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Jack Becker
University of North Texas

Nik Hassan
University of Minnesota Duluth

J. David Naumann
University of Minnesota

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Combating the Enrollment Downturn in IS/IT Programs

Jack Becker

University of North Texas
becker@unt.edu

Nik Hassan

University of Minnesota Duluth
nhassan@umn.edu

J. David Naumann

University of Minnesota
dnaumann@unm.edu

ABSTRACT

This study examines the extent and reasons for the downturn in IS/IT program enrollments since 2001. The current enrollment cycle will be compared with earlier enrollment cycles since the beginning of the modern MIS program in the 1970s. Several notable “mega-trends” that affect the enrollment cycle are suggested, and based on these “mega-trends” and other reasons underlying the downturn, innovative strategies to reverse the trend are proposed. Included among these are the following: 1) New corporate-academic partnerships; 2) Innovative curriculum adaptations; 3) Incentive program; and 4) Good “old-fashioned” marketing strategies. One can take heart from the preliminary conclusions of this paper that enrollment cycles in the IS/IT field are not new and that a turnaround will most likely occur whether we as a profession take action or not; however, we need to be more proactive and not leave our fates entirely to chance.

KEYWORDS

IS/IT program enrollments, corporate-academic partnerships, marketing strategies, enrollment trends, IS/IT curriculum.

INTRODUCTION

It is widely acknowledged that IS/IT enrollments in colleges and universities across the United States have plummeted since 2001. One cannot attend an IS/IT conference without hearing someone lament about their loss of students. Anecdotal evidence suggests that enrollments in IT/IS academic programs (at all levels) have decreased dramatically (50-60% or more) since 2001. Among the data collected that supports this dramatic downturn in IS/IT enrollments is the majors headcount and IS/IT enrollment data for the author’s own institution, University of North Texas (UNT). IS/IT enrollment and majors data has been judiciously maintained since 1982, when the Business Computer Information Systems (BCIS) department was formed. In the last 24 years the department has experienced three distinctive cycles of enrollments (See Figure 1). Downturns in undergraduate BCIS majors occurred previously in fall 1984 and fall 1993. The latest downward cycle began in spring 2001 caused primarily by the Dot-Com market collapse in April, 2001. The tragic events on September 11, 2001 further exacerbated an already weakened market. The latest cycle could easily be deemed a “recession”, given that the number of majors plummeted from 488 to 114 (76% decrease). The BCIS department changed its name in 2005 to Information Technology and Decision Sciences (ITDS) to broaden its marketing appeal.

Similar trends are noted in the graduate (masters and doctoral) enrollment data (Figure 2), where total headcount (course) enrollments, not majors, are shown. Masters enrollments fell in fall 1984 and spring 1993. The latest dip in master’s enrollments occurred spring 2002, but accelerated in fall 2003. Doctoral enrollments began their decline in spring 1996 as part of a fairly dramatic downsizing of all doctoral programs college-wide, during an AACSB reaccreditation process. The downsizing of IS/IT doctoral programs, not only at UNT, but at many other universities, will ultimately impact the IS/IT program recovery process.

Figure 3 depicts total IS/IT course enrollments. These numbers are a bit inflated with the inclusion of two required undergraduate IS/IT courses for all business majors. Nevertheless the three cycles mentioned previously are still apparent. One interesting observation is that enrollments actually began their decline in spring 2000. Not surprisingly many of our students were recruited into full time positions in the workforce during the crazy days of the Dot-Com run-up prior to 2001.

Further study of other economic and employment impacts on IS/IT enrollments is pending. It is well known that university enrollments are somewhat counter-cyclical normally. In other words, when there are plenty of jobs, fewer people attend universities and visa versa. That trend is not at all apparent in this data. Whereas the demand for web programmers and legacy programmers for Y2K projects drove the demand for programming talent in the late 1990's, the introduction of the IBM PC in 1980's spurred the need for more end-user programmers, and hence more university-based training and education.

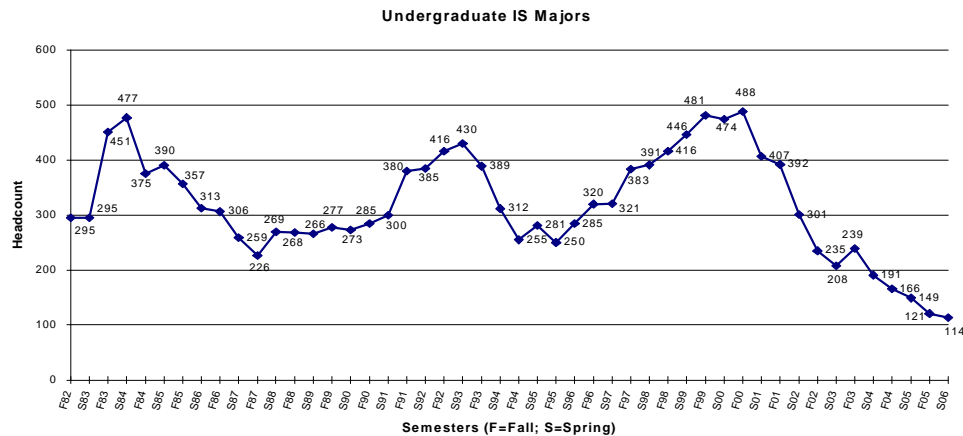


Figure 1: University of North Texas Undergraduate BCIS Majors 1982-2006

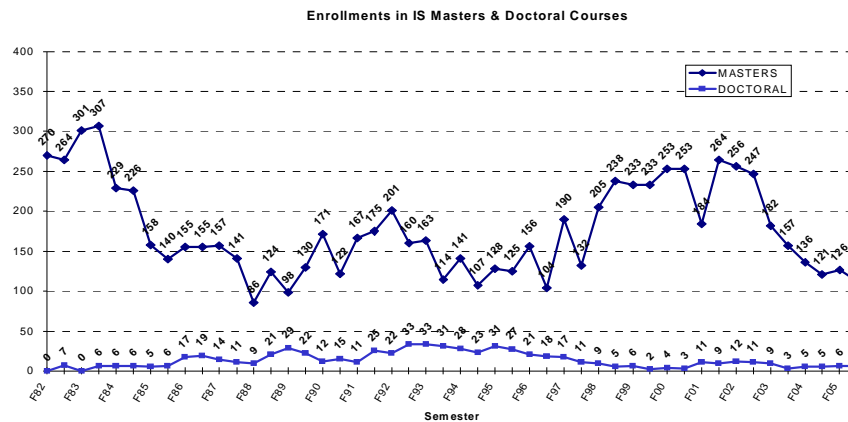


Figure 2: University of North Texas Graduate BCIS Enrollments 1982-2006

Outsourcing and especially off-shoring is another trend that is credited with significant downturns in the demand for IS/IT graduates. However, the real impact of this shift in employment is uncertain (Benarick, 2005). Furthermore recent evidence points to uneven quality of projects performed offshore, as well as increasing costs for these services.

Declines in IS/IT workforce demand is undeniable (See Figures 4 and 5). According to a survey of hiring managers (ITTA Survey, 2003), both the trend of hiring and terminations and the overall demand for IS/IT personnel has steadily declined.

EXPLANATIONS FOR THE DOWNTURN IN ENROLLMENTS

Enrollment Cycles

The downturn in the enrollment of IS majors can be explained in several ways. First, enrollment of IS majors experiences fluctuations not unlike expansions and contractions (business cycles) in the economy. A similar pattern of cycles experienced by the UNT can be seen in the overall number of bachelors and masters degrees awarded within the Computer and Information Science (CIS) programs during the period 1970 to 2003 (See Figure 7; Source: National Center for

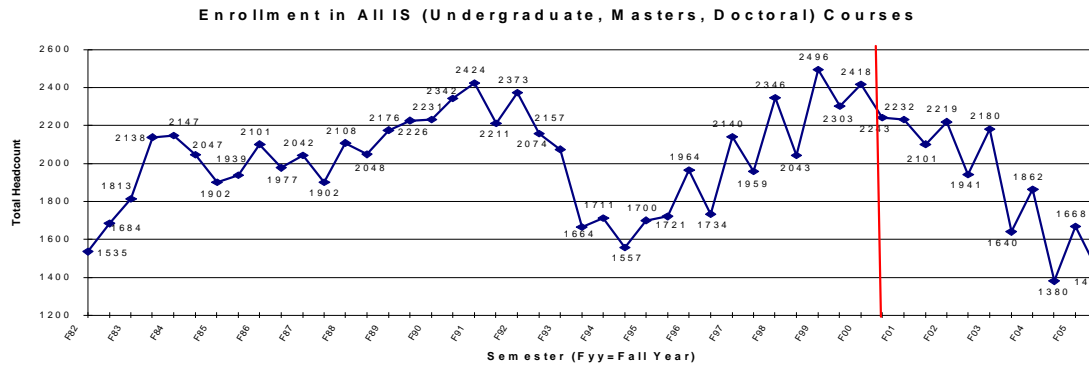


Figure 3: University of North Texas Enrollments ALL IS Courses 1982-2006

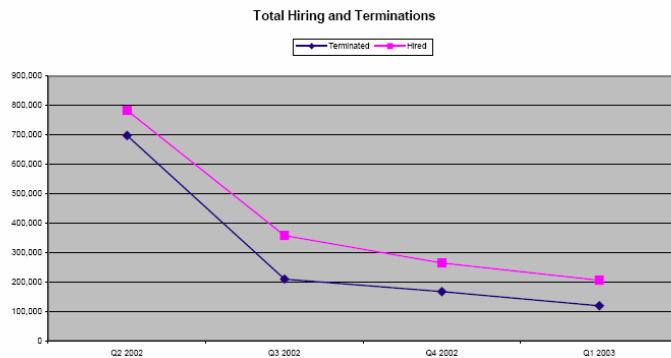


Figure 4: Total IT Hiring and Terminations

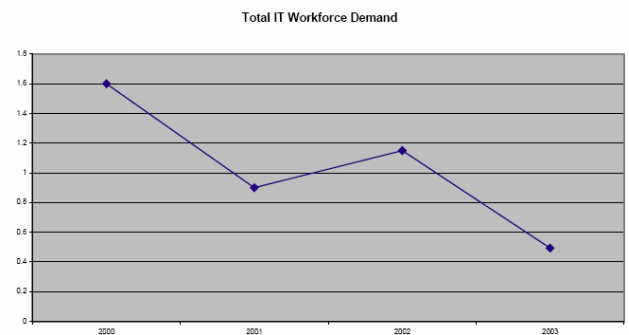


Figure 5: Total IT Workforce Demand (millions of jobs)

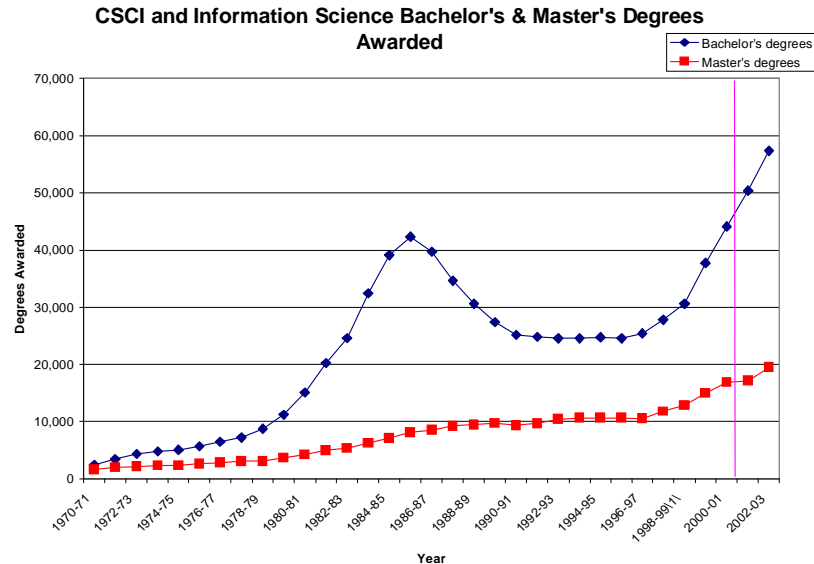


Figure 6: Computer and Information Science Bachelors and Masters Degrees Awarded 1970-2003

SOURCE: U.S. Department of Education, National Center for Education Statistics, Higher Education

Education Statistics (NCES)). Comparable data for so-called MIS degree programs is more difficult to obtain. In fact MIS Degree programs were virtually non-existent prior to 1970. According to the Directory of MIS Faculty (1982), there were only 135 MIS-type programs in the U.S. (123 programs) and Canada (12 programs), with only 504 identifiable faculty members. Most of these faculty members were terminally qualified by 1982. Thus, on average all of these faculty will be eligible for retirement by 2017. The degree cycles for CIS degree programs are similar to the UNT enrollment pattern, except they are smoother because of the larger sample size. CIS degrees experienced their first downturn in spring 1986 after over 15 years of continuous growth. The increase in the late 1990's parallels the start of the Dot-Com revolution, with graduation rates still increasing through 2002-2003.

Since the number of doctoral graduates typically lags the overall enrollment curve by approximately four to six years, it should be no surprise when the number of PhD graduates in these areas drop off dramatically during 2005-2007.

Mega-Trends 1970-2006

A further explanation for the cycles in IS/IT enrollments is the existence of several "mega-trends," which potentially affect the IS/IT field. At the least these ten (10) mega-trends accentuate the enrollment cycles experienced by IS enrollments. Among these trends since the 1970s are:

1. General employment/unemployment statistics (1970-2006)
2. Baby Boomer bubble (1970-2030) and the pending massive retirements of IT/IS workers and faculty by 2030
3. Demand and Supply of IS/IT faculty in U.S.-based programs (1970-2006)
4. Bureau of Labor Statistics forecast for demand for IT/IS employees in next 10 years
5. The increase in the number of IT programs, PhD programs, and faculty (1970-2006)
6. 1993-2001: Dot-Com job growth and Y2K legacy programming skills job growth
7. 1993-2001: Salary increase survey and impact on the demand for on-shore IS/IT employees
8. The increase in the supply of outsourcing talent, and especially "cheap" offshoring talent; and
9. Correspondingly the price of offshore IS/IT talent (1993-2006). As offshore labor becomes more competitively priced, the worldwide supply of IS/IT talents will be more dependent on the quality of talent.
10. Accreditation agency pressures from the Association to Advance Collegiate Schools of Business (AACSB) in 1990's that led to significant declines in IS/IT PhD programs

In the final paper, a model for how these trends impact one another and the IS/IT enrollment cycle will be proposed. Then each of these trends will be evaluated with respect to their impacts on the IS/IT enrollment cycles. For this limited research

in progress paper we will briefly examine only the impacts of the Baby Boomer generation and trend in PhD program graduates as reported to the AACSB (2006).

The Baby Boomer Generation and the “Bubble” Effect

One of mega-trends uniquely affecting the entire pattern of IS/IT enrollments and employments is the so-called “Baby Boomer Generation.” Boomers are defined as people born during the years 1946 to 1964. What is notable about this generation is that following WWII, the birthrate in the U.S. increased from its pre-war average of 0.93% to 1.68% for the next 19 years (Bureau of Labor Statistics Tables). After 1965 the birthrate dipped back to 1.05%. Accordingly there are a disproportionate number of individuals in this “bubble.” Table 1 gives an indication of the future Boomer impacts. Most notable for this study is that there are significantly more boomer IS/IT personnel than any other age group. As can be seen the first wave of Boomers will be taking early retirement between 2000-2010. In the next two decades practically all boomers will leave the workforce. Many of the first IS/IT faculty came from the Boomer generation—these folks will be retiring in droves during the next 10-20 years, leaving a potentially large number of IS/IT faculty openings.

Decade	Youngest	Oldest	Ave Age
1970	6	24	15
1980	16	34	25
1990	26	44	35
2000	36	54	45
2010	46	64	55
2020	56	74	65
2030	66	84	75

Table 1: Baby Boomers Ages 1970 – 2030

CIS Doctoral Enrollments and Graduates from AACSB Accredited Doctoral Programs of MIS

Figure 7 brings this dilemma into sharper focus. With increases in faculty position openings presumably on the rise, will there be a corresponding supply of IS/IT faculty talent. There are strong indications that doctoral degree production is declining. The World Wide Web drained off many prospective doctoral candidates during the last half of the 1990's. The Dot-Com crash does appears to have returned at least a few of them back to university campuses, but not necessarily to IS/IT programs in colleges of business.

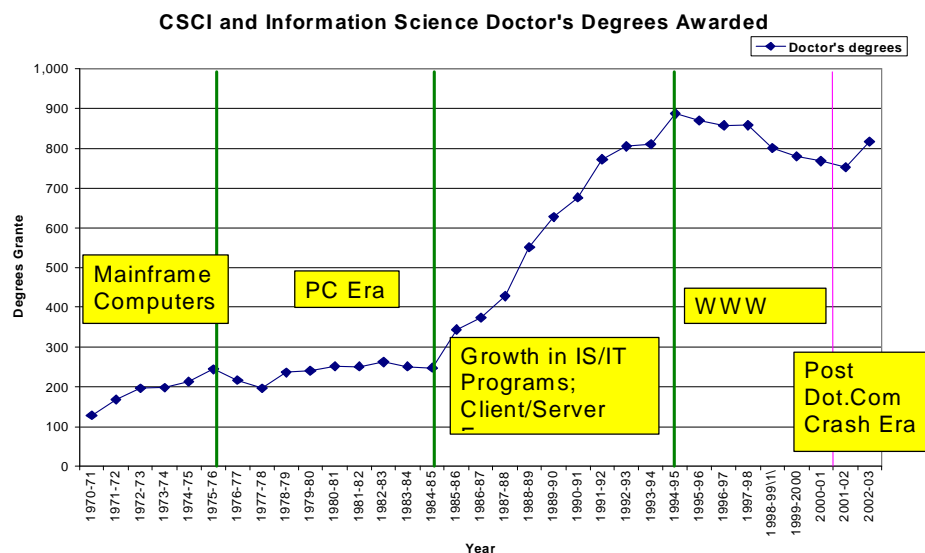


Figure 7: Computer and Information Science Doctor's Degrees Awarded 1970-2003

SOURCE: U.S. Department of Education, National Center for Education Statistics, Higher Education

According to AACSB (2006) data, the number of doctoral graduates has been in decline since 2001, the second year this data was available (See Figure 8).

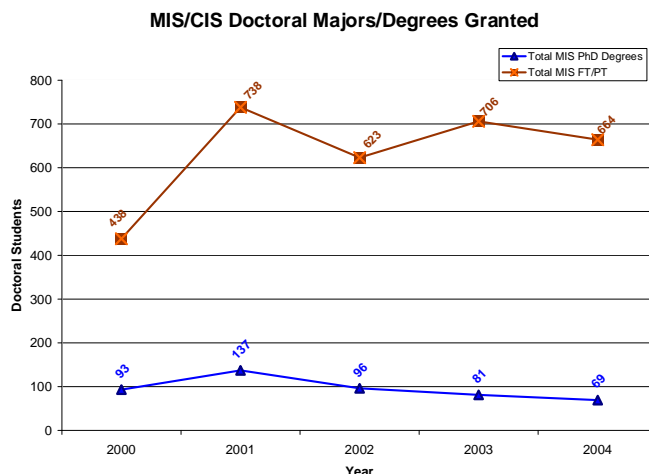


Figure 8: Computer and Information Science Doctor's Degrees Awarded 1970-2003

SOURCE: AACSB U.S. Department of Education, National Center for Education Statistics, Higher Education

While not all new U.S. doctoral faculty graduate from AACSB accredited schools it is safe to say that the vast majority do. Given the relatively small number of actual doctoral graduates—only 137 graduates in 2001 at the peak of the first Dot-Com wave—one could argue that even small swings in any of the mega-trends could have a large impact on the number of IS/IT doctoral students. This is evidenced by the drop in graduates to 69 (50% decrease) by 2004. Trends such as this one, when combined with the impending retirements of the first 500 founding faculty members in the next few years may cause one to be very concerned about the fate of the IS/IT professional.

According to David Naumann, Editor for the IS World Faculty Directory, the peak for new doctorally-qualified IS/IT faculty members, who subsequently joined a IS/IT degree granting institution occurred during 2000-2001 (See Figure 9). There were 386 faculty members, who reported 2000 as their degree granted year (generally doctoral, but some masters degrees). Since then the number of new faculty members entering academia has dwindled precipitously from 377 in 2001; to 300 in 2002; to 254 in 2003; to 180 in 2004; and finally to a mere 83 in 2005. While part of this downturn may be due to an unquantifiable reporting lag, we believe that much of this decline is due to the backlash to the Dot.Com and general market collapse in 2001, the subsequent cut backs in university recruiting budgets, and doctoral students deciding to either postpone or abandon their own degree pursuits.

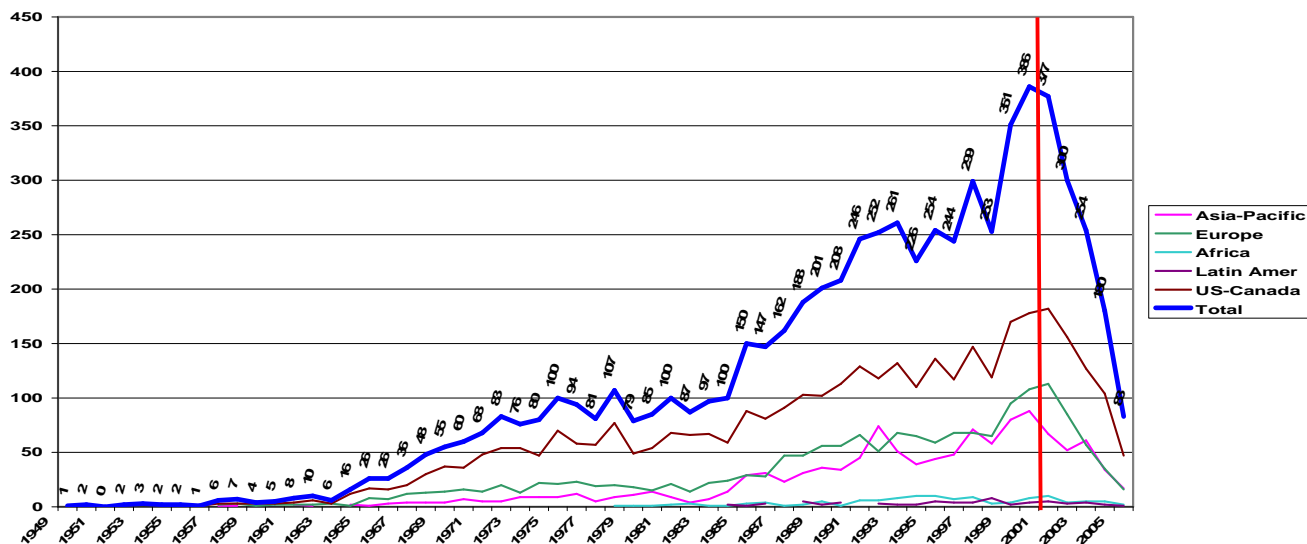


Figure 9: MIS and CIS Terminal Degrees Awarded to Active Faculty by Year: 1949-2005*SOURCE: IS World Faculty Directory, J. David Naumann***INNOVATIVE STRATEGIES TO REVERSE THE DOWNWARD ENROLLMENT TRENDS****Corporate-Academic Partnerships**

This current downturn in both demand for IS/IT personnel and enrollments in IS/IT programs should not be expected to last. One initiative that can smooth out the downturn and possibly reverse it is a partnership between academia and industry. For example, a new initiative jointly sponsored by the Society for Information Management (SIM) and Microsoft Corporation speaks to their concern for long-term supply of IS/IT talent. Their initiative, referred to as “*Future Potential for IT*” is designed to increase the number of students enrolling in IT curriculums in 4 year colleges, and two year certificate programs. They hope to influence high school students and two-year degree college students to consider entering colleges that offer IT programs and prepare for application to those colleges. The program plans to expose students to the opportunities and rewards for IT professionals in the business world. Several textbook publishers, such as Prentice-Hall and McGraw Hill are also developing their own seminars, to better understand the causes of the enrollment downturns and the decline in their IS/IT textbook market-place. IS professors should work closely with these textbook publishers to produce innovative textbooks that better represent the field and inspire students to undertake careers in IS/IT.

Innovation Curriculum Adaptations

Not all stories concerning the IS/IT marketplace are about doom and gloom. Innovative curriculum adaptations go a long way in attracting and retaining majors. For example, at Pasadena City College in Pasadena, California, one IS/IT department has taken to aggressively remake the way its IS/IT department recruit and retain its majors (Gaskin, 2006). When they started their “Aggressive 4 Paths to Enrollment Recovery Program” in 2003 they recognized that dramatic steps were needed to bolster IS/IT enrollments. The results of this program were quite dramatic, given the other market forces (See Figure 10). Not only did they reduce the decrease in their majors, they have nearly returned the number of their 2001 graduation levels. The director of the program, Prof. Gaskin calls her approach the “Education” Path Approach. Since organizations recognize the importance of career paths to employee growth, she believes that colleges and universities should place more emphasis on the whole student educational experience. This approach is comprised of four steps or paths:

- **Step 1**-Create paths that take the student to a defined place
Review and development of courses and programs
- **Step 2**-Light the path
Recruitment activities
Draw students to IS/IT like a moth to a bright light.
- **Step 3**-Give students a map of the path
Retention activities
Help the student at every step along the way.
- **Step 4**-Help students reach the end of the path
Completion, placement, and transfer
Follow-up to make sure the student is rewarded for taking the journey.

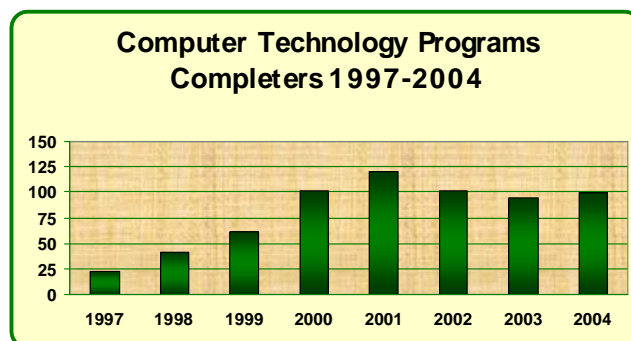


Figure 10. IS/IT Graduations 1997-2004

Source: Prof. Shelly Gaskin, Business Computer Technology Department, Pasadena City College, Pasadena, CA

Other curriculum adaptations that can help reverse the downturn include:

- Multiple specialty tracks
- Certificate programs
- Flatten pre-requisite structure
- Keep the required number of courses to a reasonable number (e.g., 10 courses; 30 hours)
- Project management
- Data warehousing/analysis
- Customer Relationship Management
- Supply Chain Logistics

Incentives

Incentives can play a significant role in reversing the downturn. Different kinds of incentives to encourage students to join the MIS program include:

- Scholarships (such as tuition waivers) to attract high-potential IS/IT majors from feeder schools, such as junior colleges and other 2-year associate degree programs.
- Partnerships with 2-year Associate Degree programs
- Recruitment strategies on Technology Magnate High Schools

Good, “old-fashioned,” marketing strategies

- Market to College Non-majors
- In your sophomore/junior introductory level IS/IT classes
- Poster boards
- College/Department TV Monitors
- Hot IT job opportunities

It may seem a bit crass to some IS/IT faculty but marketing can help sell programs! One popular technology author, Matt Moran (Moran, 2006), provides the following promotion for IT careers, based upon a Bureau of Labor Statistics (BLS) study. The BLS study ranks potential jobs on the expected percentage increases in job openings over the 2002-2012 time periods. Mr. Moran turns the study around and introduces his quartile salary ranking procedure. When jobs are ranked based upon the highest quartile salaries and greatest expected increase in jobs, the results are quite telling for IS/IT professionals. In particular, six of the top eleven fastest growing & highest paying jobs are in IS/IT (Table 2)!

	2000 Standard Occupation Classification code and title	Employment		Change		Quartile rank by 2002 median annual earnings ⁽¹⁾
		2002	2012	Number	Percent	
4	15-1081 Network systems and data communications analysts	186	292	106	57	1
5	29-1071 Physician assistants	63	94	31	49	1
6	15-1031 Computer software engineers, applications software	394	573	179	46	1
7	15-1032 Computer software engineers, systems software	281	409	128	45	1
8	15-1061 Database administrators	110	159	49	44	1
9	29-2021 Dental hygienists	148	212	64	43	1
10	15-1051 Computer systems analysts	468	653	184	39	1
11	25-1000 Postsecondary teachers	1,581	2,184	603	38	1
12	17-2081 Environmental engineers	47	65	18	38	1
13	15-1071 Network and computer systems administrators	251	345	94	37	1
14	11-3021 Computer and information systems managers	284	387	103	36	1
15	29-1123 Physical therapists	137	185	48	35	1
16	29-1122 Occupational therapists	82	110	29	35	1
17	31-2021 Physical therapist assistants	50	73	22	45	2
18	47-4041 Hazardous materials removal workers	38	54	16	43	2
19	25-3021 Self-enrichment education teachers	200	281	80	40	2
20	31-2011 Occupational therapist assistants	18	26	7	39	2
21	19-4091 Environmental science and protection technicians, including health	28	38	10	37	2
22	29-1126 Respiratory therapists	86	116	30	35	2
23	31-9092 Medical assistants	365	579	215	59	3
24	21-1093 Social and human service assistants	305	454	149	49	3
25	29-2071 Medical records and health information technicians	147	216	69	47	3
26	31-2022 Physical therapist aides	37	54	17	46	3
27	39-9031 Fitness trainers and aerobics instructors	183	264	81	44	3
28	29-2056 Veterinary technologists and technicians	53	76	23	44	3
29	31-2012 Occupational therapist aides	8	12	4	43	3
30	31-9091 Dental assistants	266	379	113	42	3
31	31-1011 Home health aides	580	859	279	48	4
32	39-9021 Personal and home care aides	608	854	246	40	4
33	25-2011 Preschool teachers, except special education	424	577	153	36	4
34						

Table 2: Matt Moran's Re-Ranking of the Hottest Jobs—In IS/IT

Source: Bureau of Labor Statistics: www.bls.gov

According to Moran (2006) the ten most attractive jobs are (IS/IT jobs in bold):

- 1. Network systems and data communications analysts**
- Physicians assistants
- 3. Computer Software engineers, applications software**
- 4. Computer Software engineers, systems software**
- 5. Database Administrators**
- Post-secondary teachers
- Environment engineers
- 8. Network and computer systems administrators**
- 9. Computer and information systems managers**
- Physical therapists
- Occupational therapists

CONCLUSION

While the downturn in IS/IT enrollment, graduations, and employment opportunities are down, the future remains bright for IS/IT careers. We could sit back and let the IS/IT market rebound on its own, as we might legitimately expect or instead take a more active role in assisting the turnaround. A number of methods for expediting the IS/IT enrollment turnaround are suggested and evidence of their success is provided.

The authors encourage interested readers to join our online discussion group: <http://groups.yahoo.com/group/BoostingCIS/>

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