

Student Attitudes toward Information Systems Graduate Program Design and Delivery

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ABSTRACT

This study examines student preferences regarding graduate management information systems (MIS) education. One hundred and eighty four graduate students responded to a survey exploring student attitudes towards degree program content, delivery format, and peer group interaction. Study results indicate that students prefer a program with an even mix of business and technical coursework taught by full-time faculty featuring frequent guest lectures by industry professionals. The most often cited business courses that should be required include quantitative business analysis, operations management, strategy, and leadership, and the most often identified management information systems courses that should be required were internships, business intelligence, data warehousing, management information systems fundamentals, and information technology project management. The study also explored how students with and without prior work experience differed in their preferences, which will help administrators and faculty with insights and tools to design more effective programs of study.

Keywords: Curriculum design & development, Enrollment, Program improvement, Program assessment & design, Program promotion, Student expectations, Student attitudes, Student perceptions

1. INTRODUCTION

Graduate programs in management information systems (MIS) have been dramatically affected by economic cycles associated with market-based economies. MIS programs during the dot-com bubble saw double-digit enrollment increases during the bubble's build-up only to experience a double-digit decrease in enrollment during its bust (George, Valacich, and Valor, 2005). The recent big data era also has resulted in dramatic growth and interest in graduate information systems (IS) education. Academic administrators faced with rapidly changing enrollment often must respond reactively in a suboptimal fashion. During periods of rapid growth, administrators may be unable to hire enough qualified faculty, they may increase class size above desired levels, and they may turn away students. During economic downturns, administrators may eliminate programs, leaving students scrambling to complete degrees and leaving faculty struggling to find employment (Weber and Zaragoza, 2009).

Economic cycles are uncontrollable. However, regardless of the economic cycle, the success of designing a degree program depends critically on how well it meets the needs of various stakeholders such as employers, faculty, students, accrediting bodies, and society (Topi et al., 2017). Traditionally, program design has emphasized the needs of

industry and the required body of knowledge as articulated by faculty (Chiang, Goes, and Stohr, 2012; Gupta, Goul, and Dinter, 2015). Student needs and expectations have often received only minimal consideration in designing IS degree programs, apart from a study by Wixom et al. (2014). Many graduate students typically possess several years of work experience building on knowledge gained during undergraduate studies. A better understanding of their attitudes towards MIS graduate curriculum program design and delivery has the potential to provide academic administrators with valuable insights into how they might improve IS graduate programs.

This study provides empirical insights into student attitudes towards MIS graduate program content and delivery characteristics. Specifically, the study examines student attitudes towards program duration, program focus, curriculum, work style, methods of instruction, and selection.

1.1 Background and Motivation

Understanding a process for the effective design of graduate programs in MIS has tremendous importance given the process's role in the success, longevity, and sustainability of the discipline. In the 2015-2016 academic year, 103 research-intensive institutions in the United States awarded a total of 4,768 Master's degrees in MIS (IPEDS, 2016).

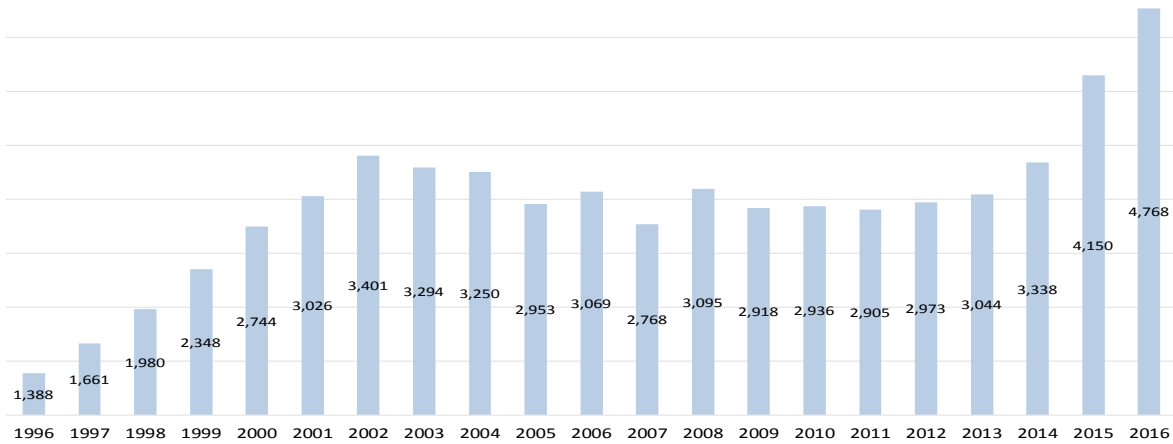


Figure 1. Master's Degrees Awarded in Information Systems from 1996 to 2016 (data from IPEDS, 2016)

This indicates that the number of institutions has more than doubled from the 51 institutions offering IS graduate degrees in 1997 (Kanabar and Gorgone, 1997). An analysis of programs awarding Master's degrees in MIS reveals a high degree of diversity in terms of learning outcomes, curriculum, and delivery format (Topi et al., 2017). This diversity results, in part, from the broad nature and evolution of the MIS discipline (Chin, 2008; Sidorova et al., 2008), historical institutional preferences, and uncertainty surrounding how to choose appropriate program characteristics.

Further complicating the situation, academic administrators designing MIS programs must also deal with the cycle surrounding the job market for MIS graduates. To be successful, a program must attract and enroll enough students to support its activities while fluctuations in the job market have a significant effect on enrollment. In addition, creating new programs takes a significant amount of time given the lengthy approval process associated with large capital expenditures in a university setting. Hence, new program implementation often lags several years behind increases in student demand. For example, an examination of MIS Master's degrees awarded and the number of universities awarding MIS Master's degrees from 1996 to 2016 illustrates the cyclical nature of enrollment in MIS programs.

As shown in Figure 1, the number of IS Master's degrees awarded increased 105% from 1997 to 2002. Then, between 2002 and 2007, the 5-year post-dot-com period saw a decline with Master's degrees awarded dropping 19%. The most recent 5-year period (2012-2016), coinciding largely with the big data era, has seen degrees awarded increase 60% – from 2,973 to an all-time high of 4,768.

The MIS discipline has also experienced a rise and fall in the number of universities awarding graduate MIS degrees. Figure 2 shows a 47% increase in the number of research-intensive universities awarding Master's degrees in MIS during the 5-year period from 1997 to 2002 that continued to rise until the number peaked in 2007. Between 2007 and 2012, the number of research-intensive universities awarding Master's degrees in MIS decreased 10%. The increase and subsequent drop in universities awarding Master's degrees in MIS also coincides with the dot-com era when factoring in the amount of time it takes academic administrators to create and eliminate programs. The 2012–2016 big data era has seen a modest 3% growth in terms of the number of universities offering IS programs. Possible reasons for the modest growth include the creation of specialty big data programs apart from IS programs and the difficulties that program designers face in knowing how

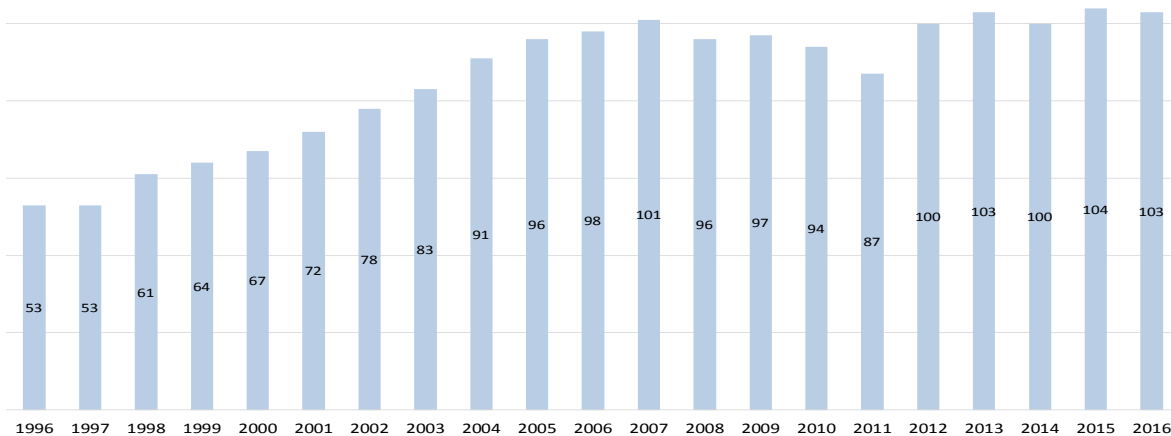


Figure 2. Number of Universities Offering Master's Degrees in Information Systems from 1996 to 2016 (data from IPEDS, 2016)

best to respond to changing market conditions. Academic administrators would greatly benefit from guidance on how best to handle this increase when creating and modifying new programs in MIS.

1.2 Learning from Stakeholders

The success of a program depends on the satisfaction of all primary stakeholders, and stakeholder satisfaction depends a great deal on the characteristics of the program; therefore, program designers must gather and understand feedback from all stakeholder communities – to research what stakeholders believe curriculum should include and how it should be delivered. Prior IS curriculum development research has obtained feedback from faculty as well as industry stakeholders, including alumni and other professionals, all of whom provide valuable insights (Aasheim, Li, and Williams, 2009; Aasheim et al., 2012; Alshare, Lane, and Miller, 2011; Brooks, Korzaan, and Ceccucci, 2014; Gorgone et al. 2006; McMurtrey et al. 2008; Plice and Reinig, 2009; Stevens, Totaro, and Zhu, 2011; Van Aukun, et al., 2011; Wilkerson, 2012).

Numerous studies examine another important stakeholder group: students. Studies focus on understanding the issues related to the boom-bust cycle of declining enrollments (Pollacia and Lomerson, 2006) and the need for soft skills or communications skills in the IS curriculum (Alshare, Lane, and Miller, 2011), whereas many studies explore why students choose IS as a major. For example, Rouibah (2012) surveys existing studies of how students generally select their major and why they select MIS as a major. Studies also examine student perceptions in their choice of IS as an undergraduate major and identify a lack of interest in IS as a major reason why students choose another major over IS (Burns, et al., 2014). For students who choose IS as a major, their love of or interest in the technology drives their interest in choosing IS as a major (Brooks, Korzaan, and Ceccucci, 2014). Student attitude is a major determinant when students choose a business major, and many students rate IS as the least-desired major (Kumar and Kumar, 2013). In fact, career-related issues, students' self-efficacy beliefs, and interest in the subject matter are categories of interest that influence student's choice of major (Ferratt, et al. 2010). Career-related issues are important to students, especially students' perceptions that an MIS major will make them more competitive in their careers (Hogan and Li, 2009). Studies show that student interest in the major influences students selecting the major. In fact, "having a genuine interest in a field consistently has been found to be one of the most important, if not the most important factor affecting students' choice of majors" (Zhang, 2007, p. 449). Researchers explore mechanisms to increase students' level of interest (Walstrom and Schambach, 2012). They also find that student interest significantly influences students' attitude to choose their major which, in turn, significantly influences their intentions to work in their major fields once they graduate (Downey, McGaughey, and Roach, 2011). They recommend that faculty design curricula and act to encourage and to facilitate that student interest.

Processes of assessment and evaluation use inputs from students as stakeholders to inform and improve educational activities. Assessment is "the process of measuring learning outcomes to provide evidence of student achievement and to guide future instruction" (Shaftel and Shaftel, 2007). These

learning assurance programs "seek to assess and improve the quality of student learning" (Karsten and Roth, 2015). Evaluation focuses on determining if an educational program is accomplishing its desired results (Shaftel and Shaftel, 2007). Formative evaluation can influence curriculum design and can guide educators as they design and select "...instructional methods and curricular materials to enhance learning or fill gaps in knowledge" (Shaftel and Shaftel, 2007), and summative evaluation can be used to provide assurance of student learning. Examples of both formative and summative evaluation exist in the literature. For formative evaluation, McCuddy, Pinar, and Gingerich (2008) provide an example that describes the use of a student survey to address curricular concerns, while Karsten and Roth (2015) and Rob and Etnyre (2015) provide examples of summative evaluation: a learning assurance measure to evaluate students' learning *post hoc* (Karsten and Roth, 2015) and an in-class student survey to inform curriculum design (Rob and Etnyre, 2015).

IS departments have proposed or undertaken formative evaluations through a number of curriculum-oriented approaches to improve enrollments in their IS programs (Becker, Hassan, and Naumann, 2006; Granger, et al., 2007; Koch, et al., 2010; Pratt, Houser, and Ross, 2010; Tehrani, 2011). These approaches in pedagogy and curriculum are in response to changing technologies and their use, as well as to an ongoing need for programs to provide students with IT skills and capabilities addressing the business, management, and client-facing technical skills that industry demands (Abraham, et al., 2006). The emphasis on program design, curriculum, and instruction is important because curriculum is indeed a major factor that students consider in choosing a major (Rouibah, 2012). This emphasis aligns with research that shows that students' aspirations to pursue an MIS degree are influenced by the students' perceptions that what they learn will provide the skills they need to succeed in their chosen careers (Akbulut and Looney, 2007) and that graduates believe that their MIS programs should be relevant, business-focused programs (Saunders and Lockridge, 2011).

This study addresses a gap in the literature by examining an underexplored stakeholder community comprised of graduate students in MIS to determine desirable program characteristics that students believe are essential to make a graduate IS program successful. This work helps program administrators to address the insights of graduate students considering changing market conditions (Eymann et al, 2014; Kappelman, et al, 2017). Specifically, this study provides insight on student attitudes towards Master's degree programs' design and delivery characteristics by answering the question, "What program characteristics are most important when designing a graduate program in information systems?" Understanding student attitudes and preferences towards IS graduate degree program content and delivery has not received adequate coverage given its importance to the success and longevity of the discipline. Thus, this study is a first step in building, maintaining, and growing sustainable Master's degree programs.

This empirical study 1) investigates student perceptions regarding program duration and focus, curriculum content, preferred work styles and methods of instruction, and program selection of graduate MIS programs; and 2) compares the perceptions of students with IT work experience with those of

students having little or no IT work experience concerning these topics. Inexperienced students are continuing on in their college education and experienced students have had some time in the IT workforce since completing their undergraduate education. By comparing perceptions of inexperienced and experienced students, we can determine whether the perceptions of the two groups differ concerning these issues. These comparisons also might reflect the expectations of new students that can have important implications for curriculum development and program design.

2. METHOD

2.1 Participants

Participants in this study were incoming students matriculated in a single graduate degree program in MIS (a STEM-designated program) in an AACSB-accredited business school located in a large metropolitan area of the U.S. Of the 227 graduate MIS students matriculating in the Fall 2013 semester, 184 students completed a voluntary survey that provides feedback on attitudes towards program content and delivery characteristics.

Table 1 shows the demographics of these students. Of the 184 students, 117 students had more than 6 months of paid IT work experience before they began graduate school (labeled experienced students in this study). The average experience was slightly more than 20 months of paid IT work experience when the survey was administered. Sixty seven incoming students had less than 6 months of paid work experience (labeled as inexperienced students in this study), as they were enrolling in the graduate program immediately after college. Survey responses from students without IT work experience are presented separately from the results of students with prior IT work experience to facilitate an understanding of the results.

	No Prior IT Work Experience	Prior IT Work Experience	Total
Number of students	67	117	184
Average IT work experience (months)	0.5	32.2	20.4

Table 1. Demographics and IT Work Experience of Participating Students

Preferred Program Duration and Courses	No Prior IT Work Experience	Prior IT Work Experience	<i>t</i>	<i>p</i>
On a full-time basis, how long should a Master of Science in Management Information Systems degree program take to complete? (number of months)	22.97 (2.91)	21.03 (3.54)	3.91	<0.000***
How many total courses should be required to earn an MS in MIS degree? (number of courses)	12.32 (1.61)	12.02 (1.13)	1.48	0.143

Table 2. Preferred Program Duration and Number of Courses

2.2 Materials

To generate data to address the research objectives, this study uses a survey that includes items to assess students' perceptions regarding program duration and focus, curriculum content, preferred work styles and methods of instruction, and program selection.

The voluntary survey collected data during a mandatory, new student orientation that occurred the week before courses began for the Fall 2013 semester. Students responded to a series of questions regarding program selection, content and curriculum, program structure and delivery, and peer group preferences. Student responses related to these areas will help program administrators understand why students select MIS programs, what students expect an MIS program to contain, how institutions should structure their MIS programs, and what students prefer with respect to their peer group.

3. RESULTS

This section presents the results of students' feedback on program duration and focus, curriculum content, preferred work styles and methods of instruction, and program selection.

3.1 Program Duration

In the survey, students first provided input and feedback on their preferences regarding program duration, the number of required courses, and the desired business/technical focus of the program. Table 2 presents the survey responses related to program length and course requirements. Students prefer a program to last under 2-years on a full-time basis. Inexperienced students preferred a slightly longer program duration ($M = 22.97$, $SD = 2.91$) than did those with prior IT work experience ($M = 21.03$, $SD = 3.54$), $t(182) = 3.91$, $p < 0.01$. Students prefer a Master's program that requires a total of approximately 12 courses.

3.2 Program Focus

Given the scope of the MIS discipline, MIS graduate programs often contain a mix of business and technical coursework. The second set of questions asks students to provide details regarding what they prefer in a desired mix of business and technical coursework. Table 3 presents these results.

Overall, students prefer a program to contain an even mix of technical and business courses with 45% of coursework being technical and 44% of coursework having a business focus. Experienced and inexperienced students differ with respect to preferences for technical coursework, with inexperienced students preferring a higher percentage of technical coursework. Specifically, students without prior work experience prefer 50% of the total program coursework to be technical ($M = 50$, $SD = 22$) while experienced students prefer 43% of total program coursework to be technical ($M = 43$, $SD = 20$), $t(182) = 2.38$, $p = 0.02$.

The next set of questions pertain to what students prefer regarding areas of specialization or themes often found in graduate MIS programs. Results are presented in Table 4. Students were asked to rate their preference for programs with a focus on IT management, IT consulting, and IT development, using a 5-point Likert scale ranging from strongly agree to strongly disagree. Students strongly prefer a program with an emphasis on IT management, giving it a score of 4.52 on a 5-point scale. Student preference for programs emphasizing IT management is consistent with the recommendations provided by Topi et al. (2014). Students prefer a program that emphasizes IT development the least, scoring this focus at 3.71 on a 5-point scale. With respect to program themes, experienced and inexperienced students do not differ in what they prefer.

MIS programs can choose how much emphasis the program gives to tools; the next two questions pertain to MIS students' preferences regarding the tool orientation of the program. Table 5 shows that, on average, MIS students prefer a program that

	No Prior IT Work Experience	Prior IT Work Experience	<i>t</i>	<i>p</i>
Technical vs. Business Coursework				
Of the total number of required courses, what percentage should be technical courses (i.e., programming, database design, systems analysis, etc.)?	50% (22%)	43% (20%)	2.38	0.020**
Of the total number of required courses, what percentage should be business courses (i.e., accounting, finance, marketing, etc.)?	43% (20%)	44% (20%)	0.42	0.678

(*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Standard Deviations appear in parentheses below means.)

Table 3. Student Preferences Regarding Technical vs. Business Coursework

	Overall	No Prior IT Work Experience	Prior IT Work Experience	<i>t</i>	<i>p</i>
Program Themes					
I prefer a program emphasizing IT management	4.52 (0.65)	4.45 (0.75)	4.57 (0.58)	1.20	0.235
I prefer a program emphasizing IT consulting	4.08 (0.87)	4.06 (0.85)	4.09 (0.89)	0.20	0.845
I prefer a program emphasizing IT development	3.71 (0.94)	3.59 (0.99)	3.78 (0.91)	1.30	0.235

(*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Standard Deviations appear in parentheses below means.)

Table 4. Student Preferences Regarding Program Themes

	Overall	No Prior IT Work Experience	Prior IT Work Experience	<i>t</i>	<i>p</i>
Tool Orientation					
I prefer a program emphasizing how to use application software and tools	4.34 (1.57)	4.52 (2.35)	4.23 (0.81)	1.20	0.234
I prefer a program emphasizing concepts, theories, and problem solving	4.12 (0.86)	3.89 (0.96)	4.26 (0.77)	2.81	0.007***

(*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Standard Deviations appear in parentheses below means.)

Table 5. Student Preferences Regarding Tool Orientation

	Overall	No Prior IT Work Experience	Prior IT Work Experience	<i>t</i>	<i>p</i>
Required Business Core Courses					
Quantitative Business Analysis	4.62 (0.58)	4.63 (0.55)	4.62 (0.60)	0.06	0.95
Operations Management	4.43 (0.74)	4.33 (0.82)	4.50 (0.69)	1.46	0.15
Strategy	4.38 (0.71)	4.23 (0.71)	4.47 (0.70)	2.17	0.03***
Leadership	4.37 (0.76)	4.18 (0.86)	4.47 (0.68)	2.47	0.02***
Entrepreneurship	4.13 (0.91)	4.00 (1.00)	4.20 (0.85)	1.44	0.15
Marketing	4.13 (0.79)	4.00 (0.80)	4.21 (0.77)	1.68	0.10*
Global Business	4.08 (0.87)	3.95 (0.87)	4.16 (0.87)	1.53	0.13
Organizational Behavior	4.05 (0.88)	3.81 (0.95)	4.20 (0.80)	2.92	0.00***
Finance	3.99 (0.84)	3.94 (0.82)	4.02 (0.85)	0.62	0.54
Economics	3.62 (0.83)	3.63 (0.85)	3.62 (0.82)	0.12	0.90
Accounting	3.62 (0.94)	3.67 (0.89)	3.59 (0.97)	0.55	0.59
Business Law	3.56 (0.97)	3.58 (0.96)	3.55 (0.99)	0.18	0.86

(*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Standard Deviations appear in parentheses below means.)

Table 6. Student Preferences Regarding Required Business Courses

emphasizes how to use application software and tools. A program that emphasizes concepts, theories, and problem solving also scores very high in terms what students prefer, with an average score of 4.12 on a 5-point scale. Interestingly, inexperienced students and experienced students differed with respect to whether a program should emphasize concepts, theories, and problem solving; experienced students show a greater preference for programs emphasizing concepts, theories, and problem solving ($M = 4.26$, $SD = 0.77$) than did inexperienced students ($M = 3.89$, $SD = 0.96$), $t(182) = 2.81$, $p < 0.01$.

3.3 Business Curriculum Preferences

Students then answer questions to provide input on what specific business courses an MIS graduate degree program should require. Using the MBA core curriculum, the survey asks students to agree or disagree (on a scale of 1 to 5) on the extent to which an MIS program should require the courses as part of an MIS curriculum. The results are presented in Table 6.

Students rank quantitative business analysis, operations management, strategy, and leadership with the highest preference regarding required coursework while they express the lowest levels of preference for courses in economics, accounting, and business law. Students with prior work experience indicate that programs should require business courses in strategy, leadership, organizational behavior, and marketing at significantly greater levels than do students without work experience.

3.4 MIS Curriculum Preferences

Students then provide input regarding what MIS courses should be required as part of an MIS curriculum. To identify courses for the survey, the MSIS 2006 Model Curriculum (Gorgone et al., 2006) was reviewed along with course offerings of the *U.S. News & World Report* top 20 graduate IS programs (US News & World Report, 2013). The survey provides a consolidated list; courses with the same content but different names were consolidated. Table 7 shows internship, business intelligence, data warehousing, MIS fundamentals, and IT project management receive the highest scores regarding student preferences for required IS courses, whereas programming, IT capstone, IT thesis/research, IT governance and auditing, healthcare IT, and computer forensics receive the lowest scores.

In considering which courses an MIS program should require, inexperienced students identified two courses that they felt should be required at a greater level than did experienced students. Inexperienced students identified that an MIS program should require an MIS fundamentals course at a greater level ($M = 4.67$, $SD = 0.56$) than do experienced students ($M = 4.37$, $SD = 0.71$), $t(182) = 3.13$, $p < 0.01$. Similarly, inexperienced students reported that an IT infrastructure course should be required at a greater level ($M = 4.18$, $SD = 0.74$) than do experienced students ($M = 3.83$, $SD = 1.00$), $t(182) = 2.68$, $p < 0.01$. Inexperienced and experienced students do not express other significant differences in their preferences for the other 25 courses included in the survey.

	Overall	No Prior IT Work Experience	Prior IT Work Experience	<i>t</i>	<i>p</i>
Required MIS Courses					
Internship	4.72 (0.56)	4.76 (0.50)	4.69 (0.60)	0.88	0.38
Business Intelligence	4.60 (0.62)	4.50 (0.69)	4.65 (0.58)	1.55	0.13
Data Warehousing	4.52 (0.70)	4.53 (0.68)	4.51 (0.71)	0.16	0.87
MIS Fundamentals	4.48 (0.67)	4.67 (0.56)	4.37 (0.71)	3.13	0.003***
IT Project Management	4.42 (0.64)	4.45 (0.63)	4.41 (0.65)	0.38	0.71
Data Mining	4.38 (0.77)	4.48 (0.68)	4.32 (0.81)	1.36	0.18
Enterprise Resource Planning	4.33 (0.75)	4.37 (0.72)	4.30 (0.77)	0.57	0.57
IT Strategy	4.29 (0.77)	4.24 (0.79)	4.32 (0.76)	0.64	0.52
Database Management Systems	4.27 (0.76)	4.34 (0.64)	4.23 (0.83)	0.96	0.34
Analysis and Design	4.21 (0.71)	4.19 (0.70)	4.23 (0.72)	0.28	0.78
Big Data Analytics	4.21 (0.92)	4.23 (0.91)	4.20 (0.94)	0.22	0.83
Customer Relationship Management	4.13 (0.85)	4.11 (0.89)	4.14 (0.83)	0.21	0.84
Web Analytics	4.07 (0.87)	4.09 (0.92)	4.06 (0.85)	0.19	0.85
IT Services Management	4.03 (0.90)	4.00 (0.92)	4.05 (0.89)	0.34	0.74
Software Quality Management	4.01 (0.94)	4.03 (0.96)	3.99 (0.93)	0.27	0.39
IT Infrastructure and Data Communications	3.97 (0.92)	4.18 (0.74)	3.83 (1.00)	2.68	0.009***
Cloud Computing	3.91 (1.03)	3.85 (1.06)	3.95 (1.02)	0.65	0.52
Enterprise IT Architecture	3.89 (0.89)	3.88 (0.85)	3.90 (0.91)	0.20	0.84
Supply Chain Management	3.86 (0.92)	3.91 (0.90)	3.83 (0.94)	0.57	0.57
IT Security	3.77 (0.99)	3.85 (0.94)	3.72 (1.02)	0.85	0.40
Spreadsheet Modeling	3.73 (0.97)	3.76 (0.93)	3.72 (0.99)	0.28	0.78
Programming	3.73 (1.04)	3.84 (0.99)	3.66 (1.06)	1.13	0.26
IT Capstone	3.69 (0.95)	3.83 (0.96)	3.60 (1.16)	1.57	0.38
IT Thesis / Research	3.64 (1.15)	3.66 (1.15)	3.62 (1.16)	0.21	0.83
IT Governance and Auditing	3.62 (0.86)	3.74 (0.88)	3.53 (0.84)	1.54	0.13
Healthcare IT	3.41 (0.98)	3.33 (1.01)	3.46 (0.96)	0.82	0.38
Computer Forensics	3.27 (1.02)	3.42 (0.98)	3.18 (1.04)	1.46	0.15

(*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Standard Deviations appear in parentheses below means.)

Table 7. Student Preference Regarding Required MIS Courses

3.5 Work Style and Method of Instruction

The next set of questions asks students to provide input on their preferred work style and preferred method of instruction. As shown in Table 8, students express a strong interest in a highly flexible program taught by full-time faculty with active student groups. Experienced students express stronger preferences for flexibility ($M = 4.59, SD = 0.61$) than do inexperienced students ($M = 4.36, SD = 0.76$), $t(182) = 2.18, p = 0.03$. Students also prefer to work in groups compared to working alone, and they desire frequent guest lectures by industry professionals. Experienced students desire frequent guest lectures by industry professionals more ($M = 4.44, SD = 0.80$) than do inexperienced students ($M = 4.14, SD = 0.91$), $t(182) = 2.31, p = 0.02$. Experienced students prefer an integrated curriculum more ($M = 4.24, SD = 0.88$) than do inexperienced students ($M = 3.94, SD = 1.04$), $t(182) = 2.05, p = 0.04$. Experienced students also prefer classes taught by part-time adjunct faculty working full-

time in industry more ($M = 3.45, SD = 1.25$) than do inexperienced students ($M = 3.11, SD = 1.25$), $t(182) = 1.96, p = 0.05$.

3.6 Program Selection Factors

The final set of questions in the survey pertain to factors that affect how students select a program. When asked to rank the top five factors affecting their decision to choose a graduate MIS program, students indicate program ranking, reputation, industry connections, and job placement success are the top factors affecting their decisions (see Table 9). Students report the lowest factors affecting their decisions to be alumni network, low cost, social activities, and advising. Compared to inexperienced students, experienced students give greater weight to reputation, whereas inexperienced students give greater weight to advising.

Preferred Work Style and Method of Instruction	Overall	No Prior IT Work Experience	Prior IT Work Experience	<i>t</i>	<i>p</i>
I prefer a program with active student groups	4.59 (0.61)	4.59 (0.56)	4.58 (0.63)	0.13	0.89
I prefer a program with a high degree of flexibility	4.50 (0.68)	4.36 (0.76)	4.59 (0.61)	2.18	0.03**
I prefer classes to be taught by full-time faculty	4.43 (0.74)	4.45 (0.75)	4.42 (0.73)	0.20	0.84
I prefer classes with frequent guest lectures by industry professionals	4.33 (0.85)	4.14 (0.91)	4.44 (0.80)	2.31	0.02**
I prefer to work in groups	4.30 (0.79)	4.26 (0.85)	4.32 (0.77)	0.51	0.61
I prefer an integrated curriculum whereby content from multiple disciplines are presented together	4.13 (0.95)	3.94 (1.04)	4.24 (0.88)	2.05	0.045**
I prefer a non-cohort style program where I take courses with different students	3.63 (0.98)	3.60 (0.98)	3.64 (0.98)	0.28	0.78
I prefer a cohort style program where I take courses with the same students	3.39 (1.06)	3.40 (1.02)	3.38 (1.09)	0.11	0.91
I prefer classes to be taught by part-time, adjunct faculty who are working full-time in industry	3.33 (1.12)	3.11 (1.25)	3.45 (1.02)	1.96	0.054*
I prefer to work individually	3.29 (1.06)	3.24 (1.02)	3.31 (1.09)	0.41	0.68
I prefer a non-integrated curriculum whereby each discipline presents its content separately	3.04 (1.08)	3.06 (1.00)	3.03 (1.12)	0.21	0.83
I prefer a highly structured program with limited flexibility	2.70 (1.01)	2.76 (0.98)	2.66 (1.03)	0.61	0.54
Of the total number of classes you take in an MS MIS program, what percentage of your classes would you like to take online?	14% (16)	12% (15)	15% (17)	0.89	0.38
How many students would you like to have in your MS MIS program?	79.71 (51.51)	79.88 (51.89)	79.61 (51.52)	0.03	0.97

(*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Standard Deviations appear in parentheses below means.)

Table 8. Student Preferences Regarding Work Style and Method of Instruction

Program Selection Factors	Overall	No Prior IT Work Experience	Prior IT Work Experience	<i>t</i>	<i>p</i>
Program Ranking	3.61	3.70	3.55	0.57	0.57
Reputation	3.57	3.25	3.77	1.70	0.098*
Industry Connections/Network	3.24	3.23	3.25	0.08	0.94
Job Placement Success	3.19	2.98	3.30	1.21	0.23
Career Placement Services	3.15	2.91	3.27	1.04	0.31
Internship Opportunities	3.04	3.02	3.05	0.11	0.91
Program Rigor	2.79	2.73	2.81	0.17	0.87
Location	2.71	2.89	2.60	0.71	0.49
Alumni Network	2.51	2.46	2.54	0.21	0.84
Low Cost	2.40	2.55	2.33	0.63	0.54
Social Activities	1.87	2.13	1.70	1.50	0.16
Advising	1.84	2.30	1.64	1.84	0.098*

(*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Standard Deviations appear in parentheses below means.)

Table 9. Student Preferences Regarding Program Selection Factors

4. RECOMMENDATIONS AND DISCUSSION

Based on the results from the student survey responses, this study provides specific recommendations regarding the design of graduate MIS programs. Students prefer programs with an even mix of technical and managerial coursework with IT Management being a more popular program theme than IT Development or IT Consulting. MIS students recognize the need to understand technology as well as core business operations to effectively design, deliver, deploy, and manage information systems. These findings confirm one of the central, foundational tenants of the MIS discipline. This study exposes that students are clear and consistent in their understanding of the MIS program and do not want a program that is too heavily focused on technology.

Students prefer 12 required courses, a program size which falls within the range of typical graduate MIS programs. Given the consistent message regarding MSIS program focus and duration, academic administrators should ensure that an MIS program curriculum provides a mix of technical and managerial coursework and is approximately 12 courses in duration. Students expect the program to take close to two years. Therefore, condensing all 12 courses into a 1-year or 18-month program may not be a good idea, especially when preferred courses such as an internship will not be fit into this shorter duration, and a shorter program may not match student preferences.

With respect to business core course content, this survey uncovered differences regarding student preferences for required business core courses; in fact, experienced students highly rated operations management, strategy, and leadership. Both experienced and inexperienced students consider the most preferred business core course to be quantitative business analysis. Therefore, moving forward, MIS program administrators may want to consider adding a required business course on quantitative business analysis.

With respect to the MIS curriculum requirements, students cited an internship as their first preference for required MIS courses. Although financial considerations may be a factor in the high rating, students appear to recognize the value of synthesizing and applying what they learn in the classroom to practical, real-world settings. Some programs provide an

internship or an IT capstone course. The IT capstone course serves much of the same purpose with respect to synthesizing and applying knowledge, yet students rank the IT capstone course as 23 of a possible 27 courses. In response to student preferences, where possible, program administrators should strongly consider replacing a graduate-level IT capstone requirement with a required internship. An internship course requires that students address the real-world needs of an external client as opposed to a traditional IT capstone course, which may not have such external requirements. Interestingly, even those students who have work experience rate internship as their most preferred course in the curriculum.

The 2013 SIM IT Trends Study (Kappelman et al., 2013) surveyed senior IT leaders in 484 organizations to provide insight into organizational activity with respect to IT investment, management, and operations. In the past five years, the study identifies analytics/business intelligence as the largest IT investment area. Hence, strong evidence exists for the marketplace demand for skills in this area. Similarly, students expressed a preference in this area with the second and third most preferred MIS courses being business intelligence and data warehousing. Given the industry activity and student preference in this area, academic administrators may want to consider requiring at least one business intelligence course and making business intelligence part of the core of a MIS curriculum.

Students prefer classes taught by full-time faculty but also express a strong interest in frequent guest lectures by industry professionals. Therefore, program administrators should implement mechanisms that include frequent guest lectures by industry professionals. Program administrators should also consider keeping the program flexible and ensuring that the program has an MIS-focused student group – students rated both highly in terms of delivery characteristics. In addition, students surprisingly express similar levels of preference for cohort- versus non-cohort-style programs; therefore, administrators may choose a cohort versus non-cohort system based on other administrative considerations apart from student preference. Students also expressed a strong desire to work in groups when compared to working individually, providing strong evidence to incorporate extensive group work in MIS classes.

Students rank program ranking and reputation first and second in terms of what they consider important when selecting a program; therefore, administrators need to develop a mechanism to manage program ranking and reputation. At a minimum, program administrators should understand the factors major ranking organizations use to rank programs (e.g., average GMAT, starting salary, peer evaluation) to improve these relevant factors over time. Students rank industry connections and job placement success as the third and fourth most important program selection factors, and program administrators should ensure adequate assistance with job placement for students via a formal career services center. Additionally, program administrators may want to provide dedicated resources for both internal (resume building, networking, interview skills,) and external (employer relations) purposes. Students do not consider program cost highly in selecting a program. This finding may result because competing programs have similar costs.

5. LIMITATIONS AND FUTURE RESEARCH

This study has limitations related to participant population, the single campus of the study, and the duration of the study. The surveyed participants are students from a graduate IS program at a single university and therefore may be subject to a self-selection bias, whereby the program preferences expressed are more closely aligned with the MIS program of the surveyed university than with the MIS student population at large. This study draws from a single campus, which may limit the generalizability of the results. Furthermore, the survey provides a single snapshot at a moment in time; a longitudinal study is necessary to identify changes over time in student preferences. Finally, this study surveyed only one primary stakeholder community: graduate students. Future replication studies can provide insights into the perceptions of students from multiple campuses of varying locations, types, and classifications and can also address multiple stakeholder perspectives to comprehend the needs and preferences of faculty, industry, and senior academic administrators.

6. CONCLUSIONS

This study provides insight into student attitudes towards MIS graduate program duration, business/technical focus, programmatic themes, curriculum, work style, methods of instruction, and program selection factors. The study surveys 184 students to reveal that students prefer a program just under 2-years in length with an even mix of business and technical coursework. In addition, students express a preference for a flexible program that emphasizes IT management taught by full-time faculty with frequent guest lectures by industry professionals. Students cite business courses – most often quantitative business analysis, operations management, strategy, and leadership – and IS courses – most often internship, business intelligence, data warehousing, MIS fundamentals, and IT project management – as courses that a MIS program should require. Program administrators should place a strong emphasis on program ranking, as it is the single most important factor driving students as they select an MIS program.

The study uncovers interesting differences between students with and students without prior work experience. Inexperienced students favor a slightly longer program and a curriculum with a higher mix of technical courses, whereas experienced students prefer a slightly shorter program and a curriculum that features a greater focus on concepts and theories and business courses emphasizing people skills (leadership, strategy, and organizational behavior). With respect to required MIS coursework, experienced and inexperienced students largely agree on what courses a program should require: from 27 possible required courses, experienced and inexperienced students differ on only 2 courses, with inexperienced students rating MIS fundamentals and IT infrastructure higher than experienced students do. Program administrators can tailor more efficient programs by understanding how experienced and inexperienced student groups differ and tailor program activities to consider those differences.

This exploratory study provides a preliminary understanding of what students need, expect, and deliver regarding MIS graduate program design and delivery characteristics. MIS graduate students, regardless of their levels of experience, possess valuable knowledge that is useful and provide input and guidance to academic administrators who are responsible for MIS graduate program design and delivery. By understanding student attitudes toward MIS program content and delivery, academic administrators can design and manage MIS programs more efficiently.

7. END NOTES

¹ The US Department of Education Classification of Instructional Programs (CIP) taxonomy was reviewed to identify programs with an MIS orientation. For purposes of this study, degrees awarded with CIP codes 11.04 Information Science/Studies, 11.05 Computer Systems Analysis/Analyst, and 52.12 Management Information Systems, General are considered MIS degrees.

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