

A+ Certification: A Pathway to Good Jobs For Low Income People?

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Introduction and Overview

The 1990s saw a huge increase in jobs in the information technology occupational cluster. Not only did accelerated development and application of new Internet and IT-related technologies increase demand for more workers in existing job categories, but these trends also drove a major "widening" in the kinds of IT jobs, especially on the applications side. Despite problems in the dot.com industry, computer applications continue to grow among a range of industries, sustaining demand for information technology skills.

The rapid growth of IT "producing" companies (i.e., hardware manufacturers and software companies) contributed to the most obvious and dramatic employment increases and the most apparent skill gaps — especially because of the length of the skill development pipeline for trained engineers, computer scientists, and software designers. But the IT "using" companies also experienced an enormous increase in their employment needs for "technician level" workers who can manage and optimize the application of the new hardware and software products to the business functions of these non-IT companies. In particular, there has been a growing demand for workers for computer repair, service to support end users of the hardware and software applications.

The education and training community was slow to appreciate the potential of jobs in IT for low-income workers without post-secondary education and good work experience. The IT skills gap was initially seen as a problem of severe shortages at the scientific, managerial and professional levels and the "solution" was identified as getting more young people into and through college level programs.

In 1998, studies by the Information Technology Association of America (ITAA) and the US Commerce Department reported, respectively, large numbers of unfilled IT jobs and rapid job growth among IT professions but a decline in students earning bachelor's degrees in computer science and related fields. Both studies focused almost exclusively on jobs for which a bachelor's degree was seen as an essential credential. These two widely circulated reports drew national attention to the serious issues of the IT skill gap, but defined it a way that did not seem very relevant of the needs of less educated young people and adult workers.

In 1999, the industry commissioned the Computing Technology Industry Association, (CompTIA), to conduct a study to define the IT workforce shortage and its impact business. The survey, *Workforce Study: The Crisis in IT Service and Support*, revealed an estimated 270,000 unfilled jobs in entry-level IT service and support and another 300,000 unfilled jobs in advanced positions within the information technology industry. These technician positions were identified as among the fastest growing professions in the nation.

The CompTIA report began to galvanize interest from organizations concerned about bettering career opportunities for less educated individuals and low wage workers. The report also underscored the interest of the IT industry itself in developing new pools of talent to draw from in order to address the on-going shortage in the service and support functions. These available, entry-level computer service and support positions require short-term training, six months or less, and a vendor-neutral, industry-endorsed certification. They provide above average entry-level salaries. According to the 1999

CompTIA survey, the national average starting salary for computer service and support technicians was \$31,000. These positions also offer opportunities for advancement with additional experience and training.

Because the skill development pipeline for workers to carry out these service and support functions is relatively short, workforce development organizations have become increasingly interested in these IT jobs. There has been growing interest in how low-income workers and disadvantaged youth and adults might get on the bottom rungs of the IT skill ladder and then begin to climb upward toward good, family-supporting jobs. Over the past few years, several no-profit training organizations historically focused on disadvantaged individuals have inaugurated training programs in the IT sector.¹

There is no reason for this interest to wane, even in the face of the economic downturn. Over the last year of severe contraction in the technology sector, overall IT employment has decreased, but the occupational "band" has not narrowed. Demand for new workers at the higher levels of the skill spectrum from the IT producing companies is way down (although, because of the length of the pipeline, shortages still persist in some areas). Worker demand for the applications and support functions is certainly down from the period of incredible growth of the late 1990s, but it remains relatively strong. And as the economy begins to recover from the downturn of the past several months, employment prospects in the IT support functions will improve faster than in the higher skill occupations.

The Focus of this Study

This study has been aimed at developing information that could help improve the efficiency and effectiveness of training programs that help young people and working adults with limited work experience and no post-secondary education to get the training necessary for good entry-level jobs in IT. It focuses on standards-based training for computer repair, service, and support occupations where employers expect candidates to have an A+ credential. A+ certification is an internationally recognized credential indicating that the individual possesses the basic knowledge, technical skills, and customer relations skills essential for a successful entry-level computer service technician.

CompTIA, the largest computer industry association, developed the A+ certification and testing program. CompTIA created A+ chiefly to meet the needs of its corporate members – some 10,000 computer hardware and software manufacturers, distributors, retailers, resellers, value-added resellers, system integrators, training, service, telecommunications, and Internet companies. By setting the standard of basic competency in computer service, A+ certification helps employers maximize efficiency in recruiting, hiring, training and promoting employees.

In practice, A+ certification also helps job seekers. It offers an entry to a career pathway (even if the details of that pathway are clouded), and testifies to transferable skills and credentials that are industry recognized. The A+ certification also gives educators and trainers the standards necessary to better prepare individuals to meet the job skill demands.

¹ Several of these programs in the non-profit sector are profiled in "From Promising Practices to Promising Futures: Job Training in Information Technology for Disadvantaged Adults" (The Bay Area Video Coalition: October 2000).

The A+ test was first available in July 1993. It was extensively revised in 1998 and again in 2001. The A+ test covers a broad range of hardware and software technologies, but is not tied to any vendor-specific products. To become certified, one must pass two parts -- the Core and the Microsoft DOS/Windows module portion. When both the Core and the DOS/Windows portions are passed within 90 calendar days, the candidate receives the A+ designation. The certification is not time-limited. Once individuals are A+ certified, they are not required to update the credential – even as the test is revised.

A+ certification has gained wide recognition as the foundation for both software and hardware career paths. Recent years have seen a sharp increase in the number of A+ certified technicians. Over 80% of the 500,000 A+ certified technicians worldwide gained their certification in the past four years. Demand for the A+ credential is likely to remain strong for several reasons:

- Computer manufacturers have begun to require that anyone who services a computer must be A+ certified or the warranty will be voided.
- A+ certification is often a prerequisite for more advanced training courses linked to higher level certifications.
- Candidates for Microsoft Certified Systems Administrator (MCSA) on Windows 2000 can now satisfy the elective exam requirement with a combination of A+ and either Network+ or Server+ certifications from CompTIA.

Initially, CompTIA limited its role to A+ test development. It neither certified nor in any way approved the organizations that offered training or the curricula designed to enable an individual to pass the A+ exam. Prometric and VUE were licensed by CompTIA to do the actual testing, and those organizations set their own testing fees - usually about \$100, a portion of which goes to CompTIA. Currently, however, CompTIA is working with the training development and publishing industry to produce CompTIA Authorized Quality Curriculum (CAQC) training products. These training products meet strict quality standards and are reviewed by experts to ensure they meet exacting requirements.

Training may be provided by any organization — public schools (in adult and vocational education programs), community colleges, community-based organizations, and (probably most frequently) by proprietary training organizations. In theory, formal training is not required; anyone who wants can pay the fee and take the A+ examination. In practice, the more experienced computer technicians often take very short training programs. These might even be 40-50 hour "cram courses" to help the candidate with actual work experience in this area get ready for the test. Strongly self-directed people can acquire the relevant skills on-the-job and or through on-line test-taking practice and commercially available manuals. Less experienced individuals benefit from the longer courses.

The steep increase in individuals achieving A+ certification demonstrates that it is a popular pathway to decent jobs. It appears, anecdotally, that A+ certification has been a pretty good guaranty of employment in most regions where computer repair and service facilities are located, and that it usually provides access to jobs that pay \$25,000 to \$30,000 at entry, usually with benefits.

Less is known about how effective the A+ certification strategy is for helping people without much previous job experience and with poor educational preparation obtain good

jobs. Anecdotally, we hear about dozens of program around the country that are providing training leading toward certification for otherwise low skilled people, including former or current welfare recipients. However, detailed and reliable information about these programs has been very thin. Still, the very strong job market for entry-level computer service and repair workers has encouraged more careful consideration of A+ certification as a means of helping low-income and disadvantaged individuals access a good job.

However, key questions need to be answered before we know to what extent A+ training offers a pathway out of poverty, for example:

- Has a consensus emerged about minimum educational preparation or competencies that are pre-requisites for A+ training?
- Which "kind " of training preparation is any more successful than any other kind?
- What is the "best" training environment?
- How long should this training take and how much should it cost?
- Are there other skills – not covered by A+ certification – that individuals in target populations need to acquire before they can obtain the desired jobs?

Answers to these questions can help identify effective practice for training members of target populations to acquire not only A+ certification but also a job that is a solid rung on a career ladder.

To seek those answers, FutureWorks developed a detailed survey for A+ training providers and asked CompTIA to promote participation in the survey among its training company members. Survey results, gathered during the second half of 2001, provide information about practice and outcomes of A+ training programs. Information gathered in follow-up interviews and visits to training providers provide more nuanced insights into the programs that successfully provide A+ training for low-income individuals. Those insights and the survey results are used to begin developing a picture of how gaining A+ certification operates in the broad market and then how well it prepares individuals with poor educational background and limited work experience for good jobs in the field of information technology.

The next section of this report summarizes the research findings. Readers seeking more detailed analysis and specific information will find survey results in the third section and profiles of selected programs in the fourth and final section.

Summary of Research Findings

Limitations of Available Information

Findings about A+ training programs and their impact upon low-income trainees must begin with a caveat about available information. The FutureWorks survey found that few training providers gather very much information about trainees when they enter the program, and few track the exam results or employment experience of trainees once they have completed the program.

During interviews, training providers often expressed frustration about the difficulty of tracking the progress of their graduates – specifically the exam results. In particular, providers targeting low-income individuals want to know how their graduates are doing, and would like to be able to identify weaknesses on the tests of their graduates. One person pointed out that if CompTIA provided this information to its members, it would be a major incentive for training providers to join CompTIA. Both course completion and placement data are easier to obtain than exam pass rates.

Limited information about the economic status of trainees makes it difficult to assess the value of A+ training for disadvantaged people. Fewer than 40 percent of the training providers that responded to the FutureWorks survey were able to provide information about trainees' income levels at the start of training. The training programs selected for follow-up information gathering were among the ones that could provide income data.

The A+ Training Providers

CompTIA counts some 425 A+ training providers among its members², including many with multiple sites. The largest category of the 76 survey respondents was for-profit firms, both multi-site and single-site operations. The dominant for-profit training providers are national firms with multiple locations such as New Horizons. However, smaller, single-site operations such as The New Technology Center in Rahway New Jersey also provide high caliber training. Community and technical colleges often offer this training in their evening programs.

Provision of computer training, which begins with A+ training, is a highly competitive market and becoming more so. There have been major bankruptcies and buy-outs in the computer training industry. As a result, fees for A+ training have fallen significantly over the last few years, producing market differentiation between providers who compete on the basis of price and providers who compete on the basis of service. Some providers are electing to compete on both bases by offering more than one curriculum for A+ training.

Market differentiation is, as economic theory would tell us, providing A+ training customers with greater choice. The choice is beneficial, because one size does not fit all, and there is no reason to waste people's time and money with a course that is either

² There is no way to know precisely how many organizations in the U.S. or the world are offering A+ training. There is no requirement to register or seek approval from any single source before offering training.

too basic or way over their head. However, choice puts the burden upon the customer to select the appropriate course.

The Customers for A+ Training

Training providers view both the individual student *and* employers as customers. Individuals may enroll in training. Firms hire graduates, achieving the desired outcome, and may also hire training providers to upgrade the skills of their incumbent workers. Most training providers reported similar and healthy levels of demand for A+ training from individuals and from employers, with overall slightly higher demand from individuals.

Survey responses depict an essentially stable demand for A+ training despite the highly publicized IT slow down. The majority of training providers described the demand from employers as stable. Of those who saw movement, the increases outnumbered the decreases two to one. One trainer explained that the collapse of the dot com economy had very little impact on the overall demand for A+ certified technicians, because they worked in multiple industries and situations. The demand for A+ training from individuals was rated as slightly stronger but also more apt to be volatile.

Increasingly, A+ certification is being sought as a means to enter computer professions rather than to validate experience of current computer technicians. Most A+ trainees work at least 30 hours a week outside the training program. However, few hold jobs that involve the regular use of computers, and even fewer have experience in computer repair and service. The typical A+ trainee appears to be a high school graduate with no additional schooling. There are A+ trainees with two-year and four-year degrees, but they are in the minority.

Despite the fact that the Workforce Investment Act has set up a system of theoretically portable vouchers for individual training, few proprietary schools target the low-income population. Two-thirds of the firms surveyed make no more than a *moderate* effort to attract low-income individuals into their A+ training programs. It is not surprising then that only nine of the 76 training providers responding to the survey estimated or knew that the majority of their A+ trainees could be considered low-income.

Has a consensus emerged about minimum educational preparation or competencies that are pre-requisites for A+ training? Survey responses describing the A+ training population and program requirements suggest that the high school diploma has emerged as the minimum academic prerequisite. Some programs also require demonstrated math competence. Interviews surfaced another, less-easily-quantified factor that is best described as the personality factor. Consistently, training providers stressed that an IT career is not for everyone.

The personality factor is as important as intelligence. "After all," one person said, "A+ demonstrates that IT work is not brain surgery – most people can do this." But according to many in the training community, not everyone has the patience, the attention span, the enjoyment of new situations and puzzles and most important, a commitment to lifelong learning. Trainers emphasize that this is not a question of intelligence or cognitive skills, but rather a matter of learning interest.

The A+ Curriculum

A+ training is widely available, and most programs can be completed in evening and weekend classes. The highly competitive training market is leading to increased differentiation between the various A+ training courses. For example, DataTrain, which designs a curriculum used extensively by A+ training programs, is considering multiple curricula. Initially, the typical A+ course included lots of theory and hands-on experience, and it was expensive – often as much as \$5,000. Today, with greater emphasis on cost competition, the cost of training has fallen and varies widely.

About 30 percent of the training providers who responded to the FutureWorks survey offer A+ training for less than \$1,000, and about thirty percent charge more than \$3,000. However, in those more expensive programs, the trainee generally pays a smaller percent of the cost, suggesting that other third party payers (employers and public or non-profit training programs) may be important customers for the more expensive, and perhaps more customized, programs.

The FutureWorks survey of training providers found that seven of ten A+ training courses require fewer than 150 hours, and the largest number are under 100 hours. Interviews revealed that those training providers who compete primarily on the basis of price have developed relatively short and inexpensive courses narrowly focused on exam preparation – cramming. These courses last 30 to 40 hours, and the cost has steadily declined until it is often under \$400. The short courses may work for the individual who has worked as a computer tech for at least six months, the original target of A+ certification. Someone seeking A+ training to enter the computer field is likely to need more instruction and especially, hands-on experience than these courses offer.

The instructor-led classroom is the predominant teaching method in nine of ten A+ training programs surveyed. Most classes are small. About forty percent have fewer than ten students and another 40 percent have between 10 and 20 students. The instructors are usually permanent faculty or staff.

Interviews with selected programs revealed an emphasis on laboratory work to reinforce classroom learning. A surprising number of students come to the A+ training programs with no hands-on computer experience. This is a change over the past few years and means that laboratory work becomes an especially important part of many training programs. One of the training programs visited, MTTC,³ has developed an A+ companion course, Benchwork Tech, to give A+ trainees more significant hands-on experience.

The lack of previous computer experience among trainees also may explain the relatively low use of the Internet as a teaching tool. The Internet is a predominant or frequently used method of instruction for fewer than ten percent of survey respondents, and only twenty percent report frequent or predominant use of software on disk or other forms of computer-based training.

³ McConnell Technology and Training Center (MTTC) is operated by Innovative Productivity, Inc., a 501(c)(3) non-profit corporation promoting economic development through industrial skills training, e-commerce, quality aspects (ISO), and technology transfer. MTTC was established in 1993 to foster high-wage job opportunities in the Kentucky mid-west region.

Employers want computer technicians with hands-on experience, but most trainees enter the A+ course without it. Although a work experience component could give trainees real-world, hands-on experience, fewer than half of the training programs ever include one. Those programs that do offer work experience most frequently described it as *unpaid temporary placement* that was included *sometimes as feasible*. Only one in four training providers reported that soft skills are a standard component of their A+ training curriculum.

Training providers appear to be protective of the A+ certification. Interviews surfaced concerns about the impact of cost competition on the A+ certification itself. If an exam cram course can prepare someone to pass the A+ certification exam without having the theoretical understanding and hands-on experience needed to decipher problems in a new situation, that will undermine the value of the A+ certification to the employer and thus to the job seeker. (CompTIA had not begun developing Authorized Quality Curriculum training products when the survey was taken.)

Training Outcomes

In the highly competitive world of A+ training, the emphasis is on passing the certification exam. Some A+ training providers offer a money back guarantee that students will pass certification tests; others allow students who fail the exam to repeat the course at no charge within a specified time period, usually six months or a year.

Survey responses are generally positive about exam pass rates. For example, three of four training providers estimated that more than half of their trainees passed the A+ certification exam within six months after completing the course. Interviews found that *estimate* is an important word in this response. Most training providers do not have hard numbers. Those training providers that are also licensed testing sites have a better idea of pass rates than do those that are not.

According to CompTIA the pass rate for all who take the A+ exam is well below 50 percent. The discrepancy between this and the training providers' estimates may reflect the positive impact of A+ training, a tendency toward optimistic estimates, or a combination of the two. One training provider suggested that only completion and placement rates be used to assess A+ training program outcomes because there is no reliable information about exam pass rates.

The A+ exam unquestionably screens people for computer careers, and some (a lot?) fall by the wayside. Failure to pass the A+ exam is often seen as a failure for the training provider as well as the trainee. Still, the perception is that the exam is doing its job, and no one interviewed suggested the exam be made easier. If possible, one recommended, the exam should be modified to do a better job of screening out people who are good test takers but lack hands-on experience.

The idea of using A+ certification to help disadvantaged people worried some training providers because they thought it might lead to pressure to lower the standards for passing or otherwise weaken the exam. This was seen as a very bad thing. Training providers seem strongly committed to a rigorous program and high expectations for performance from those who complete their programs.

A+ Training for Low-Income Individuals

Both survey and interview results support the view that A+ training and certification can provide a pathway to a good job and on to a very good job for people without strong educational credentials or previous work experience. However, administrators from programs that target low-income individuals point out that:

- A computer career is not for everyone, and the career path is there only for those willing to do the work climbing it – train, test, gain experience - over and over again.
- Selecting the appropriate training program is crucial. For some, this may mean a preparatory course before they are ready for A+ training.

Administrators at MTTTC stressed the limited appeal of a career working with computers. The MTTTC entry-level IT program – PC Essentials – reaches out to disadvantaged populations, teaches people how to use a computer and gives each graduate a free internet-ready PC to take home. Still, only a small percentage of those graduates go on to further IT training. MTTTC is developing bridge courses to facilitate the transition from PC Essentials to A+ oriented training but based upon its experience to date, does not expect that many people will choose to go on. From their point of view, A+ certification divides the committed from the non-committed.

Success or failure often rides upon selecting the appropriate training course. The market differentiation that has developed in the A+ training courses has to occur on the supply side as well. This is achieved by pre-testing students and then placing them in the appropriate type of course. Careful screening addresses the *personality factor* as well as the skills and diplomas. The trainers interviewed said that, most of all, a person has to *love* computers.

Market differentiation improves efficiency, but it also creates a snare for those who let price guide their choices or fail to consider trainee characteristics in program selection. A program can be high quality as demonstrated by positive outcomes but not be suitable for a target population that needs extra assistance. This growing segmentation and sophistication of the raining community requires that third party payers become equally sophisticated in investigating training options for their clients or employees.

For example, one of the training providers that provided additional information does a top-notch job of computer training, as demonstrated by very high exam pass and placement rates. However, its core business is training to meet the needs of the employers that subsidize its operation — not bringing low-income people into computer careers. Just as it would make little sense to put someone who barely graduated from high school into a college class with a group of top students, it would make little sense to place a disadvantaged individual in this fast-paced training program.

Individuals in low-income communities are more apt to need additional support such as help with childcare and/or transportation. IT training institutions are not in the business of delivering social services, but some refer to partners who are. Also, there is broad variation in the soft skills training that may or may not accompany the A+ oriented training.

Which "kind " of training/preparation leads to successful outcomes for target populations? Is it different from standard A+ training? There are programs that have demonstrated consistent ability to help low-income people onto the first rung of an IT

career ladder. These courses include a lot more class time, supervised laboratory time, and one-on-one attention to the individual student. Not surprisingly, that costs more.

The A+ courses that appear to work best for the typical disadvantaged student and for displaced adult workers without previous computer experience:

- are longer — the A+ oriented course would be more like 80 hours than 40 in the classroom. (Look for programs where the higher-level certification courses require more than the vendor recommended hours of class time.)
- provide one-on-one mentoring and support to students.
- include lots of hands-on experience in a laboratory where there are tutors or teaching assistants available to help out — not just access to the machines
- include soft skills — mainly communication and customer service - in their programs
- are intense – even night and/or weekend courses take more than three or four hours a week — because momentum is important to keep students from drifting away.
- provide financial assistance

Successful programs stress that especially for disadvantaged individuals, training must begin where the student is, and pre-testing is necessary to define that place. Those who are not ready for A+ training can be offered preparatory training and should not be put into A+ until they are properly prepared. Careful screening is crucial to good outcomes. To be fair – those screened out should have some access to tutoring or other help so that they might make the cut on a second try. Still, A+ is an employer-developed credential, and its function is to screen out people who lack needed skills.

Are there other skills – not covered by A+ certification – that individuals in target populations need to acquire before they can obtain the desired jobs? Only one-fourth of the A+ training programs surveyed included soft skills as part of their standard A+ training curriculum. The rest are evenly divided between those who never teach soft skills and those who teach them on an “as needed” basis. However, soft skills are an integral part of the three A+ training programs that described themselves as focusing directly on low-income individuals. The small number of training organizations focusing directly on low income workers makes it difficult to generalize, but information gathered during interviews was emphatic in support of soft skills. One trainer noted, “A+ certification opens doors, but people also need motivation, work ethic, and soft skills such as communication to move ahead.”

The soft skills most often taught within an A+ training program are described as *customer service skills*. The computer technician will work on machines, but he or she will also have to work with people, and so communication is essential. Other soft skills often taught include resume writing and problem solving. Xincon⁴ finds role playing to be an effective method of teaching soft skills, especially to younger people.

This target population may also need assistance with issues such as childcare and transportation that are not offered by computer training providers. This suggests that programs for low-income individuals be sponsored by a partnership between a training

⁴ Xincon is a for-profit computer-training provider with demonstrated success training disadvantaged individuals. Its Manhattan site began providing IT training for dislocated workers in 1999 after responding to an RFP from the City of New York (JTPA). In 1999, Xincon received the contract for the JTPA Out-of-School Youth program and in 2000 began a program for In-School Youth.

provider and human service or community development organizations. In this partnership, the training provider ideally provides communication training as well as technical skills. The human services agency provides those support services needed by individual students.

Other suggestions about what to look for in an A+ training program

- Check the curriculum – does the training course use the CompTIA Approved Quality Curriculum or some other proven approach?
- Check the teachers' backgrounds – are they both trained educators and in a position to be current with the industry?
- Check the outcomes – what are the completion and placement rates for your target population — not just the overall completion and placement rates?
- Look for good relationships with area employers, temp and placement agencies.

Survey Results

Survey Respondents

While there has been anecdotal information that A+ training offers an important point of access to information technology occupations often thought not to be accessible to low income people, there has been little hard data. To get a broad-based picture of how and to whom A+-oriented training is being delivered, as well as information about training outcomes, FutureWorks developed a detailed survey for training providers. The survey was designed to assess the extent to which training in computer repair and service, leading to an A+ certification, represents an important stepping stone toward a good job and a good career -- and particularly, if this is true for low-income individuals.

To help engage the training providers in our effort, FutureWorks partnered with CompTIA, which provided a list of about 300 members currently offering A+ training. Each was e-mailed an invitation to take the on-line survey. A follow-up e-mail from CompTIA helped raise the participation rate. Eventually 76 training providers completed the survey. Most respondents have been offering the A+ training for several years. More than a third have offered A+ training since 1997 or earlier, and half began offering it in 1998 or 1999.

The majority of the responding providers described themselves as private, for-profit companies. The others were predominantly public educational institutions, and only three were non-profit organizations. The 76 training providers included 34 multi-site and 42 stand-alone establishments. Parent organizations either responded to the survey on behalf of their total operations or sent the surveys to individual sites for them to complete. Thus, coverage was actually broader than the number of individual responses would indicate. Table 1 summarizes the information about the organizational structure of the CompTIA-certified A+ training providers that responded to the survey.

Table 1.
Description of Training Providers Responding to the A+ Survey

Which of the following best describes your organization?	private, for-profit company	private, non-profit organization	public educational institution	ALL
Ours is a branch, affiliate, or franchise of another parent body.	13	1	6	20
Ours is a parent organization with branches, affiliates, or franchises.	14	0	0	14
Ours is a single, stand-alone establishment.	32	2	8	42
TOTAL	59	3	14	76

Marketing the Training

For A+ training as for most other goods and services, the most effective marketing is through word of mouth. Some 55 percent of survey respondents reported that it *always worked well*, while another third described it as *usually helpful*. Ads in popular media, the Internet, and working through employers also are widely used marketing approaches and generally considered effective. Opinion was split about working through government agencies. At the other end of the spectrum, working through community organizations and notices in public places were either *never used* or described as *seldom fruitful* by more than half of the training providers. Table 2 summarizes respondents' evaluation of various marketing approaches.

Table 2.
Marketing A+ Training

Marketing Approach	Never used	Seldom fruitful	Usually helpful	Always works well	No Answer
Word of Mouth	1%	5%	32%	55%	7%
Radio, TV, Newspaper Ads	8%	18%	38%	29%	7%
Internet	9%	18%	46%	20%	7%
Through Employers	9%	20%	45%	20%	7%
Through Government Agencies	21%	18%	28%	26%	7%
Through Community Orgs.	24%	33%	28%	11%	5%
Notices in Public Places	33%	32%	24%	4%	8%
Other*	30%	5%	5%	9%	50%

*Direct mail, sales staff or department, and partners that do the advertising were each mentioned twice (3% of respondents)

Work Status and Experience of A+ Trainees

Survey results found that most A+ trainees hold full-time or close to full-time jobs, but not doing computer-related work. One third of training providers surveyed did not answer questions about the number of hours that trainees were working outside of class. Those who did respond reported that most trainees were working and that the majority worked more than 30 hours a week. Telephone interviews found that youth programs and displaced workers account for most A+ trainees who are not employed.

Few A+ trainees, however, hold or have held jobs that involve regular use of computers, and very few have any hands-on experience in computer service or repair. In most of the A+ training programs, the majority of trainees had no previous work experience involving the regular use of computers. Although A+ certification was originally designed to verify skills gained in about six month's experience as a computer technician, actual use is very different. Not one training provider estimated that at least three-fourths of their A+ trainees had the hands-on experience that the A+ certificate

was designed to validate. Most reported that fewer than 25 percent of trainees, the lowest choice among possible answers, had any hands-on experience. (See Table 3.)

**Table 3.
Trainees' Work Experience**

Response	Percent of providers whose trainees have work experience involving regular use of computers		Percent of providers whose trainees have hands-on experience in computer repair and service.	
	Number	Percent	Number	Percent
76-100%	11	14%	0	0%
51-75%	15	20%	4	5%
26-50%	21	28%	12	16%
25% or less	14	18%	41	54%
Don't Know	10	13%	14	18%
No Response	5	7%	5	7%
Total	76	100%	76	100%

Educational Background of Trainees

Responses to questions about the prior educational attainment of trainees indicate that the typical A+ trainee enters the program with no post-secondary education. While 17 training providers reported that more than 75 percent of their trainees had just a high school diploma or GED, only four reported that a comparable percentage of their trainees had any post secondary study. Table 4a summarizes the responses to questions asking training providers to estimate the percent of their trainees with each level of educational attainment.

**Table 4a.
Apparent Educational Attainment of Trainees**

Percent of all providers who estimate their trainees have	High School Diploma or GED	Post-secondary Study, No Degree	Two-year Degree	Four-year Degree
76-100%	17	1	1	2
51-75%	14	2	3	4
26-50%	9	23	12	3
25% or less	6	16	26	32
Don't Know	26	29	29	30
No Response	4	5	5	5
Total	76	76	76	76

Training providers are most likely to know if their trainees have a high school diploma or a GED, because that level of educational attainment is often used as an admission requirement. However, the survey suggests that many training providers do not know and do not ask about incoming trainees' post-secondary credentials. The public educational institutions that responded to this question (See Table 4b.) were no more likely than other training providers to know about the educational attainment of their trainees.

Table 4b
Apparent Educational Attainment of Trainees at Programs in Public Educational Institutions

Percent of public providers who estimate their trainees have	High School Diploma or GED	Post-secondary Study, No Degree	Two-year Degree	Four-year Degree
76-100%	2	0	0	0
51-75%	4	1	0	1
26-50%	2	3	3	0
25% or less	1	4	6	6
Don't Know	4	5	4	6
No Response	1	1	1	1
Total	14	14	14	14

Just under half, 45 percent, of the programs surveyed have formal admission standards, and eight of ten with admission standards require a high school diploma or GED. About half of the programs with admission standards also require a minimum level of math proficiency, and a third require completion of a pre-requisite course.

Admission standards are intended to ensure that people who are admitted to the A+ training course are likely to succeed. One of the programs that targets low-income individuals noted that the admission standards were often a barrier for low-income people, because many were not qualified to take the course. This program offers a separate training course for people lacking computer experience, and completion of that course would qualify an individual for A+ training.

Demand for A+ Training

The assumption entering this project was that the market for A+ training comes from individuals seeking to improve their employment situation and from employers seeking to upgrade the skills of their workforce. To provide a sense of the current market, survey respondents were asked to evaluate the current demand for A+ training from trainees and from employers and how the demand was changing. Cross tabulations of these results are shown in Tables 5a and 5b.

Individual demand for A+ training was reported as slightly stronger than the demand from employers. On a scale of one = very low to five = very high, the demand for A+

training from individuals averaged 3.4, while the demand from employers averaged 3.1. About half of the training providers reported that demand from individuals was *staying the same*, while over sixty percent described the demand from employers as *staying the same*. The majority of those who saw change saw an increase in demand.

**Table 5a.
Individual Demand For A+ Training**

Level of Demand	All Responses	Trends in Demand Level		
		Increasing	Staying the Same	Decreasing
Very Low	1		1	
Low	10		3	7
Moderate	23	7	11	5
High	31	15	14	2
Very High	5		5	
Total	70	22	34	14

**Table 5b.
Employer Demand for A+ Certified Workers**

Level of Demand	All Responses	Trends in Demand Level		
		Increasing	Staying the Same	Decreasing
Very Low	7		5	2
Low	8		3	5
Moderate	29	4	23	2
High	24	13	11	
Very High	2	1	1	
Total	70	18	43	9

The majority of training providers (45 of the 70 respondents) reported the same level of demand from both individuals and employers. Where there was a difference, it was usually because the demand from individuals was one level higher. Only six training providers assessed the demand from employers as stronger than the demand from individuals.

The A+ Training Program

Questions about the clock hours required to complete the A+ training course found that most courses are relatively short. Seven of ten require fewer than 150 hours, and the largest number take less than 100 hours. Most courses are scheduled to allow trainees to complete them during evenings or on weekends, which would appear to be necessary given that most trainees are employed. Those courses that could not be completed on evenings and weekends were found at both ends of the time requirement spectrum – the shortest courses and the longest courses. Only the private for-profit trainers reported courses requiring more than 300 hours.. (See Tables 6a, 6b, and 6c.)

Table 6a
Time Requirements and Scheduling of A+ Training Courses

Clock Hours For The A+ Training Course		Can one complete the program during evenings and weekends?			
		Almost Never	Sometimes	Usually	Always
less than 100 hours	34	5	5	9	15
100-150 hours	17	1	2	4	10
151-200 hours	7		1	3	3
201-250 hours	5			4	1
251-300 hours	4	2			2
more than 300 hours	4		1		3
Total Responses	71	8	9	20	34

Table 6b
Time Requirements and Scheduling of A+ Training Courses: Public Educational Institutions

Clock Hours For The A+ Training Course		Can one complete the program during evenings and weekends?			
		Almost Never	Sometimes	Usually	Always
less than 100 hours	4	0	0	1	3
100-150 hours	4	0	1	1	2
151-200 hours	1	0	0	0	1
201-250 hours	2	0	0	1	1
251-300 hours	2	1	0	0	1
more than 300 hours	0	N/A	N/A	N/A	N/A
Total Responses	13	1	1	3	8

Table 6c
Time Requirements and Scheduling of A+ Training Courses: for-Profit Trainers

Clock Hours For The A+ Training Course		Can one complete the program during evenings and weekends?			
		Almost Never	Sometimes	Usually	Always
less than 100 hours	30	5	5	8	12
100-150 hours	12	0	1	3	8
151-200 hours	6	0	1	3	2
201-250 hours	2	0	0	2	0
251-300 hours	1	0	0	0	1
more than 300 hours	4	0	1	0	3
Total Responses	55	5	8	16	26

For most programs, there is no degree credit for completion of the A+ course. Of the 72 training providers that responded to that question, 44 or more than 60 percent responded that they do not award degree credits, while only 16 award formal credits toward an accredited degree program. The others *sometimes* offer formal credit for successful completion of the A+ training program.

Use of computer-based instruction, was lower than expected given the course content. The *instructor-led classroom*, the predominant teaching method for A+ training, is used by 88 percent of the training providers surveyed. One-on-one tutoring was *sometimes used* by 40 percent of providers, while 29 percent sometimes use software on disk or CBT. *Other*, which was selected as the predominant method by seven percent, was divided between *hands-on instruction with an emphasis on laboratory work* and *computer-based* teaching methods Only 5 percent described the Internet as the predominant teaching method, while sixty percent never used it. (See Table 7.)

Table 7
Methods of Instruction Used for A+ Training

Method of Instruction	Pre-dominant	Frequently Used	Sometimes Used	Never Used	No Answer
Instructor-Led Classroom	88%	4%	5%	1%	1%
Other	7%	1%	1%	34%	56%
On-Line Via Internet	5%	4%	21%	60%	10%
Software On Disk, CBT	5%	14%	29%	44%	8%
Instructor-Led Distance Learning	4%	3%	12%	71%	10%
One-On-One Tutoring	3%	15%	40%	33%	10%
Videotape	3%	7%	14%	66%	10%

A+ training classes tend to be small with 40 percent of the training providers reporting fewer than ten students in an average class and another 40 percent reporting 10 to 20 students. No one reported more than 40 students per class, and only one had more than 30. Instructors at 60 percent of the sites are permanent faculty or staff, while 14 percent use adjunct faculty or staff and 10 percent use independent training providers. The remaining programs use a combination.

Survey questions regarding the A+ training curriculum asked about the inclusion of soft skills, which were defined as work readiness, communication, teamwork, problem-solving, customer relations and similar skills. The survey also asked about work experience components and any links between the A+ training and other credentials such as Network+. Responses showed that only about one-fourth of the training programs include soft skills as part of their standard A+ training curriculum. The rest are evenly divided between those who never teach soft skills and those who teach them on

an “as needed” basis. The most frequent topic of soft skills instruction was customer service, which was cited by half of the training providers that described their soft skills component. Resume writing was a distant second, followed by problem solving.

Lectures about real world experience, the corporate environment and expectations were mentioned as soft skills topics. Work experience is the most direct way to add this information, but only four of the A+ training programs reported a required work experience component. Another seven *sometimes* included work experience, and 23 included work experience when it was feasible. One program that did not include a work component recommended to students that they seek experience on their own. Most work experiences were temporary unpaid placement. Table 8 summarizes responses to questions about work experience components.

Table 8
Work Experience components in A+ Training Programs

Is There A Work Component?	All Types	Paid Internship	Paid Work Study Or Co-Op	Unpaid Temporary Placement	Other
Always	3	1		2	
Usually	7	2	1	4	
Sometimes as Feasible	24	6	3	13	2
Never	37	N/A	N/A	N/A	N/A
Total	71	9	4	19	2

Training programs increasingly advertise A+ certification bundled with other certifications, usually Network+. About one-third of the training providers reported that their A+ training course was directed at developing additional competencies. While Network+ was mentioned most often, numerous other certifications were cited. Conversations in follow-up interviews confirmed that A+ certification is only the beginning for anyone seriously interested in a computer-oriented career.

A+ Training Program Costs

The FutureWorks survey found a wide range of reported costs for A+ training, and the 70 programs that provided cost information were distributed fairly evenly across that wide range. About 30 percent of programs cost less than \$1,000, and almost 30 percent cost more than \$3,000. There are too few cases to generalize, but among the survey respondents, A+ training courses offered by the private non-profit providers were the most costly. This holds true even if you ignore the 13% of the courses that are offered by for-profits and public educational institutions for less than \$500, assuming that these may include cram courses of the type not offered by the non-profits.

The survey found no consistent relationship between clock hours for the training and the cost of the training. The most expensive courses tended to involve more clock hours than the least expensive, but the mid-priced courses involved the fewest clock hours. (See Tables 9a and 9b.)

Table 9a
Cost By Type Of Training Institution

Which of the following best describes your organization?	Cost/Trainee						No Answer
	\$500 or less	\$501-1,000	\$1,000-1,500	\$1,501-2,000	\$2,001-3,000	Over \$3,000	
Private, For-Profit Company	12%	19%	10%	15%	14%	25%	5%
Private, Non-Profit Organization	0%	0%	0%	33%	33%	33%	0%
Public Educational Institution	23%	8%	15%	8%	8%	31%	8%
Total Responding	13%	16%	11%	15%	13%	27%	5%

Table 9b
Training Costs And Clock Hours Per Course

Cost Per Trainee	All (100%)	Clock Hours per A+ Training Course					
		< 100 hours	100-150 hours	151-200 hours	201-250 hours	251-300 hours	> 300 hours
\$500 or less	10	40%	30%	10%	10%	10%	0%
\$500-\$1,000	12	50%	17%	25%	0%	0%	8%
\$1001-\$1,500	8	63%	25%	0%	13%	0%	0%
\$1501-\$2,000	10	70%	30%	0%	0%	0%	0%
\$2,001-\$3,000	10	20%	40%	20%	20%	0%	0%
Over \$3,000	20	40%	15%	10%	5%	15%	15%
Total	70	32	17	8	5	4	4

Table 10 is a cross tabulation between the cost of the course and the percent of the cost paid by trainees. It shows that the percentage paid by the trainee tends to be less for the more expensive courses. (Note: Totals for cost ranges vary because each cross tabulation uses only responses from training providers who answered both questions.)

Table 10
Cost of Training Course and Percent Paid by Trainee

Cost Per Trainee	All (100%)	Percent Of Cost Paid By Trainee			
		25% or less	26-50%	51-75%	76-100%
\$500 or less	10	10%	0%	10%	80%
\$500-\$1,000	12	8%	17%	17%	58%
\$1001-\$1,500	8	13%	0%	13%	75%
\$1501-\$2,000	11	18%	0%	36%	45%
\$2,001-\$3,000	10	20%	20%	20%	40%
Over \$3,000	19	37%	21%	0%	42%
Total	70	14	8	10	38

Two-thirds of training providers reported that *employers* contributed to training costs not paid by the trainee, and *government funding* was mentioned by almost as many. Over two-thirds of training providers said they help trainees access financial assistance, but only 11 of the 76 actually provide financial assistance themselves.

Few trainers are knowledgeable about potential funding sources. About one in four training providers responded that their trainees were eligible for federal student aid programs under the Higher Education Act, but about the same percent did not know if their training was eligible or not. The public education agencies responding were no more likely than for-profit trainers to have students receiving federal aid and no more likely to know if their programs were eligible for it. (Half the respondents reported that their A+ training program did not qualify.) Overall, Only 11 providers could estimate what percent of their trainees received federal student aid.

Training Outcomes

More than 90 percent of those who answered the question about expectations expect *all* A+ trainees to attend all sessions and complete the course. The rest expect *most* students to complete. Actual completion rates are lower. Just over 70 percent of those who responded to the question reported that more than 75 percent of their trainees completed the A+ training program. Only five programs reported that fewer than half of trainees completed the training.

Although the training is oriented toward A+ certification, only 20 percent of the A+ training programs surveyed guarantee success on the exam. Most can only estimate how well those who complete their A+ training perform on the A+ certification exam. Sixty percent report that they do not even try to track A+ exam results. Training providers that are also licensed testing sites for the A+ exam have a better sense of the percent of their completers who pass the exam, but they do not know what happens to completers who elect to take the test elsewhere.

Almost half of the training programs surveyed estimated that at least three-fourths of those who complete training also pass the certification exam within six months of completing the training. One in four estimate that fewer than half of their trainees attain A+ certification within that time; CompTIA’s data suggest that this is a more likely result. The completion and estimated exam pass rates in Table 11 show that programs with the highest rates of completion also report higher pass rates on the A+ certification exam.

**Table 11
Completion and Exam Pass Rates**

Percent Of Trainees Who Complete Training	Percent Of Completers Who Pass The Exam			
	25% or less	26-50%	51-75%	76-100%
25% or less	1	1		
26-50%	4	1	1	2
51-75%	14	3	6	5
76-100%	44	2	4	11
Total	63	7	10	17

Additional information about outcomes is even harder to assess, because most training programs collect and maintain relatively little information about trainees after they complete the program. Sixty percent describe the information they collect about the job experience and earnings of program completers as *incomplete* or *very incomplete*. No one describes it as *very comprehensive*. Thirty percent of the training providers surveyed routinely provide job placement services to those who complete the training program, and another 30 percent provide placement assistance *under certain circumstances*.

Of the 76 training providers who responded to the survey, only 61 answered the question about post-training salaries. More than 80 percent estimated starting salaries for those who complete training and pass the A+ certification exam as between \$20,000 and \$30,000, with slightly more in the lower half of the range. These estimates are based upon market knowledge as well as information about trainees' actual experience.

Training providers were asked to assess the impact of several factors upon whether or not the trainee completed the course. Possible ratings ranged from 1 = unimportant to 5 = critical. Apparently, training providers believe that the most important factor affecting trainee performance is the quality of the instructor. The second and third ranked factors are the convenience of scheduling classes and the personal attention given the trainee. The next two refer to the previous work and educational experience of the trainee, and the only other factor ranked above three, the mid-point, is the involvement of area employers in the program. The age of the trainee was given the least importance of the listed factors. The results are summarized in Table 12.

Table 12
Impact Upon Completion Rates

Factor Associated With Completion	Average Ranking
Technical Competence Of The Instructors	4.83
Scheduling Classes To Permit Full-Time Work	3.65
Providing Mentoring Or Other Personal Attention	3.37
Previous Work Experience Of Trainee	3.33
Previous Educational Level Of Trainee	3.29
Involvement Of Area Employers In The Program	3.20
Financial Aid (To Reduce Dropping Out)	2.97
Building In A Work Experience Component To Program	2.88
Rigorous Admission Standards And Skill Assessments	2.75
Partnering With Community-Based Organizations	2.74
Soft Skill Training	2.74
Current Employment Status Of Trainee	2.47
Age Of Trainee	2.03

Reaching Low-Income Communities and Individuals

A focus of this research effort is the effectiveness of A+ training as a tool to help disadvantaged populations, represented by low-income individuals, get a good job with prospects for advancement. While programs to assist disadvantaged individuals see information technology as a potential career path, survey results indicate that targeting low-income individuals is not a high priority for most of the training community. Two-thirds of those surveyed either make no effort or just a moderate effort to recruit low-income individuals into their A+ training program. (See Table 13.) A written comment, which was echoed in later interviews, expressed concern about the possibility of A+ training programs designed specifically for disadvantaged populations diluting the value of the A+ credential or creating a stigma in the eyes of employers.

Table 13
Marketing To Low-Income Individuals
By Type Of Training Institution

Which of the following best describes your organization?		Do You Market to Low-Income Individuals?			
		Our marketing and recruitment efforts do not target low-income individuals ...	We make only moderate efforts to recruit low-income people into our A+ oriented training programs.	While not exclusively targeted to low-income groups, we do significant outreach in low-income communities ...	We focus our training very directly on low-income communities and people.
Private, for-profit company	56	43%	23%	30%	4%
Private Non-Profit Organization	3	0%	33%	33%	33%
Public Educational Institution.	14	50%	36%	14%	0%
Total Responding	73	42%	26%	27%	4%

Because of the small number, survey responses can provide only limited insight about the impacts of A+ training on low-income individuals' economic status. The cross tabulation in Table 13a shows that just 14 of the 76 survey respondents both target low-income individuals and can estimate income levels of their trainees. As might be expected, training providers targeting the low-income market are more likely to gather this information.

Few training providers either market specifically to the low-income market or know if low-income individuals are attracted by their marketing efforts. However, significant or focused efforts to attract low-income individuals appear to have a positive impact, and the most targeted efforts report the most positive results. An exception was a single provider that was totally negative about the outcome of marketing to low-income

individuals despite making a significant effort to reach the low-income community. (See Table 13b.)

**Table 13a
Targeting A+ Training to Low-Income Individuals**

Do you market to or recruit low-income individuals?		Do you know or are you in a position to estimate the income levels of your participants/trainees?	
		No	Yes
Our marketing and recruitment efforts do not target low-income individuals and we have little knowledge of the economic status of the candidates who come to us.	31	24	7
We make only moderate efforts to recruit low-income people into our A+ oriented training programs.	19	11	8
While not exclusively targeted to low-income groups, we do significant outreach in low-income communities and work with government agencies and other organizations that will help us find candidates from low-income levels.	20	8	12
We focus our training very directly on low-income communities and people.	3	1	2
Total	73	44	29

**Table 13b
Success in Marketing to Low-Income Individuals
By Extent of Marketing Efforts**

Do you market to or recruit low-income individuals?		Have you successfully recruited low-income trainees?			
		Yes	Mixed Results	No	Don't Know
Our marketing and recruitment efforts do not target low-income individuals and we have little knowledge of the economic status of the candidates who come to us.	31	1	3		27
We make only moderate efforts to recruit low-income people into our A+ oriented training programs.	19	2	14		3
While not exclusively targeted to low-income groups, we do significant outreach in low-income communities and work with government agencies and other organizations that will help us find candidates from low-income levels.	20	10	7	1	2
We focus our training very directly on low-income communities and people.	3	2	1		
Total Responding	73	15	25	1	32

Although focusing on the low-income market appears to produce positive results, few A+ training programs do so. Currently, low-income individuals are not the primary market for A+ training. Most training providers who knew or could estimate trainee incomes reported that 25 percent or fewer were low-income individuals. Most programs making a significant effort but not exclusively targeting the low-income community report that fewer than half of trainees can be described as low-income. Only the three programs that focused directly on serving the low-income community reported that at least three-fourths of trainees were low-income individuals. (See Table 14.)

Table 14
Percent of Low-Income Trainees
By Extent of Marketing Efforts

Do you market to or recruit low-income individuals?		Percent Of Trainees Who Are Low-Income				
		25% Or Less	26-50%	51-75%	76-100%	Don't Know
Our marketing and recruitment efforts do not target low-income individuals and we have little knowledge of the economic status of the candidates who come to us.	31	4	3			24
We make only moderate efforts to recruit low-income people into our A+ oriented training programs.	19	10	2	1	1	5
While not exclusively targeted to low-income groups, we do significant outreach in low-income communities and work with government agencies and other organizations that will help us find candidates from low-income levels.	20	5	9	4		2
We focus our training very directly on low-income communities and people.	3				3	
Total Responding	73	19	14	5	4	31

Some Summary Judgements About Training Programs Targeted To Low-Income Individuals

Survey results for the 23 training providers that targeted or did outreach in the low-income community show some differences between that group and the other survey respondents, but the numbers are too small to serve as a basis for generalization. Still, they are useful as descriptive information.

Some differences are what one would assume; for example, trainees in the low-income friendly programs are less likely to have either post-secondary education or work experience involving computers. Other differences are less predictable; for example, a higher proportion of these training programs (a) require a GED or high school diploma and (b) award formal credits toward an accredited degree program.

Although there was no clear difference in the number of clock hours required for the low-income friendly A+ training courses, a larger proportion have embedded soft skills training and work experience. These programs also tend to cost more, but the trainee pays a smaller percent of that cost. The assessment of demand for training is higher – both demand from individuals and demand from employers – than among programs not targeting low-income individuals.

For several topics, the answers from programs targeting low-income individuals were essentially the same as the answers for and all programs; for example, teaching methods. Instructor-led classrooms predominate, and training providers place the highest value on the technical competence of the instructor. However, mentoring and other personal attention are more likely to be mentioned as contributing to successful outcomes for these programs. All programs in this group reported that they expect all trainees to complete the program.

As noted previously, few training providers gather information about the employment or salary of trainees who complete their programs. Without that information, it is hard to evaluate the impact of the A+ training on low-income individuals. A higher percent of the low-income friendly training programs try to track the A+ exam results of their trainees. Their reported results are slightly less positive, but this may reflect more accurate information rather than an impact from different trainee characteristics.

When asked if low-income individuals were harder to place equal and small numbers of training providers answered yes or no. A large majority, almost 80 percent, said they were unable to assess this or did not answer the question. When asked about their broad experience in training low-income individuals, two-thirds of providers surveyed either did not answer or responded that they could not judge. Among those who did respond, two of three reported that low-income individuals completed the program, passed the exam, and got a good job. Thus, the answer to our initial question about whether or not A+ training offers low-income individuals a pathway to a good job is *probably, yes*.

Profiles of Selected A+ Training Programs

Selection Process

Information from survey responses directed FutureWorks to those training programs most likely to have insights into the efficacy of using A+ training to help low-income individuals embark on a promising career path. A four-step screening process began by eliminating from further consideration those that in no way target the low-income community.

The second screen eliminated those respondents who reported no knowledge of trainee income levels. The third screen used the combined responses to questions about information gathering; that is, does the training provider track A+ exam results and post-training employment of individuals who complete the A+ training. The final screen looked at when A+ training began. Programs in operation for less than a year were dropped from consideration.

The programs that survived the screens were contacted and most agreed to cooperate. The following profiles describe A+ -oriented training programs at:

- The McConnell Technology and Training Center (Louisville, KY)
- Xincon, Inc. (New York City);
- Corning (NY) Community College – a site of the DataTrain Institute Academic Alliance Program;
- The New Technology Center Network Training Institute, (Rahway, NJ); and
- The Katharine Gibbs School, Computer Technical Support Certificate Program (Melville, Long Island , NY).

The profiles use information from program web sites and literature, telephone interviews with program staff and for the first two listed programs, site visits that included personal interviews with trainees as well as program staff.

McCONNELL TECHNOLOGY AND TRAINING CENTER

Background

McConnell Technology and Training Center (MTTC) is operated by Innovative Productivity, Inc., a 501(c)(3) non-profit corporation promoting economic development. MTTC was established in 1993 to foster high-wage job opportunities in the Kentucky mid-west region, where it serves small businesses and individuals. MTTC offers quality and ISO 9000 training and consulting, advanced manufacturing skills training and selected management training as well as the computer-related training to prepare displaced workers for new jobs, which is the focus of this profile. MTTC also promotes technology transfer and has a contract with the US Navy to find, test, and implement technology solutions for costly maintenance problems.

In the mid 1990s, MTTC management became aware of the likely increase in computer-related employment associated with the expanding UPS hub and asked Louisville employers about qualifications for their unfilled IT jobs. The most common response was that applicants should have an associate degree in electronics, but few employers could articulate the skills needed. MTTC staff investigated alternatives with shorter training time, and adopted training for industry standards as defined by the A+ certification as their strategy. MTTC is Kentucky's only stand-alone A+ training provider approved by CompTIA. It has been offering A+-oriented training since 1996.

There continues to be strong local demand for computer technicians. As projected, UPS has attracted several 'end-of-the-runway' computer repair firms to Louisville, and other have started-up. In addition, UPS has opened its own computer repair business, UPS Logistics. MTTC's original focus on IT training for displaced workers has broadened, and today MTTC seeks to increase the work skills of the local labor force to meet employers' needs for tech workers.

A+ certification is seen as a good strategy for both job seeker and employer. It allows the employers to screen for a minimum level of skills. For the job-seeker, A+ certification is difficult but not beyond most people's capability, and so people learn that you do not have to be a rocket scientist to succeed in the IT industry.

A+ Computer Repair is offered monthly. The day course meets for two weeks, Monday through Friday, 8:00 A.M. - 5:00 P.M. The evening course meets for five weeks, Monday through Thursday, 5:30 P.M. - 9:30 P.M. The classes are instructor-led and held at the MTTC computer lab in the Technology Park of Greater Louisville. Both day and evening versions of the A+ Computer Repair Course cost \$1,995 (If taken separately, the A+ Hardware Module and the A+ Operating Systems Module cost \$1,095 each.) Course costs include all textbooks, workbooks, tools, lab use, and materials. Fees are based upon cost recovery, and discounts are available for multiple course registrations. A student can drop out and receive a full refund within the first 16 hours of A+ class.

Several proprietary training providers in Louisville offer A+-oriented training courses at costs comparable to the MTTC courses. However, most are shorter (about 40 hours), aimed at people already working in the field, and tightly focused on A+ exam preparation for computer technicians with about six months of on-the-job experience. Because

MTTC serves a broader market and seeks to expand the IT workforce, its A+ course niche is defined by extensive hands-on experience and more intensive training suitable for people who start with more limited IT work experience.

Curriculum

The A+ Computer Repair Course is the entry-level course for MTTC's IT career training. It consists of a 40-hour A+ Hardware Module that prepares students for the CompTIA A+ certification Core Technologies Exam and a 40-hour A+ Operating Systems Module for MS Windows that prepares students for the CompTIA A+ certification Operating System (OS) Technologies Exam.

The original instructor for the MTTC A+ training modified an IT training curriculum he had used in Oak Ridge, but today MTTC uses DataTrain courseware for A+ OS Tech and A+ Core Hardware. In addition, each student receives a copy of All in One by Mike Myers, and students are directed to A+ study sites on the web. The rapid pace of change in IT skills and knowledge makes using externally developed software an efficient way to keep the training current.

A+ graduates are strongly encouraged to gain additional experience in MTTC's Benchwork Tech Program before taking the certification exam. Benchwork Tech comprises 160 hours in the MTTC computer lab. Under the supervision of an A+-certified instructor, students troubleshoot, test, diagnose, repair, and upgrade personal computers from 10 to 15 different manufacturers that have been donated to MTTC by businesses and individuals.

The Benchwork Tech final exam consists of a box of parts – some that work, some that don't, and some that are superfluous. Among the parts in the box are those needed to build a computer, load the operating system, install Internet access, and connect to the Internet. The student has four hours to accomplish that and then demonstrate success by sending an e-mail to the instructor.

Although Benchwork Tech costs an additional \$750 (\$1,000 is the stand-alone price), it is a popular add-on for graduate of the A+ Computer Repair Course, most of whom want more hands-on experience before taking the A+ exam. Students who complete Benchwork Tech receive a certificate of completion, letter of reference, and a skills checklist. They may opt to take the MTTC Certified Technician Exam, a performance-based, practical exam that focuses on PC hardware. Employers and students both cite the Benchwork Tech class as a positive aspect of the MTTC A+ training program, ensuring that the graduate has needed practical experience.

At the time of the site visit, MTTC was considering modifications to its A+ training and Benchwork Tech courses that would integrate them further and provide hands-on experience before as well as after the A+ training. Under the proposed modification, a student would take 40 hours of Benchwork Tech before the A+ training courses and then the remaining 80 hours of Benchwork Tech after completing A+ training. This modification would be especially helpful to those students with relatively little computer experience.

Although it is entry-level for MTTC IT career training, the A+ Computer Repair course is not for individuals without computer experience. MTTC interviews candidates to learn

about their experience and motivation and also requires candidates to take a pre-test before registering for the A+ training. Students interviewed for this profile stressed that the interviews were searching. Staff made it clear that MTTC did not want students to waste money and time on a course for which they were not prepared.

For the computer novice, MTTC offers a series of PC training courses intended to bridge the digital divide. PC Essentials is a three-hour, class that teaches how to set up a PC with peripherals, use Windows95 and word processing, send and receive e-mail, access and browse the Internet. Each student uses a Pentium-based PC that was donated to MTTC and refurbished by the Benchwork Tech classes. At the end of the classes, the student takes the computer home.⁵ Training and computer cost \$350, which is the cost recovery price for MTTC. The PC Essentials course is offered at MTTC in Louisville and in Lexington as part of the KTAP (TANF) training.

For PC Essentials graduates who wish to gain more skills, MTTC has begun offering follow-on courses. PC Tune-Up teaches system management and upkeep, Intermediate Internet teaches additional techniques for on-line research and activities, and PC Repair teaches just that. This set of courses can equip the novice who discovers an aptitude for computing in a PC Essentials class with additional skills and provide the bridge to the IT career courses, beginning with A+ preparation.

For those who want to go beyond A+, MTTC's IT career training also includes Network Fundamentals, Network+ Preparation, and Server+ Foundations. Each course is 40 hours long. Students may enroll for a single course or for a reduced-rate package. Unlike most training providers, MTTC does not offer training oriented toward the higher level certifications. The higher level, more expensive certification training is probably a financial necessity among for-profit providers, but continued Navy funding for other work allows MTTC to specialize in entry-level computer skills and set fees on a cost recovery basis.

Because the computer technician must be able to communicate with people, soft skills such as customer relations strategies are an integral part of the A+-oriented training curriculum. Instructors include internal staff and "visiting professors" from technical staffing companies. A second focus is on helping the students prepare themselves for the job market. It covers resume writing and interview skills. Seminars with employers are especially useful for students from disadvantaged backgrounds because they are less likely to know how to network with other IT workers and with employers.

Customers

The MTTC IT training program seeks to align the skills of available workers with employer needs. Thus, both students and employers are customers. Private firms such as UPS send employees to take the A+-oriented training so that they can advance within the company. Social service agencies are also customers. Vocational Rehabilitation, Veterans' Administration, and Refugee Service programs are among sponsors of students in the A+-oriented courses. A recent influx of students was financed by the H1-

⁵ Students receive an Internet ready, refurbished Windows95-based, Pentium personal computer with 16 megabytes of RAM, color monitor, keyboard, mouse, high speed CD-ROM, and 56k modem. The computer is configured for a free Internet access provider.

B grant awarded to the Louisville Workforce Investment Board. While not specifically targeted at low-income or disadvantaged individuals, the MTTC IT training makes significant efforts to reach those individuals and in doing so, to expand the technically-skilled labor force in Louisville. Outreach to low-income individuals is enhanced through partnerships with community-based organizations.

The barriers that impede successful participation by low-income and disadvantaged individuals in A+ training and certification are both experiential and financial. MTTC is addressing the experiential barriers not only with its additional hours and "hands-on" emphasis in the A+-oriented courses, but also with the course series for computer novices that builds a bridge to the A+-oriented courses.

Financial barriers are overcome when an individual is sponsored - by a government or private program or by an employer. Most sponsoring agencies require clients to visit at least three training providers before enrolling in a training program. The intensive hands-on approach makes MTTC's courses attractive to these clients.

Highly motivated individuals without sponsors usually find a way to finance their training. Several years ago, MTTC set up an internal, interest-free loan program but discontinued it due to the high administrative burden of collection activities. Now, MTTC helps students access the unsecured loans available for short-term IT training from Sallie Mae and Key Education Resources. But there are still individuals who fall through the cracks - usually because they fail to access funding sources that may be available to them.

Outcomes

About 50 people completed the A+ Computer Repair course in 2000. The number of graduates is expected to reach 75 in 2001. Almost all who start the training complete it. Of the 430 people who have gone begun the training program since its inception, only three have not completed the course. The extraordinarily high (99+ percent) completion rate reflects the intensive scrutiny given A+ training candidates and the commitment to be sure students are prepared to succeed.

The second level desired outcome is A+ certification. MTTC seeks to track its graduates and to get feedback on test experiences that will guide program improvements. The high mobility of IT workers can make this difficult. Moreover, all graduates are tested elsewhere because there is no on-site test facility.

MTTC only knows test outcomes when the students choose to tell them. To encourage reporting, students are sent mailings with enclosed post cards to return, asking about their certification exam experience. If there is no response, MTTC sends e-mails to the students. Efforts to gain graduate cooperation with tracking include plaques on classroom walls with the names of people who have passed the A+ and/or Net+ certification tests. MTTC can document that 64, 15 percent, of course completers have been certified but estimates that, in fact, half to three-fourths of the individuals who complete the training gain A+ certification within six months of graduation.

The final desired outcome of employment is easier to track. Although MTTC does not have a placement office, staff provides students with information about job searching - especially on-line - and work with area employers and placement agencies. Graduates are easily placed, especially the displaced workers who have an employment history.

Companies call and ask MTTC to refer their graduates. Employers who hire MTTC A+ training graduates include computer repair companies - including UPS Logistics, technical staffing firms, and computer users such as the Louisville Board of Realtors. A very few of the graduates have taken the entrepreneurial route and started their own computer service company.

Employers are receptive to non-traditional employees as long as the job candidates have the A+ certification and hands-on experience working with computers. Three years ago, local employers viewed A+ certification as a positive addition to an applicant's qualifications, but today it is almost a necessity for working on computers and meeting the conditions of manufacturers' warranties. Some firms will hire individuals with the training even if they have not yet passed the A+ certification exam, but an estimated 85 percent of these employers require A+ certification for entry-level IT workers.

Not all graduates are in the job market. Some evening A+ class graduates cannot afford to take the cut in pay that accompanies a career switch and starting over at an entry level. These people are encouraged to use temp work and volunteering to build an IT experience base and resume so that they can qualify for higher than entry-level jobs. Others find it a path to greater prosperity. An outstanding example is an ex-janitor who is now a network administrator for a Fortune 500 company.

As a non-profit with outside funding, MTTC and its staff may "go the extra mile" to help students succeed, and this contributes to positive outcomes. For example, a recent class of Bosnian refugees sponsored by Catholic Charities completed both the A+ Computer Repair and the Benchmark courses, but most of the students were reluctant to take the A+ certification exam. The instructor volunteered to conduct free Friday night study sessions to help these students gain the confidence they needed.

Lessons Learned

- Hands-on training is most effective
- IT training courses should have pre-admission assessment to ensure appropriate placement – and to be sure students are motivated
- A+ certification opens doors, but people also need motivation, work ethic, and "soft" skills such as communication to move ahead.
- IT offers career opportunities and well-paying jobs, but it is not the industry for everyone. An IT career path requires a commitment to lifelong learning, which translates in practical terms to constant retraining and tests for new certifications. Some people thrive on this; others hate it.

XINCON TECHNOLOGY SCHOOL

Background

Xincon Technology Inc. was founded in 1993 as a for-profit corporation providing computer-related training. Currently, there are three locations - New York City (Manhattan), Edison, NJ and Toronto, Canada. The Xincon Technology School facility in midtown Manhattan has 15 classrooms and a lab plus a Prometric Testing Center where students can take certification tests on site.

Xincon stresses staff quality and preparation. Instructors are expected to maintain current skills and are given training opportunities. Instructors are vendor-certified. Most also work in IT companies, which allows them to bring real work experience to the classroom. Xincon is registered by The New York State Education Department. In addition to being certified by CompTIA as an A+ and Network+ service center, Xincon is a Microsoft Certified Technical Education Center, a Certified Internet Webmaster (CIW) authorized training provider, an International Webmasters Association (IWA) authorized training facility, a Prosoft authorized training center, and approved for training by VESID.

Xincon began providing IT training for dislocated workers in 1999 after responding to an RFP from the City of New York (JTPA). In 1999, Xincon received the contract for the JTPA Out-of-School Youth program and in 2000 began a program for In-School Youth. All Xincon IT training is oriented toward certification and is not for academic credit. However, youth programs include work toward a GED for those without any high school diploma.

Xincon A+-oriented training focuses on the knowledge and skills required for entry-level employment performing computer applications, programming and support services - not necessarily a job in the IT industry. However, because A+-oriented training is seen as the foundation for an IT career - in either software or hardware - all Xincon IT training programs begin with the A+-oriented training.

Curriculum

The Xincon A+ training can be taken on a stand-alone basis, but usually it is the initial and the only required element of a three-month IT training program that also includes electives in Microsoft Office Software or in Cisco or Unix systems. Xincon has developed its own A+ curriculum, using lesson plans and other materials provided by CompTIA plus in-house expertise.

The Xincon A+ curriculum is designed for students with limited computer knowledge and experience. It is offered in two versions, 72 hours or 126 hours. A student is placed in the long or short versions, depending upon their skills and experience and results of the TABE math and reading tests. Neither version is an exam prep course for individuals working in the industry and seeking certification to validate their experience. Still, some program participants require preparatory work before taking even the longer version.

Both versions of the A+ training curriculum include theory as well as skills so that graduates will have the capability to apply their knowledge in varied situations. A mid-term exam identifies students who need extra help. There is also a final exam, separate from the A+ certification exam. The standard 72-hour course takes six weeks to

complete and is offered from six to nine PM Monday through Thursday or from ten to four-thirty Saturday and Sunday.

Xincon emphasizes hands-on training as part of the classroom experience, and students also have free access to fully-equipped labs, which are open from nine to nine during the week and nine to six on week-ends. While the training program lasts three-months, laboratory access extends for six months to allow graduates to prepare for certification exams and brush up on skills.

Internships for youth program participants provide additional hands-on experience. Xincon hires some students as interns for its consulting programs and places others through a job bank and with local government agencies. For example, a consulting project with the New York Department of Transportation employed five Xincon interns. Although DOT concluded after an initial interview that one of the five did not have the needed skill level and did not hire that one, DOT considers the project a success and would contract with Xincon again under the same conditions.

Courses are offered in daytime, evening, and weekend sessions to accommodate diverse student needs. Most courses, including the long and short A+ classes, are taught in classrooms. (Only more advanced web-oriented courses are offered on-line.) Students use software available in the library and laboratory work to reinforce the classroom learning.

Xincon A+ training includes soft skills. Placement department staff members teach students how to presents themselves in person and on resumes. Forty hours of job readiness training ensures that graduates know how to search for jobs – especially on-line – and how to dress and behave in business situations. The Xincon training environment reinforces soft skills training with strict standards for student dress and behavior. Entering students are given an identification badge, replicating the conditions of most IT employment, which gives them access to labs and classrooms.

Xincon has found role-playing to be an effective teaching method for soft skills in youth programs. During orientation, the faculty put on skits that demonstrate appropriate and inappropriate behaviors, and then ask the students to talk about which is “right” and why. Later, students role play the interview process.

The Xincon A+ curriculum also emphasizes that A+ certification is just the first step on an IT career path which will require continuing education and additional certifications. The A+ training seeks to build the resources and skills for future self-learning, which are necessary for a successful IT career. In addition to it's A+ course, Xincon offers training to prepare for CompTIA's Network + exam, for Microsoft MCSE, MCSD, and MCDBA certifications, for Cisco's Certified Network Associate (CCNA) and Certified Network Professional (CCNP). There are also courses for software programs such as Microsoft Office.

Many of the higher-level courses train for web-related certifications. These include the IWA Certified Web Professional program, which includes seven specialized certification tracks, the CIW certifications, and the Cisco Certified Internetwork Expert (CCIE). The Xincon web site lists the full range of courses offered, which may vary slightly from semester to semester.

Customers

Xincon provides training, consultation, and services to corporations and government programs as well as training for individuals and for dislocated workers and youth being sponsored through WIA. Customers for A+ training include individual students, displaced workers, participants in the Out-of-School Youth Program and a new In-School Youth Program, as well as the sponsoring agencies. In 2000, Xincon provided A+-oriented training to well over 500 individuals. Of these 200 were dislocated workers, 259 were in WIA youth programs, and the rest were individual students not sponsored by government programs.

Xincon requires IT trainees – except the in-school youth - to have a high school diploma or a GED plus language and math proficiency as demonstrated by achieving level A on the TABE tests. Out-of-school youth without a GED are helped to get one before they start the A+ training, and there is tutoring available for those who fail to get the required A level on the TABE tests. Although the combination of requirements has been a barrier to participation for some low-income and disadvantaged individuals, it is not considered a problem. The tests and course requirements are doing their job of weeding out those candidates who are not prepared to succeed in an A+ training course.

Non-academic barriers to successful participation range from drug use to pregnancy and childcare responsibilities and language barriers. In these cases, Xincon provides informal counseling. Case managers refer students to the appropriate agencies for the needed help. The WIA-sponsored youth programs offered unique challenges in terms of keeping the students engaged as well as in overcoming other barriers. These training programs were held during weekdays, and Xincon found that offering lunch was an important addition for half the students who might otherwise have had to skip the meal. Adding “fun events” to the curriculum helped keep students engaged. Xincon staff spent significant time addressing the special needs of these students.

Clearly, the customers for Xincon A+ training are diverse in terms of age, experience, social and cultural background, and reasons for enrolling. An Out-of-School Youth program participant interviewed for this profile enrolled in Xincon because he was at loose ends, unemployed after leaving college at the end of the second semester, and the training was “free.” Another graduate interviewed, a displaced worker who was laid off after 30 years with one company, chose Xincon because he felt comfortable in the learning environment, which is more structured and more like an actual work environment than others he saw. Both were highly satisfied with the training and have recommended Xincon to others.

Outcomes

The first desired outcome is successful completion of the training course. About three-fourths of Xincon students who begin the A+ training complete it satisfactorily. The Title II Youth Program reported an 80 percent completion rate for fiscal year 1999-2000. A graduation ceremony with special recognition for the best students recognizes this outcome. Instructors grade students based on class participation, test results, practical assignments and projects. Students who do not have a grade of 65% or better at midpoint are placed on probation and helped with remediation at no additional charge. In addition, Xincon Technology School has a policy permitting students to repeat all or part of a course without additional charge.

Some 25 percent of Xincon graduates take the certification exam at Xincon and pass within 6 months of graduation. The certification exam experience of most of the other 75 percent of graduates is not known. Graduates may take the test at other locations. Unless they choose to tell Xincon about their certifications, there is no way for the school to learn the results. To encourage students to report their certifications, Xincon displays a plaque with the names of students who have achieved A+ certification.

Both students interviewed for this project had achieved A+ certification. The college dropout is returning to college equipped with both A+ certification and the experience of working as a paid intern on a computer consulting contract. He plans to pursue a computer science degree and to take additional certification classes at Xincon. The displaced worker is interning as a laboratory instructor at Xincon. Although he is earning only half his previous salary, he expects to pursue more certifications and attain his previous salary level within the next few years.

A job is the final desired outcome and is easier to track than certification exam results. Xincon emphasizes placement, tracks graduates for two years, and provides lifelong placement assistance to graduates who have completed at least two courses and achieved at least one certification. Placement department staff is given targets. Exceeding the target leads to bonuses, but failing to meet successive targets can lead to dismissal. In addition, all Xincon professional and management staff support placement activities. The result is placement and retention rates well above average.

Placement rates for the publicly funded programs have exceeded contract expectations, which themselves exceeded average results for other training providers. When Xincon described an 85 percent placement rate target in its initial dislocated worker proposal, city officials were skeptical because the average placement rate for their dislocated worker training programs was about 60 percent. The actual outcome was that 90 percent of the 200 displaced workers who went through the A+ training course at Xincon in 2000 were placed in new jobs. About 80 percent of placements for A+ graduates are as computer technicians.

The JTPA and then WIA-financed training set minimum salaries, currently placement at \$11 or more per hour. Actual placement salaries ranged from \$15 per hour to \$100,000 per year (about \$200/hour). The latter was for an individual who had a strong software background and just needed to get hardware training. The youth program internships and placements have been for lower wages - \$10 to \$12/hour – but also have exceeded the minimum salary requirement. Graduates are placed in computer industry firms such as Staples or RFI Consultants and in IT-user industries such as health care and even local government. Xincon has hired some of its own graduates as tutors and as consultants.

Lessons Learned

- An IT career is not for everyone, and so it is important to screen applicants with more than tests. Important questions are: Do you like computers? Do you like to learn new things? Do you like to work hands-on?

- Training must begin where the student is – pre-testing identifies that point. Those who are not ready for A+ should be offered preparatory training and not put into A+ training until they are properly prepared.
- Two keys to successful outcomes for disadvantaged individuals are (1) high quality teaching that not only conveys information but also motivates students and (2) hands on training – lots of hands-on experience working on computers.
- Good instructors are very important and so are tutors to back up instructors – especially in the labs

To the observer, it appears that one of the keys to the Xincon success story is that this training program builds in high standards for behavior and learning along with a lot of one-on-one attention to help students meet those standards.

What Should Funders Look For In An A+ Program?

Xincon staff were asked what a funding entity or potential student should look for in an A+ training program. The responses are summarized below.

- Check the curriculum – does the training course use the CompTIA lesson plans or some other proven approach?
- Check the teachers' backgrounds – are they both trained educators and in a position to be current with the industry?
- Check the outcomes – the completion and placement rates. (Pass rates are really not reliable due to lack of information.)
- Are there good relationships with area employers, temp and placement agencies?

DATATRIN INSTITUTE

Background

DataTrain Institute (DTI), one of the largest IT training providers in the U.S., was established in New York City in 1995. That same year, it began the Academic Alliance Program, a training partnership with community colleges. The community college provides the location, hardware and some administrative support. DTI provides the instructor, teaching materials and marketing. DTI has offered A+-oriented training through the Academic Alliance since its inception.

The Alliance involves some 30 community colleges nationwide, including Corning and Hudson Valley Community Colleges in upstate New York. Originally, A+ training classes were offered Monday through Friday from nine to five, which worked for dislocated workers. An early adjustment was to make the training accessible to working people by scheduling evening classes. Classes are relatively small - eight to 16 students.

Curriculum

The initial DTI A+ training course required 264 classroom hours and was taught in 10-week blocks four times a year at participating community colleges. This course began with the assumption that incoming students had not used computers. Course work included extensive reading and hands-on laboratory time to reinforce the classroom learning. By the end of the course, the student should have the equivalent skills and understanding of a good entry-level technician with six months of industry experience. The DTI A+-oriented curriculum is being changed in response to the following market changes:

- Reduced demand due to competition from shorter, cheaper courses.
- Increasingly, people are looking for the A+ credential in combination with others, usually Net+, which is taught in a separate course.
- As computer skills become more common in the population, students are coming in with more varied computer proficiencies.

DTI has begun experimenting with shorter course times, using pre-test to assess incoming students' skills. Those who already have a level of computer competency can be assigned to shorter, less-expensive classes. E learning is another lower-cost instruction technique that works for some students. However, those with limited or no computer skills are still best served by the longer and more expensive course.

To help students figure out what course is appropriate, DTI developed the CertBlaster skills test, which points out areas of weakness and suggests remediation. CertBlaster is on-line and can be downloaded to the individual's computer. When CertBlaster is installed on a PC with Internet capabilities, it prompts the user to explore pre-identified supplemental resources on the Internet.

In addition to the A+-oriented training, DTI offers training for Network + Certification, the Certified Network Systems Technician track (CNST), Microsoft Certified System Engineer (MCSE), the Web-Site Developer's Certification (WEB+) and specialty certifications such as CSS for customer satisfaction skills and CPT for printer support skills. DTI courses include soft skills geared toward customer service. The student learns how to communicate. The focus is on how to listen and understand the person

describing their problem and on how to handle people who are angry or upset due to their computer problem.

Customers

DTI and the Academic Alliance originally trained displaced workers from other industries for jobs in the computer industry. Customers included JTPA agencies, as well as individuals and employers. Over time, the market has broadened to include employers and people already employed in the IT industry. The community college partners are also customers. DTI contracts with them to provide the A+ training package at a negotiated price. The community college then sets the fees it charges students.

DTI training materials, including the A+ training package, are offered for use outside the DTI Academic Alliance Program, which expands the potential customer base to include other training programs. The packages include DTI instructional material - instructors' guides, lesson plans and slides for use with the DTI courseware - as well as the CertBlaster self-test.

Outcomes

Most graduates of the standard DTI A+ training pass the certification exam on the first attempt. The goal is a pass rate of 80 percent or better. To achieve this, the DTI curriculum calls for five assessment tests to be administered during the training period. Test results help the instructors identify problems early enough to take corrective action. Although there is neither a guarantee that graduates will pass the certification exam nor a free re-take, the DTI instructor is available to review trouble areas and provide one-on-one remediation counseling to those who fail.

DTI has found that student income levels are less important than individual motivation in determining outcomes. This is especially true for courses that assume no computer knowledge. However, as courses become shorter and require more prior knowledge, student background becomes more important.

The DTI web-site reports that nationwide 87 percent of all graduates are placed within three months of graduation. Temp agencies and computer retailers- Best Buys, CompUSA, Circuit City - are major sources of jobs for the entry-level A+-certified technician. The reputation that DTI training has built at the community colleges is an asset in placement, and employers call seeking their graduates. DTI maintains a database of potential employers and plays a supporting role helping graduates find jobs.

Lessons Learned

- The training should be tailored to the needs of the student; pre-testing students can avoid wasting both time and money.
- Time in the classroom is not the only issue - how the time is used is equally important.
- Real-life situations will vary, and so computer technicians require a level of understanding that is not achieved by rote drilling geared to passing a certification exam.

KATHARINE GIBBS SCHOOLS' COMPUTER TECHNICAL SUPPORT CERTIFICATE PROGRAM

Background

For almost 100 years, The Katharine Gibbs Schools have trained people for jobs in business. In 1997, Career Education Corporation purchased the Katharine Gibbs Schools, and today there are nine Gibbs locations, all in the northeastern U.S., and some are known as Gibbs College. The schools are accredited by ACICS, and students receive college credit for courses.

Originally Katharine Gibbs' students were young women - many of them college graduates - preparing to be secretaries to top executives. Now that bright, ambitious young women want to be the top executives - not their secretaries, the Gibbs schools are serving different markets, including low-income and disadvantaged workers seeking to enter the IT field. That market is served by the nine-month Computer Technical Support (CTS) certificate program, which is offered by in Melville (Long Island) NY and Montclair, NJ.

Curriculum

The CTS curriculum was designed with input from IT employers to prepare individuals for an entry-level IT job. A+ certification is just part of this program, which also includes courses designed to prepare the student for Net+, CAN-Novell, Office 2000, and MCP-2000Pro certification exams. Instructors come primarily from industry.

Some things have not changed. Katharine Gibbs still produces a "polished" product, an employee who knows how to behave in business situations. CTS curriculum includes not only technical courses but also courses in communication and interpersonal skills. Students receive college credit for courses in written and oral communications, computer math, help desk/customer service, and professional development. These courses provide the soft skills that are crucial for moving people from dead-end jobs to a career path - a journey, one program coordinator describes as moving people from running a forklift in a warehouse to running a help desk in a software company.

CTS technical courses generally involve more than the vendor-recommended number of class hours. For example, Microsoft suggests 40 hours for the MSCE Windows course, but the CTS course is 55 hours. The A+-training course, which is often taught as a 40-hour crash course, takes more than 100 hours. The longer hours recognize the fact that disadvantaged and low-income students have a greater distance to travel. Courses scheduled outside normal working hours enable employed individuals to complete the program without missing work.

Customers

Both the students and the employer community are viewed as customers for the CTS program, which provides both training and placement. Most students for the CTS course are low-income individuals, and many are sponsored by government programs. There are no course prerequisites for the CTS certificate program, but to be admitted, students must have a high school diploma or a GED and a satisfactory score on a basic mathematics test.

Outcomes

Katharine Gibbs tracks the certification exam results and employment experience of its graduates. In fact, it offers lifetime placement assistance. Because the schools are accredited, they are audited every two years to ensure that student outcomes are satisfactory.

Lessons Learned

Keys to success:

- Design a curriculum that provides students with skills and behaviors that employers want
- Screen students to ensure they are prepared and capable
- Support students and give them enough time to learn
- Provide financial assistance - grants and loans

THE NEW TECHNOLOGY CENTER NETWORK TRAINING INSTITUTE

Background

The New Technology Center (NTC) is a private vocational school accredited with the New Jersey Department of Education and dedicated to preparing computer network professionals. The school is a single-site, stand-alone operation in the central New Jersey city of Rahway. NTC's main focus is customized corporate training, however, it also accepts other students. Currently, there are about 40 students enrolled at any one time. Usually there are 15 to 20 students in A+ training, which has been offered since 1996.

NTC structures its training to meet the needs of the corporate networking environment, and so most of the NTC curriculum is high-level programs organized to prepare students for networking industry certifications. All training courses are updated on a semester basis, keeping them current with the fast-moving industry. Most classes are offered on evenings and weekends because most students are employed. Course fees at NTC are relatively low, because costs are subsidized by employers – network consulting firms that get the first chance to recruit and hire graduates.

The centerpiece of NTC is an 8000 square foot laboratory containing the latest in computer networking equipment, which has been provided – usually at no cost - by the network consulting companies. The equipment includes Cisco routers, Bay Routers, digital modems, CSU/DSU's, Telecom equipment, NT, Novell and Unix servers. The open library lab allows students free practice on servers and routers and access to test preparation software, plus computer based training. The New Technology Center is an Authorized Prometric Testing Center, and so students can take tests on site.

Curriculum

A+ certification training is the beginning for the NTC student, and it is usually paired with Network+-oriented training. The A+ courses are divided into a core module and a DOS/Windows module. The core module covers basic computer concepts, hardware troubleshooting, customer service, and hardware upgrading. The DOS/Windows module covers those operating environments. Each module takes about 16 hours of class time – four weekly four-hour sessions. Although customer service is a component of the A+ curriculum, The New Technology Center does not provide soft skills training or support services. However, at the end of a course, students go through mock interviews to prepare them for the job search.

In all NTC courses, learning occurs through a combination of lecture, self-study, and lab. There is an emphasis is on hands-on experience. The A+ student will study the inner workings of the computer and build a computer from components into a complete running system. The total A+ course fee for the two modules is only \$450, making it by far the least expensive course offering at NTC.

Because the A+ training is viewed primarily as a foundation for further study, it seeks to convey a broad understanding of computer processes in the context of PC operation, troubleshooting and repair rather than simply prepare the student for the certification exam. There are no prerequisites for the A+ course; instead, A+ certification is a prerequisite for other, more advanced courses. These include courses leading to

certifications for Advanced Network Systems Specialist (ANSS), Network Systems Specialist (NSS), Cisco Router CCIE, Cisco Router CCNP, Cisco Router CCNA & CCDA, and the MCSE,

NTC instructors and lab coordinators are industry specialists, certified trainers & instructors. NTC employs trainers who work in the networking industry rather than full-time instructors to keep its classes current and relevant. Instructors have certifications ranging from A+ and Network+ to CNA, MCP, MCSE, SUN, H.P, Firewalls, MCT, Cisco CCNA, CCNP and all the way to CCIE.

Customers

Customers of the New Technology Center are the corporations that subsidize the training and/or contract for CJT, the employers who hire graduates, the students themselves, and public programs that sponsor students. The list of corporate clients includes Fortune 500 firms such as A T & T, Lucent Technologies, Automatic Data Processing, IBM Global Services, Allied Signal Inc., Toys R US Inc., Nabisco Holdings, Teleport Communication Group, Warner Lambert, ITP, Citibank, Sunoco, Bear Stearns.

The New Technology Center makes only moderate efforts to recruit low-income students. Although some students are referred through the public sector job training programs, fewer than 25 percent would be considered low-income. Two demographic groups under-represented in the A+ training are women and Hispanics.

There are no requirements for the A+ training course – it is seen as the entry point. However, a high school diploma or GED is preferred. The State of New Jersey tests people before referring them to the A+ training,

Outcomes

Fewer than half the people who begin the A+ training course complete it, and only about 20 percent actually take the certification exam. Completion and testing rates are low because the A+ course appeals to people who think they might like to try a computer career. Many discover that they do not have the temperament, patience, and attention span needed. A successful IT career is for people who “love” computers – not for everyone.

For those who do complete and take the exam, the pass rate is very high – from 80 to 90 percent. (The web site reports that the school has enjoyed an average 93% or higher passing rate in all the range of courses offered.) Still, only about 15 to 20 percent of those who start the A+ training actually end up with the certification. Those who succeed are those who are determined, and they continue to climb the career ladder.

Certification leads to a good job. Slowdowns and lay-offs in the dot-com economy affect just part of the market for IT workers, and other sectors are hiring. The New Technology Center training is more focused on systems administrators than on web designers and so it is little affected. Top students are placed directly into jobs via the New Technology Centers private Intranet site, which is linked to numerous Fortune 500 companies and to recruiting agencies. The company web site includes numerous testimonials from satisfied students, including one that mentions a waiting list of employers seeking to hire NTC graduates.

Lessons Learned

- The A+ certification, while entry level, divides the committed from the non-committed.
- Certification programs, beginning with A+, provide a pathway to jobs that pay a livable wage and beyond to very well paying jobs, but that path requires constant upgrading of skills.
- Low-income and disadvantaged workers such as single mothers often need additional support services such as transportation and childcare, which are outside the realm of training providers.
- Nothing can take the place of hands-on experience
- Keeping current is crucial to relevant training and thus, good jobs for graduates
- A program that works very well for a skilled population does not necessarily work well for a disadvantaged population.