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## MAKING PRINCIPLES OF MARKETING CASE STUDIES TANGIBLE THROUGH COMPUTER-AIDED INTERACTIVITY

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*A web-based principles of marketing case study module was developed over a two year period between marketing students and faculty and instructional design students, staff, and faculty. The module was tested with five sections of principles of marketing students to find out whether or not students perceive a difference in learning marketing concepts and problem-solving skills when working on a paper case with no interactivity versus a Web-based case study module with computer-aided interactivity. This study further investigated whether students find a web-based case more enjoyable than a paper case and if students are more likely to be interested in marketing as a field of study after using a web-based case study module than if they had only done a paper case. Although students indicated that the web-based interactive module enabled them to learn the marketing concepts significantly more easily than the paper case study, other findings showed unexpected results.*

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### INTRODUCTION

This article presents information about the design, development, and testing of a web-based interactive case study module and its effectiveness with principles of marketing students. Innovations in technology are shaping our entire teaching approach and building advanced knowledge for undergraduate students. Computer-aided interactivity has become an innovative way to enhance learning in various fields of study. Case studies provide an important tool to help students develop and use their analytical and creative abilities. Students learn more effectively when actively involved in the learning process (Bonwell & Eison, 1991; Sivan, Wong, Woon, & Kember, 2000). Grant (1997) outlined the benefits of using case studies as an interactive learning strategy, shifting the emphasis from teacher-centered to more student-centered activities, which builds advanced marketing knowledge and creativity.

Nevertheless, students introduced to marketing case studies for the first time are faced with the challenge of analyzing real-world cases while learning marketing concepts. Although using case studies to enhance learning has become effective, educators would agree that many students have a difficult time sorting and organizing their information to come to the right conclusions about how to solve the marketing problems at hand. Educators may become concerned that this struggle may turn introductory marketing students off to fields in marketing if they do not obtain a level of success analyzing the cases early on in their marketing courses. However, new interactive learning tools are being

developed, which may help students solve case studies and make the process more rewarding.

Current trends show an overall decline in marketing majors (Hugstad, 1997). At the same time, there has been a decline in the quality and quantity of students attracted to marketing (Hugstad, 1997; Newell, Titus, & West, 1996). It is also perceived that a sizeable portion of business school graduates are lacking communication, analytical thinking, and ambiguity-tolerating skills (Chonko, 1993). However, if educators use interactive tools to enhance students' analytical thinking and marketing concepts, this may build confidence in developing marketing knowledge, therefore, making students more interested in marketing as a major.

Interactivity is a learning enhancement tool defined by Jaffee (1997, p. 268) as "regular interaction between teacher and students, among students, and between students and the learning environment." Instructors have traditionally used interactivity between students and themselves to help students understand case analysis. For example, students are typically given a case study and asked to answer a series of questions and then the case and answers are reviewed in class. While this method is an effective in-class interactivity in learning, this study takes a further step to explore student learning experience through two comparable marketing case studies in two different formats: a paper case versus a computer-aided case analysis module. According to Pickett, et al. (2000), interactivity can be computer-aided to enhance learning using computer programs that respond to user activity.

The objectives of this study were first, to find out whether or not students perceive a difference in learning

marketing concepts and problem-solving skills when working on a paper case with no interactivity with instructor or peer students versus a web-based case study module with computer-aided interactivity. Second, the study investigates if students find web-based case studies more enjoyable than paper cases. Third, it explores if students are more likely to be interested in marketing as a course major after using a web-based case study module than if they had only done a paper case. This study contributes to marketing education in significant ways. First, it helps instructors understand whether or not computer-aided interactivity advances the ability to learn marketing concepts and problem-solving skills when doing case studies. Second, it progresses the body of knowledge about using principles of marketing case studies from paper-based studies to web-based modules, not yet seen in the literature. Third, it provides insight about working across the marketing and instructional design disciplines, useful in both academic and business settings.

### LITERATURE REVIEW

Marketing educators are challenged with how to integrate technology into their courses to enhance student learning of marketing concepts and prepare them for careers in marketing. Hannaford, Erffmeyer, and Tomkovic (2005) report that most educators have integrated technology into traditional courses through an "infusion approach" (p. 68). Infusing technology into the classroom has evolved over the last decade. In a study of student outcomes using electronic tools, Clarke III, Flaherty, and Mottner (2001) confirm that technology created portals for learning and enhanced the learning experience. Close, Dixit, and Malhotra (2005) state that while technology and the Internet "facilitate" and "enhance learning" (p. 91), there is little known about how students learn with technology. Strauss and Frost (1999) suggest that it not only enhances learning but that it increases skills needed in marketing careers.

Studies regarding technology's effectiveness in the marketing classroom are limited (Close, Dixit, & Malhotra, 2005). Malhotra (2002) points out that while there are many advantages to using technology, educators need to maintain a balance between traditional and electronic methods. Karns (2005) finds in a study of marketing student perceptions of learning activities that using technology generates a positive response by students if they are real world based. Karns (2005, p. 165) states, "Students' willingness to engage fully in learning through a particular pedagogy is an important element in a pedagogical approach's ability to foster

learning." Marshall and Michaels (2001) point out educators should use technology that is driven by the course's focus and content. Furthermore, there are few pedagogical studies about how technology interfaces with different approaches to learning, such as case studies and problem solving, and this is one area that needs further examination (Achenreiner, 2001).

Web-based delivery systems are popular electronic tools that have been effectively used in diverse marketing courses. Its overall advantages over traditional course methods for students include interactivity, real-time communication, and self-motivated learning. Furthermore, it supports multiple data formats such as audio, video, and graphics, and can be updated when necessary (Kaynama & Keesling, 2000). However, research on the effectiveness of web-based delivery systems for different learning approaches is limited and marketing educators wonder if technology actually adds to student learning of marketing concepts (Close, Dixit, & Malhotra, 2005).

Case studies are a traditional pedagogical tool used by marketing educators to build marketing problem-solving skills, gain real world knowledge, and develop marketing concepts. Traditionally, case studies have been taught by using text books or paper cases such as Harvard Business School case studies. Various studies have been conducted to demonstrate the value of Web-based cases versus paper cases. Mabrika (2003) uses an online case study which contributed to learning about the impact of multimedia in improving higher-order cognitive skills with marketing students. Liebowitz and Yaverbaum (1998) demonstrate that Web-based cases are more enjoyable than paper cases with information systems students.

Given a student's cumulative experience with problem-solving, it is unclear whether or not a positive or negative experience with case studies impacts his/her choice of a major in business. In a study of students' decision-making processes in selecting a business major, marketing students rated the need for interesting course content and variety the highest on their attribute importance scale (Newell, Titus, & West, 1996). Furthermore, they find that marketing students felt that their quantitative skills are lacking. Therefore, this study investigates whether an interactive case study module for principles of marketing students enhances the learning process of marketing concepts versus a paper case study. The study further investigates whether a computer-aided interactive case study makes it easier for students to learn the marketing concepts than a paper case. Also, whether students enjoy the learning process more by completing a

computer-aided interactive case study compared to a paper-based case, and if students have a greater interest in marketing as a field of study after completing the case study module. The hypotheses to these research questions follow:

**H1:** Students will find that a computer-aided interactive case study enhances their learning of the marketing concepts more than a paper case.

**H2:** Students will enjoy a computer-aided interactive case study more than traditional, paper case study version in learning marketing concepts.

**H3:** Students will learn the marketing concepts more easily with a computer-aided marketing case study than with a paper case study.

**H4:** Students who complete the computer-aided interactive marketing case study are more likely to be interested in marketing as a field of study than if they worked on only paper cases.

### Module Development and Application

Typically, it is difficult for instructors to infuse traditional teaching methods (that they have grown comfortable using) with interactive teaching tools. This is due in part to limited time and technology training. This study was made possible by a Basic Educational Technology (BET) grant offered to the faculty at a major university in the northeastern part of United States. The grant included the use of an instructional design student to incorporate more technology into courses through an internship. The interactive case study module took three semesters to complete and one semester to test, for a total of two academic years.

There were several steps in the development of the interactive module. The module template was designed as a universal tool to fit various marketing case studies. Undergraduate students who had taken the principles of marketing course wrote the script for the module. The script was revised seven times. The case used was "Trap-Ease America: The Big Cheese of Mousetraps," taken from Kotler and Armstrong's (2006) text. This case is typically completed after students learn the difference between strategic and tactical problems, have identified the marketing mix, and have completed the first two to three chapters of the text. An instructional design staff member designed the module framework. The development process included providing objectives, arranging the information and assignments into phases, and creating multiple choices and matching sections to enhance the student's understanding of the marketing

material. Multiple choice pretest and posttest questions were developed for students to assess the student's outcomes before and after completing the module.

### Challenges in the Module Development

The framework for the module took time to construct given differences in marketing and instructional design conceptualization of the module. Since there were multiple facets to explaining how to problem-solve through the data of the case, instructional design found the non-linear process difficult to understand and explicate into a framework. Therefore, there were several team meetings and discussions about explicating the process into a universal framework. Originally, marketing students created a 10-step module. However, developers could not understand the steps because the information did not flow from one point to the next. Therefore, they requested to change the steps into phases. The process was frustrating and time consuming for both groups due to marketing's high tolerance for ambiguity and instructional design's low tolerance for ambiguity. While marketing was trying to explain how to problem-solve through the case, instructional design wanted to know why to problem-solve in those specific ways. Tips were added into the phases as to why thinking about decision-making in specific ways was important for marketing managers. Tips were inserted where developers had their own gap in understanding the module. Since principles of marketing students vary across fields of study, working with instructional design helped develop a module for diverse student populations.

### Module Framework

The module broke the case down into five phases and walked students through how to sort information, organize it into strategic and tactical problems, prioritize the problems based on marketing management issues, and problem-solve creative solutions to the problems. It also incorporated marketing mix development so that students specifically isolated and focused on those problems. It included interactive exercises and matching, as well as a decision-making protocol. The module was set up so that students took a pretest consisting of 20 random multiple choice questions after they read the case but prior to starting the module. Following completion of the module they took a posttest of 20 random multiple choice questions to benchmark the module's effectiveness based on the learning objectives. The pretest was timed at 20 minutes and students were unable to go back to it. Students that received an 80% or higher on the post test unlocked a certificate of completion. Although the

posttest was not timed, students were given two tries to achieve the 80%. The module sequence was controlled by a password, so that students had to work through the beginning to the end of the module.

**Pretest of the Module**

The module was tested with 21 advertising and sales promotions students. Students were given directions to work through the module and critique the module for user friendliness, typographical errors, and the understanding of marketing concepts and decision-making. Students found several typographical errors and tabs that did not perform properly. Although some graphics were not liked by the students because of the lack of sophistication, the decision was made to leave the graphics alone due to lack of resources to make them more stylish. Instructional design module was revised and six students and two instructors tested it again. All known usability problems were rectified prior to the actual use of the module.

**METHODOLOGY**

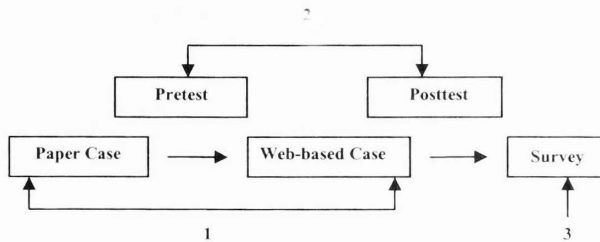
**Sample and Research Design**

The study was carried out during spring 2006 with a total of 96 undergraduate business students in five sections of principles of marketing from two campuses of a major university in the northeastern United States. As part of their class assignment, students were assigned a paper case without any interactivity from the instructor on the first week, then a web-based case study module without any interactivity from the instructor on the second week. Both of the case studies came from Kotler & Armstrong principles of marketing texts and were

comparable in length and learning objectives. The layout of the experimental design is depicted in figure 1. The paper case assigned to students the first week was “RJR’s Premier: Where There is No Smoke, Are There Customers?” Seven discussion questions were provided at the end of the case and students were instructed to complete the case on their own with no help from other students or the instructor. The answers were evaluated based on a total of 100 points.

The second case study assigned to students in the second week was a web-based version of “Trap Ease America: The Big Cheese of Mousetraps” for which students also had to answer seven discussion questions provided at the end of the case by the instructors. The answers were also evaluated based on a total of 100 points. Both cases were chosen by the instructors (researchers) because they represent a typical “first case” study for principles of marketing students. The cases deal with products that lack market demand due to problems with product development. Students had to categorize information regarding the marketing mix, identify both strategic and tactical problems, evaluate target markets, and rank/order their decisions. Discussion questions were similar in both cases with identical points pre-assigned. After completing two case studies in consecutive weeks, students completed an outcomes assessment survey (see appendix). The survey was designed to answer the research questions. Neither the purpose nor procedure of this study was explained to the students in order to avoid a selection bias, in case the students’ responses to the experiments were a function of the treatment selected (paper case with no interactivity or module with interactivity).

**Figure 1: Experimental Design**



**Measurement Instruments and Analysis**

In order to test the effectiveness of the computer-aided interactive case study module over the paper case with no interactivity, three assessment instruments were used (figure 1). First, seven discussion questions for each case

were assigned to students to answer. Students’ answers were subjectively assessed and compared for their learning between treatments (paper with no interactivity to computer-aided interactivity). Two instructors graded students’ answers to discussion questions using one set of answers as a rubric to maintain grade consistency.

Second, the average quiz scores of a randomly computer-selected 20 multiple choice quiz questions in a pretest and posttest that students had to complete before and after completing the module were compared for differences. This assessment method provided an objective measurement tool. Third, Outcome Assessment Survey that contained 22 questions assessed differences between computer-aided interactivity and paper case with no interactivity.

The four variables for each case study used to test the hypotheses were learning enhancement, enjoyment, easiness to comprehend, and interest in Marketing as a field of study. A 5-point Likert scale is used with 1 = strongly disagree to 5 = strongly agree. Additional questions were included as a reliability check and to gain further insight. For example, a direct comparison of the responses to the statement, "I enjoyed completing a Web-based case study module more than completing a paper-based marketing case study," was checked against the responses to the statements, "completing the web-based Trap-Ease (paper RJR's Premier) marketing case study made the learning process enjoyable."

The hypotheses were tested using paired sample t-tests on the data collected through the Outcome Assessment Survey. The results were also cross-validated with the data collected through the first and second assessment instruments described above. Using the independent samples t-test, the average scores of the answers to the seven discussion questions for each case from the first measurement instrument and the average quiz scores of the posttest and pretest from the second assessment instrument were compared for significant differences.

## Findings and Discussion

The summary of the results are presented in table 1.

**Table 1: Results of Hypotheses Testing**

Assessment Instrument #1	Paper Case			Web-based Case			t	Sig. (2-tailed)
	N	Mean	St. Dev.	N	Mean	St. Dev.		
Grades for answers to seven discussion questions	92	81.49	11.38	92	83.76	11.41	-1.42	0.16
Assessment Instrument #2	Pretest			Posttest			t	Sig. (2-tailed)
	N	Mean	St. Dev.	N	Mean	St. Dev.		
Scores for pretest & posttest	88	57.50	10.93	88	66.93	10.16	-5.71	<b>0.00**</b>
Assessment Instrument #3	Paper Case			Web-based Case			t	Sig. (2-tailed)
	N	Mean	St. Dev.	N	Mean	St. Dev.		
Outcome Assessment survey	96	3.31	0.91	96	3.30	.996	0.97	0.93
<b>H1:</b> Enhance Learning	96	2.61	0.97	96	2.73	1.10	-1.02	0.312
<b>H2:</b> Enjoyment	96	3.07	0.94	96	3.33	1.05	-2.27	<b>0.03*</b>
<b>H3:</b> Easiness to Comprehend	95	2.80	0.92	95	2.80	0.96	0.00	1.00
<b>H4:</b> Interest in Marketing	93	1.17	51.5	93	152	53.8	-5.19	<b>0.00**</b>
Time Spent (minutes)	96	2.88	0.73	96	2.81	0.93	0.61	0.543
Difficulty								
<b>Mean comparisons: * p &lt; 0 .05, ** p &lt; 0.01</b>								

The first assessment tool was the comparison of the grades that students received for their answers to seven discussion questions in each case study. The paired-sample t-test indicated that the mean scores were not significantly different. The second assessment tool was comparison of the pretest and posttest scores before and after completing the module. Significant difference was found between the pretest and posttest scores, indicating that the module improved students' understanding of the case content.

The third assessment instrument, the Outcome Assessment Survey, provided the data to test the four hypotheses. The finding of the first hypothesis testing showed that students did not find that a computer-aided interactive case study significantly enhanced their learning of the marketing concepts more than a paper case ( $t = 0.97$ ). Therefore, H1 is not supported.

Testing of the second hypothesis indicated that students did not enjoy the computer-aided interactive case study more than traditional, paper case version ( $t = -1.02$ ). Therefore, H2 was not supported. This finding is contrary to that of Liebowitz and Yaverbaum (1998). They found that students gave higher rankings to case enjoyment with respect to meeting the needs of the students.

Testing of the third hypothesis provided a significant result. Students indicated that they learned the marketing concepts more easily with a computer-aided interactive case study than with a paper case study ( $t = -2.27$ ) at  $p < 0.05$  level. Therefore, H3 is supported. Lastly, the result of the fourth hypothesis testing was not statistically significant. Students who completed the computer-aided interactive marketing case study were not more likely to be interested in marketing as a field of study than if they had worked on only paper cases ( $t = 0.0$ ). Therefore, H4 is not supported.



In the Outcome Assessment Survey, additional questions were included to gain further insight. For example, students indicated that paper case took significantly less time to complete than the web-based interactive case (117 versus 152 minutes) at  $p < 0.01$  level. The results also indicated that neither case study was more difficult for students to complete than one another, which provides evidence that both case studies were comparable. In the survey, students were asked to indicate their agreement level to the statement that the web-based case study module was user-friendly. Forty-nine percent of the students either disagreed or were neutral. Fifty-one percent agreed. Lastly, 35 percent of the students did not prefer, 27 percent were neutral, and 37.5 percent preferred completing a web-based case study to a paper-based marketing case study.

### Limitations

This study used a convenience sample, and was limited to five sections of principles of marketing at two universities. These campuses contain a high percentage of commuting students and were held in the evening, after 4:30 p.m. Therefore, the study cannot be generalized to all principles of marketing students. Student's comfort level with technology and prior experiences or expertise with web-based tools was unknown. Furthermore, some students had technical difficulties using the module (disconnection with dial-up, or server), which may or may not have biased the survey responses.

Time constraints also limited this study. If students underestimated the amount of time they needed and waited until the last minute to complete the module, this may have biased both student performance and survey results. Since the module had questions that were sent to the instructor through an on-line memo, it was noted that in all five sections many students submitted their answers at the last minute, right before the deadline. Finally, the development was limited by the capabilities of the instructional design student team. Possibly, different types of interactivity such as message boards and student collaboration would have made the module more effective and changed the results.

### CONCLUSION AND RECOMMENDATIONS

The findings from this study correspond with Peterson, Albaum, Munuera, and Cunningham (2002) in their study at the University of Texas in Austin that students surveyed did not feel that technology increased learning, but made the process more interesting. This study found that students felt the Web-based case study

module didn't increase learning but made learning marketing concepts easier.

Furthermore, similar to findings by Romiszowski and Jost (1998), some students also found the technology was a hindrance. As suggested by Woolley (1998), text-oriented web-based training can be overwhelming to those who are expected to read and respond to a number of messages. Given the inter-disciplinary approach to this research, it was appropriate to access the instructional design capabilities of the university. These skills warranted a text-oriented design of the module. Although an interactive skill set including animation and collaborative design might have been better; marketing students and faculty did not know the skill set of the instructional design team prior to embarking on this project. This demonstrates the importance of understanding skill sets and the effects on project requirements earlier in the project development process. Both educators and practitioners embarking on projects across disciplines or departments can learn from this study. Future research should include updating the module to include greater interactivity such as providing ways for students to collaborate and discuss the case while working on the module. Clarke III, Flaherty, and Mottner (2001) state that electronic interaction between students should be encouraged, although there is no empirical evidence that it helps students learn.

Finally, marketing educators are encouraged to develop tools that motivate students to engage in the marketing process and become marketing majors. If marketing education is to continue to effectively prepare students for marketing careers, educators must understand the ways that technology and other educational methodologies inspire students (Clarke III, Flaherty, & Mottner, 2001). Therefore, infusing traditional pedagogy with technological advancements through trial and error and making the results available to educators would advance research on this topic.

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### Appendix: Assessment of Paper and Web-Based Cases

How difficult was the paper RJR's Premier (the Web-Based Trap Ease) case study for you to complete?

**Scale:** 1 = Extremely Difficult to 5 = Extremely Easy

What type of difficulty did you experience in completing the paper RJR's Premier (the Web-Based Trap Ease) case study?

Open-ended

Completing the paper RJR's Premier (the Web-Based Trap Ease) marketing case study enhanced my learning of the marketing concepts.

Completing the paper RJR's Premier (the Web-Based Trap Ease) marketing case study made it easy for me to learn the marketing concepts.

Completing the paper RJR's Premier (the Web-Based Trap Ease) marketing case study made the learning process enjoyable.

Completing the paper RJR's Premier (the Web-Based Trap Ease) marketing case study increased my interest in marketing as a field of study.

I find the Web-Based Trap Ease marketing case study module user-friendly.

I enjoyed completing a Web-Based marketing case study module more than completing a paper-based marketing case study.

I prefer completing a Web-Based marketing case study module to completing a paper-based marketing case study.

**Scale:** 1 = Strongly Disagree to 5 = Strongly Agree