THE KNOWLEDGE-RELATED CONFIDENCE EFFECTS OF A MARKETING SIMULATION GAME

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Abstract

Computerized simulation games are becoming increasingly popular in marketing programs and in business school curricula in general. Unfortunately, empirical evidence concerning the impact of this method of instruction is contradictory. Furthermore, few studies have investigated the impact of complex business games played over a long time period. This paper reports the preliminary results of an empirical investigation of the impact of a complex business simulation which focuses on product management decisions over eight simulated years. Preliminary analysis suggests that participants' confidence in applying learned marketing concepts and tools to real-world situations increases significantly due to participation in the simulation.

Introduction

Increasingly, business schools are investing time, effort and money to install, operate, and maintain complex computer simulation games. Unfortunately, research concerning the impact of simulations on participants is still inconclusive. Both positive and negative results have been obtained from studies investigating the impact of simulations on cognitive learning compared to traditional teaching methods and on attitudes (Pierfy 1977, Foster, et al., 1980). Simulations do appear to have an advantage in terms of short-term retention of information and student interest (Pierfy 1977, Bredemeir and Greenblat 1981). In addition, Lee and O'Leary (1971) reported increased confidence in decision-making ability and tolerance for ambiguity as a result of participation in a simulation.

None of these studies have investigated the student's confidence in his/her mastery of the material which the simulation experience is proposed to teach or reinforce. We believe that confidence in one's knowledge is an important attribute which business schools attempt to develop in their students. The use of simulations which continue over a relatively long period of time, providing continuous feedback to participants, appear to be consistent with this objective, since they allow experimentation with one's knowledge and intuition and continual growth/revision of these based on timely feedback. Therefore, we hypothesize that this type of simulation leads to increased confidence in one's knowledge. This increased confidence should be reflected in student's confidence in discussing learned concepts and tools with experienced marketing executives.

The Experimental Study

The Marketing Simulation

The Markstrat simulation is used extensively in both business schools and in industry to develop decision-making skills in the area of product management. The simulation provides participants the opportunity for extensive analysis of marketing and internal data related to all types of marketing decisions and provides timely feedback as input to subsequent plays. Markstrat simulates two consumer durable goods markets consisting of five potential consumer segments and incorporates many complex market and environmental phenomena with which student teams must deal. These include: competitive actions; changing economic conditions; government price controls; evolving consumer needs; channel-specific margins; and variable segment, market, and GNP growth. Internally, consideration must be given to changing manufacturing costs, experience-curve effects, inventory holding costs, and budget available for marketing expenditures. Within this context, teams focus on the issues of segmentation, positioning, new product development, and new market development, making decisions about price, product characteristics and new product introductions, advertising, advertising research, R & D, sales force coverage, production levels, and purchase of marketing research.

The Sample

Subjects consisted of 60 second-year, full-time MBA students enrolled in a strategic market planning course. At the end of eight weeks of instruction in strategic marketing planning tools and concepts, followed by a final case examination, students were assigned to 20 three-person teams. These teams were randomly assigned within sections to participate in one of four simultaneous simulations, five teams per simulation.[1]

Experimental Design

During the class meeting following the final examination, but prior to the initial introduction to the simulation, students responded to a questionnaire assessing their level of confidence in discussing, in a real-world context, three specific areas related to marketing. Participants responded to the confidence questions within the context of a consumer durable goods industry, which the Markstrat world simulates.

Teams then made eight moves, or sets of decisions, representing eight years. At this time, teams also ordered market research studies to be conducted. Decisions were input to the computer at fixed times twice a week. The day after each move, teams received the results for the "year" in the form of a company report, accompanied by market research reports purchased for the period. This continued over a period of four and one-half weeks, during which time classes were adjourned. At the end of the simulation, students were again assembled for presentation and comparison of results.

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[1] All simulations are initially identical. However, the evolution of each particular simulation depends upon interdependent decisions of the five teams playing competitively.

Before this presentation, students' confidence in discussing marketing tools and concepts was again assessed.

Exhibit 1 shows the context within which students were requested to respond to questionnaire items; i.e., to imagine themselves in conversation with an experienced executive in the consumer durables industry (the industry simulated by Markstrat).

EXHIBIT 1

SCENARIO PRESENTED TO SUBJECTS

On an airplane trip, you find yourself seated next to a business executive who discovers you are currently enrolled in a strategic marketing planning course. In your conversation, you find the executive has fifteen years of consumer durable goods industry experience in marketing. The executive recently has been promoted to vice president of marketing and is eager to discuss with you your MBA program and specifically the Strategic Marketing Planning course. Of the following topics, how comfortable are you in engaging the executive in a discussion of the topic in the context of the executive's business setting.

Exhibit 2 details the marketing areas included in the study. In addition, students' level of confidence in their understanding and interpretation of various types of marketing research data was assessed. These are listed in Exhibit 3; actual questions gave further explanation of the type of data mentioned.

EXHIBIT 2

MARKETING CONCEPTS/TOOLS
STUDIED AND RESPONSE SCALE UTILIZED

Concepts Of	Application Of
Market Segmentation	Market Segmentation
Product Positioning	Product Positioning
Marketing Strategy/Plan	Marketing Strategy/Plan
Marketing Research Data	Marketing Research Data
Marketing Objectives	Marketing Objectives
Planning Tools (BAMA, portfolio, etc.)	Planning Tools (BAMA, portfolio, etc.)
Marketing Budgets	Marketing Budgets
Forecasting Market Evolution/Dynamics	Forecasting Market Evolution/Dynamics
Market, Competitive, and Organizational Assessment	Market, Competitive, and Organizational Assessment
Marketing Planning Process	Marketing Planning Process

Students responded to each of the above on the following scale:

Would Avoid the Topic	1	2	3	4	5	6	7	Very Comfortable with the Topic

EXHIBIT 3

MARKETING RESEARCH DATA TYPES
STUDIED AND RESPONSE SCALE UTILIZED

How confident are you in understanding and interpreting the following types of marketing research data:

Consumer survey data on attitudes and perferences

Consumer panel data

Distribution panel data

Consumer survey data on product similarities and ideal characteristics

Market forecast data

Students responded to each question on the following scale:

Very Low Confidence	1	2	3	4	5	6	7	Very High Confidence

Analysis and Results

In an effort to avoid respondent bias by requesting only team identification, we are not in a position to calculate individual change scores. Subject responses before and after the simulation were, therefore, treated as responses from two different groups, and standard MANOVA test were conducted.

Preliminary results indicate that hypothesized relationships are significant (See Exhibit 4).

EXHIBIT 4

HYPOTHESES

	Significance Level
HO_1: Participation in a complex, long-term marketing simulation leads to no significant change overall in students' confidence in their ability to discuss marketing concepts and the application of these concepts, and their understanding and interpretation of marketing research data.	.00
HO_2: Participation in a complex, long-term marketing simulation leads to no significant change in students' confidence in their ability to discuss marketing concepts.	.00
HO_3: Participation in a complex, long-term marketing simulation leads to no significant change in students' confidence in their ability to discuss the application of marketing concepts.	.00
HO_4: Participation in a complex, long-term marketing simulation leads to no significant change in students' confidence in their ability to understand and interpret marketing research data.	.00

Overall, students' confidence levels changed significantly during the period that they participated in the Markstrat simulation. This overall change was due to significant increases in each of the areas investigated: confidence in marketing concepts, in the application of marketing concepts, and in the use of marketing research data. Future analysis will explore the changes in confidence related to individual marketing concepts and marketing research data.

Limitations

Since the Markstrat simulation is an integral part of the student's learning experience, no control group was available to test the possible external factors affecting students' confidence levels. Such possible effects include history and maturation. A verification of events taking place during the experimental period showed that MBA students were interviewing on campus during the time that they participated in Markstrat. An increase in confidence in discussing marketing concepts and the application of these concepts could conceivably be related to experience gained during the interview process for those students interviewing for marketing-related positions. However, students began the interview process approximately one month before the start of the simulation, so that confidence due to interview experience should have been well established by the start of the simulation and, therefore, should be reflected in the initial as well as the final confidence scores of students.

Maturation may be another suspected threat to the validity of results. However, strategic market planning was the only marketing course offered during the semester treating marketing planning and strategy concepts; since the study investigated confidence only as it pertains to marketing concepts and tools, learning in other classes may be ruled out as a suspected cause of results. In addition, since class was adjourned during the simulation period, confidence effects may not be said to result from additional learning in class. It would then appear that "maturation" effects would be the result of having participated in the simulation itself (i.e., making successive decisions and receiving timely feedback), and this is what the experiment was designed to measure in terms of confidence.

Potential student response bias based on fear of being evaluated on responses was eliminated by positioning the questionnaire in the introduction as part of a doctoral student's research unrelated to the course and grading. Furthermore, students were not required to supply their names on questionnaires, but only to specify the Markstrat team of which they were a member.

Implications

Complex computer simulations, particularly when they are used for large numbers of students, typically make considerable demands on professors' and students' time, on computing facilities and personnel, and on monetary resourses to purchase, maintain, and run the program.

The results of this study suggest that, from the standpoint of increased confidence in one's ability to discuss learned concepts and tools with experienced people, complex simulations such as Markstrat have a positive impact on students. Confidence in discussing one's knowledge resulting from university training is of great importance for university graduates during job search and during their initial work experiences. In addition, confidence in one's knowledge may logically be seen as an implicit goal of the pedagogical process. Although more research must certainly be conducted into the link between subjective confidence and acquired knowledge, the results of this study should be useful to business schools, specifically, and educational institutions in general, since they provide empirical evidence to help evaluate the decision to invest time, money, and computer resources in computer simulations.

References

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