Teaching the Introductory MIS Course: An MIs Approach

Completed Research Paper

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ABSTRACT

The introductory Management Information Systems (MIS) course plays a very important role in attracting and retaining students in the MIS program. Accordingly, MIS educators have been paying an increasing attention to the question how to teach this course effectively, especially faced with declining enrollments in the MIS discipline. However, an easy-to-use guideline is still lacking. Although some conceptual frameworks for teaching the introductory MIS course are designed, they lack actual implementation and/or empirical examinations. Based on a review of previous literature and various learning theories, this study develops an MIs approach to teaching MIS courses. Then, this study explains how to implement it using a specific case, and further examines the effectiveness of this new teaching approach based on students’ responses. Overall, this study describes a useful starting point for MIS programs to curb the declining enrollments. Both administrators and MIS instructors may benefit from this approach.

Keywords

IS course, introduction to IS, IS Curriculum, Teaching Approach

Introduction

The introductory Management Information Systems (MIS) course plays a very important role in attracting and retaining students in the MIS program. For most business schools, this course is required for business majors and elective for business minors. As an entry-level and core course, Introduction to MIS inaugurates fundamental MIS concepts and application software skills and provides students with a first impression about the MIS major (Gudigantala, 2013). In addition, this course is very important to help students decide whether or not to major in MIS. Obviously, if a student has an excellent first impression and learns useful skills in the first MIS course, s/he is more willing to choose advanced MIS courses later. Accordingly, MIS instructors are required to excel and innovate when teaching this course.

Although MIS instructors play a significant role in designing and teaching MIS courses, the effectiveness of MIS education is also significantly impacted by other four perspectives: student, recruiter, administrator, and technology. Putting together, MIS courses are impacted by “five forces”, as depicted in Figure 1. First of all, all MIS courses are designed to deliver relevant knowledge and skills from MIS instructor to students. Therefore, the two parties are directly involved in MIS courses. In addition, recruiters may partly determine what content should be taught in MIS courses (He & Guo, 2011). Administrators focus on improving students’ enrollment and retention, evaluating teaching performance, and providing MIS instructors with required resources. The last “force” is technology, which forces MIS instructors to integrate new IT (information technology) phenomenon, terms, and approaches into their courses.
Four recent trends drive IS educators to make changes in course content and teaching approach in MIS programs. First, enrollment in MIS programs has been declining since 2001 with some programs shutting down completely (Firth et al. 2008; Frankel, 2008; Koch & Kayworth, 2009; McCoy et al., 2013). In order to reverse the trend, two associations (i.e., AIS and ACM) and many universities seek to redesign MIS curriculum or improve teaching effectiveness (Everard, 2011). Second, recruiters significantly consider IT knowledge and skills during the hiring process (He & Guo, 2011). In order to keep competitive in job market, students have to learn required IT knowledge and skills before they graduate. However, those practical skills may not be incorporated into current MIS courses, indicating a significant disconnect between the realms of business and education (LaFrance, 2010; He & Guo, 2011; McCoy et al., 2013). Third, business analytics and big data have become increasingly important in the past few years and therefore provide a unique opportunity for IS units in business schools to revise current curriculum or develop new courses (Chen et al, 2012). Although it is claimed that graduate programs are the obvious choice due to the depth of knowledge required for this new field, we believe that it is very valuable and innovative to briefly introduce new terms and approaches related to business analytics and big data in undergraduate MIS courses, especially for the introductory course. In doing so, MIS instructors can encourage students to pursue this new field in the future. Fourth, current college students are increasingly using many IT-based products and service, including iPhone, social media, Google documents, Prezi, Twitter, and so forth. Therefore, it is very valuable for MIS instructors to understand students’ behaviors, interests and hobbies and to integrate them into MIS courses.

All these trends above force MIS educators to design and use a new approach to teaching MIS courses, especially for the introductory one. In the past few years, MIS educators have paid an increasing attention to the question how to teach this course effectively. For instance, Frost et al. (2008) present a strategic framework for introductory MIS course, in which three components along with many valuable teaching initiatives are discussed. Based on Assimilation Learning Theory (Ausubel et al., 1968), Drake (2012) offers an alternative pedagogical framework and uses three examples to illustrate how this framework is used in teaching decision support systems module in the introductory MIS course. Similarly, Gudigantala (2013), applying an active learning approach, documents and implement various techniques in the introductory MIS course. All these studies contribute by providing a pedagogical framework along with particular techniques for teaching MIS courses. However, those conceptual frameworks lack actual implementation and/or empirical examinations.

In addition, previous studies introduce many practical teaching techniques, but it is still unclear that what characteristics or attributes those techniques should demonstrate in order to make them work effectively. For instance, it is known that case study can help students understand and assimilate key terms, but an inappropriate use of this approach might make students feel boring. Therefore, it is more important to know how to use a teaching tool, rather than what tools could be used. However, an easy-to-use guideline for how to use teaching tools is still lacking. Without a clear guideline, some of them are difficult to
implement in a new case, whereas others may restrain the instructor’s innovation and initiatives due to too many detailed instructions. This study briefly presents a useful and easy-to-use guideline, namely, the MIs approach, then explains how to implement it using a specific case, and further examines the effectiveness of this new teaching approach based on students’ responses.

The paper proceeds as follows. We start with a review of previous relevant research, and then briefly introduce MIs approach. Then, we use a case to exemplify how to use this new approach and examine its effectiveness. This study ends up with discussing contributions and future research directions.

A Review of Relevant Research

We review ten articles, all of which have been published in the past 10 years (Table 1). Interestingly, nine of them focus on the introductory MIS course, indicating its great importance. In addition, the introductory MIS course not only delivers fundamental MIS concepts and application software skills (Gudigantala, 2013) and teaches students to think like professionals (Frost & Pike, 2004), but also changes students’ stereotyped perceptions of IS professionals (Akbulut-Bailey, 2013). In general, two key questions are addressed: course content (what to teach) and teaching approach (how to teach).

In terms of course content, Wang (2007), based on IS 2002 Model Curriculum, presents a list of topics which could be taught in the Introductory MIS Course. Using semi-structured interviews from recruiters, He & Guo (2011) identify a list of heavily weighted IT skills during the hiring process such as general computing, database, and communication via IT. McCoy et al. (2013) examine how faculty, recruiters, and students differ in valuing specific topics in the introductory MIS course and find that topics such as system security and IS Infrastructure are highly valued by all the three groups of stakeholders.

In terms of teaching techniques, Mukherjee (2005) finds that an appropriate use of class exercise in the introductory MIS course promotes students’ understanding on the importance and relevance of MIS, motivates students to study what they consider to be relevant. Drake (2012) exemplifies three teaching approaches (traditional lecture approach, active learning approach, and case study approach) and notes that the most appropriate way of promoting meaningful learning is to develop a hierarchically based conceptual understanding. Furthermore, applying an active learning approach, Gudigantala (2013) introduces many techniques, including student projects, individual student presentation, formative quizzes, visual demonstrations, instant feedback, out-of-class exercises, and case study.

<table>
<thead>
<tr>
<th>Studies</th>
<th>Level</th>
<th>Purposes</th>
<th>Methods</th>
<th>Main Findings/Contributions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frost &amp; Pike (2004)</td>
<td>Intro.</td>
<td>Design the intro to MIS course using the SDLC approach</td>
<td>Applying SDLC approach</td>
<td>A revolutionary design of the intro to MIS course is documented to teach students thinking like professionals.</td>
</tr>
<tr>
<td>Mukherjee (2005)</td>
<td>Intro.</td>
<td>Examine benefits and drawbacks of class exercise in an introductory MIS course</td>
<td>Design science and response from students</td>
<td>Students get a good understanding of how information systems help in improving business operations. Students feel motivated to study what they consider to be relevant.</td>
</tr>
<tr>
<td>Wang (2007)</td>
<td>Intro.</td>
<td>Provide a general guideline of topics and assessment scheme for intro to MIS course</td>
<td>Review and Design science</td>
<td>Present four modules (instructional, intellectual, clinical, and technical) and an assessment scheme as a framework that unifies the teaching-learning approaches to achieve course goals.</td>
</tr>
<tr>
<td>Firth et al. (2008)</td>
<td>Intro.</td>
<td>Design intervention initiatives to attract students and reverse declining enrollments</td>
<td>Interviews, Design science</td>
<td>Describes a 12-step program targeted at the introductory MIS course; As a result of implementing the 12-step program, enrollments double.</td>
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</tbody>
</table>
A good teaching philosophy/approach should make teaching techniques fit in with course content. Wang (2007) provides a framework for matching four modules of teaching techniques with topical areas in the introductory MIS course. In addition, Frost et al. (2008, p. 190) note that “care for the students’ progress should be demonstrated in the content and delivery of the course”.

The MIs Approach

Based on our literature review and many learning theories such as cooperative learning theory (Johnson et al., 1991; Slavin, 1995), active learning theory (Bonwell & Eison, 1991), student involvement theory (Astin, 1984), and learner-centered paradigm (Freed & Huba, 2000), we introduce an MIs (Multiple “I’s”) teaching approach. As the name suggests, the MIs approach includes a set of adjective words that start with the letter I (see Figure 2): Innovative, Interesting, Interactive, Influential, integrative, Informative, Instructional, Initiative, and so forth. These words describe how an MIS course, especially for the introductory course, may be taught. In addition, this approach may also guide MIS instructors to choose alternative topics when they design a course or write their syllabus. Here, we only explain the first five dimensions in details below.

The first I is “Innovative”, which indicates the level of innovativeness perceived in an MIS course. A teaching activity which is potentially valuable but not commonly used by MIS instructors is considered innovative (Albers-Miller et al., 2001). To put it differently, if many instructors have adopted an activity, this activity is considered “less innovative”, and vice versa. Innovative teaching is intensively researched in many fields such as marketing (Albers-Miller et al., 2001). Although technology innovation has been intensively studied in the MIS field, innovation in MIS education is rarely addressed and examined. Innovations in MIS education may include many activities, such as organizing novel classroom activities, incorporating latest innovative information technologies into an MIS class, creating course-specific cases, introducing cutting-edge techniques, designing some counter-conventional but relevant discussion questions, and many others. For instance, in order train students’ problem solving skills, Neo & Neo (2001) use multimedia technology as an innovative teaching and learning strategy by giving students a
multimedia project. Both students and instructors benefit greatly from an innovative pedagogy (Albers-Miller et al., 2001; Frost et al. 2008).

Figure 2. The MIs Approach

The second dimension is “Interesting”, which refer to the level of interest students can gain in an MIS course. Learning theories suggest that learners’ interest plays an important role in determining the learning outcomes. Students like to learn engaging and interesting courses or topics (Gudigantala, 2013). However, MIS courses are not perceived as fun and interesting (Frost et al., 2008) and many students (especially for non-MIS majors) feel boring in MIS courses (Mukherjee 2005). We may hear such a conversation on campus: “Hi, Mike, how about your MIS XXX course?” “It’s really boring. I wish I could drop it”. Noticing this problem, instructors attempt to stimulate students’ interest in MIS courses. For instance, Frost et al. (2008) aim to generate students’ interest by designing a strategic framework for introductory MIS Course. It is worth noting that instructors should generate students’ interest at the beginning of the class (Mukherjee, 2005; Frost et al., 2008). If students’ interest is not stimulated at the first few classes, it would be very difficult for an instructor to motivate it later. Previous research suggests implementing activity-based learning to attract students (Benson & Blackman, 2003). For instance, Mukherjee (2005) find that an appropriate use of classroom exercise can develop and increase students’ interest in the introductory MIS course.

The third dimension is “Interactive”, which describes the level of students’ participation and contribution the instructor can motivate in an MIS course (Kennewell et al., 2008). Interactive learning promotes students’ learning effectiveness (Hake, 1998). In a class with a high level of interactivity, students are more willing to engage effectively with the subject matter and learn collectively. Hargreaves et al. (2003) divide interactive teaching techniques into “surface” and “deep” forms. Whereas surface forms aim at engaging students, student practical and active involvement, broad student participation, collaborative activity, and conveying knowledge, deep forms are designed for assessing and extending knowledge, reciprocity and meaning making, attention to thinking and learning skills, attention to students’ social and emotional needs and skills (Kennewell et al., 2008). Fellers (1996) demonstrates that student interaction with one another and with faculty are key elements of cooperative learning model, which claims that learning is a social process that occurs through interpersonal interaction within a cooperative context (Johnson et al., 1991). Fellers (1996, p. 58) further suggests that MIS instructors should “be very
active in the teaching of social skills, monitoring of team interactions, and providing feedback to each team and individual team member”.

The fourth dimension is “Influential”, which represents the level of impact an MIS course can impose on students. In other words, MIS instructors should make a course valuable or influential for students. Students who value the subject matter are more likely to employ deep-level learning strategies (Blumenfeld et al, 2006). The strategic framework for the introductory MIS course designed by Frost et al. (2008) suggests demonstrating the relevance of MIS to a business career and providing project-based problem solving and decision-making focused content. Students are expected to acquire MIS knowledge and practical skills in the short term and to develop their analytical capability in the long term. If students can apply what they learn from an MIS course into their real cases such as applying for a job or plan a student organization event, they will highly value this course. In addition, in order to make students more competitive in the job market through taking an MIS course, MIS instructors may have to know what MIS knowledge and skills are needed by recruiters (He & Guo, 2011; McCoy et al., 2013).

The fifth dimension is “Integrative”, which describes the degree to which MIS instructors integrate what they teach with the reality and other relevant subject areas (Nagel, 1996). Integrative education “is organized in such a way that it cuts across subject-matter lines, bringing together various aspects of the curriculum into meaningful association to focus upon broad areas of study. It views learning and teaching in a holistic way and reflects the real world, which is interactive” (Shoemaker, 1989. P5). The purpose of integrative teaching is to help students apply course materials to their lives (Sharp & Ganong, 2000) and help students unify different knowledge over the subject areas. MIS instructors can first present a model or concept by showing some examples, cases, and projects, and then encourage students to link it with their own background in a small group. In addition, such an approach requires instructors to integrate lectures with technologies, individual assignments, case studies, group discussions, and other class exercise. In doing so, this course is perceived as coherent, rather than loose.

In sum, the five “I’s” above describe distinct but interdependent dimensions in the MIs approach. The five dimensions facilitate and supplement each other. For instance, in order to improve the introductory MIS course, Firth et al. (2008) suggest a 12-step program, which involves multiple dimensions in our approach. In addition, the MIs approach integrates viewpoints from various stakeholders, including instructors, students, and recruiters.

**Applying the MIs Approach: A Case**

**Background Information**

In Fall 2013, the MIs approach was implemented into an introductory MIS course, which was taught in a large public university in United States. This course was designed as a selective course for business minors from various majors. The instructor used the textbook entitled *Information Systems* authored by Paige Baltzan and Amy Phillips (2011), which is one of the most commonly-used textbooks in the MIS field (McCoy et al., 2013). This course was taught in two sections each semester, and the class size in each section varied between 30 and 35 students.

At the first day of the class, the instructor used an ice breaking game and then shared his new teaching approach with students. After introducing the syllabus, the instructor invited students to voluntarily answer a few questions in an online survey designed by the instructor: whether they own some IT-related skills and knowledge, why they decide to take this course, what they want to learn from this course, what concerns or challenges they may expect to finish this course, and what interests/hobbies they want to share in class. A majority of students finished this survey. Such basic information helped the instructor know students better. As the class goes on, the instructor could make appropriate adjustments and design personalized class exercise and group discussion topics based on this understanding on students’ information. During this semester, guided by the MIs approach, the instructor employed many activities such as designing a website using Google Site, group discussions, playing the beer game, team work, peer website evaluation, and designing exam questions. These activities aimed to integrate knowledge with the real business and students’ interest and to facilitate effective knowledge delivery and assimilation. The e-commerce module is used to briefly explain how the MIs approach was implemented.
E-Commerce Module

In the beginning of this module, the instructor introduced learning outcomes. Noticing that students were very interested in online games, shopping, social media, and NBA, the instructor used relevant examples when delivering knowledge points. In order to stimulate students’ interests and facilitate students’ interaction, especially for those students from different majors, the instructor designed three group discussions, each of which included multiple personalized discussion questions. For instance, sports fans may choose the question how the internet (e.g., social media) changes the sports industry. After each discussion, the instructor invited each group leader to present their discussion findings and then commented on their discussions and presentations.

As depicted in Figure 3, the instructor innovatively asked students to design a website using Google Site (one individual assignment), to evaluate websites designed other students, followed by a group discussion, and then to analyze their websites using Google Analytics (one group assignment). When introducing the two assignments, the instructor emphasized the importance of learning these tools. For instance, Google Analytics is considered as one of the five skills everyone needs to have on a resume (Trikha, 2012).

Website Design

The instructor briefly introduced Google Site and presented some sample sites. Students were asked to design a simple site which should meet the minimum requirements specified by the instructor. At the same time, students were instructed to register a Google Analytics account and link the account with their own website. After two weeks, students submitted the URL of their website. Figure 4 shows two sample sites. The great majority of students thought this assignment was (very) useful (see Figure 5).

![Figure 3. Website Design, Evaluation, and Analysis](image)

![Figure 4. Two Sample Websites Designed by Students](image)
Website Evaluation

One week later, students were asked to evaluate 10-13 websites designed by students in the other section (all students agreed to let their websites be viewed by others) (see Figure 6). After that, students were asked to share how they evaluated those websites and what they learnt from other websites in a small group. The majority of students thought this assignment was (very) useful (see Figure 7).
Figure 7. Students’ Perceived Usefulness of Evaluating Websites

Website Analysis

The second assignment in this module was to analyze their websites. In peer evaluation, each website got many hits. Some students shared their own sites with their friends on their Facebook. The instructor designed a few questions along with a clear guidance to motivate students to “play” with Google Analytics. This assignment also included some open questions: How can you increase the number of visits for your site? How to make your visitors spend more time on your website? Do you want to increase or decrease the bounce rate of your website? How?

After examining students’ responses, the instructor was glad to see that many students provided very good answers and some of them even used analytical approach to support their strategies. One student wrote this in the assignment:

“A second way ... is to constantly evaluate the analytic information and data. ... Analytics is arguably the best way to improve website traffic and hits overall.”

Overall, students perceived this assignment as very interesting and valuable. At the end of this course, many students demonstrated that they were excited to learn Google Analytics and that their own sites could make them more competitive in job market.

Evaluating the MIs Approach

The instructor taught one section of the introductory MIS course in the Spring 2013 semester using the traditional approach, and then taught two sections of the same course in the Fall 2013 semester using the MIs approach. There is no significant difference in students’ demographic variables (gender, year, and major) across two semesters. Accordingly, the effectiveness of the MIs approach was tested using students’ self-reported measures (see Table 2). Apparently, the MIs approach significantly improves instructor effectiveness and students’ learning outcomes. More importantly, the overall value of the course and overall quality of teaching increased significantly.

In addition, some students commented on the strength and/or weakness of this course. Some sample comments were listed as below:

“*** is such a caring and awesome professor! He made this course as interesting as possible”.

“*** was an excellent professor! He made me enjoy the class and I am glad I was able to get to know him”

“Overall, there are many tools we learned in *** (course name) that I see myself using in my future job(s). I feel the worth of this class for cannot be calculated, and I am very glad I took it.”
“I will now be much more confident in creating a site that is professional as well as achieve my desired intentions.”

“*** was very dedicated and thoughtful in how he approached the materials. I enjoyed his energy.”

“This course has supplied me with the knowledge that it takes to survive in the ‘real world’ and is a course that will continue to develop my knowledge throughout my life.”

These comments above suggest that students had a very good impression of both the course and the instructor. Students recognized that this course is quite interesting and they enjoyed it. Furthermore, they felt that they learn a lot from this course, indicating that this course is influential for them.

<table>
<thead>
<tr>
<th>Evaluation items</th>
<th>2013 Spring</th>
<th>2013 Fall</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Instructor Effectiveness</strong>^a**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presented material effectively</td>
<td>2.89</td>
<td>3.53</td>
<td>.001</td>
</tr>
<tr>
<td>Stimulated interest of the subject</td>
<td>2.68</td>
<td>3.45</td>
<td>.000</td>
</tr>
<tr>
<td>Encouraged class participation</td>
<td>3.29</td>
<td>3.56</td>
<td>.089</td>
</tr>
<tr>
<td><strong>Students’ Learning Outcomes</strong>^a</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I learned to respect different viewpoints</td>
<td>2.85</td>
<td>3.53</td>
<td>.001</td>
</tr>
<tr>
<td>Strengthen my ability to analyze and evaluate information</td>
<td>2.81</td>
<td>3.53</td>
<td>.000</td>
</tr>
<tr>
<td>Helped me develop the ability to solve problems</td>
<td>2.96</td>
<td>3.67</td>
<td>.000</td>
</tr>
<tr>
<td>I gained understanding of concepts &amp; principles in this field</td>
<td>2.93</td>
<td>3.56</td>
<td>.001</td>
</tr>
<tr>
<td>Course stimulated me to read further in the area</td>
<td>2.67</td>
<td>3.44</td>
<td>.001</td>
</tr>
<tr>
<td><strong>Overall Evaluation</strong>^b</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall value of the course</td>
<td>2.36</td>
<td>3.44</td>
<td>.000</td>
</tr>
<tr>
<td>Overall quality of teaching</td>
<td>2.79</td>
<td>3.61</td>
<td>.000</td>
</tr>
</tbody>
</table>

^a: the scale is from 1 (strongly disagree) to 4 (strongly agree); b: the scale is from 1 (poor) to 4 (excellent).

Table 2. Teaching Evaluation from Students across Two Semesters

Overall, both quantitative and qualitative evidence confirms the effectiveness of the MIs approach in teaching the introductory MIS course.

**Conclusions & Discussions**

Based on a review of previous literature and various learning theories, this study develops an MIs approach to teaching MIS courses. The effectiveness of this approach is also tested and supported. This study describes a useful starting point for MIS programs to curb the declining enrollments. Both administrators and MIS instructors may benefit from this approach. However, this approach is still at the initial stage, so more additional efforts are needed to improve and enrich it. One of them is to develop systematic items or activities for each dimension under this approach. Based on these measurements,
future research can examine relationships between all dimensions and test how each dimension contributes to students’ learning outcomes. In addition, this study measures the effectiveness of the MIS approach only from students’ perspective. Future research can examine how other stakeholders such as peer instructors and recruiters view this approach. In sum, improving MIS course is a challenging and consuming but interesting and valuable job for all MIS instructors and administrators.

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