

Principal as Programmer: Six Years of Differentiated Instruction Fostered by a Home-Grown Data System

Principal: Fortunato Rubino
School Type: Intermediate
Neighborhood: Williamsburg, Brooklyn
Title I: Yes
Total Enrollment: 1518
ELL: 68
Special Ed: 146
Web site: www.is318.com

Asian or Native Hawaiian/Pacific Islander:	6.4 %
American Indian or Alaska Native	0.1%
Black or African American:	13.8 %
Hispanic or Latino:	62.3 %
White:	17.4 %

Principal's Vision:

Principal Rubino stresses that his school strives to meet its students' varying academic needs: "It is our goal to meet the needs of each student so that gifted students can excel, grade-level students can meet State standards, and below-level students can make up as much ground as possible." At IS 318, students "prep for high school and college, not tests." He uses a self-created electronic data system to track student performance, differentiate learning, and inform decision-making. The combination of creative and capable teachers with up-to-date technological equipment and data systems allows IS 318 to offer a high-quality, comprehensive education with technology integrated in core curriculum and enrichment.

Data Collection on Student Performance:

Computerized Diagnostic Testing Program (CDTP) for Class Grouping

At IS 318, electronic data collection on student performance was started in 1983 with Dbase III, IV, and eventually, Microsoft Access. Principal Rubino reports that from 1991-1998, when the school was still grouping students in classes of heterogeneous performance levels, it experienced "major difficulties" selecting textbooks and workbooks that would be appropriate to all student levels. Therefore, he decided to split classes so that the weakest students could be placed in smaller classes for ELA and/or Math (a single class of 25 was split into two classes of 12 and 13). Initially, classes were rearranged based on post-State test performance data. However, this practice was often problematic because of the time lag between the April test date and the September/October score receipt. Students needed to be scheduled for the following year in June, but their scores were not in yet.

In 2003, Principal Rubino (a self-taught computer programmer) developed the IS 318 Computerized Diagnostic Testing Program (CDTP). CDTP is used in conjunction with the school's self-developed

assessments, which are administered four times per year and are made up of questions from old State tests. Unlike Periodic Assessments, which are usually scored within three weeks, the school assessments are scored and analyzed with CDTP within a day.

CDTP allows IS 318 administrators to assess the performance of the school, a single class, or an individual student based on hard data. Using this data, administrators can rearrange students according to performance *before* students actually fail their State exams. CDTP has thus become an integral part of initial class placement and class rearrangement.

In the past, Principal Rubino had the opportunity to hire additional teachers for split classes, but with current budget constraints, this has become difficult. Because he has a stable teacher core, he has chosen not to excess anyone, which leaves him with no funds for new hires. Although teachers can use CDTP data to target the needs of particular students, they are unlikely to be able to give them extra attention in split classes in the future.

Computerized Diagnostic Testing Program (CDTP) for Differentiation within a Class

In addition to regrouping, CDTP is also useful within a single class. Teachers can use CDTP reports of “performance by content area” to differentiate instruction. For example, a teacher may use time to conference with individuals or small groups rather than stand in front of the entire class. In many instances these conferences serve as mini-lessons focused on a particular skill. This intervention has helped bring up achievement for all students. Because CDTP allows assessments to be scored almost immediately, teachers can make changes to their lesson plans while students are still working on the topics covered in the assessments.

CDTP empowers teachers to pair personalized performance information with their knowledge of curriculum and instruction to help struggling students succeed. Data is easily disseminated among the administrative staff (APs, deans, secretaries, guidance personnel) since they are all members of a workgroup accessible through a central server.

Instructional Goals:

Student Engagement

The differentiation made possible by CDTP data helps keep students engaged with the material, since instruction is more targeted toward their particular needs. Technology in the classroom has also served to keep students more engaged, as it works on multiple learning modalities. Principal Rubino cites a combination of good teachers and technology as a main reason for high student attendance at IS 318: 95 percent, compared to approximately 90 percent district-wide.

Multimedia Smartboard Lessons

Although some teachers still use overhead projectors, most have LCD projectors, which they hook up to their own laptops. This makes it easier for them to deliver PowerPoint lessons. Many teachers also have Smartboards mounted in their classrooms. Principal Rubino much prefers the stationary boards to the moveable boards, and recently received a \$20,000 Reso-A grant to fund additional Smartboards.

Smartboards have enhanced the delivery of instruction across all subject areas, and have afforded teachers the opportunity to include a variety of visual and auditory materials within the presentation of a lesson. For instance, if a teacher is discussing “volcanoes and magma displacement as a volcano erupts,” instead of verbal explanation, the teacher has the ability to log onto a Web site and project onto the Smartboard so the students can see and hear the volcano. In the past, the teacher would have had to get VHS tapes or DVDs that included examples and copy them to a master tape prior to the lesson. Fast forwarding and rewinding during a lesson to find a certain example wastes time and disrupts the flow of a teacher’s lesson, giving students an opportunity to get distracted. Although laser disk technology made it easier to move from example to example, it was expensive and the materials developed for it were limited.

Not only do teachers utilizing Smartboards spend more time creating and developing high-quality lessons, but these lessons are more engaging for students, who can interact through the board’s touch, drag, and drop features.

Literacy with Scholastic Read 180

Students functioning on a pre-primer to 1st-grade reading level are enrolled in the Wilson Program, which addresses decoding and reading fluency issues. When students reach the 2nd-grade level, they can begin the Read 180 program. Scholastic’s Read 180 program is designed to address students’ reading difficulties from grades 2-8. It is a scripted program involving a lesson, computer, and daily independent reading module. The 90-minute blocks (20 minutes for each component) are used in conjunction with a 30-minute writing module that has been added by the school to improve each child’s writing skills. The Scholastic lab has 15 computers and is dedicated to this program. All of the materials needed for students to complete assignments (including library books) are also contained within this setting.

Teaching Basic Technological Skills and Internet Literacy

IS 318 has two computer labs, and students go to the lab as a class. In 6th grade, a computer literacy class is programmed in to all schedules. Students learn word processing with Microsoft Office, basic Web browsing skills, and PowerPoint for their exit project presentations. As they prepare their PowerPoints, they often want to embed video, and end up acquiring additional skills. In 7th and 8th grade, teachers can schedule time in the lab or sign-up for laptop carts (there is one cart per floor).

Principal Rubino sees basic Internet literacy as particularly important, and it is taught in Social Studies as well as in the computer literacy course. Students learn how to discern fact and opinion, find legitimate Web sources, and cite these sources correctly. As they move through school, Principal Rubino says, they will need to get used to having so much information at their fingertips and understand how easy it is to fall into the trap of plagiarism. They also learn how to conduct research through more formal online databases available in the library: Ebsco, Gale, and Facts on File. Database searching is an important part of college-level research.

Enrichment

Principal Rubino’s aim is to provide a comprehensive education. To help achieve this goal, he offers numerous opportunities for enrichment outside of the core curriculum, many of them incorporating technology. The chess team, in particular, has helped increase the sense of community at IS 318. Posters in the hallways, printed with the school’s poster printer, highlight their achievements.

Chess

About 10 years ago, IS 318 became involved with Chess in the Schools. The team has won a title at Nationals for the past 10 years running, and one of its members is currently the National individual champion. All incoming sixth graders take a chess module to decide if they like the game and want to join the team. The school's chess team learns strategies from a chess master two times per week, and practices five days per week after school. There are about 50 students on the traveling team, as well as 200 students who play but are not part of the official team. In addition to books, the students practice with touch screens that allow them to move pieces, and with Chess Master 8000 computer programs. The school's chess program allows students, many for the first time, to travel on airplanes and stay in hotels.

Students can keep up on chess team news by reading the school Web site's chess blog. It includes photos and tournament news, as well as a "What Would You Play?" feature. This allows the students to view a move faced by one of their classmates and post comments about what they would have played in the same situation.

The screenshot shows a web browser window displaying the I.S. 318 Chess Team website. The browser's address bar shows the URL <http://www.is318.com/>. The website has a red header with the text "IS 318 Academy of the Arts and Sciences" and a navigation menu with links for Home, Notices, Parent Info, Counseling Dept, Classes, Student Portal, Activities, Student Government, School Info, and School Personnel. A sidebar on the left lists various school activities such as 2009 Graduation, 2008-2009 School Concerts, Chess, Ceramics, Photography, Robotics/Future Cities, Cheerleading, Athletics, Recycle a Bike, and Guitar. The main content area has a green background and features the title "I.S. 318 Chess Team" and a description: "The blog for the National Champion Chess Team from I.S. 318 located in Williamsburg, Brooklyn. Check here for the latest team news including highlights of recent tournaments, news about trips and club session updates." Below this, there is a date "Sunday, March 8, 2009" and a section titled "Lisa's NICE IDEA" with a chessboard image. A photo of the chess team is also visible on the right side of the page.

Chess team blog

Arts: The Past Meets the Future

IS 318 has a darkroom that gives students the opportunity to develop black and white prints utilizing a three-pan developing process (developer, stop bath, and fixer). Students develop the negatives and then use enlargers and photosensitive paper to develop prints. They learn about film speeds, shutter speeds, exposure times, and photo composition, as well as techniques such as enlarging, dodging, and cropping. As part of this photo class, they also use digital cameras. Students download their photos to a Mac, and

print with a black and white laser printer or a color emulsion process printer (which is capable of printing up to 5"x7" color photos).

The school has also put together a group of 25 Macs for digital video and design. Students are becoming proficient at shooting and editing video to create projects ranging from commercials, to vignettes, to clay animation. The pieces of software used most frequently for these projects include the Adobe Suite (such as Adobe Illustrate), Final Cut Pro, and Logic Studio 8 and Adobe Sound Booth for music and sound mixing.

According to Principal Rubino, students enjoy learning photography the traditional way alongside their digital work. Art classes exemplify Principal Rubino's view that technology can add another perspective, and that the old and new can exist side by side.

Robotics and Future Cities

In the school's Robotics Lab, students utilize Lego Robot kits to build robots that are capable of various programmed movements. The kits contain building blocks, motors, axles, drive belts, and gears of various designs and ratios, and students learn how these parts interact with each other. In the LEGO Robotics Competition, students create robots that perform a set number of tasks, and each team is rated on how well their robots perform these tasks. IS 318 has done quite well in the borough and city-wide robotics competitions over the years.

Future Cities is a competition designed around the SIM City program. Students design a city with SIM City software, and then create a model of a portion of the city with various materials. They earn credit for their design, how well the model depicts that portion of the city, and how well they present their project to the judges. Students have learned a great deal about team work and accomplishing goals through these competitions.

Parent Communication:

IS 318 leverages technology to engage parents. Not only does it regularly contact parents via e-mail (parent e-mail addresses are collected at the beginning of the year and the secretary creates a distribution list), but information is also made available through the school Web site (www.is318.com). All notices that are sent home are posted on the site. In addition, teachers can save their homework assignments to a public drive that the computer teachers access to post the assignments to the Web site. Because there is no log-in required, parents can keep track of their children's homework. In addition, the school uploads sample tests to help parents work with their children to prepare for State exams.

IS 318 Academy of the Arts and Sciences

Home Page

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2008 Graduation
2008-2009 School Concerts
2007-2008 School Concerts
Chess
Ceramics
Photography
Robotics/Future Cities

**** Math State Exam ** March 2009 ****

[Letter to Parents regarding Math State Exam Arrival Times](#)

To view the exams, download [Adobe Reader](#)

Practice State Exams

2005 Sample Test

[6th Grade 2005 Book 1 Sample Test](#)
[6th Grade 2005 Book 2 Sample Test](#)
[7th Grade 2005 Book 1 Sample Test](#)
[7th Grade 2005 Book 2 Sample Test](#)
[8th Grade 2005 Book 1 Sample Test](#)

Practice tests posted on Web site

Virtual Streaming of PTA meetings

The Parent-Teacher Association (PTA) has an online presence, which allows working parents who cannot attend meetings to participate. Parents can submit questions online in advance, and three tech-savvy teachers and several enthusiastic students film the meetings. The actual meetings stream live as webcasts on the school's Web site, and videos of the meetings are posted so they are available for later viewing. About 150 parents attend the meetings in person, and an additional 50 parents log in to the live-streaming. The school currently uses Ustream for PTA streaming, but is exploring other options.

<http://www.ustream.tv/channel/pta-meetings>

IS 318 Academy of the Arts and Sciences

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Partnerships

[I.S. 318 Merchandise](#)
[Follow the National Chess Team](#)

Departments

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P. T. A.
Community Education Council
School Counseling Department
High School Information
English Department
Math Department
Science Department
Social Studies Department
Special Education Department
Special Subjects
Physical Education

P. T. A.

[Letter to Parents regarding 2009 PTA Nominations](#)

If you would like to ask questions during a live stream of a P.T.A. meeting, please send an e-mail to Questions@is318.com. We will only accept and ask these questions during the Live Stream.

Upcoming PTA Meetings for 2008 - 2009

- September 16, 2008
- October 7, 2008
- November 5, 2008
- December 1, 2008 -- Will not be broadcasted

Online PTA presence

Online Technology Tutorials for Parents

If parents have difficulties taking advantage of these offerings because they are not well-versed in technology, the school seeks to provide support. Under the "Parent Portal" section of its Web Site, the

school provides tutorials that explain how to use the most common IT tools. These tutorials are in PDF format, and through multiple screenshots, provide detailed explanations of the basic functions of Gmail, the most commonly used Web browsers, and Microsoft Word and Excel.

The screenshot shows the website for IS 318 Academy of the Arts and Sciences. The top navigation bar includes buttons for 'Notices', 'Parent Info', 'Teachers & Classes', 'Clubs & Activities', 'Student Gov.', and 'School Info'. A sidebar on the left lists various departments and school activities. The main content area is titled 'Parent Portal' and features a graphic with the text 'HOW TO USE Gmail'.

Online tech tutorials for parents

Administrative Efficiency:

Library and Textbook Tracking

The library has its own server. Books are bar-coded, and to check them out, students use a fingerprint scanner in place of library cards. The system was created by Biotech and cost the school \$1,000. It is used for textbook inventory, as well, so there is no longer a need for traditional book receipts. The school used to lose about 20 percent of textbooks each year (each of which costs \$60-70), but now the number is down to 7-8 percent. Principal Rubino would not consider moving to digital textbooks “until everyone has a home computer.”

Implementation of Technology:

Budgeting and Procurement

With the exception of Reso-A City Council grants, the school's budget consists of the DOE's standard allotment. Principal Rubino has a clear understanding of how technology can be leveraged to better serve his students, and made its acquisition for use in instruction and administration a top priority. Procurement decisions are typically made by Principal Rubino and the tech teacher, who attend technology conferences. One recent discovery they've made is the existence of the Creative Sweet for free and inexpensive software (<http://putthingsoff.com/the-creative-sweet/>).

It took about five years for IS 318 to achieve its initial technology goals: 2 computer centers (40 workstations), 3 laptop carts (28 per cart), 1 computer on each teacher's desk, and the acquisition of 12 Smartboards. The funding for this initiative came from various sources, and the school would have fallen

short without assistance from Reso-A grants. The two computer centers were created and the laptops acquired with Reso-A grants of \$150,000 and \$200,000. For the 2009-2010 school year, Principal Rubino used his Reso-A grant to purchase Plasma Monitors with Smartboard overlays for about 20 classrooms.

Each year, the school also receives a NYSTL allocation for software and hardware. This is a per-capita allocation determined by the State. In 2009-2010, the allocations were \$15,640 for software and \$18,765 for hardware. Over the years, NYSTL money has typically gone to maintaining technology. Beginning in the fifth year after technology implementation, it became necessary to either upgrade or replace outdated machines.

Staffing Roles Related to Technology

Technology Teacher

A technology teacher is responsible for teaching students basic computer and Internet skills as well as doing most of the on-site hardware support and technology professional development. He attends vendor presentations and central training meetings for new and existing software and acts as a liaison for the rest of the faculty. The technology teacher also serves as the school's Webmaster.

Tech Support

Technology Teacher

The technology teacher (described above) is able to assist with software and hardware issues that may arise. If machines are experiencing problems with the operating system, he has "ghost disks" that have been created by the DOE, which have the standard operation system and the necessary protocols on them to bring workstations back online.

Student Tech Squad

A group of 6-8 students deals with basic maintenance issues (functioning as an unofficial MOUSE Squad). They officially work two hours per day, four days per week, but they often work additional hours. These students receive service credit, which is placed on their middle school cumulative card and included in their middle school records. They also receive service awards at their awards ceremonies in 6th, 7th, and 8th grade. They are led by the technology teacher.

DOE Support

The Borough Tech Manager is the main support for the server. When the school tech staff cannot determine the problem with a workstation, or if it needs repairs beyond their scope of understanding, then they call for service. Most printer repairs, motherboard issues, and connectivity problems are resolved with the assistance of DOE service technicians. These services are available to all principals.

Former Student

The school Web site was custom-coded with HTML and Dreamweaver by a former IS 318 student. The student, now in high school, comes in two hours per day, four times per week to assist with updates and tech support. He is also paid as a student aide to assist the technology teacher with her summer Web design class.

Change Management

Principal Rubino has several teachers on his staff who do not consistently read e-mails. In order to send teachers memos, he uses DOE e-mail exclusively (he no longer puts notes in their mailboxes). At times, he uses a return receipt. Because he does not send e-mails very often, when he gets a message that a teacher's inbox is full, he knows that the teacher isn't checking his or her e-mail. Overall, his teachers don't need much prodding when it comes to technology usage. However, he stresses that the implementation of technology at IS 318 did not happen overnight; it was at least a five year process.

Professional Development

The school supports technology adoption by providing professional development to its staff. The technology teacher conducts in-house training with other teachers on the use of software, hardware, and the resources of the school's general network. He always covers basic topics such as e-mail, online homework uploading, and Web site log-ins. In addition, every teacher receives a minimum of 2-4 hours of Smartboard and LCD projector training. One of the APs recently provided teachers with training in ARIS, although they typically stick to the school's data system. Professional development takes place during lunch periods.

Achievement Highlights:

	2006-2007	2007-2008	2008-2009
Enrollment (# of students)	1394	1426	1518
Attendance	95%	95%	95.3%
ELA (Level 3 or 4)	65.5%	70.2%	81.2%
Math (Level 3 or 4)	77.4%	86.1%	90.6%

In addition, the 8-10 percent of the 8th grade students who take accelerated Regents exams pass them.

There is no doubt that technology is a factor in IS 318's success, but Principal Rubino stresses that technology is only one factor among many: "We have a dedicated teaching and administrative staff that is conscious of the fact that we need to keep up-to-date with the latest technology if we are to prepare our students to learn, work, and exist in a world where, each day, more and more of the technologies we, in our lives, have seen as innovations, become obsolete."

Contact Information:

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