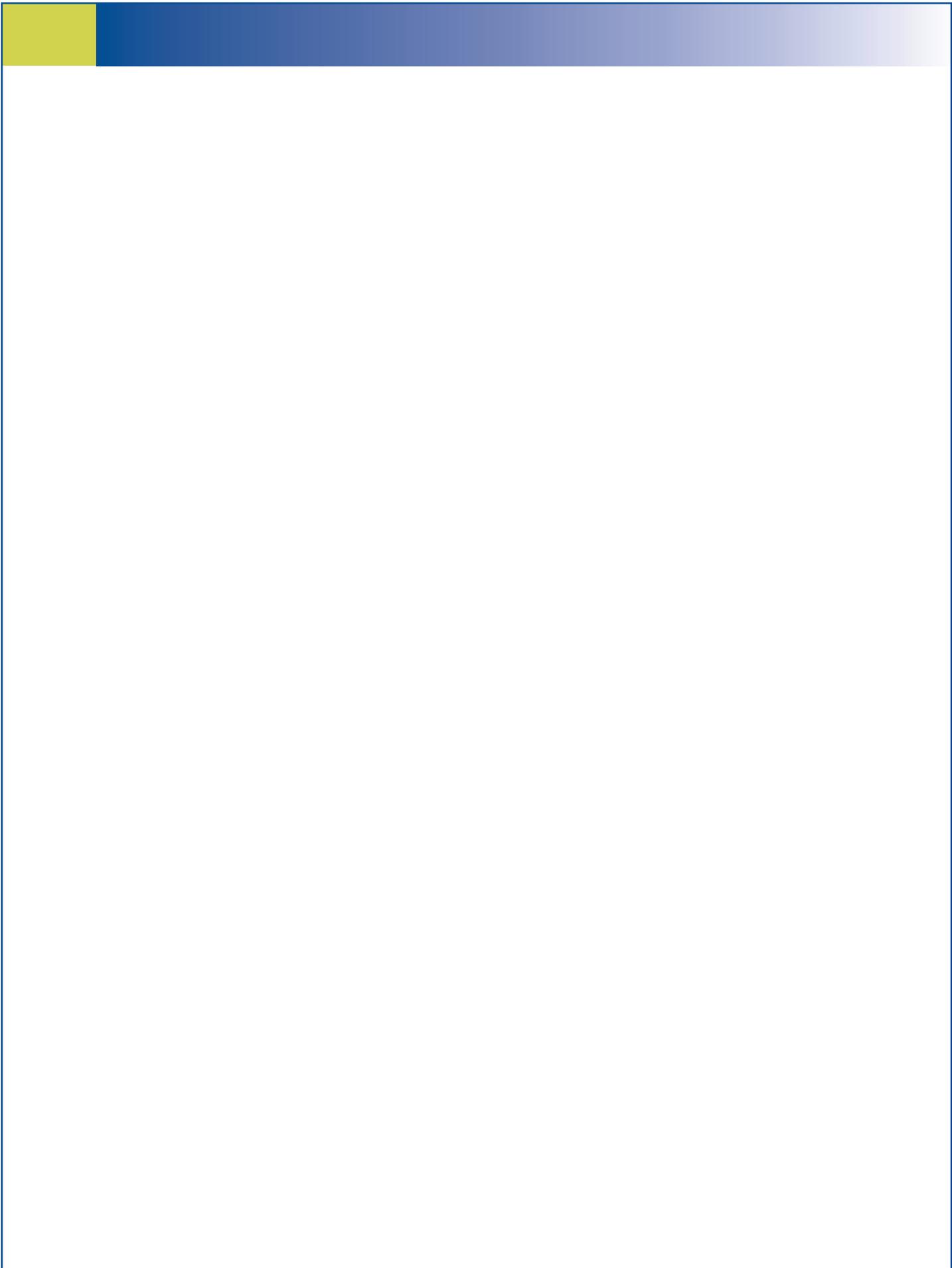
APPENDIX 7.4

TechBoston staff list

Position	Full-time equivalent	ERS coding categories	Other
Math	1	Instruction	
Math	1	Instruction	
Math	1	Instruction	
Science	1	Instruction	
Science	1	Instruction	
Science	1	Instruction	
Foreign language	1	Instruction	
English language arts	1	Instruction	
English language arts	1	Instruction	
Social studies	1	Instruction	
English language arts	1	Instruction	
Social studies	0.5	Instruction	
Social studies	1	Instruction	
Technology	1	Instruction	
Technology	1	Instruction	
Special education inclusion	1	Instruction	
Special education	1	Instruction	
Principal (chief executive officer)	1	Leadership	
Assistant principal (chief academic officer)	1	Leadership	
School supervisory (support and enrichment); high school administrator	1	Leadership and instruction	
School supervisory (technology integration and professional development); high school administrator	0.75	Leadership	
English language arts	0.25	Instruction	
Student success and assessment	1	Pupil services	
Information technology support	1	Instructional support	
Principal assistant	1	Leadership	
Nurse	0.3	Pupil services	
Library aide	1	Instructional support	
Behavioral specialist	0.2	Pupil services	
Principal support	0.15	Leadership	
Instructional coach	0.2	Instructional support and professional development	
Instructional coach	0.5	Instructional support and professional development	







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Education Resource Strategies, Inc., is a nonprofit organization that has worked extensively with urban public school systems to rethink the use of district- and school-level resources and build strategies for improved instruction and performance.

Our mission is to be a catalyst for the creation of high-performing urban school systems by promoting and supporting the strategic management of education resources. Our unique strength is in our action research where our partnerships with school systems bridge research and practice. We support our clients with Web-based tools, research and training, and diagnostic analyses tailored to their districts. Together, we outline strategies that are actionable and transformational both within and beyond the districts in which we work.

ERS's work and research have identified several areas in which school systems effectively leverage their resources to improve instruction, forming the basis for our five practice areas: Strategic School System Design; School Funding and Staffing Systems; Strategic School Design; School Support, Planning, and Supervision; and Human Capital.

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The Bill & Melinda Gates Foundation supported Education Resource Strategies in a three-year effort aimed at building understanding and tools that would support districts in creating cost-effective systems of high-performing urban high schools.

Out of our extensive research, we created the following reports and tools to support leaders as they consider and design small high schools in their districts. All materials are available at www.educationresourcestrategies.org.

- *“The Cost of Small High Schools: A Literature Review”*
- *“Strategic Designs: Lessons from Leading Edge Small Urban High Schools”*
- *“Case Studies of Leading Edge Small Urban High Schools”*
- *“District Spending in Small and Large High Schools: Lessons from Boston, Baltimore, and Chicago”*
- **Going to Scale Tool**
- **Small Secondary School Design Tool**
- **District Assessment Tool**



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