Learning From Action Evaluation of the Use of Multimedia Case Studies in Management Information Systems Courses

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Abstract

This manuscript shares lessons learned from conducting an action evaluation of the use of multimedia case studies in Management Information Systems (MIS) courses. Three undergraduate MIS classes took part in the study. The purpose for using case studies in these classes was to teach students about the role of MIS in business. An action evaluation approach, focusing on the establishment of goals, assessment for refinement of goals, and retrospective assessment (Rothman, 1999), was used; this process incorporates formative evaluation into an action research approach which enabled the external evaluators to provide feedback to instructors about students' perceptions of the use of the multimedia case studies in MIS classes. This study used open-ended qualitative survey questions to identify how students experienced the use of multimedia case studies in their learning course material. The findings of the study indicate that the use of case studies in teaching MIS is effective; however, as with any new teaching innovations, what is new quickly becomes boring when over-utilized. Findings also informed our selection of future data collection methods to yield deeper responses by students.

Introduction

Case studies have been used effectively in education to assist postsecondary students to connect theoretical concepts learned in the classroom with practice in real world contexts (Butler, Lee, & Tippins, 2006) and to learn to use critical thinking skills in problem solving (Lee, 2007). Multimedia case studies were used in this study to teach Management Information Skills (MIS) students about the role of MIS in business, thereby providing an innovative way to effectively expose MIS students to real-life cases of success and failure, an approach recommended by the National Academy of Engineering (2004). The broad research question guiding this study was: How beneficial do students find the use of multimedia case studies to be in helping them learn course material? The findings from this study were used to determine how the use of multimedia case studies might be improved. The formative evaluation results of this study were used by instructors to inform their practice in the use of multimedia case studies as a pedagogical tool. Equally important, the findings provided learning opportunities to the author, who was an external evaluator, about what data collection methods yield the depth of response needed to fully answer the research questions. This paper addresses both the students' perceptions of the use of multimedia case studies and the lessons learned about effective evaluation techniques as a result of conducting the study.

Teaching with Case Studies

It is not unusual in the typical classroom for instructors to use lectures as a tool for covering the course materials, thereby transferring knowledge from the expert (the instructor) to the learner (the students) (Leidner & Jarvenpaa, 1995). PowerPoint slides and other visual tools may be used to enhance the lectures, providing outlines and summaries of important points and providing a review tool for students' later use. Slides may also contain video clips used to share examples or further explain theoretical concepts. While lectures and PowerPoint have proven to be effective methods for teaching and learning, they may limit students' experiential learning. Case studies serve as a teaching tool that enables students to participate in the learning process in an active way, rather than as passive receptacles for knowledge, and they give students the opportunity to study real life situations to solve problems (Kolb, 1984). Case studies are useful to develop students' critical thinking skills, such as analysis, discrimination between/among concepts, application of standards, logical reasoning, searching for information, and prediction of outcomes (Sandstrom, 2006). Further, they relieve the boredom students may experience when repeatedly exposed to the same teaching methods, they enable students to share viewpoints, and they facilitate learning both process and content, while utilizing the thinking processes of the cognitive, affective, and moral domains (Sandstrom, 2006). Leidner and Jarenpaa (1995) support the idea that using innovative strategies helps students improve their ability to apply constructive, cognitive, collaborative, and socio-cultural models of learning. Additionally, case studies are useful for developing self-reflection, peer collaboration, and processes of inquiry for self-directed learning (Askell-Williams, Murray-Harvey, & Lawson, 2007), and the experiential learning experience provided through case studies facilitates students' assimilation, synthesis, and application of course concepts (Brannan, White, & Bezanson, 2008). Though they take time and effort to develop, case studies can be valuable pedagogical tools when instructors take care to present them effectively. Effective use of case studies by instructors involves establishing clear goals for each case, providing sufficient time for proper coverage of the case, being prepared to present the case and direct students on how to discuss a case, practicing the use of case studies, and incorporating the cases into the framework of the course to ensure committed involvement of students (Herreid, 1998). A detailed tutorial on how to implement a multimedia case study in an

introductory course is available in an article by Bradley, Mbarika, Sankar, Raju & Kaba (2007).

In the courses in this study, the multimedia case studies that were added to the lecture/PowerPoint teaching method enabled students to be involved in individual and group interactions with the materials. The course objectives addressed students' understanding of basic MIS terminology, MIS business application and supporting theoretical foundations, and analysis of MIS applications options for business. The soft skills used to support these course objectives were addressed in the case studies and included such skills as improved communications, critical thinking skills, improved teamwork skills, and an understanding of ethics. Instructor-led lectures were used to discuss theory; then, students used the multimedia case studies in a computer laboratory to apply the theories to real life situations that involved problem solving. Students prepared their recommendations for potential solutions to the problems presented in the case studies and presented those recommendations to the class (see Mbarika, Sankar, & Raju, 2003; Bradley, et al., 2007). Case studies were used by students in this study over three to four class periods, during which they analyzed each case, providing a multi-disciplinary approach to their learning of the course content (Zirnheld & Halstead, 2008). Lectures, PowerPoints, and multimedia case studies were supplemented with quizzes, small group discussions, and projects. The multimedia case studies were accessed at www.liteecases.com. These cases provided groups of students with the opportunity to discuss the various alternative solutions to the problem presented and to defend each solution from the perspective of management. For this semester, the case studies used included the Della Steam Plant, STS-51 L, Chick-fil-A, and Lorn Manufacturing Case Studies to focus students' learning on the importance of ethics, safety, and communications issues in the work environment. Through interacting with the multimedia case studies, students were exposed to a myriad of problems typically faced in the workplace, giving them an opportunity to further develop their understanding of the course concepts, while improving their teamwork, communication, and presentation skills (Maxwell, Gilberti, & Mupinga, 2006). The multimedia case studies extended lectures and written text by adding at least one other media form, such as audio, video, or photos, via a Web browser format with hyperlinks. While case studies have been used in various disciplines to teach skills that students will use in future work (Koh & Branch, 2004), the addition of other media, such as video or audio, extends students' experiential learning by facilitating students' hands-on application of information technology principles in real life scenarios.

Methodology

Action evaluation involves establishment of goals, assessment for refinement of goals, and retrospective assessment (see Rothman, 1999). The action research aspect of this long-term project has involved cycles of action in which multimedia cases were developed, refined, and utilized in engineering, MIS, and other classrooms, culminating in revisions and further development of cases and evaluation instruments, feedback from which has been used by instructors to improve their use of the case studies and students' learning course concepts. The focus of this article, however, is the initial use of multimedia case studies in MIS classes, what we learned, and how we implemented changes in the pedagogy and evaluation processes.

To conduct a formative evaluation (see Patton, 2002) of the use of multimedia case studies in MIS classes that would provide instructors with helpful feedback, two external evaluators approached the action evaluation from different research standpoints—one using quantitative survey questions and the other using qualitative survey questions; this manuscript, however, addresses only the findings from the qualitative data. The case study developers requested that external evaluators be involved in the evaluation to offer different viewpoints. As a qualitative researcher, I was asked to participate in helping them to evaluate the use of the multimedia case studies qualitatively, while the other external evaluator used quantitative means to evaluate their use. The instruments used to collect data were administered by the instructors themselves. I live in a U.S. state different from that of the university where the study took place, and this fact made it difficult to conduct interviews or observations of the classes; as we later learned, this was problematic. At the time, we decided that the best way to approach the qualitative data collection was to add open-ended questions to the quantitative survey to allow students to elaborate on their thoughts in their own words. While this was not the optimum qualitative approach, in my view, I thought it would at least afford us the opportunity to gather sufficient data to answer the

research question of how students perceived the effectiveness of the use of multimedia case studies in learning new course content. In thinking about the research design, we had to consider how much time students would be willing to spend giving us data for our study, and a survey at the beginning and end of the semester seemed to be the most productive way.

The qualitative data were derived from the surveys administered to students from three Spring 2008 undergraduate MIS classes at a large southeastern university to determine their perceptions of the effectiveness of the use of multimedia case studies. The evaluation of students' perceptions was implemented through pre- and post-semester surveys containing both quantitative and qualitative questions. The original quantitative survey instrument with which we worked was developed by Kramer, Sankar, and Hingorani (1995), and it was later refined by Hingorani et al. (1998) and expanded by Marghitu, Sankar, and Raju (2003) and by Sankar, Varma, and Raju (2007). Qualitative questions were added to the evaluation protocol and used for the first time in Spring 2008 (see surveys in Appendix A).

There are several advantages to using qualitative surveys. They can be useful for generating and developing appropriate survey questions for quantitative surveys; providing more depth and detail to better understand quantitative results; and exploring in an ethical manner what respondents think and feel (Fink, 2005). In this study, qualitative survey questions were helpful in providing information about respondents' attitudes and opinions in their own words (Fink, 2005). While typical quantitative survey approaches may force respondents to formulate opinions artificially (Garson, 2007), qualitative surveys use open-ended questions that enable respondents to freely respond to questions according to their own experiences. Fraenkel and Wallen (2006) suggest that open-ended questions offer respondents more freedom in their responses, the questions are easier to construct, and they permit researchers to follow up later; the disadvantages they note include that respondents tend to answer open-ended questions with responses that vary in length and content across respondents, and that responses are subject to misinterpretation and may be harder to analyze. Open-ended questions may be perceived by respondents as less threatening than closed-ended questions and enable respondents to offer their opinions without fear of retribution or embarrassment. Students in this study were instructed to respond with candor and were told that their responses would not affect their grades in any way, and the use of outside evaluators ensured that responses would be confidential and that respondents were not identified by their responses.

Undergraduate students in three Introduction to MIS classes responded to the pre- and post-semester surveys. The number of students who responded to the pre-semester survey was 119, while 91 undergraduates responded to the post-semester survey. The 12 open-ended questions (see Appendix A) on the survey related to students' previous exposure to the MIS field, their preferred teaching and learning styles, their perceptions of the effectiveness of the instructors' use of multimedia case studies, and the impact of group work in case studies and projects as learning tools. We also asked for their suggestions for improving the course, and we queried them about how they foresaw using MIS skills in their future work and whether taking the course had influenced their desire to work in the MIS field. In this manuscript, however, the focus is on those questions that inform the research question about the effectiveness of the use of multimedia case studies.

The instructors for the three sections of Introduction to MIS included a novice instructor, who is a PhD student (referred to as Prof A), and two MIS professors (referred to as Prof B and Prof C) with many years of teaching experience. One of these two veteran professors (Prof B) was involved with the development of the multimedia case studies used in this study. He had previously used various iterations of them and therefore was more experienced in their use and more familiar with the problems presented in the cases for discussion. Each instructor used his preferred style of teaching the shared course objectives, yet one of the common factors in teaching the three classes was the use of multimedia case studies. During the pilot of the new survey that included open-ended questions for qualitative analysis, no observations of teaching took place, and evaluators were unaware of how instructors were actually implementing the case studies; at this point, our initial emphasis was on whether students perceived the use of the multimedia case studies to be an effective pedagogical tool for learning new material.

Data Analysis

To analyze the qualitative data from the open-ended survey questions, I used constant comparative method and thematic analysis,

a coding process that involved reading each response and assigning to it a code. Then I grouped similarly coded items together to construct themes that would help to explain the students' responses to survey questions. For example, the specific question on the pre-survey that directly related to whether students perceived that there would be benefits involved with using multimedia case studies in learning course materials yielded responses that were coded Yes (meaning 'I expect these case studies to be beneficial'), No (meaning 'I do not expect these case studies to be beneficial'), Somewhat/Maybe (meaning 'I expect them to be somewhat beneficial' or "I think they might be beneficial'), and No Response (student did not respond to the question). Examples of responses coded Yes include:

- Helpful, if the presentations are interesting
- Everyone loves multimedia
- Will help to explain further and enhance learning of material
- It will help keep my attention

Examples of No responses were:

- Students just try to find ways to get through them, therefore making them non-useful and a waste of time

Responses coded Somewhat/Maybe included:

- Depends on how in-depth

Because responses on the survey were so short and lacked much depth, there was limited usefulness; further, there was no opportunity for me to get them to elaborate on their responses as would have been possible in an interview or focus group. As a result, I chose to quantify the qualitative data using descriptive means, as suggested by Maxwell (2010), and then I used specific responses to further explain the themes identified. By counting the number of responses pertaining to each theme, I was able to provide a comparison between the number of students whose response related to that theme and the percentage of respondents who participated in the survey at the beginning and at the end of the semester (McDavid & Hawthorn, 2006; Miles & Huberman, 1994). I did this for two reasons: first, it is more meaningful to talk about 7 out of 10 students responding in some way than to say the majority of students responded in that way; second, students' responses were not sufficiently detailed and in-depth to enable me to code or analyze them further. Typically, response lengths ranged from a few words to, at most, two sentences, which did not give me the depth of response that I might have received from having conducted interviews or focus groups or other face-to-face methods that would allow for probing students' responses for elaboration. This information also gave us some insight into how students' experiences in the three classes differed, though the intent of the study was not to compare classes or instructors.

Some limitations of our ability to draw conclusions from the data included these:

1. Because the surveys were anonymous, we did not know which of the students in each class responded to both the pre- and post-semester surveys, so we were unable to determine change in individual student perceptions.
2. We were more interested in reporting group perceptions than individual perceptions, though quotes are shared sporadically to exemplify typical responses in various themes.
3. As is typical in qualitative research, the results are not meant to be generalizable to other MIS classrooms; however, we hope to explain response categories in sufficient detail for the reader to determine the possible transferability of the results to other contexts.
4. Because the responses were typically short answers, we did not have the depth of detail that might be assumed had we used one-on-one interviews, focus groups, or even observation, any of which might have leant greater depth to the study, but which would have been unwieldy in terms of the time and distance constraints of the participating research team members.
5. Because open-ended survey questions were positioned after the closed-ended questions on the survey, it is possible that students were "primed" to respond to questions in some way (Garson, 2007).

Results

In these results, I will only address the data that I found helpful in answering the research question of how students experienced the use of case studies in learning MIS concepts. Findings from the surveys indicated that most of the students had no prior experience with the MIS field of study with the exception of some exposure to MIS concepts in previous coursework, and a few students indicated having some work experience in the field. Specifically, in Prof A's class, over ¾ of the students reported having no prior work experience in MIS, while in the other two classes, over half of the students reported no prior MIS work experience. Hence,

these were typically novices in the MIS field of study.

Preferred Teaching Style

We asked students: What are your preferred teaching styles for learning new material? Students were allowed to mention as many teaching styles as they found helpful to their learning and were not limited to one response.

For each of the tables shown in this article, the number in parentheses after the instructors' names indicates the number of students responding to that survey. Within the table, the actual frequency count of the number of responses indicated for that theme is shown first; following in parentheses is the percentage of students whose responses related to that theme. Throughout the analysis, when a student's response was insufficient or inexplicable for coding purposes, it was coded as an indeterminate response.

As shown in Table 1, in Prof A's (the novice instructor) class, on both pre- and post-semester surveys, students' responses indicated that they preferred teaching styles that incorporated both visual and auditory methods of delivery. There was a small increase in the number of students indicating a preference for the use of multimedia case studies. In Prof B's (the experienced instructor with prior knowledge of the case studies) class, students initially indicated a preference for a combination of visual, kinesthetic, and auditory methods, but by the end of the semester, their responses indicated a preference for visual methods, kinesthetic methods, and multimedia case studies. In Prof C's (an experienced instructor with little/no prior knowledge of the case studies) class, students indicated on the pre- and post-semester surveys that they preferred being taught using visual and auditory methods.

Interestingly, there was a large increase, from the beginning to the end of the semester, in the number of students in Prof B's class who indicated a preference for being taught using the multimedia case studies. The reasons may be that he had previous experience in developing and using these specific cases(which would have increased his familiarity with all of the important aspects of each case), that he had a more dynamic personality and presentation style than the other professors, or that, at the beginning of the semester, the students had not previously been exposed to this type of teaching tool and, therefore, did not state case studies as a preferred method. The cause for this increase, however, is unknown. This issue might have been explained more readily if we had incorporated the traditional qualitative methods of interviewing students and observation of classes into the evaluation.

Another aspect that might have been further explained through observation or interviews was the fact that nine students in Prof C's class stated that they had not used case studies in their class. Other qualitative methods could have assisted our understanding of whether students simply did not realize that they were using case studies or Prof C actually failed to use case studies during this semester. These issues caused the evaluation team to recognize the need for expanding the evaluation to include opportunities for the evaluators to both

Theme	Pre-Prof A (43)	Post-Prof A (38)	Pre-Prof B (39)	Post-Prof B (30)	Pre-Prof C (37)	Post-Prof C (23)
Visual methods (PowerPoints)	26 (60.5%)	16 (42.1%)	28 (71.8%)	12 (40%)	27 (73%)	17 (73.9%)
Auditory methods (Lecture, interactive discussion, examples, stories, pictures, movies)	30 (69.7%)	19 (50%)	16 (41%)	5 (16.7%)	20 (54.1%)	12 (52.1%)
Kinesthetic methods (Group projects, hands-on activities)	11 (25.7%)	7 (18.4%)	21 (53.9%)	14 (46.6%)	7 (18.9%)	3 (13%)
Multimedia case studies	3 (7%)	6 (15.8%)	4 (10.3%)	13 (43.3%)	4 (10.8%)	0 (0%)

Table 1: Teaching styles students found most helpful in learning new material

Theme	Pre-Prof A (43)	Post-Prof A (38)	Pre-Prof B (39)	Post-Prof B (30)	Pre-Prof C (37)	Post-Prof C (23)
Lecture	3 (7%)	5 (13.1%)	0 (0%)	0 (0%)	1 (2.7%)	0 (0%)
Teamwork/ group work	5 (11.6%)	1 (2.6%)	15 (38.5%)	6 (20%)	0 (0%)	0 (0%)
MIS/ technology	5 (11.6%)	16 (42.1%)	4 (10.3%)	5 (16.7%)	20 (54%)	16 (69.6%)
Case studies	1 (2.3%)	9 (23.7%)	7 (17.9%)	17 (56.7%)	0 (0%)	0 (0%)
Variety/All of it	0 (0%)	0 (0%)	4 (10.3%)	0 (0%)	0 (0%)	1 (4.3%)
None/not sure/no response	23 (53.5%)	6 (15.8%)	6 (15.4%)	0 (0%)	11 (29.7%)	2 (8.7%)

Table 2: Part(s) of this course expected to find or found most interesting

observe the classes to determine how case studies were being implemented and what the students' responses were to those cases, and to interview students about their experience. Future iterations of this project have incorporated both interviews and observations, which has improved the depth of data we have been able to collect. The primary learning for the evaluation team from this survey question was that, when utilized effectively, students found the use of multimedia case studies to be helpful to their learning; the question then arises, what does it mean to "effectively utilize" the case studies?

Aspects of the Class of Interest to Students

We asked students which part of the course they expected to find (at the beginning of the semester) or found (at the end of the semester) most interesting. Table 2 shares the number and percentages of students responding to this question.

At the beginning of the semester, more than half of the students in Prof A's class indicated that they were not sure which aspects of the course they anticipated finding most interesting, but, by the end of the semester, their responses showed a definite preference for learning about MIS and related technology and learning through the case studies. In Prof B's class, students noted the expectation for teamwork being the most interesting aspect of the course, but by the end of the semester, their preference for the case studies was noted (56.7%). Interestingly, this question was one that could have yielded more information about the effectiveness of the case studies had we used interviews to delve into students' preferences, since the case studies were conducted in groups/teams. In Prof C's class, students indicated an initial expectation for finding the MIS/technology aspects of the course to be most interesting, and their responses on the post-semester survey indicated this to have been the case for them.

Theme	Pre-Prof A (43)	Post-Prof A (38)	Pre-Prof B (39)	Post-Prof B (30)	Pre-Prof C (37)	Post-Prof C (23)
Text/ handouts	5 (11.6%)	10 (26.3%)	2 (5.1%)	4 (13.3%)	3 (8.1%)	0 (0%)
Power Points	1 (2.3%)	4 (10.5%)	1 (2.6%)	6 (20%)	3 (8.1%)	18 (78.3%)
Lecture	13 (30.2%)	9 (23.7%)	5 (12.8%)	2 (6.7%)	3 (8.1%)	4 (17.4%)
Case studies	1 (2.3%)	2 (5.3%)	6 (15.4%)	10 (33.3%)	2 (5.4%)	0 (0%)
Group work	2 (4.7%)	0 (0%)	18 (46.2%)	8 (26.7%)	1 (2.7%)	0 (0%)
MIS technology	3 (7%)	1 (2.6%)	0 (0%)	0 (0%)	7 (18.9%)	1 (4.3%)
Examples/ exercises	3 (7%)	2 (5.3%)	1 (2.6%)	0 (0%)	1 (2.7%)	0 (0%)
None/not sure/ no response	14 (32.6%)	12 (31.6%)	6 (15.4%)	0 (0%)	13 (35.1%)	1 (4.3%)

Table 3: Part(s) of this course expected or found to be most helpful in learning the material

Theme	Pre-Prof A (43)	Post-Prof A (38)	Pre-Prof B (39)	Post-Prof B (30)	Pre-Prof C (37)	Post-Prof C (23)
Yes	31 (72.1%)	16 (42.1%)	32 (82.1%)	25 (83.3%)	28 (75.7%)	8 (34.8%)
No	2 (4.7%)	5 (13.1%)	1 (2.6%)	0 (0%)	3 (8.1%)	2 (8.7%)
Some-what/ Maybe	3 (7%)	4 (10.5%)	1 (2.6%)	2 (6.7%)	1 (2.7%)	2 (8.7%)
No response	7 (16.3%)	11 (28.9%)	4 (10.3%)	1 (3.3%)	5 (13.5%)	11 (47.8%)

Table 4: Helpfulness/Expectation of helpfulness of multimedia case studies in learning material

Aspects Most Helpful to Learning

We also wanted to know which parts of the course they expected or found to be most helpful to their learning experience. Table 3 illustrates their responses to this question.

In Prof A's class, on both surveys, lectures and text/handouts were noted by students as being most helpful to them. Group work was mentioned most frequently by students in Prof B's class on the pre-survey as being the aspect they expected to find most helpful to them, while on the post-survey, the most frequently mentioned part of the course found to be most helpful was case studies. In Prof C's class, students expected the MIS technology to be most helpful, but found the PowerPoint slides to be most helpful in learning course concepts new to them. In Prof A's class, almost a third of the students (on both surveys) indicated they were unsure what would be most helpful to them in learning the material or had no response, while in Prof B's and Prof C's classes, at the end of the semester, there were few students who responded that they were unsure about what was helpful to them.

Effectiveness of Multimedia Case Studies as a Learning Tool

We specifically asked students how helpful they expected (or found) multimedia case studies to be in helping them to learn the material presented. Their responses were coded as either yes (helpful), no (not helpful), somewhat helpful/maybe, or no response. These results are shown in Table 4.

On the pre-survey, at least 70% of students in all 3 classes indicated that they expected multimedia case studies to be helpful in learning the material. On the post-survey, while "case studies were helpful" was the most prevalent response in each class, the percentage of students reporting case studies to be helpful in Prof A's and Prof C's classes was less than they expected, according to the pre-survey. Over 80% of students in Prof B's class indicated that they expected to find and found multimedia case studies to be helpful to their learning. Few students in any of the three classes indicated that they had failed to find case studies helpful, and few responded that they found them only somewhat helpful. In all three classes, most students responded positively to the use of case studies or did not respond at all.

Effectiveness of Group Work

Since the multimedia case studies involved grouping students to study the cases and make presentations to defend a particular position or role found in the cases, we also wanted to know whether students perceived the group work associated with the use of case studies to be effective in helping them solve problems; thus, we asked them about their expectations (at the beginning of the semester) of the usefulness of group work and about their perceptions of its effectiveness (at the end of the semester). Table 5 shows the results of their responses.

More than 70% of students responding to the pre-survey from Prof A's and Prof C's classes and 97% of students from Prof B's class indicated that they expected to benefit from group work through the use of the case studies; however, that expectation was not realized for students in Prof A's and Prof C's classes, according to their responses. On the post-survey, fewer students (in number and percentages) in these two classes indicated that the group work had been effective in helping them learn new material, while over 90% of students in Prof B's class indicated that group work had been helpful. More students in Prof A's class found the group work to be helpful than the number of students who did not. Almost half of the students in Prof C's class responded that group work had sometimes been helpful, depending upon the situation; interestingly, nine students in this class indicated on the post-survey that they had not used group work in studying the cases. Use of interviews or focus groups would have allowed us to delve into their responses; however, these techniques for data collection were not used.

Theme	Pre-Prof A (43)	Post-Prof A (38)	Pre-Prof B (39)	Post-Prof B (30)	Pre-Prof C (37)	Post-Prof C (23)
Yes	32 (74.4%)	13 (34.2%)	38 (97.4%)	28 (93.3%)	26 (70.3%)	3 (13%)
No	5 (11.6%)	8 (21.1%)	0 (0%)	2 (6.7%)	7 (18.9%)	0 (0%)
Sometimes/ Depends	4 (9.3%)	2 (5.3%)	0 (0%)	0 (0%)	2 (5.4%)	12 (52.2%)
No response/ Didn't use	2 (4.7%)	15 (39.5%)	1 (2.6%)	0 (0%)	2 (5.4%)	8 (34.8%)

Table 5: Perception of helpfulness of student groups/teams to solving the problems

It has been my experience that some students find group work in general to be more of a hindrance to their learning than working alone, yet teamwork is an essential skill for work in today's marketplace. We wanted to find out whether students in these classes preferred working alone or in groups to solve problems, since that was a major focus of the case studies. Responses were coded as both (alone and in groups), in groups, alone, depends on the situation, or none (no response). Table 6 shows these results.

An approximately equal number (about 1/3) of students in Prof A's class reported preferring to work alone or in groups; this was true for both pre- and post-survey responses. In Prof B's class, 71.8% of students on the pre-survey and 66.7% of students on the post-survey indicated a preference for working in groups. In Prof C's class, the largest number/percentages of students (from 40.5% on the pre-survey to 47.8% on the post-survey) reported a preference for working in groups, while 29.7% on the pre-survey and 39.1% on the post-survey indicated that they preferred working alone; on both surveys, about 13% of students in this class reported that it depended on the situation as to whether they preferred working alone or in groups.

Primary Learning from Open-Ended Responses

Students' responses to open-ended questions indicated a preference for learning new concepts through typical teaching tools, such as lecture with interactive discussions between students and between teacher and students, and having power point slides as a source for test review. They noted that they enjoyed the case studies and found them to be helpful in learning about business ethics, safety, and communication issues. An additional note students added was that no more than three case studies should be used, as students became bored when more were used. They found the case studies to be interesting at first, but overuse of them made the activity boring. The students indicated that they enjoyed the group work and found it beneficial, as it provided them with various perspectives on a problem, improved their interpersonal skills, and enabled them to share the workload and share responsibility for the decision making. On the whole, students found the case studies to be helpful to their learning new course concepts. On the other hand, the detriments of group work they mentioned were that it required that they deal with scheduling problems and with members who did not pull their weight.

Discussion

The focus for this article was to share students' perceptions of the effectiveness of multimedia case studies as a pedagogical tool for learning course concepts and to determine

Theme	Pre-Prof A (43)	Post-Prof A (38)	Pre-Prof B (39)	Post-Prof B (30)	Pre-Prof C (37)	Post-Prof C (23)
Both	4 (9.3%)	2 (5.3%)	3 (7.7%)	2 (6.7%)	2 (5.4%)	0 (0%)
Groups	17 (39.5%)	14 (36.8%)	28 (71.8%)	20 (66.7%)	15 (40.5%)	11 (47.8%)
Alone	17 (39.5%)	13 (34.2%)	7 (17.9%)	4 (13.3%)	11 (29.7%)	9 (39.1%)
Depends	2 (4.7%)	2 (5.3%)	1 (2.6%)	3 (10%)	5 (13.5%)	3 (13%)
None	2 (4.7%)	6 (15.8%)	0 (0%)	1 (3.3%)	2 (5.4%)	0 (0%)

Table 6: Preference to work alone or in groups to solve problems

how we could maximize our evaluation efforts. Regarding students' perceptions of the use of case studies, we found that students in all three classes exhibited a preference for interactive lectures that include discussions and PowerPoint slides for later review, and, particularly in Prof B's class, students indicated that the use of group work and multimedia case studies proved to be an effective enhancement to the typical lecture/PowerPoint classes. It is possible that those students who preferred to work in groups found the case studies to be a more effective learning tool than did students who preferred to work alone, as students were assigned to work in groups to accomplish the assigned case studies. Prof B had more experience than the other two instructors in using these multimedia case studies to present MIS course content and, therefore, it may be that he was more effective in their use because of that experience and enhanced knowledge of the case studies. As Herreid (1998) suggests, practicing using case studies is important for instructors to be effective. Lectures with PowerPoints were frequently mentioned by students as their preferred teaching styles, which may have been because that is the teaching style to which they are most accustomed and with which, as a result, they are most comfortable. Based on students' responses to the survey, the addition of the multimedia case studies to the lecture/slides format enabled them to utilize a variety of learning styles, to work in groups, and to interact in a different way with the concepts, applying them in real world contexts. This served as a means for development of other work-related skills and enabled them to see the applicability of the course concepts. Because the data were collected by use of surveys, it is difficult to add any substantive comments about the effectiveness of each instructor's use of these case studies in their classes. This is one of the limitations of the study, which has subsequently been rectified by adding interviews with students, periodic observations of the classes, and ongoing discussions with instructors to ensure that the content and methods of delivery are the same for each class. These methods will enable us to obtain a more in-depth understanding of exactly what each instructor did to utilize the case studies in his class, how content is being delivered, and how it was received by students.

Based on students' responses, it would seem that Profs A and B utilized the multimedia case studies to promote individual and group learning, while Prof C's use of them focused on individual learning. This factor may be one variable that affected the students' responses about what methods were perceived as most effective in learning material that was new to them, since almost all students reported that the group work proved to have been beneficial to their learning experience. Further, the hands-on aspect of the case studies is attractive to students who prefer interaction and active learning, rather than the passive learning provided only through lectures and PowerPoint slides.

Students perceived the case studies as helpful in enhancing learning of the course material and as interesting, providing a welcome deviation from the typical lectures and PowerPoints. Their responses substantiated Sandstrom's (2006) contentions that case studies alleviate boredom in the typical classroom and facilitate learning both process and content. Their responses also supported Butler et al.'s (2006) assertion that case studies help students connect theoretical concepts to practice in real world contexts. In our study, students said that they found case studies to be relevant and useful in providing real life examples that enabled them to apply the concepts learned in the course, to take part in decision making, and to sharpen their technology skills. As one student put it, case studies "helped to see examples of real business and see how they solved their problems." Their comments upheld Lee's (2007) suggestion that case studies are useful in helping students learn critical thinking skills in problem solving. Students also mentioned that case studies were beneficial in developing communication, leadership, and problem solving skills. A few students, however, did not agree that case studies were useful. For example, one student noted, "Case studies take too long and can be more of a headache than an opportunity to learn." Another student indicated that case studies may be useful, but it depends on how in-depth they are. As noted earlier, one student added that "students just try to find ways to get through them, therefore making them non-useful and a waste of time." An interesting and helpful observation made by a couple of students was that, while the multimedia case studies were initially exciting and innovative, using more than three case studies during the semester made the experience boring and mundane. They suggested using three cases and involving students in the analysis of the problem solving exercises contained therein in more depth and with more discussion, thereby maintaining the interest factor for students in studying MIS content.

For the most part, they found the group work associated with the case studies to be a rewarding experience. The findings of this

study illustrate that students in all three classes viewed group work as helpful and shared several benefits of group activities involving the case studies. For example, they indicated that participating in group work enabled them to improve their interpersonal, problem solving, leadership, and teamwork skills. For some students, their group activities also made their work more enjoyable and less stressful, as they were able to bounce ideas off each other, learn from each other, hear different perspectives, share responsibility for decision making, and improve their understanding of the course content. Another advantage one student mentioned was that group work "give(s) students a break from listening to the professor." In contrast, some students had concerns about the group makeup and about how well the groups work together. As one student noted, "I don't like work in groups, because some people slack off, while others do all the work." Other students noted that working in groups can "slow down the work" and can be "bothersome," "a waste," and "pointless," but, as some students added, it depends on the situation.

This study illustrates that these multimedia case studies and the related group work were found to be helpful to students' learning and provided a myriad of benefits, including opportunities for them to improve their teamwork skills, their communication and presentation skills, and their problem solving skills. Further, the multimedia case studies used in this study provided a novel approach to learning that students found exciting and that enhanced their technological skills, decision making skills, and leadership skills. The use of case studies may not have been effective at changing students' views about MIS as a chosen career, in many instances, but exactly how their use affected students' views is unclear at this time. Exposure to the MIS field through these classes may have long-term effects undetected at this point; it may be that, later in their lives, students will recognize benefits of their exposure to the course concepts that they do not now consider important.

Recommendations for Future Research

One of the two foci for this manuscript was to share what I learned from this study. As we (evaluators, designers, students, and instructors) continue our study of the use of multimedia case studies and the associated group work in MIS and other classes, there are several changes that we have made in the research design to enhance our collection of informative data. For example, student focus groups have been added to enable us to use more probing follow-up questions to get more details about their responses to help us understand exactly what students mean and what they experienced. These focus groups facilitate our gathering more in-depth information through students' sharing of examples or incidences that more fully explain their experience. Sometimes their short answer responses were insufficient to give the detail needed to interpret their true attitudes or perspectives. Using a combination of surveys (pre- and post-), along with focus groups gives more in-depth information about student perceptions than simply using externally analyzed surveys (by external evaluators who were not present in the classroom and have no knowledge of how pedagogical tools were used). Interviews may be conducted with instructors as well as students. It helps to know how much experience with various teaching tools each instructor has and how he/she implements them. By knowing this, we can better determine whether the results directly relate to the instructor's effective use of the tool or some other factor. Teachers with more experience in the use of a particular tool are apt to do a better job using that tool than someone who has never done so before. Observation of classes has been an additional change we have made in our evaluation process to help us determine differences in teaching styles and students' reactions to various styles. There are differences in the instructors' teaching styles that may have affected the results, but without the observation and, perhaps, focus groups or interviews, we do not know what teaching styles, methods, or tools were truly effective—that is, all we have to go on is students' short answer responses. Observation and other qualitative methods give us more opportunities to collect data that would facilitate comparison of classes in terms of the effectiveness of teaching styles and pedagogical tools, specifically how the instructors used the case studies. They also enable us to collect information, such as student comments and non-verbal communication, to explain certain classroom phenomena. Another potential data source might be to have both students and teachers journal about their progress in the class, using specific prompts. The use of directed reflections periodically throughout the semester would give more in-depth information about the effectiveness of the use of case studies or other teaching tools. Other document analysis might involve having students in all classes complete worksheets or answer spe-

cific questions related to the case studies that could then be compared for detail and differences in knowledge of concepts.

The students' responses to the surveys have given us fodder for rewording questions to better obtain informative data for future studies using these cases. For example, we have revamped the question asking for students' suggestions for improving their learning to make it clear whether we mean things they (the students) or the instructor can do to improve their learning experience. Further, rather than ask them about their preferred learning/teaching styles, we may rewrite the question to have them share what pedagogical tools they find most helpful or have them share their preferences for various styles in a different way than that which we used here. Another piece of information that may be helpful would be to know what experience students have had with multimedia case studies (as we define them) as well as what experience instructors have had in their use. Additional information that would help us to place the data within context would be to have copies of the syllabus and lesson plans.

Summary

This study focused on the survey responses of students in three MIS classes to determine how effective they perceived the use of multimedia case studies to be in teaching MIS course content. Students indicated an overall preference for lectures with interactive discussions and PowerPoint slides to help further explain concepts presented in class lectures and to provide them with a review tool for later use. They also preferred activities in class that enabled them to put theoretical principles into practice, such as group work and hands-on activities, both of which are incorporated into the use of multimedia case studies. Students in one class found case studies to be particularly effective in helping them learn the course materials, and students in another class (taught by the novice instructor) found hands-on activities and group work to be useful, while students in the third class found PowerPoints to be most helpful to them in learning the material. Students found the group work associated with case studies to be helpful in learning skills that will assist them in future work environments. Results of this study illustrate that the use of multimedia case studies provided students with an effective means for learning material that was new to students in an innovative, exciting way and provided them with opportunities to relate course materials to real life situations. Further, these case studies enabled them to learn the material that was new to them in the course in various ways. It was evident from students' responses that they believe the instructors' use of several teaching methods, particularly the use of case studies, lectures, and slides or other visuals, was effective in helping students to learn the course concepts and to apply theory in real life situations that enhanced their problem solving, interpersonal, leadership, and decision-making skills.

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Appendix A

Pre-Semester Qualitative Survey Questions

Survey of Attitudes and Perceptions toward MIS

The questions below are designed to identify your attitudes about MIS. Be as honest as possible; there are no correct or incorrect answers. Your responses will not impact your grade in this course or in other courses. If you have very limited experience with MIS, then respond to the following questions with your expectation.

Please answer the following questions in as much detail as you can to enable us to improve the use of multimedia case studies in your course of study. We are interested in learning both what works and what needs improvement in the course. Your input will be kept confidential and will be used in our formative assessment to improve the program.

1. What experience do you have with the MIS field of study? (Include work experience, related courses or other experience with MIS)
2. What teaching styles do you find most helpful in learning new material? (for example, lecture, distance learning, PowerPoint presen tations, multimedia case studies, group projects, etc.)
3. What learning styles do you believe should be addressed to help you learn new material?
4. What part(s) of this course do you expect to be most interesting?
5. What part(s) of this course do you expect to find to be most helpful to you in learning the material?
6. Do you expect the use of multimedia case studies to be helpful in learning the material presented? (Please explain in detail the benefits or non-beneficial aspects)
7. Do you expect the use of student groups/teams to solving the problems presented in the case studies to be helpful? (Please explain in detail the ways in which working with other students in groups was helpful or not in your learning the course materials)
8. Do you prefer to work alone or in groups to solve problems?
9. What suggestions do you have for improving your learning experience in this course?
10. What suggestions do you have for the instructor to improve his/her teaching in this course?
11. How do you perceive that you might use the information learned in this course in your future work environment?
12. How do you think this course might affect your desire to pursue a career in this field?

Thank you for completing the questionnaire.

Post-Semester Qualitative Survey Questions
Survey of Attitudes and Perceptions toward MIS

The questions below are designed to identify your attitudes about MIS. Be as honest as possible; there are no correct or incorrect answers. Your responses will not impact your grade in this course or in other courses.

Please answer the following questions in as much detail as you can to enable us to improve the use of multimedia case studies in your course of study. We are interested in learning both what works and what needs improvement in the course. Your input will be kept confidential and will be used in our formative assessment to improve the program.

1. What experience do you have with the MIS field of study? (Include work experience, related courses or other experience with MIS)
2. What teaching styles do you find most helpful in learning new material? (for example, lecture, distance learning, PowerPoint presentations, multimedia case studies, group projects, etc.)
3. What learning styles do you believe should be addressed to help you learn new material?
4. What part(s) of this course did you find to be most interesting?
5. What part(s) of this course did you find to be most helpful to you in learning the material?
6. How beneficial would you rate the use of multimedia case studies in your learning the material presented in this course? (Please explain in detail the benefits or non-beneficial aspects)
7. How helpful did you find the use of student groups/teams to solving the problems presented in the case studies? (Please explain in detail the ways in which working with other students in groups was helpful or not in your learning the course materials)
8. Do you prefer to work alone or in groups to solve problems?
9. What suggestions do you have for improving your learning experience in this course?
10. What suggestions do you have for the instructor to improve his/her teaching in this course?
11. How do you perceive that you might use the information learned in this course in your future work environment?
12. How do you think this course has affected your desire to pursue a career in this field?

Thank you for completing the questionnaire.