

Recruiting MIS Minors: The Impact Of In-Depth Database Exposure In The Accounting Information Systems Course

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ABSTRACT

This study empirically examines the possible relationships between the accounting majors' in-depth exposure of database knowledge and their willingness to expand their knowledge beyond the required Accounting Information Systems (AIS) course by taking additional classes leading to a Management Information Systems (MIS) minor. Our empirical results suggest that in-depth database exposure in AIS classes has a positive impact on accounting students' interest in pursuing an MIS minor. The findings of this study encourage the collaboration between MIS and accounting faculty in developing AIS courses to include in-depth database knowledge content. Such collaboration can benefit both accounting and MIS programs.

Keywords: MIS enrollment; MIS recruitment; accounting information systems course; social cognitive career theory

INTRODUCTION

*M*anagement Information Systems (MIS) faculty witnessed a rapid decline of student enrollment in recent years, which in some cases led to the cancellation of courses or even programs. On the other hand, many majors in the business college are benefit from minoring in MIS or taking additional MIS courses. Particularly, accounting majors have the greatest potential to minor in MIS due to the increasing need of MIS-related expertise by the accounting profession.

Throughout the last decade, the accounting profession has rapidly expanded the range and spectrum of professional services offered to clients. Some of this ongoing change is closely related to the rapid evolution of information technologies and the continuing advances in accounting information systems (AIS). Accelerated broad advances in AIS are forcing university students, who are preparing for professional accounting careers, to enhance and expand their competency in MIS-related subject areas. Furthermore, such students need to familiarize themselves with Information Security Management, Information Technology (IT) Governance, Business Continuity Management (BCM), Disaster Recovery Planning (DRP), Privacy Management Mobile, Remote Computing, and Identity and Access Management. Year after year, these topics remain in the American Institute of Certified Public Accountants' (AICPA) list of Top Ten Information Technologies. The existence and professional importance of this AICPA list demonstrates the ever increasing integration between the accounting profession and information technology. In addition, it emphasizes the paramount importance for accounting majors to acquire expertise in effective data management and to develop a broader understanding of databases' structures. The expectations that young professionals and new accounting graduates be technologically savvy lead us to agree with Bhattacharjee and Lewis (2001), who suggested that additional studies are needed in order to identify new strategies for acquisition and improvement of highly demanded technology-related skills in American universities.

This study represents the joint effort of MIS and accounting faculty to examine the relationship between students' classroom exposure to the essentials of databases and their subsequent desire to earn a minor in MIS. Specifically, we investigate whether accounting students' (1) perception of the usefulness of MIS courses and (2) self-efficacy of learning MIS subjects can be positively affected by their initial exposure of database knowledge from an AIS course. Then, we examine how the perception of usefulness and self-efficacy affect accounting students' interest in pursuing an MIS minor. To our knowledge, no empirical or systematic scholarly research on this linkage has been performed.

DATABASE COVERAGE IN THE AIS COURSE

Borthick (1996) argued in favor of teaching database concepts to accounting majors. She stressed the necessity of teaching data models and database queries to accounting students. She also advocated the usage of database management software in the classroom because the knowledge of database development software gave students the expertise to design and manage information systems (Borthick, 1996, p. 83). Furthermore, this mode of instruction enhanced students' capabilities in evaluating and maintaining these information systems. Fordham (2005) reported on a university where some faculty wanted to eliminate a database course from the curriculum but had to reconsider their decision after they encountered stiff resistance from alumni. The alumni argued that a solid knowledge of databases enabled them to understand the mapping of complex business processes into a coherent, relational, and synergistic informational structure.

Similarly, Norman, Rose, and Rose (2006) stated that knowledge of database design is rapidly becoming a critical skill for accountants and auditors. They asserted that just as the accounting equation is the backbone of financial accounting, database systems are the foundation of AIS. Thus, database design knowledge is essential for understanding contemporary AIS, business processes, and system controls. Fang (2007; 2007a; 2007b) recognized the necessity of understanding the basics of database concepts by accounting professionals. According to Fang, acquiring the knowledge of some basic database concepts can close the communication gap between accountants and IT professionals. Overall, prior academic research on the broad subject of AIS consistently outlines the importance of correlating competence of accounting professionals with rapid technological changes of the business environment. Information systems technology in general, database technology specifically, plays a crucial role in supporting organizational decision-making.

SOCIAL COGNITIVE CAREER THEORY

The Social cognitive career theory (SCCT) extended the social cognitive theory (SCT) (Bandura, 1986), which views psychosocial phenomena as mutually and reciprocally determined by environmental, personal, and behavioral factors, into the domain of academic and career development. By providing a theoretical foundation for understanding and predicting career choice, SCCT has been widely and empirically tested in the educational setting (e.g., Flores & O'Brien, 2002; Navarro, Flores, & Worthington, 2007) and has also been applied in the MIS field (e.g., Akbulut & Looney, 2009).

According to the SCCT, instead of making choices in a vacuum, individuals make reasonable choices to accommodate particular environmental circumstances. Environmental factors, like learning experience, influence personal factors which include self-efficacy and outcome expectation. Self-efficacy refers to "people's judgments of their capabilities to organize and execute courses of action required attaining designated types of performances" (Bandura, 1986). Outcome expectation involves the imagined consequences of performing particular behaviors (Lent, Brown, & Hackett, 1994). As indicated by the SCCT, self-efficacy and outcome expectation play key roles in determining one's choice of activities.

By applying the social cognitive theory and social cognitive career choice theory, Akbulut and Looney (Akbulut & Looney, 2009; Looney & Akbulut, 2007) empirically tested the relationship between students' choosing an MIS major and the teaching effectiveness and the content in introductory MIS courses. They found that teaching effectiveness and teaching content in introductory information systems courses have a positive effect on the MIS career choice of business students who have yet to declare their major.

Although the MIS discipline encourages other business major students to minor in MIS or take more MIS courses (Granger, Dick, Luftman, Van Slyke, & Waston, 2007), no empirical research in recruiting MIS minor students from other business majors has been reported. By applying the social cognitive career theory, this study examines the exposure of accounting majors to the structure and design of databases in terms of its impact and implication in the recruitment of MIS minors.

RESEARCH MODEL AND HYPOTHESIS

As discussed above, general expertise in MIS-related subjects including database knowledge has a great value to practicing accountants, and by extension, to students majoring in accounting. However, accounting students may not perceive the value of intensive database knowledge acquisition. Due to the increased emphasis of MIS in the accounting profession and the practical value of database knowledge, it is important for undergraduate accounting majors to appreciate database education and to pursue additional MIS-related coursework beyond the initial AIS course. To evaluate how accounting students’ perception of database knowledge and interest in MIS courses can be affected by their initial exposure of database knowledge from the AIS course, we build a research model (shown in Figure 1) based on the SCCT which provides a theoretical foundation for our empirical design.

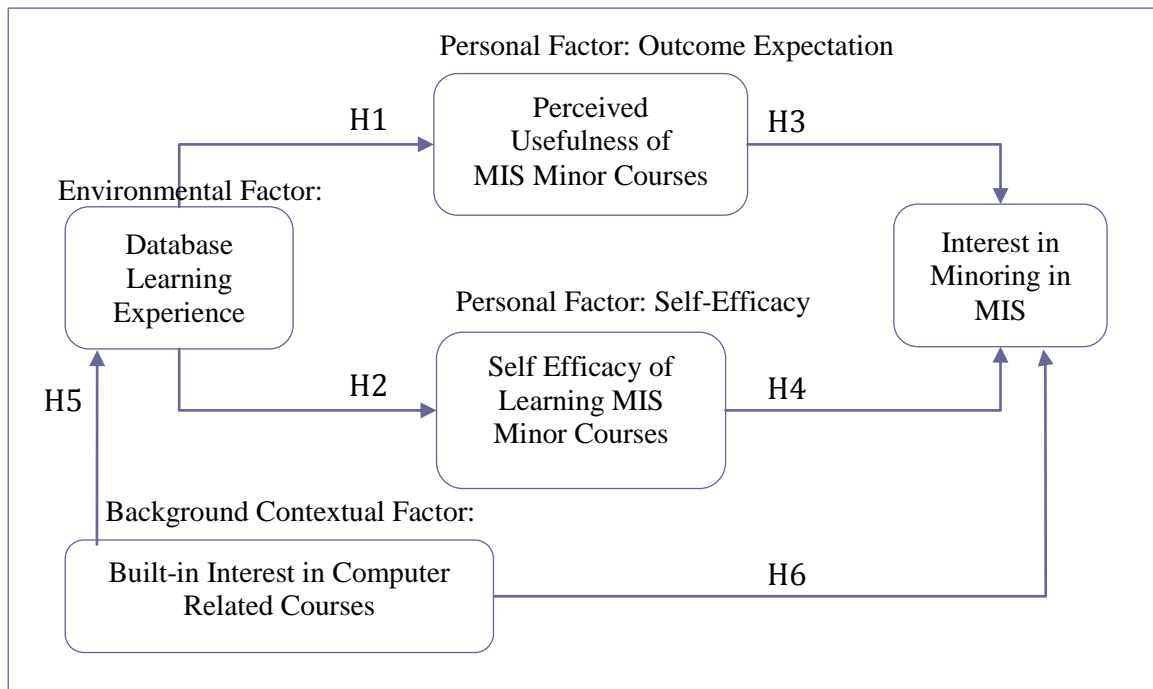


Figure 1: Research Model

Based on the SCCT, positive learning experience should have a positive effect on the outcome expectation (Navarro et al., 2007). In fact, Looney and Akbulut (2007) provided evidence that teaching effectiveness in the introductory MIS course does affect students’ outcome expectation on MIS careers. Although MIS knowledge, including database knowledge, has a great value to accounting students, accounting students may not automatically realize this value. The learning experience shaped by in-depth exposure of database knowledge should allow accounting students to better understand the usefulness of database knowledge.

In our study, the in-depth exposure of database knowledge in the AIS course means utilizing a “hands-on” approach to deeply expose the database concepts which include normalization of data, modification and population of tables, identification and establishment of relationships, creation of queries, and construction of data entry forms.

The MIS minor courses include business database application, business applications program design, spreadsheet modeling for business application, and e-commerce and e-commerce system design.

H1: Database learning experience has a positive effect on the perceived usefulness of MIS minor courses by accounting students.

Based on the SCCT, learning experience would affect self-efficacy (Lent et al., 1994; Navarro et al., 2007). Many prior MIS studies indicated that the positive learning experience of MIS courses increases students' self-efficacy in MIS courses or MIS software/computer skills (Baker-Eveleth, Stone, & Pendergraft, 2005; Compeau & Higgins, 1995; Harrison & Rainer, 1992; Looney & Akbulut, 2007). However, MIS courses, database included, are traditionally seen as "hard" courses which are difficult for accounting students to learn and grasp. In-depth exposure of the database knowledge can increase accounting students' self-efficacy on learning more database related courses.

H2: Database learning experience has a positive effect on the self-efficacy of learning MIS minor courses by accounting students.

According to the SCCT, outcome expectation and self-efficacy are two main factors affecting students' interest in a career choice (Lent et al. 1994). These two factors also have been tested in MIS educational settings (Akbulut & Looney, 2009; Looney & Akbulut, 2007). It is expected that increasing outcome expectation and self-efficacy of learning database related courses can influence accounting students' intention to learn more MIS courses and ultimately lead accounting students to earn MIS minors or even MIS majors.

H3: Perceived usefulness of MIS minor courses has a positive effect on the interest in minoring in MIS by accounting students.

H4: Self-efficacy of learning MIS minor courses has a positive effect on the interest in minoring in MIS by accounting students.

Background contextual factors are commonly incorporated into the SCCT model. In fact, SCCT posits that background contextual factors shape learning experiences (Navarro et al., 2007). Students' built-in interest in computers or computer software was included as a background contextual factor in this study. It is our expectation that students' interest in computers and computer software will have a positive effect on the database learning experience and also will have a positive effect on the interest in choosing an MIS minor.

H5: Built-in interest in computer related courses has a positive effect on the database learning experience.

H6: Built-in interest in computer related courses has a positive effect on the interest in minoring in MIS by accounting students.

METHOD

The study utilized a survey-based methodology to test the proposed research model. Based on the instruments presented in literature (e.g., Looney & Akbulut, 2007), we developed a survey questionnaire (see the appendix for the instruments) to capture each of the constructs identified in our model. The questionnaire utilized a seven-point, Likert-type scale ranged from 1="extremely disagree" to 7="extremely agree."

A total of 120 undergraduate students participated in this study. They were junior accounting majors registered in five sections of the AIS course offered by two regional comprehensive universities in the U.S. across a three-quarter/two-semester period. The AIS course utilized a "hands-on" approach and extensively exposed students to essentials of database concepts which included normalization of data, modification and population of tables, identification and establishment of relationships, creation of queries, construction of data entry forms, and formation of standard reports. Two instructors agreed to deliver the AIS course under a mutually agreed format and with mutually agreed upon course content. The class format and delivery mode was based on collaboratively developed curriculum and materials. At the end of each quarter/semester, instructors distributed questionnaire to all students in attendance. In total, 120 usable responses were collected.

Partial Least Squares (PLS), more specifically, SmartPLS version 2 (Ringle, Wende, & Will, 2005), was used for the data analysis due to the relatively small sample size. Table 1 reports statistics for the constructs. All individual item loadings exceed the 0.7 recommended by Chin (1998). The Cronbach’s Alpha and composite reliability are also above the recommended 0.7 level (Gefen, Straub, & Boudreau, 2000). The AVEs (average variance extracted) are all greater than the square of the correlations among the constructs. These results confirm discriminate validity, convergent validity, and the reliability of the scales.

Table 1: Reliability And Validity Of The Constructs

Construct	No. of Indicators	Item Loading Range	Cronbach’s Alpha (α)	Composite Reliability	AVE
Database Learning Experience	4	0.7953-0.9251	0.9020	0.9320	0.7746
Perceived Usefulness	5	0.7901-0.8965	0.9062	0.9303	0.7277
Self-Efficacy	2	0.9550-0.9561	0.9059	0.9550	0.9140
Built-in Interest in Computers	3	0.9289-0.9522	0.9310	0.9560	0.8786
Interest in Minorng in IS	3	0.9598-0.9870	0.9720	0.9816	0.9469

The model fit analysis is shown in Figure 2. The significance of the path coefficients was examined by analyzing the t-values of the parameters obtained using the Bootstrap resampling method. Results from this study are promising.

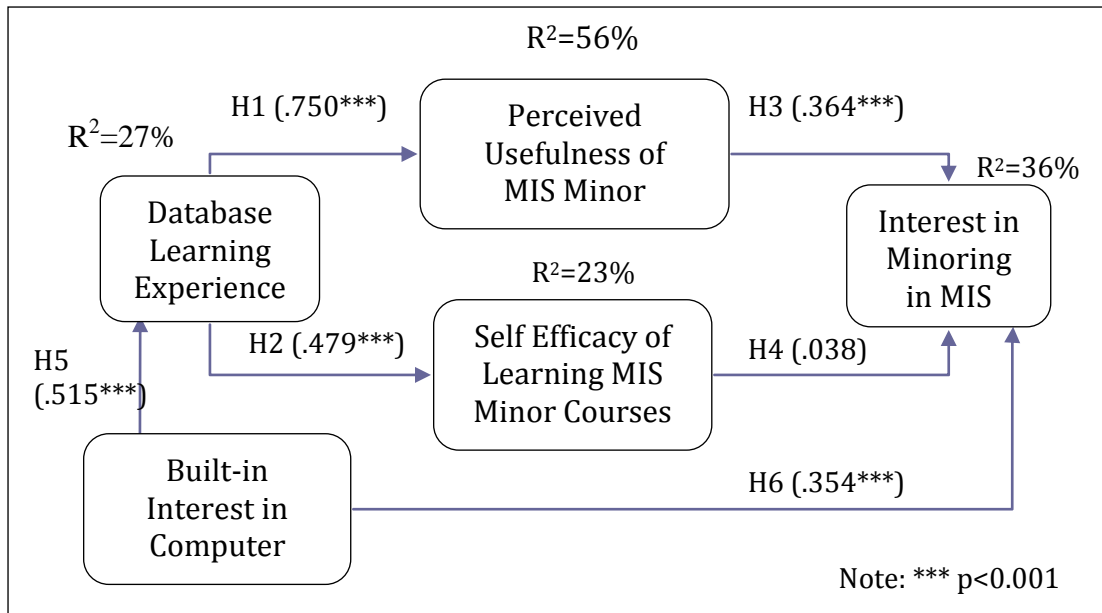


Figure 2: Structural Model Results

The R-square results show that the model explains a sizeable proportion of the variance in database learning experience (27%), perceived usefulness of MIS minor courses (56%), self-efficacy of learning MIS minor courses (23%), and interest in minoring in MIS (36%). Furthermore, all hypotheses, except H4, were supported. We find that, to accounting students, database learning experience has a positive effect on the perceived usefulness and self-efficacy of MIS minor courses. These findings support H1 and H2. The perceived usefulness of MIS minor courses further has a positive effect on the accounting students’ interest in minoring in MIS, which supports H3. We, however, do not find evidence to support H4 that self-efficacy of learning MIS minor courses has a positive effect

on the interest in minoring in MIS by accounting students. A previous study (Akbulut & Looney, 2009) had a similar finding; the possible explanation is given in the next section. In terms of how accounting students' built-in interest in computer related courses affects their database learning experience and interest in minoring in MIS, we find evidence to support both H5 and H6. Specifically, accounting students' built-in interest in computer related courses has a positive effect on their database learning experience as well as their interest in minoring in MIS.

DISCUSSION

Accelerated technological developments and rapid innovations have been transforming business environment and accounting discipline for the past century and will continue in the future (Shafer, 1998). Computerization of business processes has pushed the accounting profession far beyond its traditional practice of accounting and financial and management reporting (Fisher, 1994, p. 73). As a result of this rapid expansion of information technology, today's accountants, at the very least, have to be familiar with the most recent advances in accounting systems, applications, and software that complement compilation, preparation, and publication of financial statements. Consequently, the education process has to adjust in order to meet these challenges.

Meanwhile, because of the dot com bust and students/parents' perceptions of outsourcing IT jobs (Martz & Cata, 2008), the past few years have witnessed the sharp enrollment decline of MIS major students (George, Valacich, & Valor, 2005). Being concerned about this decline, some MIS programs that have surplus faculty capacity are seeking to draw students from other business disciplines (Granger et al., 2007). This study investigates the possibility to recruit MIS minors from accounting major students. By applying the SCCT, we empirically examine the possible relationships between the accounting majors' in-depth exposure of database knowledge and their willingness to expand their knowledge beyond the required AIS course and to take additional classes leading to an MIS minor.

Outcome Expectation: Perceived Usefulness

From the supporting evidence of H1 and H3, this study finds that in-depth database knowledge exposure has a positive impact on accounting students' interest in taking MIS minor courses by means of the increased perceived usefulness of those courses. The conceptual framework of the SCCT is based on the notion of existing correlations between behavioral patterns, environmental factors, and personal traits. An important factor of the SCCT is outcome expectation. Although database knowledge is becoming a critical skill for accountants and auditors, accounting students need to be educated to develop the desire to adapt to this new demand. If accounting students don't consider MIS minor courses to be relevant, or if they don't really understand the correlation between accounting and MIS, they will not have the desire to take MIS courses. Through in-depth and "hands-on" exposure to database knowledge, accounting students are expected to develop a better understanding of the usefulness of database knowledge in the accounting profession, and this enhanced understanding will be followed by an increased interest in taking MIS minor courses. The research findings of this study confirm this notion.

Self-Efficacy

In general, database and other MIS courses are seen as "hard" courses and are difficult for accounting students to learn. Self-efficacy, an important factor identified in the SCCT, can directly affect a person's behavior (choice). By increasing their self-efficacy on database knowledge, accounting students are expected to have more interest in MIS minor courses. In-depth and "hands-on" exposure to database concepts is an appropriate teaching tactic to increase students' self-efficacy on database knowledge and MIS minor courses. From the supporting evidence of H2, this study shows that in-depth database exposure in AIS classes significantly increases students' self-efficacy of learning MIS minor courses. However, our results did not support the hypothesis (H4) of self-efficacy leading to increased interest in minoring in MIS. This finding is consistent with a previous study by Akbulut and Looney (2009). One possible explanation is that accounting students often perceive that accounting is the hardest among all business disciplines, and the majority of them have strong discipline loyalty and career orientation. As a result, increased self-efficacy may not alter their career choice or desire for cross disciplinary study. He and Freeman (2010) also indicate that self-efficacy alone does not fully predict students' perception of majoring/minoring MIS and other factors like job market may play important roles.

Background Factor: Built-In Interest

According to the SCCT conceptual framework, background contextual factors affect learning experience. This study tests the effect of a typical background contextual factor, students' built-in interest in computers and computer related courses. The results support our hypotheses (H5 and H6) that students' built-in interest in computers and computer related courses has a positive effect on database learning experience as well as on interest in minoring in MIS. This finding confirms the usefulness of MIS recruiting efforts of targeting high school and incoming students. Strategies like sponsoring summer camps for high school students to increase their interest in computers and computer software can be effective in recruiting MIS majors/minors.

Practical Implications

The findings of this study identified some useful practical implications in the design of courses' content. While database knowledge is critical for accountants, accounting students may not automatically realize the importance and have the desire and self-efficacy to grasp the knowledge. A carefully designed AIS course is critical to fostering students' interest in MIS courses. It should include cases to demonstrate the usefulness and importance of database knowledge. In addition, the course should include "hands-on" and structured database contents, such as normalization of data, modification and population of tables, identification and establishment of relationships, creation of queries, construction of data entry forms, and formation of standard reports. This type of course design requires strong collaboration between MIS and accounting programs and this cooperation has been already taken place in some business schools. Revising curriculum to be complimentary and encouraging accounting students to take MIS courses can benefit both accounting and MIS programs. By doing so, accounting students can enhance and expand their competency in MIS-related subject areas and gain technological expertise required by professional accounting careers. Management Information Systems programs, meanwhile, can maintain a healthy enrollment level.

LIMITATIONS

A few limitations of this study need to be discussed. First, although we do see some increase in our MIS minors in this year, this study did not examine whether structured database contents in the AIS course result in an actual increase in MIS minors. Future study can compare the AIS courses with and without database contents and their relationship with the actual number of accounting students minoring in MIS. Second, all subjects came from two universities, which may limit the applicability of the results to other academic environments. Extensions can be made by future studies to examine the effect of academic environments on the results of this study. Third, this study measures database learning experience using survey data collected from students. Instead of measuring the objective differences in students' database learning experience, the survey instrument measures the perceptions of database learning experience. Be that as it may, one can argue that since both self-efficacy and outcome expectation in the SCCT reflect personal perception or reflection, the environmental factors (i.e., learning experience) may very well be measured by the perceived rather than by the objective learning experience. Fourth, this study is not strictly double blind, and possibilities exist that the instructors' actions biased the perceived database learning experience. However, the fact that the survey was anonymous and that the primary researcher was not involved in instructions ought to ease this concern.

CONCLUSION

This study represents the effort of MIS and accounting faculty to draw on the social cognitive career theory to empirically investigate the possible impact of students' broad exposure to the database concepts in the AIS course. The research findings indicate that in-depth database knowledge exposure positively affects accounting students' interest in taking MIS minor courses. Furthermore, the findings encourage the collaboration of MIS and accounting faculty to carefully design and teach AIS courses to include in-depth database knowledge content to accommodate the needs of the accounting profession, and to keep MIS programs at a healthy enrollment level.

AUTHOR INFORMATION

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APPENDIX: CONSTRUCTS AND ITEM INDICATORS

Construct	Item Indicators
Database Learning Experience	I gain a better understanding of a database and its components (e.g., tables, queries, forms, reports etc) from this class.
	I enjoy learning about database knowledge in this class.
	I am excited that I have learned database knowledge in this class.
	Learning database knowledge in this class opens my eyes in terms of what role databases play in accounting systems.
Perceived Usefulness of MIS Minor Courses	Minorng in MIS can enhance my chances of getting a job.
	Minorng in MIS increases my chances of getting a job with a higher salary.
	Minorng in MIS can decrease job-searching lag time.
	Minorng in MIS significantly broadens job opportunities.
	Minorng in MIS can help me to more efficiently manage a business.
Self-Efficacy of Learning MIS Minor Courses	MIS minor courses are not so hard for me.
	I can get good grades in MIS minor courses.
Built-in Interest in Computer Related Courses	I always enjoy leaning/using computer applications.
	I am always interested in learning computer application related courses, such as database, programming, e-commerce, etc.
	I always enjoy taking computer application related courses, such as databases, programming, e-commerce, etc.
Interest in Minorng in MIS	I will investigate what it will take to get a minor in MIS.
	I will seriously consider minorng in MIS.
	I plan to get a MIS minor.