

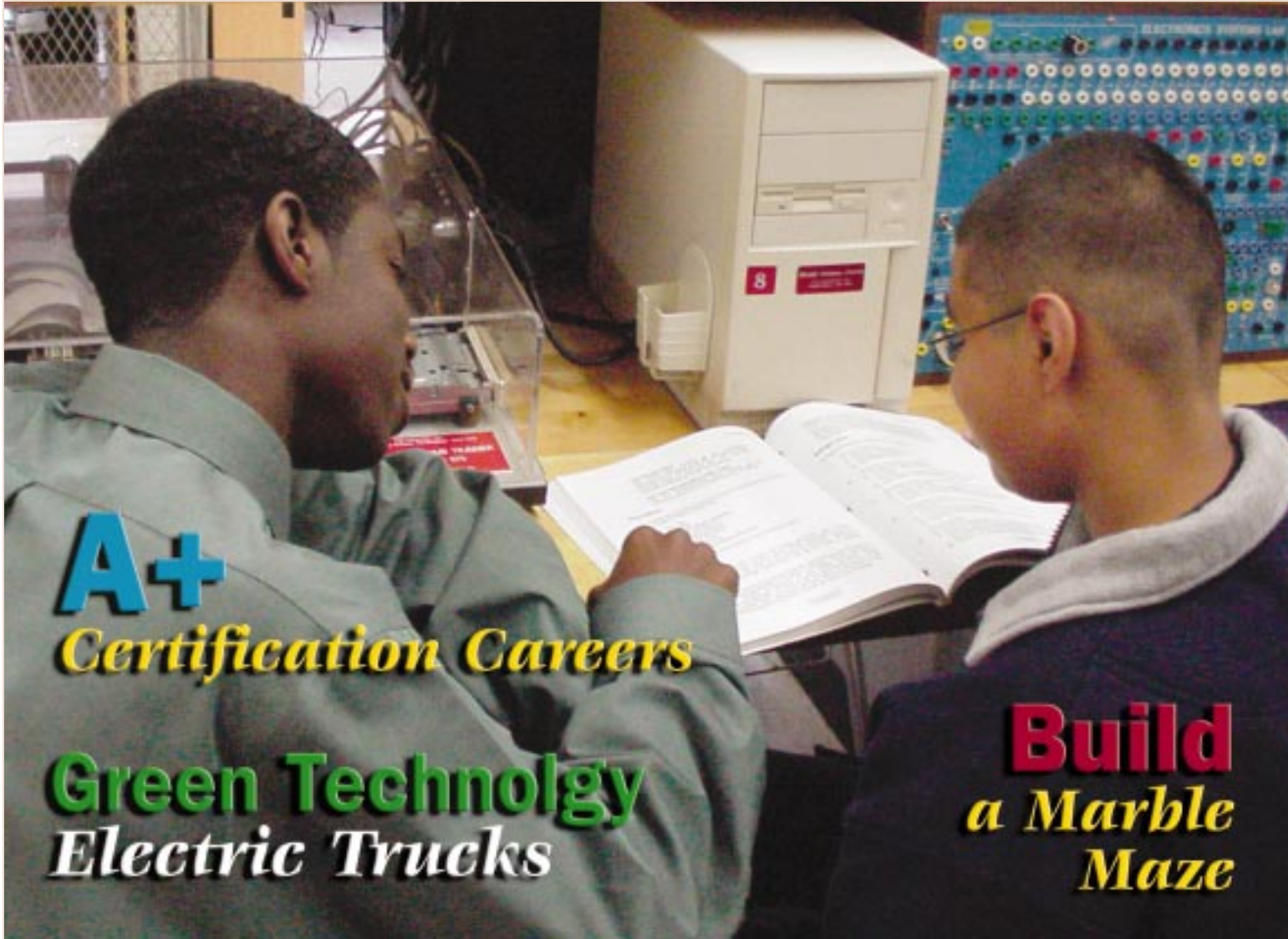


# techdirections

www.techdirections.com

linking education to careers

JANUARY 2003



**A+**  
*Certification Careers*

**Green Technology**  
*Electric Trucks*

**Build**  
*a Marble  
Maze*





# An A+ Certification Program

*Edison High School teacher A. C. Bell fails to meet the school's goal of getting all students jobs—his students get A+ Certified or go to college instead!*

By Dr. Charles Rubenstein  
c.rubenstein@ieee.org

**T**HE stated mission of Thomas A. Edison Vocational and Technical High School, located in Queens, NY, is to develop the leaders of tomorrow by preparing all students to meet the high academic, technical, civic, and workforce challenges of the 21st century.

In addition to the information technologies program—which focuses on Computer Repair-A+, Cisco, and MOUS certifications—Edison offers career paths in medical and pharmaceutical chemistry, computer electronics engineering, mechanical tech-CAD, computer science, commercial art, electrical installation, and automotive technologies.

Last year, Edison was one of 10 schools (out of 20 that applied) ap-

*Charles Rubenstein, a learning technologies grant consultant for NYC schools, is a professor in the graduate school of Information and Library Science of Pratt Institute in Brooklyn and holds a doctorate in engineering from the Polytechnic Institute of New York.*

proved as a New York State Career in Technology Education program. The goal of every vocational and technical high school is to place its graduates in jobs. This article concentrates on Alexander Bell, an Edison Computer Repair-A+ teacher, and the failure of his students to meet that goal.

Happily for them and their community, Bell's students do not get jobs after graduation. Some go on to secondary specialty schools, such as Computer Career Center of Garden City, Long Island, for additional certifications before going to work. However, the majority of his students go on to community colleges or four-year colleges to earn bachelor degrees.

## 1997—A Turning Point for Edison

Named Teacher of the Year in 1997, Bell was introduced to the A+ Computer Repair Program that same year.

A typical class of 15 to 24 students is divided into teams to use the nine training systems in the lab. "I'd love to have the students work

on individual systems, but teams of three or four students encourages collaborative learning," Bell notes. He points proudly to the fact that usually two female students enroll in the program each year.

"Shop teachers who teach 'shop students' won't succeed," he continues. "You need students who want to learn and study to become technicians.

"The guidance department needs to know that A+ is not a lower-than-sciences program. It is college-level technology. Some colleges even offer advanced placement credits for certifications.

"The administration must be aware that labs used for this type of training must be single-instructor labs. Sharing Cisco and A+ means someone is going to come in and not be able to use the systems."

## Success in the "Failure" to Get Jobs

Bell teaches about half of the 50-60 students admitted annually into the A+ Computer Repair program in their junior year at Edison, and his results are impressive. About half of

his students take the certification exams.

He beams when he talks of the 96 percent success rate of those who take the exam. Of the 24 students in my classes in 2000 and 2002, all 11 permitted to take the exam in 2000 and 13 of 14 who took the A+ certification exams in 2002 passed. Eighty-five percent passed the exams on their first attempt.

"2001 was a tough year as the CompTIA requirements changed to include Windows 2000. We did not have anyone wanting to take the exams," he says.

"Students come into the program after taking basic electronics in their freshman and sophomore years. We typically complete the first part of the program in two 40-minute periods per day during the students' junior year. The remaining part of the program plus review are completed in three periods per day during the first part of their senior year."

Asked why students in other Edison teachers' A+ classes do not take the certification exams, Bell notes, "I try to be very focused in class and that comes through. The program gives students the background they need to answer the exam questions and to be able to troubleshoot real systems, which is critical to their understanding of how computers work."

## A Full-Featured Curriculum Is the Key

"From time to time, even in the A+ class, I use the computer-assisted instruction component of the CES analog or digital systems for review," he states. "They got used to assembling simple electrical circuits a few weeks after they started their technology series as freshmen.

"By the time they got to digital circuits in their third semester, they began to understand the fundamentals of how a computer was assembled. My students all create their own 'Tech Manual,' which is what we call their lab notebook.

"Having all lab work, trouble-

shooting hints, and practice exams in one place makes studying for exams much easier. We sometimes use real customer case studies. After students have graduated and gone out into the field, they often come back and tell me it was just like we practiced in class.

"The computer repair equipment is just another hands-on way to learn," he continues. "Students began with the fully functional 'visible computer' trainer, where they see how a computer works as a system.

"Then they earn the right to assemble a computer and have it come to life, piece by piece. The computer parts are too valuable to allow stu-

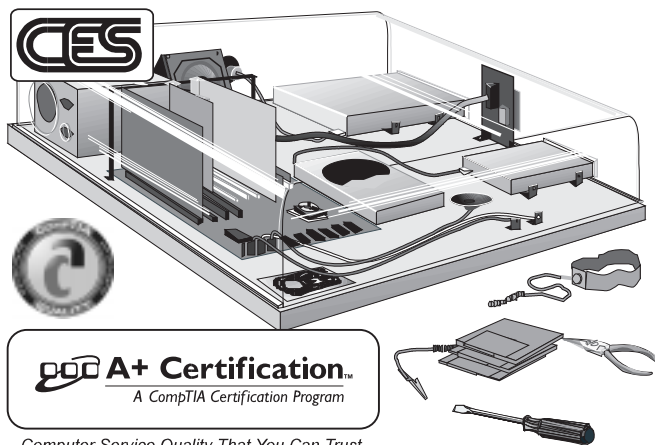
## About CompTIA

CompTIA—the Computing Technology Industry Association, Inc.—is a global trade association representing the business interests of the information technology industry. For over 20 years, CompTIA has provided research, networking, and partnering opportunities to its members and developed standards and best practices that have affected information technology worldwide.

According to their website ([www.comptia.org](http://www.comptia.org)), the CompTIA A+ certification is the industry standard for validating vendor-neutral skills

expected of an entry-level computer technician. Those holding the A+ certification have a broad base of knowledge and competency in core hardware and operating system technologies, including installation, configuration, diagnosing, preventive maintenance, and basic networking.

The A+ certification opens the door to exciting careers in computer technology and is the perfect launch pad into careers in information technology that require degrees and/or other certifications such as those offered by Microsoft.



Computer Service Quality That You Can Trust

Recognized by CompTIA as an Authorized Training Provider  
The CompTIA A+ certified professional logo is a registered trademark of CompTIA. (All rights reserved)

## TEACHING COMPUTER REPAIR IN TODAY'S CLASSROOMS CAN BE A DIFFICULT...

and often *FRUSTRATING* experience

Finding a comprehensive, highly  
organized Program in Computer Repair  
can be equally difficult and frustrating...

## UNTIL NOW...

## CompTIA A+ Certified Computer Repair Program



Industries, Inc. 130 Central Avenue, Farmingdale, New York 11735  
Call Toll Free 1-800-CES-LABS or visit our website at [www.cesindustries.com](http://www.cesindustries.com)

Call us for information on this  
**NEW TECHNOLOGY** today

Circle No. 17



dents to haphazardly throw them together and expect them to work.

"The right to touch the computer parts comes after they've learned what the parts do and the precautions they need to take when handling the parts. All along the way, students use fault insertion to experience real-life troubleshooting techniques."

### Keeping Current with New Certifications

To keep abreast of the newest troubleshooting techniques and teaching methods, Bell attends A+ Training Workshops each August at CES Industries headquarters in Farmingdale, NY. He and his senior students also participate in bi-monthly review sessions at local area schools.

"Because of my students' success, Andrea Solgan, Edison's Principal, and Building Trades and Information Technologies AP, Jack Flaherty, support my classes. We plan to upgrade the A+ trainers and add a Network+ Certification program next year."

### Mark Sulaiman, Star Pupil

Asked about the diversity of the student population at Edison and in his classes, Bell notes that although the local Queens community is predominantly Guyanese and Asian, his classes are typically 50 percent Muslim, 30 percent African-American, and 20 percent other minorities. Asked if he has any particular success stories, he points with pride to the dozens of photos on his lab walls of students

who have gone through the program.

In fact, he notes, "One of them wrote this letter I have on the wall for all to see. He's coming tonight to our career open house to talk to the parents of next year's classes and answer their questions first hand.

"I guess you might say Mark is my shining star. When he was preparing for his A+ certification exam, he formed a study group with three other students. They all passed with Mark getting the highest marks at the exam center!

"He was my Lab Shop Foreman and went to Computer Career Center of Garden City after graduating Edison. After that, Staples hired him as a technician, and after three

months was made lead technician. Later, he left Staples to become a Network Engineer."

Mark Sulaiman, Class of 2000, received his A+ certification after taking Bell's class, and then with Bell's encouragement went on to Computer Career Center where he studied for and earned Microsoft's MCP, MCSE, and MCSA certifications. The 20-year-old is a Network Engineer at Promenet, pulling down over \$42,000 a year.

Last year's class also did well on their certification exams, as is noted in another letter on Bell's lab wall. Also on Bell's wall are reproductions of the Quick Access A+ CORE Module information sheets, which he recommends as a student study guide. These are produced by the Research & Education Association and are available from their website at [www.rea.com](http://www.rea.com).

### Student Motivation with IT Jobs and Role Modeling

Certainly not all students do as well as Mark, or do so as quickly. All

## Funding a Lab

Since purchasing a full A+ Computer Repair program can cost \$30,000-\$80,000 and the Network+ an additional \$10,000, equipping your school for an A+ /Network+ program may exceed your budget.

One funding technique used is to administratively combine current software and hardware budgets. Your vendor can often work with you to apportion the cost of a lab so you can purchase lab equipment that has software components, etc.

Major funding for labs is often included in New Construction and/or Modernization budgets. Including the power, A/C, and network cabling for A+ and Network+ programs at the beginning often saves money. Don't forget that the equipment requires lab benches, students need chairs, security needs to be considered, as do storage and repair spaces. Including these costs in the overall education plan for new or modern-

ized space requires a lot of cooperation and planning with school administration.


Many states have Learning Technology Grants or Equipment Grants. Find out about your state's grants and apply for these funds. Some school districts have experienced grant writers—seek them out.

A less likely place for funding comes from local businesses that may have grants or training program funds that can be used to sponsor or co-sponsor portions of your program. Or a large local firm might contract with a school to have its employees trained in an after-school program using the A+ equipment. (Additional help and resources may be found in the following two *Tech Directions* articles: "How to Create a Tech Ed Program" by Dwayne Hobbs, January 2001, pp 35-38, and "Building an Effective Trades Program" by Kurt Morauer, January 2002, pp 23-25.)

students don't take or pass the certification exams, and all students don't go on to college.

You need motivated students. Bell often suggests they review the career opportunities so that they can get excited about their future.

Bell closes by stating that after 19 years of teaching he firmly believes

that "You've got to be the role model for your students. You've got to set the tone. You've got to tell them the first day of class what you expect of them: No sleeping or eating in class, no horsing around. Either focus—or go home! You must believe in your students and make them believe in themselves." 

## IT Jobs and Titles

The CompTIA TechCareers Compass website (at <http://tcc.comptia.org>) has tools for students to find out about the vast variety and educational levels of careers in information technology.

Each of the six job categories on the TCC pages: Network Services and Operations, Programming and Software Development, Information Support, Interactive Media, Internet and e-Business, and Database Development and Administration is described and links to pages of job titles. Each job title entry is illustrated with a page including the essential functions of the position, tasks, skills and knowledge requirements, available training, roadmaps for growth in that job area, and even possible certification information.

Among the major job categories listed on the site are:

**Network Services and Operations.** Jobs that involve the building, supporting, and maintenance of networks i.e., local area networks, wide area networks, and TCP/IP networks and the related services.

**Programming and Software Development.** Jobs that involve the creation of software and/or applications, and the associated enabling technologies, i.e., JAVA development, Lotus Notes applica-

tion development, Visual Basic application development, and so forth.

**Information Support.** Jobs that involve the support and maintenance of information via technology (includes help desk support jobs).

**Internet and e-Business.** Jobs that involve the development and design of web applications that facilitate organizations being able to manage traditional business operations such as e-business, e-commerce, e-learning, marketing, and distribution over the internet.

**Database Development and Administration.** Jobs that involve the development of databases, the associated enabling technologies, and the related database administrative processes, i.e., relational database technology, non-relational databases, data warehousing, data mining, etc.

