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Information Systems Enrollments: Challenges and Strategies

Mary J. Granger

Department of Information Systems and Technology Management
George Washington University
Washington, DC 20052
granger@gwu.edu

Geoffrey Dick

Australian School of Business
University of New South Wales
Sydney NSW 2052 Australia
g.dick@unsw.edu.au

Carolyn McKinnell Jacobson

Information Systems and Management Science
School of Business Administration
Marymount University
Arlington, VA 22207 USA
Carolyn.Jacobson@Marymount.edu

Craig Van Slyke

Decision Sciences and Management Information Systems
Saint Louis University
Saint Louis, MO 63104, USA
crvanslyke@gmail.com

ABSTRACT

Since the late 1990s, enrollments in Information Technology and Information Systems-related academic programs have declined sharply. This paper addresses possible causes of the enrollment decline, and some of the "myths" regarding careers in IT/IS are dispelled. A number of efforts underway at various universities and professional organizations in the areas of redesigning core curriculum and developing secondary programs are described as well as marketing and promotion approaches. Finally, the authors call for more cooperative and coordinated efforts to address the underlying problems that have led to the current enrollment declines.

Keywords: Enrollments, Information Systems, Information Technology, Labor Market

1. INTRODUCTION

As we approach the latter part of the new millennium's first decade, an interesting and troubling set of seemingly contradictory events is occurring. As most of us are well aware, enrollments in Information Technology and Information Systems-related academic programs have

declined sharply since the late 1990's. Reports of enrollment declines of 70% and more are not uncommon. At the same time, however, demand for Information Technology and Information Systems professionals is growing (Longo, 2006). To make the situation even more confusing, the popular press is rife with articles (Brandel (2006) or Rossheim (2006)) detailing how IS jobs are "going

overseas." There is comment too on the impact of this on workers in developed countries (Shao and David, 2007)

To say that this is a frustrating time for Information Systems (IS) educators would be a gross understatement. We have college and university administrators pushing us to increase enrollments, students expressing great apathy towards the field, and employers demanding that we produce more graduates.

The purpose of this paper is twofold. First, we report on a number of efforts underway at various institutions to increase enrollments in IS programs. This may provide examples for other universities, or generate additional suggestions. Second, we wish to bring about discussion and debate with the hopes of helping promote more cooperative and coordinated efforts. By working together, the IS community may be able to address the underlying problems that have led to the current enrollment declines.

We begin by briefly discussing the enrollment challenge facing us, and identifying and trying to understand the possible causes of this decline. A number of 'myths' regarding careers in this field are also addressed. The field has been in a similar situation once before. Cale, Mawhinney, and Callaghan (1991) predicted serious shortages of entry-level personnel in the early 1990s. This shortage likely contributed to increased starting salaries for graduates, encouraging students to enroll in IT-related programs in the late 1990s.

It should be noted that in this paper, the terms "Information Technology" and "Information Systems" follow the definitions proposed by the Joint Task force for Computing Curricula 2005. Specifically, Information Technology (IT) in the broadest sense refers to all of computing and is used here when discussing employment opportunities. Information Systems (IS) is used to refer to academic programs that emphasize the information aspects of information technology and how that technology is used to address the needs of business and other organizations.

- As one of the reviewers of this paper pointed out, this nomenclature issue may present a problem of its own.
- If we are confused, no doubt the students and prospective students are too.
- The students' inability to see IS and its business-related focus in a different light from technology, and even programming, may be contributing to the very problem this paper is trying to address.

2. THE CHALLENGE

Enrollment in IS-related academic programs has declined dramatically since the heady days of the dot-com boom. According to Bureau of Labor statistics, "the number of total incoming freshmen planning to seek an IS or computer science degree is 1.1 percent, down from 3.7 percent in 2001" (Tucci, 2007). One of the challenges faced by the authors in preparing this paper was determining an accurate figure. The figures that are available do not clearly identify what is being counted: graduate or undergraduate enrollments; computer science, information technology or information systems; full-time equivalents or numbers of students; graduating students or numbers enrolled in majors; geographical locations; and whether or not students enrolled in compulsory core units are included. Nevertheless, it is safe

to say that throughout large portions of the world, the number of students majoring in information systems and related computing areas has declined sharply. It is not unusual to hear cases of enrollment declines of over 70 percent. (ISWorld 2006; McGettrick, Cassel, Guzdial & Roberts, 2006). Throughout the United States, there has been a decrease in enrollments that ranges from 25 to 75 percent (George, Valacich & Valor, 2005). As an illustration, Figure 1 (George, Valacich, & Valor, 2005) depicts enrollment trends at one school. The graph is noteworthy because some believe the enrollments between 1996 and 2000 were an anomaly, driven by the dot.com boom, and that only a drop below 1995 levels would indicate a problem (ISWorld 2006). This graph indicates such a drop, if only for one institution. While many schools are reluctant (or unable) to provide specific figures, and while the numbers vary dramatically from school to school, the authors have had conversations with representatives from numerous programs that confirm this trend.

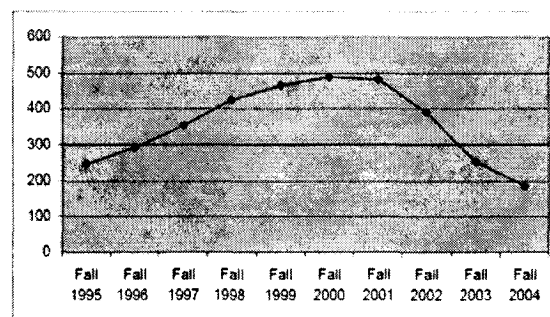


Figure 1. Number of MIS Majors at Florida State University, 1995–2004

One question that must be addressed is whether the declining enrollments are the problem or the symptom. It may be that the decline in the number of majors is indicative of other, more fundamental problems. For example, it is possible that many IS curricula do not reflect the evolving demands of today's (and tomorrow's) IS professionals. For many years, the entry point into the IS profession was application programming. A combination of outsourcing and modern development tools may have greatly reduced the need for traditional application programmers. If this is the case, and if IS programs do not reflect this evolution, then perhaps we need to rethink how we are educating our students.

Another interesting question is whether the decline in enrollments is simply cyclical. Other, more established, professions have periodically experienced surges and declines in enrollment and employment. There is disquiet among our sister disciplines too – Computer Science and the more recently formed Information Technology programs are concerned with similar issues (Carter, 2006; McGettrick *et al*, 2006; Remington, 2004).

3. IDENTIFYING ROOT CAUSES AND MYTHS

3.1 Root Causes

An interesting and critical set of efforts is aimed at identifying the underlying, root causes for the shrinking interest in IT-related programs. Why is it that students are no

longer attracted to our majors? In order to build positive perceptions of Information Systems as an exciting, rewarding profession, we should first understand how potential majors currently view our field. There are several different, but overlapping perspectives, on how to answer this question.

Lomerson and Pollacia (2006) investigated reasons students did not choose IS as a major. Interestingly, only 13 percent of the students who reported considering, but not choosing, a computer-related major cited poor employment prospects as a reason. In contrast, 50 percent cited the nature of the work as being either too hard (24 percent) or too technical (26 percent). The most frequently chosen reason for not choosing IS as a major (cited by 45 percent of respondents) was that the students didn't think they would like the work. Students who did not consider computer-related majors overwhelmingly cited a lack of interest in technical careers as the reason.

Lee and Lee (2006) used the Analytic Hierarchy Process across twelve business schools to discover why students were not selecting Information Systems as a major. Their study found that the most critical issue is the students' perception of the IS job market. Students believe there is a scarcity of IS positions. Other issues cited by these researchers relate to a lack of marketing of the field, the belief that IS is a difficult major, and the negative attitude of parents and peers toward an IS major.

A survey of 648 14-19 year olds in Victoria, Australia ("ICT Skills Research" 2007) suggests that young people do not understand the kinds of careers that are open to graduates with technology skills. Working with the latest technology, working in a growing industry, many job opportunities and being well paid were seen as the most positive aspect of a career in ICT. However, careers are still seen as boring.

An in-progress study in the US examines the sources that influence students in their selection of a major. The possible sources of influence are many: peers, secondary school counselors, university advisors, parents, and the popular press, to name a few. However, a systematic examination of which of these sources are the most important may help focus marketing and promotion efforts. Without this knowledge, we could quite easily direct our efforts at the wrong audience. This study also investigates students' impressions of Information Systems as a career. There is some evidence to suggest that college freshmen may believe that a career in IT means a career as an application programmer. This may be the result of outdated curricula (high school and/or university level) that do not reflect the mix of business and technical skills expected for employment. Students need to be made aware of the broad range of knowledge and skills required in the IT field and the many varied and exciting career paths available.

Another in-progress study takes a different approach to understanding students' perceptions of Information Systems as a profession. This study uses both focus groups and a survey to investigate students' perceptions of various aspects of the culture of the IT field, including normative, affective and continuance commitment. When complete, this study may provide valuable insights into the minds of students, enabling us to improve the image of IT-related professions.

Programs with a significant international student population saw a decline that was directly attributable to the

events of September 11, 2001, as some Middle Eastern students returned to their home countries and student visas to the US became harder to obtain. A number of these students did not return to the US, and at least one embassy redirected scholarship dollars from the US to Canada.

3.2 Myths About IT Careers

Some of the enrollment decrease may also be attributable to a number of "myths" regarding careers in IT ("Five Myths about Future Employment in IT"). By identifying and understanding these myths we can begin to develop strategies to address them.

- The first myth is that there are no jobs in IT; the fact is that the IT job market is very healthy (see Table 1 which reports the position in the US) and the technology skills shortage is real (Brandel, 2007) . . . According to one survey, 50 percent of organizations are increasing their IT staff by at least 5 percent in 2007, and an additional 25 percent expect to grow by at least 15 percent (McGillicuddy, 2007). When asked to list their top concerns regarding IT staffing in 2006, 53 percent of CIOs surveyed cited finding and hiring needed skill sets (Overby, 2006). In April 2007, Dice.com listed over 96,000 technology jobs, an increase of almost 38 percent in the past two years.
- A second myth is that there will be no IT jobs when the student graduates. In fact, IT in the US is among the fastest growing occupations, with six IT job categories projected to grow more than 36 percent between 2004 and 2014 (Table 1). Couple this with the fact that the first baby boomers reach retirement age in 2011, and it can be expected that the IT job market will be healthy for some years to come.
- A third myth, which has drawn much media attention, is that all IT-related jobs are going off shore. This may be complicated by students not understanding the difference between offshoring and outsourcing. While it is true that some IT jobs (e.g. help desk, operations, some programming) are going overseas, the more highly skilled jobs relating to a company's core competencies or products remain very much on-shore. These include functional and process knowledge, business process management, and industry and company knowledge ("Is there still life?"). Brandel (2007) suggests that even many of the so-called technical jobs ripe for outsourcing are in demand in the US.
- Fourth is the myth that IT salaries are depressed due to competition with cheaper labor abroad. In fact, undergraduate starting salaries in IT-related fields are among the highest (Table 1). The scarcity of qualified workers has driven salaries up, with the average IT salary in 2007 projected to increase by 3.8 percent, following an increase of 3 percent in 2006 and 2.5 percent in 2005 (McGillicuddy, 2007). Current factors (e.g. job growth, enrollment declines, retirement of baby boomers) can be expected to continue to exert upward pressure on salaries.
- Yet another myth is that IT-related educational degrees are worthless. However, as can be seen from Table 1, the demand for computer science and engineering skills is expected to increase at a rapid rate at least until 2014.

Occupation	Projected additional workers needed 2004-2014	% growth 2004-2014	Median wage 2005 (US dollars)
Computer Software Engineers, Applications	268,000	36+	77,090
Computer Software Engineers, Systems Software	180,000	36+	82,120
Network Systems and Data Communications Analysts	153,000	36+	61,750
Network and Computer Systems Administrators	138,000	36+	59,930
Computer Security Specialists		36+	59,930
Database Administrators	51,000	36+	63,250
Computer Systems Analysts	208,000	21-35	68,300
Computer Support Specialists	183,000	21-35	40,610
Computer and Information Systems Managers	124,000	21-35	96,520
Computer and Information Scientists, Research	8,000	21-35	91,230
Mechanical Engineers	87,000	10-20	67,590
Sales Engineers	32,000	10-20	74,200
Computer Hardware Engineers	20,000	10-20	84,420
Computer Programmers	117,000	0-9	63,420

Table 1 – Information Technology Jobs (Source: online.onetcenter.org)

- While technical skills are still important, job candidates today are also expected to have a solid understanding of business fundamentals, including project management expertise as well as enterprise and industry knowledge (Overby, 2006). Additionally, the skills possessed by an IS graduate are highly regarded in business – systems thinking, ability to analyze business problems, a sound technical knowledge, and communications skills. These put the graduate in an extremely strong position for many positions within and outside the organization.

Systematic investigations into the underlying reasons students choose or do not choose IS-related majors may yield important information that may help us address the enrollment issues. More such studies are needed. Perhaps we need to look at our own performance and offerings too. Again anecdotally, it seems that many of our courses are boring to the students, particularly in the early years. We need to examine the diversity in what we teach and how the curriculum might be modified to provide an interesting and stimulating student experience. Perhaps at some time in the future we may look back on this as a temporary difficulty that led us as a discipline to re-examine what we teach and how we present it.

4. APPROACHES

In early 2007, a request was posted to ISWorld, asking faculty how their universities have approached the declining enrollment issue. A number of interesting responses were received. The discussion in this section is based on these responses, the authors' personal experiences and knowledge,

and subsequent papers presented at AMCIS 2007. The authors would like to express their deep appreciation to those who so willingly shared their experiences. It is through this sort of cooperative effort that we will overcome our current challenges.

4.1 Curriculum-oriented approaches

Some institutions have taken curriculum-based approaches to improving enrollments. The current challenge may actually represent an opportunity to engage in thoughtful study of IS curricula. The face of IS has changed, and perhaps our curricula must change as well. The first step is to determine what desired learning outcomes and objectives are appropriate (e.g. what knowledge and skills our graduates should have). "While technical proficiency is still important, CIOs are desperately seeking employees with project management expertise, enterprise and industry knowledge and the business skills necessary for customer-facing roles" (Overby, 2006, p.41). Defining appropriate outcomes and objectives enables us to determine what courses are necessary and what should be taught in those courses. Akbulut and Looney (2007) showed that the degree to which students perceive the technology taught in introductory IS courses as sophisticated in that it matches business demands and uses, affects student aspiration to pursue an IS degree. Bullen, Abraham and Gallup (2007) also drew attention to the need to match the curriculum to market needs.

In addition, links between courses can be better understood and unnecessary redundancies can be eliminated. Ohio University engaged in such a long-term examination and redesign of their curriculum. Their efforts were rewarded

in sharply increasing enrollments and placement rates (McGann, Pike, Huang & Matta, 2005). Other programs might benefit from similar curriculum reassessments.

Some departments have taken a curriculum-related approach to increasing credit hour production. These efforts involve increasing the presence of IS in the college core requirements. For example, one department was successful in adding an additional course to the core. Another department, as part of an overall restructuring at the college level, added one credit hour to the core IS course. In the latter instance, the additional hour was sufficient to justify an additional faculty line. This type of action may affect enrollments in several (albeit relatively minor) ways. First, the increased exposure will hopefully help students see IS as an integral part of a business degree and consider IS for a major. Secondly, the increased credit hours mean more faculty, thereby enabling more diversity in the programs and probably smaller classes in senior years. Both of these initiatives could be expected to make the discipline more attractive and have a positive effect on enrollments.

4.2 Modifications to Course Offerings

Another approach is to leverage current course offering into what might be called secondary programs. Secondary programs are defined as academic programs designed to appeal to students who are not enrolled in our major. Examples include minor and certificate programs. In some cases, existing courses can be repackaged to create programs that are attractive to non-majors. For example, the University of Central Florida recently packaged three enterprise-systems-related courses into a certificate program. Although it is too soon to assess the success of this effort, early indications are positive.

The secondary programs approach has the potential for a dual benefit. In the short term, these programs can add to the number of students in a class section. If existing courses are used for secondary programs, additional students may enroll in sections that are already being offered. This is a low-cost way to generate additional credit hours. (Like it or not, many universities are credit-hour driven.) A longer-term benefit comes from attracting students to our majors. Some students who participate in secondary programs may find IS is attractive and choose to major in IS. Additionally, such programs may offer opportunities to correct misimpressions regarding the nature of IS work.

Another benefit of secondary programs is that they can leverage inherent competencies of individual departments. This allows a department to build a "personality" that may be an important component of ongoing marketing efforts. For example, a blended IS and decision sciences department may be able to repackage courses to build supply chain management or business intelligence certificate programs or minors.

Some departments partner with other disciplines, particularly at the master's level, to create cross-disciplinary programs, such as accounting information systems (Georgia State University), information security (Marymount University), health information management (Claremont Graduate University), geo-spatial information systems (University of Texas at Dallas), or business process innovation (Georgia State University). These types of

partnerships hold considerable promise, especially when directed at areas where there is much employer demand, such as healthcare. Leeds Metropolitan University in the UK is already reporting some success with a multi-media program that combines information systems and music.

A significant benefit of partnerships and secondary programs is that they may help smooth out seemingly inevitable peaks and valleys in the number of majors. As one respondent to our ISWorld query pointed out, the number of majors in an area is often cyclical. Majors become more or less popular in response to cyclical changes in job markets. Overall enrollment in universities may be more stable. By offering secondary and joint programs, IS departments can attract students from other programs. If these areas are sufficiently diverse, the total number of students in secondary and joint programs may be relatively static, offering much-needed stability in the overall enrollment in IS courses. Secondary and joint programs may also help address the need for IT-knowledgeable professionals in other areas, such as accounting and healthcare.

A similar approach might be for IS to become a "minor of choice". In other words, students majoring in other disciplines could be encouraged to take enough classes in IS (three or four in most cases) to provide them with a solid grounding in general IS knowledge, thus making them more attractive to potential employers. Carefully chosen combinations of classes might lead to job opportunities in one of the current IS growth areas: risk assessment, audit, IT governance, etc.

4.3 Marketing and promotion approaches

Marketing and promotion, the third category of approaches, seem to be quite popular, judging from the responses to our ISWorld query. As incoming Association for Information Systems President Dennis Galletta pointed out in an ISWorld posting, marketing the field is of critical importance to AIS.

Many departments are engaging in marketing and promotion efforts. These vary in their level of complexity and in the amount of resources required. However, most seem to have one of two goals: building awareness of a department's programs or changing the image of the profession. Of course, some marketing programs are directed at both. The MIS Department at Florida State, in collaboration with their MIS Industry Advisory Council, sponsors "MIS@ the Movies", offering free showings of popular films and recent releases that highlight the role of Information Technology in today's society. Bearing Point recently sponsored a showing of "The Matrix", complete with free popcorn.

Reaching out to influential groups was a recurring theme in the responses received. A number of respondents indicated that their departments were making concerted efforts to reach "feeder" institutions, such as secondary schools, junior/community colleges and regional campuses. There is anecdotal evidence that high school counselors are still under the impression that the IT job market is poor. Educating counselors and even our own admissions officers on the glowing prospects in the IT profession may lead to more capable students being advised to consider IS-related programs. A more serious education problem is that many high school teachers and counselors may not have a good

understanding of the nature of Information Systems jobs. Many may equate IS with computer science and think that IS professionals spend their days programming. It will take considerable effort to correct these misimpressions, but the effort is likely to pay off in the long run. One department that has engaged in outreach efforts to feeder institutions reports stable enrollments, providing evidence to support the efficacy of this tactic.

More comprehensive marketing efforts are also underway. The MIS department at the University of Georgia developed a multi-phase marketing plan. This plan included various components such as developing and distributing marketing materials, contacting employers and alumni for assistance, and holding social events for prospective students. According to the chair of this department, these efforts have yielded results. In less than a year, preliminary figures indicate that the number of MIS majors has more than doubled. The well-thought-out, comprehensive nature of this marketing plan is likely one reason for its success. Efforts that are well planned are much more likely to bring success than haphazard, "shotgun" approaches.

At Baylor University (Koch and Kayworth, 2007) a great deal of energy created an event, titled "IS Summit" targeted at recruiting IS majors. Current and former IS students, faculty members, and IS practitioners were involved in the effort to highlight the potential of majoring in IS. There were roundtable discussions, contests, and prizes. Students completing questionnaires at the end of the day indicated that they learned more about potential IS careers and increased their knowledge about the IS major. How many of these students decide to major in IS still must be determined. However, the awareness of IS definitely increased.

One promising and socially beneficial approach is to market the profession to underrepresented groups. The literature has documented the under-representation of women in IT-related fields (Chabrow, 2007; Cone, 2007; Reich, 2006). These groups represent a large and potentially fruitful pool of potential majors. Efforts are underway to recruit those in underrepresented groups. For example, Saint Louis University, Claremont McKenna College and the Claremont Graduate University are collaborating on the Workshop for Women in IT Emerging Leaders, which provides an opportunity for young women to explore opportunities in IT. Similar efforts have been made in other fields, such as engineering.

A number of departments are using the core course (such as Introduction to IS) as a means for changing students' perceptions of IS-related careers. Traditionally, some departments have relegated the introductory course to "second-rate citizen" status. This course was often viewed purely as a service course to be taught by graduate students or other less experienced faculty. More recently, however, many have realized that the introductory course offers an opportunity to educate and excite students about IS. Looney and Akbulut ((2007) provide evidence that effective teaching in the introductory IS course can positively influence a student to pursue an IS degree. Several universities have effectively used the core course to attract students to the major and/or secondary programs. This approach may require careful redesign of the core course to make it

interesting and informative, while at the same time achieving educational objectives. In addition, the most successful efforts put the "best and brightest" teachers in this course. This approach takes considerable effort, but may prove to be an effective tactic for many programs.

IT-related professional organizations are also lending their support to promoting careers in IT. Microsoft and the Society for Information Management (SIM) have partnered in developing a program whose goals include dispelling the myths about the IT field, increasing the number of students enrolled in IT programs, and creating meaningful opportunities for future IT professionals through mentoring, internships, and scholarships. To date, the program has been presented on about a dozen campuses across the US. One SIM chapter, in an effort to reach teens early, has partnered with their local library to sponsor a weeklong summer IT camp for youth ages 12 to 15. The program, which is now in its third year, includes an orientation session for the campers and their parents during which the sponsors lay out the curriculum and promote careers in IT (Tucci, 2007). The Association for Computing Machinery Education Board has developed an information brochure to promote opportunities in the computing field (computingcareers.acm.org). This brochure addresses various computing fields: computing engineering, computer science, software engineering, and information systems. The National Workforce Center for Emerging Technologies, the National Science Foundation, and IEEE are working together on CyberCareers, a project to provide resources for students, faculty and counselors regarding IT careers

(www.nwcet.org/programs/CyberCareers/default.asp).

Programs are also encouraged to develop relationships with practitioners in general, enlisting their support in increasing the pool of IS majors and potential future employees. Advisory Board members and adjunct faculty may be willing to sponsor interns, provide a guest speaker from their organization, or offer a tour of their corporate site. They can directly assist in recruitment by promoting your graduate programs at their work sites and providing connections to high schools in their neighborhoods. Baylor University's IS Summit solicited speakers, prizes, and funding from area businesses. Florida State obtained corporate sponsorship for their MIS @ the Movies.

4.4 Visibility of IS within the university

Marketing efforts may also need to be directed to faculty in other departments who do not understand or who downplay the significant role of IS within organizations. If students are made aware of the importance of IS to an organization, in any field, this awareness may positively impact enrollments. At George Washington University, students in a sophomore-level core course completed team projects on assessing the impact of IS on a business issue. The best team projects from each of 10 sections competed against each other. Faculty and students from across the university as well as staff advisors were invited to the competition. This exercise provided both visibility and information about the IS field. The IS Summit at Baylor University also raised the visibility of IS on campus.

The National Science Foundation also sponsors a summer Research Experience for Undergraduates (REU) to

encourage future research in the sciences. Students work on a project with a faculty mentor. Within the computing field, these programs are almost exclusively in Computer Science. Some universities provide REUs during the school year. In both instances, presentations and sharing of the students' research work provides visibility for the IS field. Other computing disciplines may benefit by introducing similar programs.

5. CALL FOR COORDINATED EFFORT

Information Systems as a viable academic discipline faces a number of serious challenges. Perhaps the most immediately critical of these is reversing our recent decline in enrollments. Addressing these challenges effectively is difficult for individual departments; a coordinated collaborative effort is necessary.

In early 2007, Dennis Galletta announced via ISWorld the formation of a task force directed at marketing the Information Systems profession. This is an excellent and important first step. However, simply forming a task force is not enough. Individuals will need to answer Dr. Galletta's call and contribute their time, talents and efforts for the common good. We urge each of you to contribute what you can.

Regional collaborations may also be useful. Important regional variations in students, jobs, and other environmental factors may necessitate modifying marketing materials and approaches. While schools within a region may be competitors, effective collaborative efforts may lead to a "rising tide" of students that will benefit all.

Our recent request through ISWorld generated numerous comments on declining enrollments. While the authors are most grateful to those who responded, they would like to see a more formal mechanism for tracking enrollment data that would distinguish program (CS, IS, IT, SE, CE), academic level (bachelor, master, Ph.D.), metric used (e.g. number of IS majors, total number of students in IS courses), geographic region, etc. Perhaps AIS would be willing to host such an initiative. Figures that are currently available tend to lag by a year or two and do not provide a good basis for addressing the immediate problem.

6. DISCUSSION

It has been suggested that the decline in our enrollments is simply cyclical. IT experienced a decline in the early 1990s followed by a resurgence in the second half of that decade, fueled at least partially by Y2K and the rapid development of the Internet ("Degrees in computer and information sciences"). Perhaps our current enrollment declines are just part of a cycle. Enrollments may come back regardless of what we do. Or they may not. The authors do not believe that a cyclical pattern is completely responsible for the downturn we have seen over the last few years.

The IS field needs more visibility. Educating university admissions officers and academic advisors and counselors at both the secondary and university levels will help. However, educating faculty and students in all disciplines is critical. The core IS course in the curriculum is a key factor in attracting IS enrollments. Shifting the focus to the impact of

IS in the organization, treating technology as a tool, and downplaying programming may attract more students who want to interact with people, not computers. Most of the strategies suggested here are designed to address the problem in the short run. In the long run, the current enrollment crisis provides the opportunity to rethink our discipline and what shape it might take in the future.

The picture, we believe, is not all doom and gloom. There is considerable evidence that student enrollments and the job market are recovering, perhaps very significantly. The efforts and modifications made by many universities, as reported here, seem to be bearing fruit, although it is early days yet. It seems to us that in order to be successful, a number of coordinated approaches will be required, from increasing visibility through re-designing curricula and course offerings to marketing campaigns.

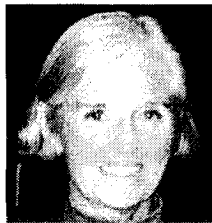
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AUTHOR BIOGRAPHIES

Mary J. Granger is a professor of Information Systems and Technology Management at George Washington University, Washington, DC. She has been director of the Information Systems undergraduate program for 16 years. She works with the International Academy for Information Management (IAIM) and is currently editor of the *Journal of Informatics Education Research* (JIER). Professor Granger publishes in *Computers and Education*, *Journal of Information Systems Education*, *Science and Engineering Ethics* and the *Journal of Computers in Mathematics and Science Teaching*. Additionally, she has presented papers at many conferences including: Information Resources Management Association, ISOneWorld, Association of Information Systems and the International Conference of Informatics Education Research. She served on numerous panels addressing Information Systems Curriculum Issues and co-chaired three working groups at SIGCSE/SIGCUE ITICSE (Integrating Technology into Computer Science Education). Professor Granger has received numerous faculty development grants and several teaching awards. Some of her research interest include: Information Systems curriculum development and design, system analysis and design, database design, international Information Systems, human-computer interactions and ethical issues in the computing environment. She recently helped the University of Alexandria, Egypt create their executive MBA program, and was awarded a Fulbright Scholar to teach at the Warsaw School of Economics. She participated at Hope College, Computer Science Department, in their Research Education for Undergraduates NSF grant



Geoffrey N. Dick is a senior lecturer in Information Systems and Director of the undergraduate programmes for the Australian School of Business at the University of New South Wales. He is currently on the AIS President's working party looking at enrollment numbers, has been on the board of the SIG Ed for most of the last 10 years, twice elected president, and on the executive of the Australasian chapter since its 2001 inception until 2006. He is a reviewer on the global textbooks project, a Director of the International



Telework Academy and a member of the Board of Editors for the *Journal of Information and Management*. His research (around 50 publications) is mainly in the areas of telecommuting (his PhD) and on-line education – he is the recipient of an ICIS prize for best paper in education. He is a visiting professor at Georgia Southern and recently has been a visiting fellow at the University of Malaya, the Tec de Monterrey in Mexico and Agder University College, Norway.

Carolyn MC K. Jacobson Ph.D., is a professor at Marymount University in Arlington, VA, where she served as chair of the Department of Information Systems and Management Science for six years. Under her leadership, the department established an undergraduate degree in information systems. Dr. Jacobson has won grants from several organizations including GTE and Verizon. Her current research interests are in knowledge management, information systems education, and information assurance. Dr. Jacobson has published in a number of journals and received awards for her scholarship including the AIS Best Educational Paper Award. She serves on the Editorial Review Board of the *International Journal of Technology and Human Interaction*. Dr. Jacobson is a past president of the International Academy for Information Management and is currently a member of the Computing Accreditation Commission of ABET.



Craig Van Slyke is an Associate Professor of Management Information Systems and chair of the Decision Science/Management Information Systems department at Saint Louis University. He holds a Ph.D. in Information Systems from the University of South Florida. His current research interests focus on issues related to the adoption of information and communication technologies. Dr. Van Slyke has published in a number of journals including *Journal of Information Systems Education*, *Communications of the ACM*, *Journal of the AIS*, *European Journal of Information Systems*, and *Decision Sciences*, among other journals. He serves on the editorial board of *Information Resource Management Journal*, and the *Journal of Information Systems Education*. In addition, he has co-authored three information systems textbooks. Dr. Van Slyke holds leadership positions in AIS SIG:ED and the Southern Association for Information Systems.





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