

Employment Experiences and the Nontraditional Student

How do the varied employment experiences of IT workers in the Washington, DC, area relate to their educational experiences? Are there predictable pathways or do market opportunities affect nontraditional students in unpredictable ways?

This chapter primarily discusses information obtained from one-on-one interviews with IT employees and employers at businesses, nonprofits, educational institutions, and government agencies in the Maryland, Virginia, and Washington, DC, area. Other information derives from a mail survey of alumni from universities and colleges in the same region and, where relevant, from one-on-one interviews with faculty and students at colleges and universities also in the DC metropolitan area. Descriptive information on the study participants and data collection methods can be found in Chapter 2.

Overall, we found differences between nontraditionally and traditionally educated students in how they found a job and the employment choices they made. Such findings can assist university and government policy-makers, as well as employers, in developing strategies to more fully use nontraditionally educated students, women, and minorities in IT positions.

The major highlights from our analysis are as follows:

- People with a nontraditional education are more likely to work for smaller organizations that do not have IT as their primary focus, e.g., government agencies, financial institutions, and educational institutions.
- Nontraditional students are less likely to know of or have convenient access to university/college career services. However, contacts with career centers may be a primary mechanism through which larger IT companies (software services, etc.) hire entry-level employees. This

may make it more difficult for nontraditional students to enter this sector of the workforce.

- Employees with a nontraditional educational background express higher levels of satisfaction overall with their jobs and career prospects. It appears that nontraditional students made well-considered educational choices that satisfied their career goals.
- Nontraditional students, though often working full-time, are interested in having internship experiences. These opportunities, however, are typically not made available to them.
- All students seem to realize the importance of internships, but faculty seem less aware of their value as a path to a better job.

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Finding a Job

How did the experience of finding a job differ between traditional and nontraditional students? Was a nontraditional educational background an asset or an impediment? What aspects of nontraditional or traditional training are assets when seeking a job and what are impediments?

Overview

The employment experiences of the groups we surveyed varied a great deal, as did the methods they used to find a job and the value they placed on college employment in finding their first job. Employees who were nontraditional students were more likely to have been employed full-time in an IT field while attending college. Employees who were nontraditional students were also more likely to accept an offer of continued employment from their college employer after graduation. A large fraction cited the stability of continued employment as a reason for staying with the same employer, as well as the offer of a promotion or more responsibility. This may indicate that employees who were nontraditional students had family or other commitments that made them less able to take the time to search for a new job when they finished their degree and more anxious to accept a job offer once they received one. However, it may also indicate that nontraditional students make better employees, i.e., employers who already had experience with a

nontraditional student were eager to hang on to that employee. Employees who were nontraditional students were also less likely to have used any university resources in their job hunt. This may be because they did not need those job-placement resources as much. But it may also be because the career center had inconvenient hours for nontraditional students or that the services provided were not appropriate for or marketed to nontraditional students.

Employment during and immediately after college

The employee perspective

An important aspect of our study was to assess the employment experiences of traditional and nontraditional students and to determine how full-time employment during college, as is the case for many nontraditional students, might have been beneficial or detrimental. Therefore, a number of our survey questions asked employees about their employment experiences during and immediately after college. Almost all of the employees we surveyed were employed in some capacity during college (92%). However, employees who were nontraditional students were more likely to have been employed (96% compared to 88%) and were much more likely to have had an IT-related job during college (78% versus 71%) and, of course, to have been employed full-time (49% of nontraditional versus none of the traditional students). Traditional students, in contrast, tended to have held internships or co-op positions during college. Because nontraditional students were often working full-time and going to school part-time, it would have been more difficult for them to fit an internship or co-op into their schedules (see Appendix Tables D.1 and D.2).

Alumni views

Among our alumni survey participants, those who had been nontraditional students were less likely to have had a co-op or internship. They expressed lower levels of satisfaction with the co-op/internship opportunities that were available to them (44% of nontraditionally educated alumni were satisfied or very satisfied versus 70% of traditionally educated alumni) (Table 4.1).

The employees who were nontraditional students were far more likely to have been offered a job by their college employer, whether they were full-time or not, upon graduation (49% compared to 17% of their colleagues who were traditional students). Of those who were employed as students and offered a job upon graduation, nontraditional students were much more likely to accept that job (37% versus 9%). Nontraditional students were also four times more likely to have been offered a raise or promotion as an enticement to accept a post-graduation continuation of employment (33% of the nontraditional students who accepted a job from their college employer versus none who were traditional students). As noted in Chapter 3 (Chart 3.1), alumni who were nontraditional students were more likely than alumni who were traditional students to pursue an IT degree as a path to promotion and advancement. These data indicate that this is an effective strategy (see Appendix Table D.3).

Interestingly, given that employment in college often led to a job that employees wanted to keep, the vast majority of the employees we surveyed (87%) said that work experience in college was *not* beneficial overall. However, when asked to describe the value of college employment in more detail, most of the survey participants had numerous good things to say about their employment experience. Employees who were nontraditional students were somewhat more likely to cite the opportunity to gain non-classroom IT skills and apply classroom knowledge as values of work experience during college. Employees who were traditional students were more likely to cite the exposure to career opportunities as a value of work experience (see Appendix Table D.4).

The faculty perspective on internships and college employment

A majority of faculty felt that internships were very important for traditional students, although 15% of the faculty felt that external work is not particularly beneficial. The faculty tended to regard internships and other external work programs as less important for nontraditional students, although 39% of the faculty still described them as important, even for nontraditional students. This parallels the employee evaluations (above) of the value of the internship/co-op program (see Appendix Tables D.5 and D.6).

TABLE 4.1 Alumni Survey Responses:

“Using the following five-point scale, please indicate how satisfied you are with your IT/CS bachelor’s degree program in each of the following areas.”

Opportunities to participate in co-op/ internship programs	Nontraditional (n=52)	Traditional (n=123)	All Alumni (n=175)
Extremely+very satisfied	23% (12)	44% (54)	38% (66)
Extremely+very+somewhat satisfied	44% (23)	70% (87)	63% (110)
Somewhat+very dissatisfied	21% (11)	23% (28)	22% (39)
NA	35% (18)	7% (8)	15% (26)

Career mentoring	(n=52)	(n=123)	(n=175)
Extremely+very satisfied	14% (7)	29% (36)	25% (43)
Extremely+very+somewhat satisfied	40% (21)	64% (79)	57% (100)
Somewhat+very dissatisfied	39% (20)	34% (42)	35% (62)
NA	21% (11)	2% (2)	7% (13)

Only 17% of the faculty felt that outside work programs lead to better employment opportunities. Our data indicate that this is probably an underestimate on the faculty’s part, since more than 30% of the alumni who had a job in college, 47% of the employees who had an internship, and 33% of the employees who had regular employment in college were offered jobs by their college employer upon graduation. Employment in college clearly leads to job offers, at least from the college-period employer (see Appendix Tables D.7, D.8, and D.3).

The student view of internships

The vast majority of traditional students we interviewed (90%) either had done or were planning to do an internship or co-op. Even among the nontraditional students, 74% were doing or were hoping to do an internship or co-op. The students clearly felt that the formalized work experience of a co-op/internship would be beneficial, and given the data mentioned above on the number of students offered jobs by their college employer, the students may have had the most accurate view of the value of this work experience (see Appendix Table D.9).

Summary

Internships and co-ops are important for traditional students, but may also provide considerable benefit to nontraditional students, especially if they are not already working full-time. This fact is borne out by national data from the National Association of

Colleges and Employers (NACE), which reports that college graduates are much more likely to find employment if they have had an internship(s) or a co-op during the college years.¹ Additionally, in other surveys by NACE, employers definitely indicate that hiring preferences are given to those individuals who have done an internship or co-op.² Nevertheless, relatively few of the faculty we surveyed felt that outside work programs lead to better employment opportunities.

Job search

To learn if colleges and universities are providing adequate job placement and career resources for both their traditional and nontraditional students, employees and alumni were asked to describe the types of resources they used at their college or university to help in their job search after receiving their baccalaureate degree. Employees who were nontraditional students were quite a bit less likely than their traditional student colleagues to have used any university resources in their job search. Although nontraditional students may not have needed university career resources if their college-period employer was likely to offer them a job, many nontraditional students' comments revealed that they felt that university career resources were of limited availability and were geared primarily toward traditional students. Thus, these resources were not helpful for those nontraditional students who might have wanted to look for positions beyond accepting a job with their college-period employer (see Appendix Table D.10 and Chart 4.1).

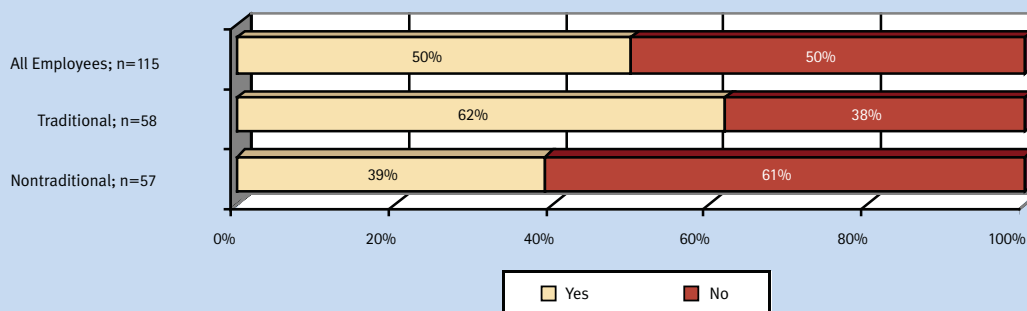
Alumni views

Participants in our alumni survey who were nontraditional students were much less likely than alumni who were traditional students to have used any university career mentoring services. The nontraditional alumni who did take advantage of university career services also expressed less overall satisfaction with those services (see Appendix Table D.11).

Alumni who were traditional students were more likely than those who were nontraditional students to have found their current job through the newspaper, internship/co-op contacts, or on-campus recruiting and their university career center/alumni job bank. Those who were nontraditional students were more likely to have found their current job through the Internet or a headhunter/recruiter (Table 4.2). This once again indicates that nontraditional students may have less time available for job hunting and need to have career resources that are available when they are and that are accessible via the web.

Alumni who were nontraditional students, as one would expect, were often employed full-time during college. They were also much more likely than their traditional student peers to be working for the same employer who employed them during college, emphasizing again the value of college employment. Alumni who were nontraditional students were more likely to have received a promotion since starting with their current employer and were more likely to feel that receiving their degree had an impact on the promotion they received. As noted in Chapter 3, this desire for advancement is what often led nontraditional students to pursue a degree (see Appendix Tables D.12–D.14).

CHART 4.1 Employee Interviews: “Were University Resources Used in Job Search?”



Among the students we surveyed, 76% of the traditional students were using or were planning to use their university or college career center. In parallel with what we have seen in the employee and alumni interviews and surveys, nontraditional students were either less likely to have or less likely to be aware of a career placement facility at their college or university and were about half as likely to plan on using it in their job search. Nontraditional students often said that they did not use university career resources because they were not available at a time when they, as nontraditional students, could get to them (see Appendix Table D.15).

Value of university reputation

Traditional students who have yet to prove themselves on the job market (even if they have had an internship, which is deemed essential by the National Association of Colleges and Employers) use the reputation of their school to get a foot in the door of employers. Most nontraditional students are already through the door; they simply need further credentialing, and they are less concerned with where they get it, as long as it's convenient. Our study confirmed this view. Employees who were nontraditional students placed less value in the reputation of their (or any) college or university in job hunting. These employees were also less likely to have used college/university resources in their job search and were more likely to have received a job offer from their college-period employer. Employees who were traditional students were much more likely than those who were nontraditional students to feel that the reputation of a college or university has a positive affect on searching and interviewing for jobs (Tables 4.3 and 4.4).

Reasons for selecting current job

Alumni views

Our alumni survey also queried IT/CS graduates about the factors that led them to select their current employer. Alumni who were traditional students were more likely to rate salary and benefits as very or extremely important and also regarded stock/equity options as more of a draw to their current employer than did alumni who were nontraditional students. This tends to correlate with the perks more commonly offered by larger employers, who, as we will see in the section titled "Current

TABLE 4.2 Alumni Survey Responses:

"How did you find your current job?"

	Nontraditional (n=52)	Traditional (n=123)	All Alumni (n=175)
On-campus recruitment or job fairs	8% (4)	33% (41)	26% (45)
Internet	19% (10)	8% (10)	11% (20)
Internship/co-op contacts	6% (3)	11% (13)	9% (16)
Unsolicited resume or contact	12% (6)	8% (10)	9% (16)
University/college career center or alumni job bank	0	5% (6)	3% (6)
Other	56% (29)	35% (43)	45% (72)

TABLE 4.3 Employee Interviews:

"What effect did the reputation of your undergraduate institution have on the types of jobs you applied for, or the companies or organizations you applied to?"

	Nontraditional (n=57)	Traditional (n=58)	All Employees (n=115)
Positive effect	28% (16)	40% (23)	34% (39)
Negative effect	12% (7)	5% (3)	9% (10)
No effect	37% (21)	50% (29)	43% (50)
No answer, not sure	23% (13)	5% (3)	14% (16)

TABLE 4.4. Employee Interviews:

"What effect did the reputation of your undergraduate institution have on the interviews that you received or did not receive?"

	Nontraditional (n=57)	Traditional (n=58)	All Employees (n=115)
Positive effect	25% (14)	50% (29)	37% (43)
No effect or negative effect	37% (21)	38% (22)	37% (43)
No answer, not sure	39% (22)	12% (7)	25% (29)

Work Environment," more frequently hired alumni with traditional backgrounds. Of course, in today's marketplace, signing bonuses and stock options are almost nonexistent, particularly for new entrants to the profession.

Alumni who were nontraditional students rated good management as a slightly more important factor in selecting their current employer than did those who were traditional students. This may reflect their greater experience, through longer employment overall, with bad management. They also regarded a family-friendly work environment as more important to their choice of employer than their traditionally educated peers (see Appendix Table D.16).

Current Work Environment

Recall that the primary purpose of our study was to determine if nontraditional training leads to different employment outcomes. We especially wanted to find out if nontraditional training results in less desirable jobs or lower status in the workplace. We did find that nontraditional education correlates with holding different types of jobs. Those who were nontraditionally educated were less likely to work for “traditional” IT employers such as software companies and were more likely to work in an IT capacity for a non-IT organization such as the government or a bank. However, we could not ascertain if this is because nontraditional students were more likely to begin their IT career with a nontraditional IT employer, perhaps before obtaining an IT degree, or if nontraditional students were simply less likely to be recruited by the traditional IT sector.

Job titles, sector of employment, and skills used

Job titles

Employees who were nontraditional students showed a slightly greater prevalence of job titles indicating leadership positions, although as noted before, employees who were nontraditional students were likely to be older and therefore further up the career ladder (see Appendix Table D.17).

Women we interviewed were less likely than men to hold IT leadership positions but more likely to have general leadership roles (Charts 4.2 and 4.3 and Appendix Table D.18). African Americans were less likely to have leadership job titles than Asians or Caucasians (see Appendix Table D.19).

Alumni views

Sector of employment

Alumni who were traditional students were more likely to work in the more “traditional” sectors of IT employment: IT/CS services, IT/CS software and hardware products, or the nebulous field of consulting. In contrast, the alumni who were nontraditional students were much more likely to work in government agencies, nonprofits, educational institutions, or the broad category of “other” (Chart 4.4 and Appendix Table D.20).

Alumni who were nontraditional students were considerably more likely to work at small employers, i.e., 42% of the nontraditionally educated alumni worked at organizations with less than 500 employees, whereas 46% of the traditionally educated alumni worked at organizations with more than 5,000 employees (Table 4.5).

Technical skills used in current employment

Corresponding to the different sectors of employment, there was some variation in the specific technical areas and skills that the alumni survey participants used. Alumni who were traditional students were more likely to be involved in the development of applications, databases, or systems, whereas alumni who were nontraditional students were more likely to be involved in internal IT support (see Appendix Tables D.21 and D.22).

CHART 4.2 Current Job Title of Male Employees (n=44)

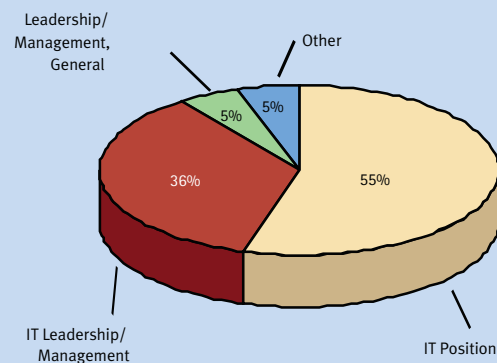


CHART 4.3 Current Job Title of Female Employees (n=71)

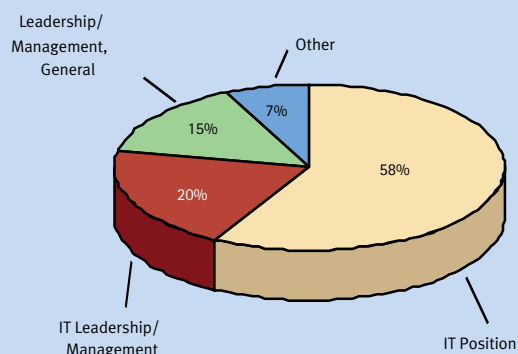
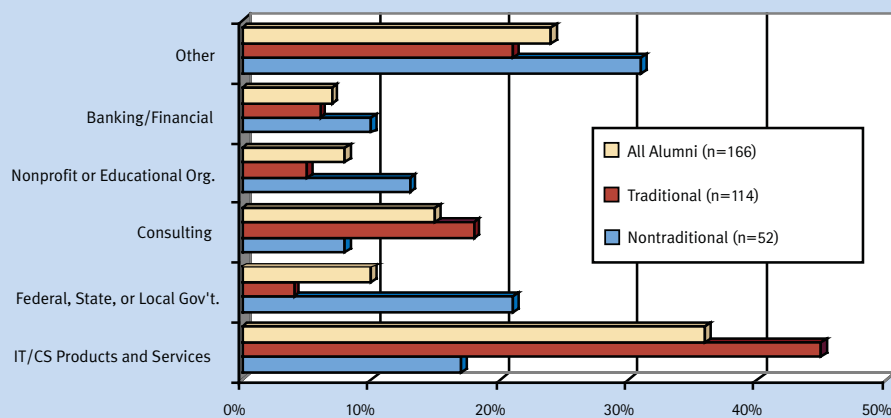


CHART 4.4 Sector of Employment of Alumni



On the whole, the differences in the skill sets used by the alumni survey participants and the activities in which they were involved do not indicate major differences in the prestige of their work, but rather are likely due to the different responsibilities inherent in the job sectors in which they are employed. Because alumni who were nontraditional students were drawn to “nontraditional” IT employers such as educational institutions and government organizations, they were perhaps more likely to be among a small cadre of IT workers who have more support responsibilities.

Applying skills from undergraduate degree

A crucial element of our study was assessing whether nontraditional training provided the skills needed for a successful IT career. We asked the alumni and employees we surveyed how often they applied the skills and knowledge from their IT/CS bachelor’s degree in the current work. Nearly 60% of both traditionally and nontraditionally educated alumni felt that they applied knowledge and skills from their undergraduate degree frequently to very frequently. Similarly, nearly 70% of employees with both nontraditional and traditional undergraduate experiences felt that they applied skills from their undergraduate degree frequently. This indicates that higher education is largely giving IT/CS graduates the skills that they need in the workplace (see Appendix Tables D.23 and D.24).

Among the employees we interviewed, those with a nontraditional educational background were

more likely to say that they wished their undergraduate degree had provided them with more IT-specific courses, such as additional Unix training or a web development course. Those employees who were traditional students wished that they had had more hands-on experience. These data indicate that, at least for IT careers, hands-on experience is very valuable. It also suggests that nontraditional education may not provide the same depth of IT training that employees feel they need (Chart 4.5).

However, when asked how they coped with any lack of preparation, employees who were nontraditional students seemed to rely effectively on self-teaching. Regardless of educational background, all employees said they take classes and simply learn on the job (see Appendix Tables D.25 and D.26).

TABLE 4.5 Alumni Survey Responses:

“What is your employer’s approximate number of employees (total for the whole organization)?”

	Nontraditional (n=52)	Traditional (n=123)	All Alumni (n=175)
Under 100 employees	23% (12)	15% (18)	17% (30)
100–499 employees	19% (10)	11% (13)	13% (23)
500–999 employees	15% (8)	7% (9)	10% (17)
1,000–4,999 employees	15% (8)	15% (18)	15% (26)
5,000+ employees	27% (14)	46% (57)	41% (71)
NA	0	6% (8)	5% (8)

Alumni views

Skills needed

In an effort to assess what sorts of skills an IT undergraduate degree ought to impart, we asked the IT/CS alumni we surveyed to select from a list the skills or content that they felt their degree program *should have included* and which they needed in their current job or to move up in their IT/CS profession. Alumni who were nontraditional students were considerably more likely to indicate wanting more experience/training in presentation and public speaking. Alumni who were traditional students wished that they had received more advanced computer topics, more computer hardware training, and more training in management and supervision skills. The differences in skills desired from their degree may once again reflect the differences in employment sectors (see “Job titles, sector of employment, and skills used” above) as much as any deficits in either a nontraditional or traditional education (see **Appendix Table D.27**).

Additional training and new duties

To further refine the question of whether a nontraditional education is adequate, we also asked employees if they had received any special training after they were hired. Almost 60% of both traditionally and nontraditionally educated employees had received some sort of special training after being hired, but the difference between traditional and nontraditional education paths was not striking. Of greater note, almost 70% of women employees reported receiving special training compared to only 48% of male employees (**Chart 4.6**). Whether this indicates that women feel less stigma associated with seeking training, or instead indicates deficiencies in the training of women, remains unanswered. The IT employees we interviewed often commented on the need to update and augment their skills. As the IT job market has changed, this need and constant stress has only increased (see **Appendix Tables D.28 and D.29**).

Summary

Nontraditional students are, for the most part, graduating with the skills they feel they need (experience with public speaking/presentations is a notable exception). The differences in the skills desired by traditionally and nontraditionally educated alumni

may largely reflect differences in their respective employment sectors. Therefore, the larger question is what drew the nontraditional students who responded to our alumni survey to smaller organizations out of the mainstream of IT employment. As we will discuss below, it may be that “mainstream” IT employers, who are more likely to have well-established recruiting networks at universities, are less able to find and less likely to seek out or consider employees with a nontraditional educational background.

Expectations and Satisfaction with Employment Opportunities

Employees with **traditional** educational backgrounds were considerably more likely to express **dissatisfaction** with their current employment and how well it met the expectation they had in college. Some of the specific comments from these traditional students were, “[It] doesn’t meet them. Not even close!”, “It’s bad, [I] feel down, but it’s the economy,” and “[I] work hard, but [I’m] disappointed.” This seems to indicate that employees who were nontraditional students, perhaps through their greater work and life experience, had more realistic expectations and had made well-considered educational choices (see **Appendix Table D.30**).

Employee interviewees were also asked, “How satisfied are you with the types and number of employment opportunities now available to you?” Employees who were nontraditional students were much more likely to say that they were satisfied or very satisfied (50% in these two categories combined) with the employment opportunities currently available to them. In contrast, only 16% of employees who were traditional students said that they were satisfied or very satisfied with their employment options (**Chart 4.7**). Although this could indicate lower expectations on the part of nontraditional students, it seems likely instead to indicate that nontraditional education has adequately satisfied their career objectives. However, as a caveat, older employees also expressed more overall satisfaction with their employment opportunities, and as noted previously, among our participants, older employees were more likely to have been nontraditional students (see **Appendix Tables B.7, D.31, and D.32**).

Women, who represented 62% of our sample, were more satisfied than men with the employment

CHART 4.5 What Employees Felt Was Lacking in Their College Education

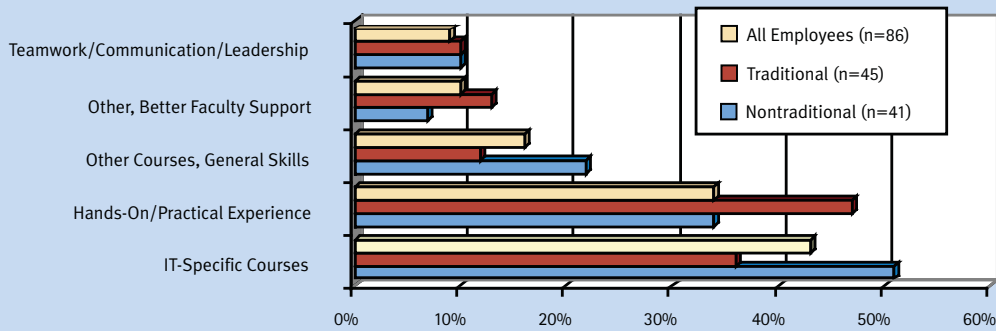
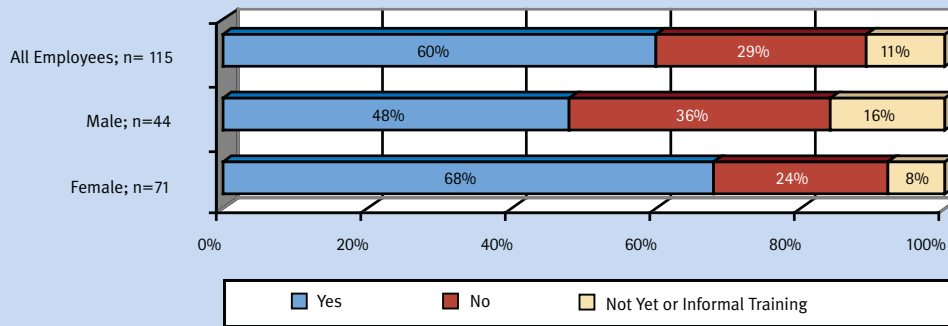


CHART 4.6 Percentage of Employees Receiving Special Training After Being Hired



opportunities currently available to them, although the gender difference was much less striking than the traditional/nontraditional difference (see Appendix Table D.33).

Alumni views

We also asked alumni to rate how well their post-graduate work experience met their precollege expectations. In parallel with the employee data described above, alumni who were nontraditional students were almost twice as likely to say that their work experience met their precollege expectations “exceedingly well” (see Appendix Table D.34).

Salary

We wanted to assess if there are differences in the perceived value of nontraditional students compared to traditional students. We therefore queried our interviewees and survey participants about salary. Asked whether or not their salary was com-

mensurate with their education, most employees (~60%) did feel they were compensated appropriately, and the differences based on traditional versus nontraditional education were negligible (see Appendix Table D.35).

Women were less likely than men to feel their salary was appropriate for their education, and African Americans and Asians also were less likely than Caucasians to feel their pay was commensurate with their education (Chart 4.8 and Appendix Tables D.36 and D.37).

More interestingly perhaps, employees with majors in computer systems or management information systems were the least likely to feel that their salary was commensurate with their education and were even less satisfied than those with non-IT majors. Employees with computer science or computer engineering majors were considerably more satisfied with their salaries (Chart 4.9 and Appendix Table D.38).

CHART 4.7 Employee Satisfaction with Available Employment Opportunities

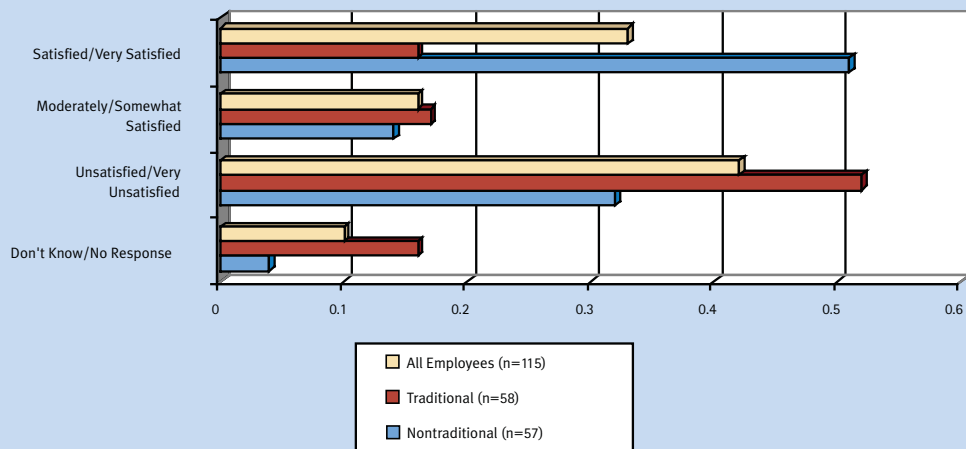
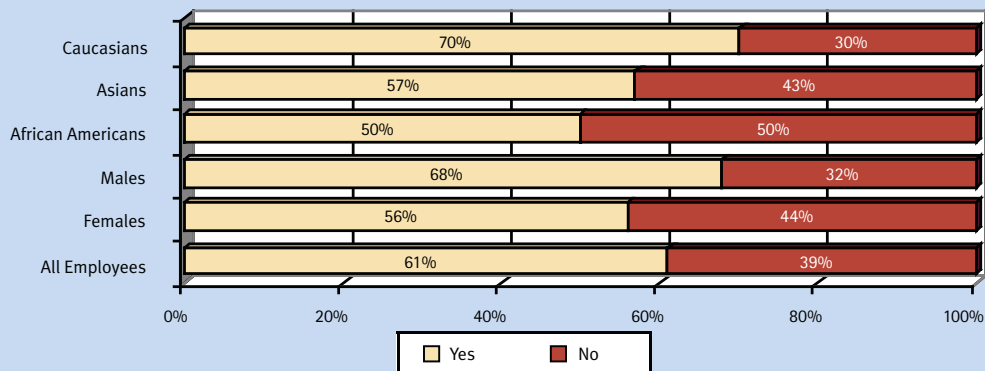


CHART 4.8 “Do you feel your salary is commensurate with your education? (By sex and race/ethnicity)”



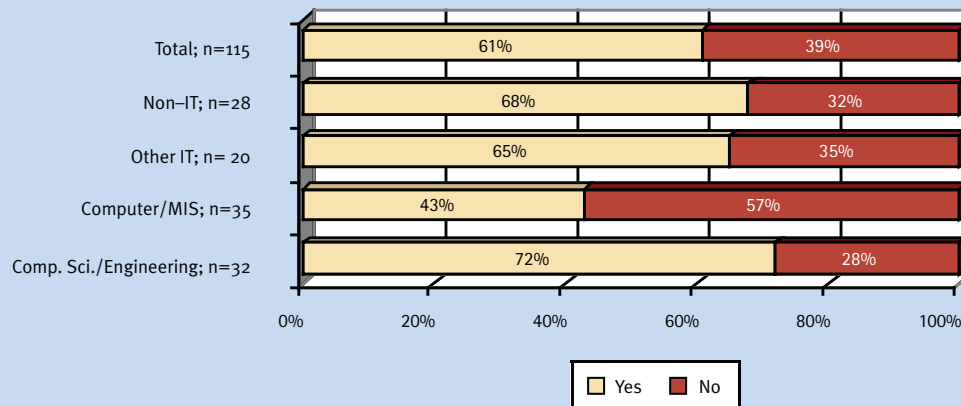
Alumni views

Ominously, among the alumni we surveyed, those who were nontraditional students were more likely to have salaries of less than \$40,000 (23% of nontraditional alumni versus 11% of traditional alumni), whereas those with a traditional educational background were more likely to have salaries in the \$40,000 to \$59,999 range (58% of traditional alumni versus 44% of nontraditional alumni). This finding may be related more to the types of employers selected by alumni who were nontraditional versus traditional students. However, it could also relate to the quality of the education they received and therefore the types of jobs that seemed accessible (see Appendix Table D.39).

Hiring the Nontraditional Student

There is a continuing need to understand the views held by those who hire IT workers about nontraditional education, nontraditionally educated employees, women, and underrepresented minorities. Our interviews focused on assessing what employers seek in their workforce and how they hire and support their workers. The information was obtained from 23 interviews with relatively senior management staff in the Metropolitan DC area who have a role in hiring IT workers. The demographics of this group are described in Chapter 2. Although this is admittedly a very small sample, some general trends and attitudes emerge from their answers.

CHART 4.9 “Do you feel your salary is commensurate with your education? (By major)”



Desired employee qualities

The HR managers were asked, “What is the single most important skill you look for in new hires in IT/CS areas?” The most common responses described seeking candidates with overall qualities that would make them good employees in any capacity: overall intelligence, motivation, enthusiasm, and “good character.” Interpersonal skills and of course technical skills were also important. This is noteworthy because the similar qualities of motivation, discipline, commitment, and breadth of thinking were often mentioned by HR managers as noteworthy traits among nontraditional students (Table 4.6 and Appendix Table D.40).

Recruiting methods

Almost all of the HR managers we surveyed used personal contacts and referrals as well as the web to recruit new employees. Almost one-third used various types of directed recruiting, including campus visits and job fairs, to recruit new employees. However, among the HR managers we interviewed, little of their hiring was of new college graduates with bachelor’s degrees, and most said they did not target their recruiting toward new graduates. Only 26% of the HR manager interviewees said that they recruited on campus at all (Chart 4.10 and Appendix Tables D.41–D.44).

When asked about the schools from which they recruited, the HR manager named a few targeted schools. Local/nearby schools were the most commonly mentioned. Although HR managers did have specific schools from which they preferred to recruit, there was no consensus among the 23 HR managers about which schools were the best source

of new hires (see Appendix Table D.45).

We also asked whether their organizations had any ongoing relationship (formally or informally) with any colleges or universities (including internships, advisory boards, and recruiting networks). Just over half said that they did have some sort of relationship, mostly informal and with Research I or Master’s institutions in the area. These informal relationships formed the base from which HR managers sought entry-level employees, and because few of the employers needed many entry-level workers, the HR managers were unlikely to seek other sources of recent graduates (see Appendix Tables D.46 and D.47).

Role of university reputation in recruiting/hiring

Most of the HR managers we interviewed said that they do not avoid any particular schools or graduates. Most did, however, admit that a school’s reputation would have some or a lot of influence on whether or not they would decide to interview a job candidate (see Appendix Tables D.48–D.50).

Not surprisingly, all 23 HR managers said that they look more favorably on job candidates with prior work experience, and most preferred that experience to have been IT related. This opinion, however, conflicts with their descriptions of the value of employment during college, which is discussed in the next section. It seems that the HR managers primarily want to hire people with work experience but prefer for that experience to be post-college employment rather than employment during college (see Appendix Tables D.51 and D.52).

TABLE 4.6. HR Managers:

*“What is the single most important skill you look for in new hires in IT/CS areas?**”

	n=23	Percentage
Overall intelligence/motivation/character	10	43%
Interpersonal/communication skills	8	35%
Appropriate technical skills	7	30%
Overall good match	4	17%
Education	2	9%

*Multiple answers possible: total > 100%.

Views of nontraditional education

Most of the HR managers we interviewed had some experience with “retooled” majors, i.e., persons originally trained in a non-IT area who then undergo training in IT or computer science. Of those who had experience with retooled majors, the vast majority viewed them favorably (nearly 70%). Most HR managers, similarly, had experience with IT employees who had been nontraditional students. Although broad education and previous work experience were well regarded, most went on to say that either their organization did not have a preference for nontraditional students (30%) or that they might even view nontraditional education as a negative (22%). We cannot know for certain that the HR managers we interviewed were not conflating nontraditional students, who may have gone to school at any number of institutions, with “nontraditional” educational institutions, although we did try to maintain a clear distinction between the two during the interviews. However, even when asked explicitly which schools they would avoid in recruiting, only six HR managers were willing to say that they would avoid any schools, and only three of them mentioned “nontraditional” or “smaller” institutions. Many of the interview participants, it should be noted, were unwilling to answer this question (see Appendix Tables D.53–D.55 and D.48).

When queried more specifically about what they saw as the particular advantages or disadvantages to hiring nontraditional students compared to traditional students, most cited the advantages of real-world experience as well as greater discipline, motivation, focus, and commitment (Table 4.7). When asked if they would actively recruit or

encourage IT students to begin employment before completion of their bachelor’s degree, many felt that work experience would be helpful. However, many of those who favored work experience during college spoke more positively about internships and/or co-ops rather than full-time employment, and several said that any employment at all in college would only distract from college education (see Appendix Table D.56).

Diversity

We also wanted to learn about diversity in the workplace and recruiting efforts aimed at creating a more diverse workforce. Few organizations had any ongoing efforts to diversify their workforce; nevertheless, most did not feel that they were experiencing difficulties recruiting women and underrepresented minorities. However, many seemed a little unclear about who might be considered a minority and did not differentiate between underrepresented minorities and any non-Caucasian.

CHART 4.10 “What percent of your hiring is new college graduates?”

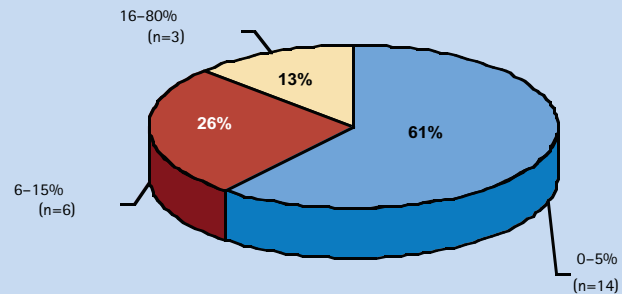
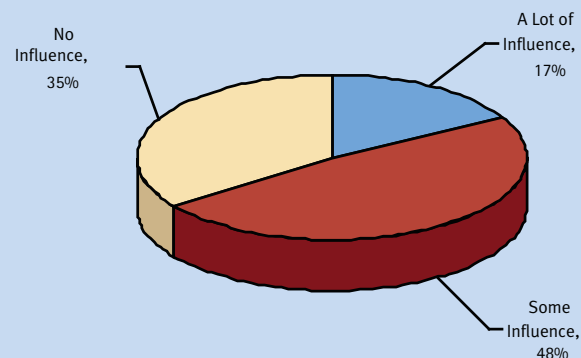


CHART 4.11 “What influence does a school’s reputation have on the decision to interview? (n=23)”



When asked how they defined diversity in their workplace, only 4 of 23 had a ready definition (see Appendix Tables D.57 and D.58).

Of the four HR managers who said their organization had some sort of ongoing efforts to diversify, three elaborated:

- *“Constantly looking for qualified people. Supports Vietnam vets, women, Latinos, African Americans.”*, *“targeted searches. [We] try to promote blacks, Hispanics, and females.”*, *“Intern program with minority schools, also a program with Hispanic students.”*

These answers indicate that some HR managers were indeed seeking out underrepresented groups. Of greater concern are the other 19 HR managers for whom diversity is not a priority and who appear indifferent to the sex and race/ethnic composition of their workforce.

We received some particularly illuminating answers to the question, “Does your organization experience any difficulties in recruiting and obtaining women or underrepresented minorities?” Nine HR managers admitted that it is difficult to find underrepresented minorities or women or both. However, among the 14 respondents who said they did not have any difficulties were the following answers (see Appendix Tables D.58 and D.59):

- *“No, they are an equal opportunity employer.”* (The interviewer noted that this organization had two women in total, and one was a secretary.)
- *“Yes. It’s diverse. There are many more men than women, but there are a variety of ethnic groups represented, especially south Asians—Indians and Pakistanis.”*
- *“No, candidates are equal. Lots of east Asians, not just white males.”*
- *“No, they are very diverse now.”* (This was said by someone who did not answer the “definition of diversity” or “efforts to diversify” questions.)

There were some answers indicating that the idea of targeted recruiting has not caught on:

- *“Not women (they are at least half of workforce). More difficulty recruiting minorities [...] just don’t get many applications.”*
- *“They don’t look for people of color [and] women are underrepresented [at this organization] in general.”*

TABLE 4.7 HR Managers:

*“Do you see any particular advantages or disadvantages to hiring nontraditional students compared to traditional students?**”

	n=23	Percentage
Advantages		
More real-world experience	11	48%
More driven, motivated	6	26%
More disciplined, focused, committed	7	30%
More versatile, broader thinking	4	17%
Disadvantages		
Family responsibilities, older, other comments	5	22%

*Multiple answers possible: total > 100%.

But there was also some cause for optimism, granted from the same respondents who seemed most aware of diversity issues in the earlier questions.

- *“No. This [organization] pays attention to diversity [and] targets recruiting to minority publications.”*
- *“They’ve been successful here because of proactive things they have in place. [You] can’t wait for good people to come to you.”*

The HR managers were asked how many of the IT employees in their organization were women or underrepresented minorities, and their answers superficially indicate diverse workplaces. However, it should be kept in mind that some HR managers classified administrative staff in an IT department as IT workers and also that some may have classified all non-Caucasians as underrepresented minorities (see Appendix Tables D.60 and D.61).

Supporting a diverse workplace

The HR manager participants were asked what features of their organization made it attractive or unattractive to women. Many responded that they felt their organization was generally supportive of women. A fair number also described specific family-friendly policies that would benefit women (or men) with balancing work and family. Some of the specific attributes mentioned were onsite child care, flexible work schedules, a women’s networking group, the presence of women in upper management, and good advancement opportunities for

women. However, five described their workplace as difficult for women, including the comment:

— “[*This workplace*] is attractive [*to women*] if you feel like trailblazing” (see Appendix Table D.62).

Regarding the features of their organization that might make it attractive to underrepresented minorities, the HR managers’ responses were more likely to describe the overall positive aspects of their workplace. For instance, “*Job security and learning business skills are valuable to all employees, especially minorities.*” The presence of diversity training was also mentioned several times. A few comments reinforced our impression that efforts to diversify did not necessarily encompass underrepresented minorities (see Appendix Table D.63):

— “[*The*] CEO is very vocal about hiring other nationalities [*and is*] active on the Hill regarding H-1B visas for math and sciences.” And, “[*we*] hire and pride [*our*]selves on international diversity. Domestic diversity isn’t as high. [*We*] have lots of Africans, [*but*] few African Americans.”

Supporting nontraditional employees

We asked the HR managers what qualities might make their workplace attractive to nontraditional students. Half of the responses described features that would make their workplace appealing, including an emphasis on experience, and flexible work schedules and/or work locations that might make it easier to be a nontraditional student. However, the other half of the responses were either neutral or indicated that it would be difficult to be a nontraditional student while working there or to be hired as a nontraditional student (see Appendix Table D.64).

Layoffs

We asked about employee layoffs to determine if nontraditionally educated employees were more likely to be involuntarily terminated than those with a traditional educational backgrounds. Remarkably, given the time frame when these interviews occurred, only 3 of the 23 HR managers said that their organization had laid-off IT staff in the previous year. Only one felt that the layoffs had affected recruitment—in that case because it forced them to recruit “someone with more skills to cover more areas.” This particular comment reemphasized the anxiety of many of the employees we interviewed

about the need, in a competitive employment market, to constantly learn the latest skills and broaden their experience.

Summary

The employers we spoke with who supervise the hiring of IT workers have favorable views toward the nontraditional students in their employ. Nevertheless, there was an ambivalence or even resistance toward hiring nontraditional students and certainly little willingness to seek out those with nontraditional training. In terms of hiring women and underrepresented minorities, a few of the employers we spoke with had excellent policies and practices in place to create and maintain a diverse workforce. However, the majority of employers did not have specific plans, did not think that diversity was a problem or issue, and in many cases did not seem to understand the difference between underrepresented minorities and all non-Caucasians.

There often appeared to be a discrepancy between what the HR managers said about the desirable qualities found in nontraditional students and their unwillingness to seek out those employees with nontraditional educational backgrounds. It may be that they did not clearly understand the difference between nontraditional students and nontraditional (i.e., proprietary) educational institutions. However, what seems more likely is that although these employers were happy with the nontraditionally educated workers they had found through their standard recruiting methods, they simply felt no need to seek out additional employees with that sort of background.

Supervising the Nontraditional Student

To learn more about employers’ perception of nontraditionally educated workers, we conducted 28 one-on-one interviews with staff selected for their immediate supervisory responsibilities over IT workers (line managers) at 26 area employers.

Perceptions of nontraditional education and the value of work experience

The line managers were asked if any universities or colleges stood out in their minds as having exceptionally well-prepared graduates. Many of the supervisors felt that some schools produced better

employees, including many area institutions. Only two were willing to name a college or university that they felt produces consistently unprepared graduates, one named a proprietary institution, and the other a Research university.

Almost all (27 of 28) line managers said that they looked more favorably on job candidates with prior work experience. Many did explicitly mention co-ops and internships; however, line managers were more likely than HR managers to mention a wide variety of work experiences that would be valuable. When pressed to say still more about the kinds of experience that led them to view a job candidate more favorably, the most common answers were the need for interpersonal skills or for specific experience in the type of work required for the position (see Appendix Table D.65).

Most of the line managers (86%) had experience with employees who had retooled majors (those with training in a non-IT subject followed by IT training) or were nontraditional students. Less than half (43–46%) felt positively about employees with retooled majors and also about those with nontraditional education (see Appendix Tables D.66 and D.67).

When asked about the advantages or disadvantages of hiring nontraditional students in several specific categories, there were far more positive responses than negative. The most positive responses were regarding work skills and habits, realistic expectations, maturity and responsibility, and ease of training.

Recruiting nontraditional students

In contrast to the HR managers, the line managers were more open to recruiting nontraditional students. The actual content of their comments regarding nontraditional students as employees was also more positive than the comments of the HR managers.

- “[Nontraditional students] are wonderful... Especially those with military training first, then a degree, are focused, task-oriented, goal-oriented, seasoned, and take orders well.”
- “[Nontraditional students are] very motivated, driven, and focused. Credentials are not as important as experience.”
- “[Nontraditional students] are successful, motivated, persevering. They battle through a lot of stuff.”

Relationships Between Educational Institutions and Employers

Because IT fields are particularly dynamic, with constantly changing technologies, we wanted to assess the degree to which educational institutions and employers worked together to ensure a suitably prepared workforce.

Employer perspective

HR managers were asked if their organization had any ongoing relationship with any colleges or universities. Half (12 of 23) said that they did. Several of these collaborations were extensive, for instance, developing a bioinformatics track to capitalize on the biotech boom or creating a programming course to design software for a government agency. However, the majority of the university/employer relationships that the HR managers reported were informal at best, primarily involving passing on the names of good students, but including mention of a chilly response from a university that had been approached. Few of the HR managers (13%) felt that their interactions had any impact on the curriculum at the schools with which they interacted (see Appendix Table D.47).

Faculty perspective

The faculty who participated in our interviews were also asked if their institution had direct interaction or contacts with employers to ascertain their workforce needs. Nearly 40% reported having a business advisory council of some sort, and a similar number reported other unofficial and informal relationships. Only 14% reported no current interaction or not knowing of any interaction. Also in contrast with the views of the employers above, half of the faculty (51%) felt that the interactions that they had with employers had led to some or significant course/curriculum changes. More than three-quarters of the faculty felt that the interaction they or their institution had with employers helped students obtain placements for internships, co-ops, and/or jobs (Tables 4.8–4.10).

Summary

Clearly, both employers and faculty see the value in developing relationships. However, it appears to be difficult to formalize these relationships into interactions that would prove more thoroughly beneficial to both the students and the employers.

Perceptions of the Job Market

In spite of the difficult IT employment market during the course of our study, few (13%) of the HR managers reported having laid-off staff in the previous year. However, the situation was less rosy for new graduates. The employers we surveyed were generally less interested in hiring recent graduates. When queried about employment rates for their traditional student seniors, 20% of the faculty felt that the situation in 2001–2003 was worse than it had been in previous years. Of those faculty who had an opinion about the employment situation for nontraditional graduates, most felt that nontraditional students already had a job or that the situation for nontraditional students was no different than that for traditional graduates. Only 4% of the faculty surveyed felt that their nontraditional students received fewer job offers (see Appendix Tables D.68 and D.69).

Conclusions

Our study indicates that nontraditional students often end up working for smaller organizations that are not “mainstream” IT employers, whereas traditional students are more likely to work for larger organizations whose primary business is software or hardware support/services. Because nontraditional students often accepted permanent jobs with their college-period employer, it may be that these smaller, not primarily IT employers were more willing to initially hire IT workers without formal IT training. It is also possible that nontraditional students were simply overlooked by larger IT employers. This could be due to limited access to university career resources that network to these larger employers or recruitment methods that may ignore or devalue nontraditional education even from a traditional institution. Nevertheless, nontraditionally educated workers, even in lower-paying jobs, expressed higher levels of satisfaction with their employment opportunities. This suggests that they made well-considered educational choices that satisfied their career objectives. However, it may also indicate that their career objectives were less ambitious.

Employers who had experience with nontraditionally educated workers were generally impressed by their maturity, responsibility, and work ethic and

TABLE 4.8 Faculty:

*“Does your institution have direct interaction or contacts with employers to ascertain their workforce needs?**”

	Percentage (n=72)
Business advisory council	39% (28)
Unofficial/informal interaction	36% (26)
Faculty contacts	17% (12)
Career office contacts	11% (8)
Through internships/co-ops	7% (5)
No current interaction or don't know	14% (10)

*Multiple answers possible: total > 100%.

TABLE 4.9 Faculty:

“Does your department make course/curriculum decisions or changes based on these interactions?”

	Percentage (n=72)
Yes, made some curriculum/course changes	38% (27)
Yes, made significant curriculum/course changes	14% (10)
Minimal changes/generally aware of employer needs	13% (9)
No changes/should not make changes	11% (8)
NA/don't know	25% (18)

TABLE 4.10 Faculty:

“Does this interaction help with student placement in internships/co-ops/jobs?”

	Percentage n=72
Yes	76% (55)
No/don't know	8% (6)
NA	15% (11)

found that they fit well into their workforce. Data from the U.S. Department of Education³ indicate that nontraditional education is on the rise, and in our study, all employees, regardless of educational background, described the need for constant training to keep pace with rapidly changing IT fields. With so many people pursuing their education nontraditionally, we need to encourage employers to make more effective use of the full spectrum of workers that is available to them. Given the large number of underrepresented minorities among the nontraditional students in our student interviews and National Center for Education Statistics (NCES) data indicating increasing rates of two-year college attendance among underrepresented minority groups, minority populations may increasingly achieve their educational goals through nontraditional paths.⁴ Thus, if we do not ensure that nontraditionally educated students have access to the full spectrum of career opportunities, we will compound the racial disparities that are already too often present in the IT workforce.

The policy recommendations that may help address these and other issues are the subject of the final chapter.

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