

Competing with FaceBook, IPod, YouTube; Recruiting Business and Computer Women Majors; Case Studies and Jobs Review

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Abstract

For twenty-three years, the ISECON conferences have covered topics in computer curriculum differences in CS, IS, and IT, supply and demand of IT workers, employer perceptions and expectations, soft skills, Capstone courses, recruiting women for CS majors, E-commerce, Certification of Microsoft or Oracle, Microsoft Visual .NET Web Services, and project management. The enrollment of students as computer science, computer information system, and management information system majors have decreased significantly in 2006. Many of us, professors who have presented papers at the ISECON conferences, have taught fewer students. Performing surveys and SPSS analysis (one way Anova, T square, Chi square, etc) does not help the situation. How do we compete with FaceBook, MySpace or YouTube? Students constantly use their cell phones, PDAs, and IPods in the classroom. How do we teach them when nothing seems to interest them? Most young women pursue careers in Education, Nursing, or Social Science. How do we recruit them to the Information Technology field? This paper gives concrete strategies for competing with distractions in the classroom and recruiting young men and women into the business and computer fields. The use of case studies and final projects in the curriculum, helped students gain leadership skills. The internships which students obtained in Corporate America led to good paying full-time jobs after graduation. In general, student evaluations were excellent. Because of their positive experience, students recruited their relatives and friends through word of mouth to Dominican. The total number of students taught in 2006 by this author was 320; actually the highest in the past 19 years!

Keywords: C++, Java, Visual Basic, System Analysis Design, Database, Software Development, Unix, C# .NET, Project Unlimited, and International Management

ISECON conferences have been around for twenty-three years. Grant and Babin (2006) examined the factors impacting the supply and demand of IT workers in Canada and USA. Longenecker et al (2006) reviewed the relevance of the certification of computer professionals and program assessment process. Mento et al (2006) encouraged women and minorities to attain computer degrees. Molluzzo and Dwyer (2006) reported women had much lower interests in considering technology as a career. Neel and Joseph (2006) used ALICE project to draw women to information systems. Synder et al (2006) explored the rules governing

MySpace.com. Tesch et al (2006) studied employers' expectations of IS entry-level personnel and interpersonal skills. Woratschek and Lenox (2006) defined the differences in CS, IS, and IT. Using E-commerce, case studies, and real world projects attracted much student interest. Peslak (2006) used Visual Studio and ASP.NET to create travel project tutorials. Hsu (2006) employed Project Unlimited as the new paradigm for learning. Janicki et al (2006), a paper that received the Distinguished Paper Award, incorporated real world projects and emerging technologies into one MIS Capstone course.

In the media, there has been plenty of news of the decline of computer majors in the USA. Chow (2005) gave five recruiting pitches:

- Computer Science is not just programming
- You will learn how to think
- You have tremendous opportunities to delve into other fields of study
- The jobs and money are still there
- If you are in the US, this country needs you

Bill Gates, founder of Microsoft, had a hard time convincing high school students to choose the computer field. As a result, Microsoft gave plenty of free software to high schools to encourage student learning and participation. Recently, Microsoft gave \$1 million USD to jump start the Computer Science programs at Georgia Tech and Bryn Mawr College, International Herald Tribune (2007). Gina Poole, IBM Vice President, developed the IBM Academic Initiative to reverse student decline in computer science in 2004. Two years later, 1900 institutions, 11,000 faculty members, and 440,000+ students attended the training program, Harris (2006). Computer Science majors fell sharply in 2005-2006: 67 at Harvard, 14 at Princeton, and 24 at Yale University, Balakrishna (2006). The Computing Research Association Taulbee Survey of PhD granting Computer Science and Computer Engineering departments in North America is conducted annually. The data shows that the percentage of incoming undergraduate students who indicated they would major in CS was 15,958 in Fall 2000 and 7,798 in Fall 2006. The slight decrease from 7,952 in Fall 2005 may mean that the numbers are stabilizing, Vegso (2007).

Since 1996, internet e-commerce has quickly become the new mechanism for doing business. Students are fully aware of these trends. They used their cell phones, PDAs, sidekicks, iPods, and any other new gadget given to them by their parents as birthday gifts. They love to search on FaceBook, MySpace, or YouTube for friends and play video games all day long. Yet, when it came to choosing a major in college/university, they did not choose

Computer Science. Why? Perhaps it's because students who major in Computer Science are required to take courses in abstract mathematics, Calculus, quantitative analysis, automata, and compiler design. None of these courses are easy to handle and even the best mathematics professors are recruited to teach them. This type of curriculum discourages students who would likely be interested, therefore, with due respect, we, the professors at ISECON who create the curriculum, are the problem of the decline, not the students.

DOMINICAN

In the Fall Semester of 1988, Dominican enrolled 1,400 students when this author joined the Division of Business Administration as an Associate Professor in Computer Information Systems. The Business Division offers two Bachelor of Science programs in Information Technology (IT), one in Computer Information Systems (CIS), and the other in Management Information Systems (MIS). As of the Spring Semester of 2007, the College student population was about 1,850 with 10 CIS and 31 MIS majors representing 2.2%, slightly higher than the national average of 0.8%. The College is located 14 miles northwest of the New York City. Business is the largest division (30%) among other programs which include Arts and Science, Education, Nursing, Occupational Therapy, Physical Therapy, and Social Science. The requirements for CIS majors, following the IS 2002 Model Curriculum.

The requirements for MIS majors are similar to CIS except that students take computer electives in lieu of Calculus I, Database Organization System, and Software Development Project.

A. Competing With FaceBook, MySpace, Or YouTube

Students constantly play with their cell phones, PDAs, and iPods in class. How do we handle it? We, as instructors, insist on no cell phones, PDAs, or other such electronic devices in the classroom and most likely confiscate these devices when students use them. The outcome is usually that a majority of students will be hesitant

to or will not take any of our courses the following semester. However, one way to keep a student's attention when he/she is on PDA is to ask, "What does IBM stand for?" If that student doesn't know, ask another cell phone user, or write on the blackboard, International Business Machine to get their attention. By continuing to ask questions like, "What about ATT?" the machines slowly begin to turn off. Do not read the textbook; they will be bored in two minutes. As they start to pay attention, then we say "I respect your culture but this is my class and I ask that you respect my class." We must try to engage our students so they would actually learn something in class.

B. "Hands-On" One-Credit Computer Courses

Depending on the course, each class should be given a fair amount of "hands-on" time. At Dominican, there are many one-credit courses offered such as Internet, MS Word, MS Excel, and so on. The standard schedule for these courses is that each course meets twice per week for one hour and fifteen minutes and runs for five weeks. They run consecutively and any student can take them with no prerequisite. One can take an Excel course before or after an Internet course. At the end of the semester, each student will have completed three one-credit courses. Upon completion of six of these one-credit courses, the student receives a "Certificate in Personal Computers" from the State of New York. These courses have been popular among non-CIS and non-MIS majors and taught completely "hands-on" with no lecture by this author. On the first day of class, the student's software template is installed. As the students work side by side using their textbook, they go through the "hands-on" exercises step by step. With students working side by side, they can help each other. The Instructor is in the class to help them as well. Female students who are not Business or Computer majors also take these courses because the skills they learn are useful in office jobs. CIS/MIS majors are discouraged from taking these courses because they overlap with their other computer courses. Microsoft Vista Operation System and Microsoft Office Professional 2007 have been released. Dominican's IT staff is in the process of installing the

software for the Fall Semester 2007. Yes it costs money, but it is essential to keep up with Microsoft and US corporate environment.

C. Computer Literacy course

One of the most important courses for which CIS or MIS majors should be recruited is the computer literacy course. In this course, fifty percent of the time is spent explaining concepts and the other fifty percent is spent "hands-on" using the Internet to solve problems individually or in groups. The chapter dealing with the mainframe computer utilizes examples of the ATM and credit cards to explain the use of COBOL programming language to run credit card programs. Teaching DOS was a benefit to our students since they did not learn it in high school. Teaching DOS got the student respect immediately. Although there was no programming taught in this course, comparisons of C++, Java, COBOL, and Visual Basic were made. Each semester, four sections of this course were offered in the hopes of recruiting students to the CIS or MIS programs. Over the last 19 years, many students have decided to become CIS/MIS majors after taking this one course. After performing one popular assignment called "Dream Machine" where students were required to shop at computer stores for IBM-compatible PCs, students discovered that most of the salespeople were not knowledgeable or helpful. Students wrote their experience in a ten-page report. They enjoyed this type of field experience.

D. Programming/System courses C++ and Advanced C++ Programming projects

This course was taught to day, evening, and accelerated evening adults (ACCEL) students at Dominican. Many of the ACCEL students were employed and worked in the IT field. For the Advanced C++ course, students were required to do final projects. It consisted of a particular programming problem, written paper, and oral presentation. A group project made up of two or more students was assigned when the class size was large (12 or higher) and an individual project was given when the class size was small (less than 12). Students

received the same group grade (40% of the final) for the written paper, but were graded individually for the oral presentations (60% of the final). Many final projects were completed including Common Gateway Interface C++ Website, Dynamic Object Calculator with Hex Codes, and Electronic Shopping Cart Program just to name a few. Each of these projects took anywhere from 20 to 40 hours to complete.

1. Java And Advanced Java Programming Projects

Both courses were taught at Avtech Institute, Baruch College, BlueData Int'l, Computer Impact, IEEE, Netcom, Xincon, as well as Dominican, (Hsu 2002, 2003, 2004). Except for Baruch and Dominican, these firms** ran Work Force training programs for displaced workers in NY or NJ. Each displaced worker (student) received a stipend from State of New York or the State of New Jersey. The stipend was given to the training firm while this author was hired to provide Java and Advanced Java training as part-time consultant**. For the Advanced Java course, students were required to do final projects which included Airline Applets, Cold Fusion, Corba, Java Server Page, Investment Applets, J2ME, Jini, WebLogic, WebSphere and XML. Many displaced workers got jobs after taking one or two Java courses in NYC. The data showed there was no gender difference in obtaining Java programming jobs; the female students were able to get the same kind of Java programming jobs as the male students.

2. Visual Basic Programming Projects

This author taught Visual Basic at BlueData, Computer Impact, and Netcom as part-time Consultant. One student who worked for Morgan Stanley did a final project explaining how to link different Microsoft Excel worksheets from different client portfolios (stocks, bonds, 401K, 529 program) using the Visual Basic Application (VBA) framework. VBA has been popular in many New York law offices and financial firms.

3. System Analysis Design Projects

This course has existed for the past 30 years. How can instructors make it more

interesting? By using MS Visio and MS Project 2003, it was easy to construct flowcharts that helped explain concepts in project management (Hsu 2004). The final projects that were presented included the following: IBM DB2, Intel ISMART, MySQL, Oracle 9i, PeopleSoft Purchase Order System, Sakroc Formula Management System, and Sybase Adaptive Server. Microsoft Project 2007 has just been released showing how difficult it is to keep up with Microsoft.

4. Database System Projects

This course has been taught twice at Dominican by this author. With the recent development of Oracle 9i, 10g, and 11i, the course should be redesigned, see Hsu (2004) and Ricardo (2004). A sabbatical award was granted in Fall 2005 allowing this author to take a course in Oracle 10g/MS SQL Server 2003. An Oracle or MS SQL server course may be offered at DOMINICAN in the future.

5. Software Development Projects

At Dominican, Software Development is a capstone course for the CIS majors. In many cases students spent 120 hours in their senior year working as interns at local area companies. They attended to their regular job assignment within the company as well as worked on a software project that was useful for the company. The final projects that were completed under this author's supervision were Accounting Payroll System, Customer Support System, Healthcare Inventory System, and Network Marketing.

6. Unix Projects

This course was taught as an independent study at Dominican using a PC with a Redhat Linux operating system. However at Xincon Technology, this course was taught using a Sun Solaris Unix platform. They learned the Unix commands at Xincon but could not practice them at home which resulted in each student installing Linux, a different operating system, on his/her home PC. By performing the system testing and trouble shooting, students were able to complete their final projects which included Redhat

Linux, Mandrake Linux, Suse Linux, and Turbo Linux applications. At Xincon, students were able to learn both Unix and Linux in one course. In this case, the "hands-on" learning was crucial.

7. C# .NET Projects

This course was taught at Avtech Institute Technology to 14 IEEE engineers in the Spring 2006, 5 people in the Fall 2006, and 6 people in the Spring 2007, Hsu (2006). The MS Visual Studio 2005 Express Edition was used with a C# .NET compiler. The download was free and the memory space was about 80 MB. Deitel (2006) was used as the textbook. It was a lot of work covering 27 chapters of Deitel in 30 hours of class. This was possible because the students were professional engineers or programmers. After each class, they spent 2 to 10 hours on their own to do assignment. The Final projects that were completed: ADO.NET, Electric Power, Graphics User Interface, Infrared Imaging, Management Console, Model View Controller, Optical Scanner, Power Computation, Rolling Dice, Single Server, Sudoku, Visual Studio 2005 Special Features, Web Crawler, and Web Services. Many of these projects were applied directly to their engineering day jobs.

E. International Management Curriculum

Hsu and Wirth (1997) reported Japanese management styles; Hsu (2003) completed case studies in Business, Finance, International Management and Marketing courses, and Hsu (2003) worked on strategies of teaching foreign students. Students who major in Business Administration at Dominican can graduate in four years (120 credits) with two concentrations, one in Management Information System (MIS) and the other in International Management (IM).

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- International Business
- Global Marketing
- International Finance
- International Management

- Manage Global E-Commerce Project

Since 1995, many students have pursued dual concentrations in MIS and IM. This leaves them the option of graduating with an International Management degree if they fail their MIS courses. Since 2004, many business majors have pursued Marketing and IM as a dual concentration. This author has been a professor in MIS and IM. Therefore new strategies need to be developed to reverse this trend.

F. Internship, Part-Time Work And Full-Time Jobs

Every year, 1.1 million students graduate from over 4,000 US colleges/universities. Only 0.8% (or 8,800) majored in Computer Information Systems and related areas. Dominican graduates have no problem getting jobs with starting salaries of \$35,000 to \$47,000 per year.

IT outsourcing has been a concern, however, the percentage of outsourcing is only less than 5% of the overall IT jobs, Hsu (2005). The total projection for IT jobs through 2012 will be 1.6 million, which means many young adults will be working in this field. As a result, the training companies such as BlueData, Netcom, and Xincon in New York and Avtech in New Jersey are doing very well training recent college graduates that can not find full-time jobs in their field of studies: Art, Biology, Engineering, English, Education, History, Psychology, or Social Science, Hsu (2006).

The job market varies from city to city. In the New York area, IT jobs are back with 2725 in Java, 1237 in C#, and 5200 in Project Manager; paying \$40,000 to \$165,000 yearly for entry-level to senior manager positions, Dice (2007). Since many of these jobs are with the International firms, IM majors graduated from Dominican, have an edge when they apply.

Dominican students normally hold part-time jobs in retail, restaurants, and the like. In the summer of their junior year, they participate in internships (pay/no pay) to gain corporate experience. The survey from the alumni indicated that 98% of the Dominican graduates found full-time

positions within 6 month of graduation, see Table 1.

G. Retraining of CS/IS Faculty

One of the most important things for us, professors speaking at ISECON, is to get training ourselves. We cannot teach new courses if we continue to use the skills we learned twenty years ago. The best way to do this is to take a Sabbatical Leave for one semester or a year. At Dominican, faculty members receive full pay for taking one-semester off and half pay for a one-year sabbatical. This author received two Sabbatical Awards. The first one was in the Spring 1998 semester which allowed this author to take two Java Programming courses. The second sabbatical was in the Fall 2005 semester when this author took MS SQL and Oracle 10g Server (Performance and Tuning) courses. The Java course has been taught many times at Dominican since 1999 and Oracle may be offered in the future. Table 2 gives the number of students taught by this author showing 320 students in 2006; the highest number to date.

H. Recruiting Women For Business Or CS Majors

In Spring 2007, 154 students were taught by this author of whom 61 were women or 40% of the total. However, only one woman was enrolled in the Java class which shows that more work is needed in recruiting female students as CIS or MIS majors.

The best way to recruit female, is to have a female faculty member in CIS/MIS. Unfortunately, there was no female faculty at Dominican. Two female professors: one in Management and one in Marketing, did bring in many female students to major in Business since 1994.

I. Client/Student Feedback On MIS

- This course showed me how Java applies to the Web.
- Very successful computer course
- Lots of "hands-on" programming exercises in C# .NET class
- Real life examples are very good
- The class is a great experience

- Professor is very willing to help students with assignments
- I am looking forward to Advanced Java course

J. Client/Student Feedback On IM

- I never really thought about globalization before
- The class is very interesting
- Instructor is well traveled and he can relate much to real life
- Teaches you about business abroad and foreign contacts
- I learn the connection between international markets
- Enjoy the travel projects and in-class group exercises
- Very knowledgeable and experienced instructor – globally

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CONCLUSION

One-credit, Computer Literacy, Programming, Systems and International Management courses were developed and taught at 8 organizations to 1700 people by this author since 1999. Using hands-on approach, in-class and/or homework assignments, case studies, internet search, and final projects with oral presentation will provide students the best chance of success. Students raved about the courses and found full-time jobs, see Table 1.

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**TABLE 1 COMPANIES
CLIENTS/STUDENTS WORKED (A
PARTIAL LIST)**

Accelerated Technology, Active International, Add System, Agilon Finance, Alliance Capital Mangt, American International Group, AQR Capital Mangt, Argent Mortgage Company, Asco Power Tech, AT&T, AT&T Wireless, Automatic Data Processing, Avaya Corp, Avon Product Inc, Axa Equitable Financial Services, BAE Systems, Bank of New York, Becton Dickinson, Bergen Industrial Supply, BMW USA, Bradley Corporate Park, Brooklyn VA Hospital, Brooks Brother, Business Performance Solutions, Butler International, Canon, Castrol North America, CBS, Children Apparel Network, Cingular Wireless, Citigroup, Clinical Diagnostic Service, Columbia University, Consumers Union, Control Screening, Covanta Energy, Credit Suisse First Boston, DaimlerChrysler, Datascope, Delta Airline, Depository Trust Clearing Corp, Deutsche Bank, Diversified Investment Advisor, Donovan Data Systems, Eaton Corp, Empire Insurance, Edax Inc, EDO Marine Aircraft System, Electrophysics Corp, E-Sync Network, Essential Oils Inc, Fidelity Investments, First Data Corp, Ford Motor Co, General Cable, General Dynamics, Goldman Sachs Co, Guardian Life, Health First Insurance, Hertz Corp, IBM Corp, IBM Global Services, IDT Telecom, Intel Corp, JD Edwards, Jefferies Co, JPMorganChase, Keane Co, Konica Minolta Corp, KPMG Inc, Krka Pharmaceutical, Lehman Brothers, Level 3 Communications, Lucent Technologies, Mastercard International, Materials Research Corp, MCI Corp, Mellon Investor Service, Merck Inc, Merrill Lynch, MetLife Insurance, Microsoft Corp, Misys Healthcare System, Morgan Stanley, Myron Manufacturing, New Jersey Transit, Nice Pak, Nortel Network, NYC Comptroller Office, NYC Government Law Office, New York State Dept Banking, North Shore Long Island Jewish Hospital, Nu Sound Telecom, Opici Wine Group, Oppenheimer Co, Orange Rockland Utilities, PaineWebber, Panasonic Computer Solutions, Par Pharmaceutical, Paynet Transactions, Pearson Education, Peoples Publishing, Pepsi Bottling Group, Philip Morris, Polo Ralph Lauren, PricewaterhouseCoopers Inc, Provident

Bank, Prudential Securities, Salomon Smith Barney, Siemens Inc, Short Billy PC, Simon Shuster, St. Luke's Hospital, Sungard Data System, Syms Corp, Tender Touch Healthcare, Tilcon New York, Toyota Corp, Traffix Inc, Unilever Inc, Union State Bank, United Parcel Service, United Water Resources, Verizon Communications, Viacom Inc, Volkswagen Credit, Volvo Finance, Weiss Peck and Greer, William Sonoma, WMC Mortgage Corp, Wyeth Pharmaceutical, and Xerox Corp.

TABLE 2 STUDENTS TAUGHT

Year	Enrollment
1988*	80
1989	226
1990	245
1991	218
1992	182
1993	161
1994	141
1995	151
1996	163
1997	204
1998**	102
1999	185
2000	206
2001	250
2002	317
2003	301
2004	294
2005***	191
2006	320
2007****	154
Total	4091

***Fall only**

****Spring Sabbatical**

*****Fall Sabbatical**

******Spring only**

TABLE 3. WOMEN vs. TOTAL, SPING 2007

Course #	Title	Wom	Enrol
BU 325	Internl Bus	10	28
CI 120	MS Word	6	14
CI 170	Web Page	10	17
CI 170*	Web Page	0	1
CI 180	MS Power	7	16
CI 211-3	Comp Syst	8	15
CI 368	Java Prog	1	14
MG 355-L	Internl Man	7	11
MG 366-L	Global E-C	2	9
MK 326	Global Mkt	10	29
	Total	61	154