

# ADDRESSING CURRENT RESEARCH GAPS AND DIRECTIONS IN EDUCATIONAL MARKETING SIMULATIONS

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## ABSTRACT

*An increasing number of marketing professors are embracing computer-based simulations within their classrooms. These simulations do offer an impressive array of benefits through an experiential-based learning approach. Since various marketing simulations display great differences in complexity, however, a professor is faced with a plethora of decisions on how to design the best simulation experience for the participants. Unfortunately, current research on simulations has failed to offer marketing professors any assistance or guidelines in making these determinations in light of varying course objectives or varying student needs. A research agenda and initial directions are proposed to offer marketing professors such guidelines.*

## INTRODUCTION

Since the inception of higher education, college professors have continuously searched for creative ways to stimulate student learning both in and out of the classroom. As part of their never-ending quest, professors seek out ways to reach the needs of varying student groups through a wide variety of tools and approaches. Allred and Swenson (2006) (along with many others), for example, have trumpeted the benefits of utilizing technology as a critical component of these classroom tools in reaching today's college students.

As a whole, marketing instructors seem to concur with the arguments for enhancing classroom instruction with technological advances. For many marketing professors, whether teaching undergraduate or graduate students or even facilitating business executive training sessions, the use of computer simulations has become an important tool in delivering marketing education. Depending on the specific simulation, these computer simulation "games" typically allow students to compete as individuals or as teams against their fellow students or executives, against the computer itself, or even against some outside parties (other students, for example, who are participating in the simulation at another institution). In so doing, participants actively engage in a variety of marketing activities from developing marketing strategies to answering specific content-related questions.

As marketing simulations have become more popular and widely accepted, the number of simulation choices has increased dramatically. A marketing professor who wishes to incorporate a simulation exercise within his/her course now must select a simulation out of a plethora of

options that offer a wide variety of features and complexity. Research has failed, however, to offer any empirical or even conceptual studies to determine *how* varying levels of complexity *should* be considered in selecting a simulation for varying student groups or for varying course objectives. Marketing faculty, therefore, have received little guidance as to how much complexity within any or all of a simulation's components is best suited for a particular course or for a particular student group. Previous research has also offered little guidance to marketing professors in other areas such as determining ways for administering the simulation or reinforcing the learning objectives through a final debriefing based on course or student differences. This research paper intends to illustrate how an individual marketing professor would likely benefit from guidelines in selecting and in utilizing marketing simulations and calls for research that would lead to such guidelines.

## BENEFITS OF SIMULATION USAGE

Marketing computer simulations enjoy widespread usage because of their unique benefits. As Zych (1997) points out, "A recurring concern for educators is how to immerse students in the learning process, rather than have them be passive receptors of theory or knowledge expounded by the teacher" (p. 51). Actual marketing case studies can certainly serve this purpose. An effective case discussion can encourage a debate between multiple options and multiple viewpoints that fosters learning through the decision process. A case discussion is limited, however, to conjecture about what *might* happen if a company were to develop a plan and implement it well. Cases offer

almost no measure of probable competitive response to the proposed strategy and the actual results of implementing a plan are always purely speculative. In a sense, therefore, cases are one dimensional tools that are only capable of generating internal debates over alternatives from one company's perspective.

Burns and Gentry (1992), however, explain how computer simulations effectively offer participants very robust experiential learning opportunities. Such experiential learning is extremely valuable for teaching a discipline such as marketing. Although using a context of children as learners instead of adults, Hilton (2006), for example, describes how this experiential learning component of computer simulations offers a particularly significant benefit in teaching non-linear skills. Hilton points out that simulations are particularly effective in teaching "multifarious solutions to problems, and consequential ramifications that are not easily taught or discussed. Only through experience can these skills be described, or their results demonstrated, to the pupil" (p. 16). Offering empirical evidence consistent with Hilton's assertions, Herche and Fox (1994) had previously demonstrated that the use of nine iterations of a marketing simulation game improved undergraduate marketing students' forecasting and decision-making skills. Anyone who has ever "taught" marketing to adults will immediately see how Hilton's (2006) description fits the challenges of leading adult students to understand more than concepts, but actually how they are integrated in addressing very complex situations that may not have one clear cut "best" solution.

Marketing simulations allow students to experience the complex integration of marketing inputs, the importance of anticipating or reacting to competitive decisions, and the impact of marketing decisions in driving the company's financial numbers. Unlike case studies, the simulation gives students direct feedback on their decision making—"rewarding" them for implementing shrewd strategies in reaching their target market as compared to their competitors and "punishing" them for poor strategies or for poor implementation of strategies.

An additional benefit to utilizing computer simulations stems from the participants being required to work through a great deal of uncertainty as a team. Lamont (2001) argues that simulations should be used to teach teamwork and collaboration skills. Obviously, these additional skill-building opportunities are not possible if students do not work within a team format. For students who do participate within teams, however, further developing these skills can prove to be extremely valuable.

Clearly each of these benefits can serve the needs of a variety of different marketing courses. Similarly, these benefits can also serve the needs of marketing students at different levels (i.e., undergraduate students, graduate students, executive "students"). Such a broad usefulness of highly desirable benefits helps to explain why marketing simulations have become so popular.

Given these widely recognized benefits of marketing computer simulations and their correspondingly widespread use one would expect that this tool would have received far greater attention from researchers in the academic community than it actually has. The limited amount of research on marketing simulations and their effectiveness as an educational tool is far from complete and it leaves an individual marketing faculty member with a slew of unanswered questions. Furthermore, like teaching approaches in general, much of the published research on simulation games offers only a time-constrained usefulness. As rapid changes in technology allow for continuous improvements through innovations, research on specific simulations can become outdated fairly quickly.

There are many decisions for the marketing instructor for which current research offers little to no guidelines. The marketing instructor is typically forced, therefore, to utilize a less-than-informed opinion (1) for selecting a specific simulation, (2) for determining the appropriate instructor involvement level and the most desirable simulation format, and (3) for determining a debriefing and grading/feedback approach. A trial and error method of attempting different options then ensues for each of these decisions to either confirm or disconfirm the instructor's original opinion. Such trial and error processes, however, could take several semesters before any reliable conclusions are reached. In the meantime, students who were part of a trial and error process may have received a less-than-ideal experience. Furthermore, even when the marketing professor finally feels completely comfortable with each of the above decisions, technological changes or other changes may have incurred that require him/her to revisit the process again. Marketing professors, therefore, would likely benefit from a process that would provide them current guidelines for selecting a simulation as well as guidelines for incorporating it into a particular course curriculum.

With large gaps in each of the three decision areas for simulation usage listed above, a new research agenda is proposed. Specifically, this proposed research agenda should consider the implications for how each of these three broadly-defined areas of decisions is dependant upon two variables: the specific course objectives and the needs of the specific marketing students. Each "area of decisions" is considered individually and questions are included within the consideration of each area for future researchers to consider. Such a research agenda could offer valuable guidelines to assist marketing professors in making decisions for simulation usage. Ideally, such guidelines would save marketing professors time and frustration and offer new insights into a widely-utilized marketing education tool.

## Area 1: Evaluating/Exploring Simulation Options

With a plethora of options from which to choose, selecting a particular simulation game can be a challenging task. Marketing simulation games can vary greatly both in format and in complexity. Selecting a specific simulation should logically vary by the needs of the students and by the needs of the course.

A typical marketing simulation requires students to set strategies and to make decisions for implementing those strategies within an electronically simulated marketplace that includes many unknown variables. The participants typically go through a series of decisions that require them to design marketing variables as if they were in control of the marketing functions of an actual company. Each participant, or participant group, therefore, represents one “firm” within the simulation game. It is worth noting, however, that while this format may be the most popular one for marketing simulations, it is not the only one. Drea, Tripp, and Struenkel (2005), for example, offer an analysis of two marketing simulations that follow more of a game-show format in which students play the role of contestants. Participants in these simulations compete by answering questions specific to the marketing discipline in keeping with this game-show approach. While these and numerous other possibilities may also exist, this call for research focuses solely on the computer simulation format in which students compete in an electronically simulated marketing environment as described above.

The most commonly used form of such electronic simulations compiles input data regarding the marketing variables from each competing “firm” and then outputs simulated marketing results for each of these firms based on their relative decisions. Within these “batch” simulations several firms are able to compete against each other. (As an alternative to batch simulations, students may also participate in an “interactive” simulation where a single firm competes against the computer. See Burns and Gentry 1992 and Lamont 2001 for additional comparisons between batch and interactive simulations.) The simulation software then compares each competing firm’s decisions against both the parameters of the “marketplace” and the competitors’ decisions and then determines a variety of results – including sales levels and profitability. Market share can then be calculated for each firm and for each brand that a firm offers. As the simulation progresses through additional iterations, each firm is able to further capitalize on its previous successes or must overcome its previous mistakes. More sophisticated simulations may even account for the ongoing development of “brand equity” that would be created among loyal customers whose needs are being satisfied. Ideally, any simulation should require that students think and act strategically in order to achieve the best results.

As stated previously, the complexities of these decisions vary by the specific simulation utilized. At a mini-

um, most marketing simulations require that participants compete in an electronic marketplace by directly inputting levels for each of the marketing mix variables (the traditional “4 Ps”) into a computer software file and then selecting from marketing research report options to aid them in the next upcoming decision. One only needs to consider one component of this process to recognize that stark differences between simulation options can (and do) exist. Various simulations, for example, require specific decisions on choosing between disparately priced marketing research reports to purchase for the next decision (each participant or group typically works off of a limited “budget” of funds). In different simulations, the extent of research report options ranges from simple and few too complex and many.

These differences in the complexities of the research options of differing simulations are typical of the differences found in other simulation components as well. Simulation options can range from simple to complex, for example, in determining product attributes, promotional approaches and content, sales force deployment and incentives, distribution approaches, or many other possibilities. Some marketing simulations also require participants to determine production capacity or even inventory management. Different simulations have different parameters for each of these variables as well as a variety of others. In moving toward a capstone strategy simulation, some marketing simulations even enhance the marketing discipline by integrating it with “non-marketing” specific decisions such as human labor deployment or financing production and capacity requirements or cash flows from operations. The differences among all of these variables are dramatic across differing simulation games. They are so dramatic that Burns and Gentry (1992) categorize the simulation options of that time (early 1990s) into four categories based on levels of complexity. With dramatic changes in the technology supporting simulation offerings as well as the dramatic impact technological advances have brought about within college students over time (see Drea et al. 2005 among many others) even their four categorization scheme may or may not still be useful for marketing educators.

Within such varying options what guidelines exist for a professor in searching for the most appropriate simulation? In examining various administrative issues surrounding marketing simulations, Gentry, Burns, and Fritzsche (1993) propose that the course objectives and the specific student groups should be among the instructor’s considerations in selecting a simulation game. As noted above, however, research on marketing simulations as an educational tool is severely lacking in offering any conclusions, either conceptually or empirically, that would assist the professor in determine *how* varying levels of complexity *should* be considered in selecting a simulation for varying student groups or for varying course objectives. Obviously, a professor could rely on the advice of

the developer(s) of a specific simulation. Such advice would likely be found in the instructor's manual that would accompany the simulation package. While their opinions are no doubt valuable, one must also consider that such developers do have an objective of making a sale. A publisher's sales representative represents another source of information in selecting a simulation, but this "book rep" also is looking to make a sale. Neither of these sources, therefore, should be considered as being completely unbiased sources. A research agenda that would evaluate how such complexities should be considered in light of course objectives and in light of student needs could offer marketing professors unbiased assistance in selecting a simulation.

In the past, research has offered some assistance to professors looking for the right simulation by offering published reviews of various simulation games. Burns and Gentry (1992), for example, offer a review of the characteristics of ten marketing simulations that were popular back in the early 1990s. Just a quick scan of these reviews, however, demonstrates how quickly any review of a specific simulation can become outdated. A bigger problem for the marketing professor in search of a simulation is probably the issue of understanding *which* simulation characteristics are relatively more important for the purposes of a specific course and/or of a specific student group. Various simulations seem to be a potential fit for use in teaching marketing courses from undergraduate introductory marketing principles to an Executive MBA capstone marketing strategy course. In most cases, however, the published research offers the faculty member little insight as to what are the key marketing *areas of focus* that a simulation should offer to best meet the objectives of various courses or of various student groups.

Consistently, various marketing simulations require a wide range of interdependence on other disciplines. Some simulations require the participants to integrate their marketing decisions with information and/or additional decisions regarding their firm's R&D, production, accounting, finance, and/or operations requirements. The course requirements and the student sophistication levels should obviously impact such decisions on the appropriate levels of required integration with other disciplines.

Again, however, research has offered the individual professor little guidance in making these determinations. A marketing professor should certainly rely on his/her estimation of the relevance of a particular simulation prior to adopting it and "testing it out" on students. Theoretically, for example, simulations with many complex options should require students to proceed with a more complex decision-making approach. Assumedly, more advanced students may, therefore, gain from the greater decision-making experience that accompanies greater simulation complexity. But that begs the basic question of how much complexity would offer a more (or less) ideal learning

environment for students at differing levels of marketing (and business in general) acumen.

All of these issues demonstrate the need for more empirical research to examine the varying characteristics in existing marketing simulations in light of various course requirements and various student groups. In other words, would graduate students actually benefit more than undergraduate students in participating in more complex options? If so, then would "executives" (either "Executive MBAs" or non-degree executives) benefit more than "non-executive" MBA students from greater complexity? Furthermore, different undergraduate students may vary in sophistication levels. Would undergrad students in a capstone marketing course, therefore, benefit more than those in a marketing principles course from greater complexity? If one argues that the answer to that question is "yes," then such an argument would be consistent with Wellington, Faria, and Nulsen's (1996) ancillary conclusions that introductory marketing students should not participate in a particularly sophisticated marketing simulation. Interrelated with the complexity level, would students with lesser marketing sophistication benefit more from simulations that require a less challenging learning curve? If so, then what other characteristics (in addition to variable complexity) might contribute to that learning curve?

#### Area II: Instructor Involvement Level and Simulation Format

The marketing instructor can also choose how involved he/she will be in the processes of introducing and of running the computer simulation. On one extreme the instructor could simply inform the students of their required participation in the game and then leave each student or group to work through their own questions by process of trial and error. On the opposite extreme, the instructor could become so highly involved in the students' decision-making process that he/she begins to lead every decision that the "students" make. Certainly, there are many options of faculty involvement level that fall between these two extremes. Baglione, Tucci, Talaga, and Burson (2003) demonstrated that participants who rated their instructor as being more involved prior to and during the simulation game also evaluated the simulation exercise higher than those who rated their instructor's participation lower on the same scale items. Their research offers some important insights as to the value of the professor's participation in the simulation activities.

*Simulation Introduction.* Follow-up research is needed, however, to ascertain specifically how much and what type of involvement are ideal in administering simulations with various groups. Marketing professors should benefit, for example, from research that examines how much initial introduction to the simulation is most appro-

appropriate for various students. Should this introduction include a detailed description of the simulation customer groups and/or key decision variables? How much would participants benefit from one or more “trial” decisions? How much importance should the professor place on finding a simulation that offers a tutorial or some other form of built-in practice session? Much uncertainty still exists for professors who wish to help participants become comfortable with the simulation tool, but simultaneously not provide so much introductory information that the participant feels unnecessarily overwhelmed or frustrated.

*Additional Assignments/Requirements.* Additional research also needs to consider the implications (both positive and negative) of augmenting the simulation experience with additional coordinated course requirements. One such possibility would be to incorporate some form of testing the participants as part of graded (or not graded) exams and/or quizzes on simulation material that ensures their understanding of game parameters. Doing so, for example, could offer the professor a method of measuring each individual student’s understanding of the marketing interactions (which may otherwise prove difficult if students are participating in teams). A professor could also require additional assignments that pertain to the simulation components such as developing a “competitor” and/or a “customer” profile. In offering another approach, Alpert (1995) argues for the importance of using “executive briefing” sessions with each group throughout the simulation. He defines executive briefings in terms of the instructor (playing the role of company CEO) periodically meeting with each group and stimulating the participants’ thoughts by questioning their decisions. He then identifies other instructor interaction methods such as requiring oral team presentations, requiring written briefs, and “MBWA,” which is his label for “management by walking around.” He offers a solid conceptual argument for the relative strengths and weaknesses of each approach. Zych (1997), on the other hand, offers a rationale for incorporating case analyses that are consistent with the principles that the instructor wants to highlight throughout the simulation experience.

Considering the fact that simulation exercises easily lend themselves to incorporating any, all, or none of these options into the participant’s experience, frameworks such as Alpert’s (1995) and Zych’s (1997) could serve as a legitimate starting point for matching the needs of various student groups and various course objectives with the appropriate faculty interaction approach. Much empirical data would be needed, however, to offer significant insights into such a research stream. Additional questions in this research stream could also be addressed, particularly in light of the potentially varying needs of differing student groups. If an instructor were to meet with the participants, how *often* should he/she meet with each competing individual/group? Furthermore, how should

instructors handle special requests such as budget increases or even group mergers?

*Team Size.* Finally, Cosse, Ashworth, and Weisenberger (1999) studied undergraduates in a principles of marketing course and provided evidence for greater team financial performance in teams of four vs. three and also in teams of three vs. two respectively. They also demonstrated that participant ratings both of personal performance and of satisfaction levels were positively correlated with team size when comparing teams of four, three, and two. Since Cosse et al. (1999) has demonstrated that a relationship does exist on these important variables, additional research is now needed to consider how team size relates to such variables within various student groups.

Conducting reliable research on any of the above questions would certainly not be easy. Additional empirical discovery in these areas, however, could be very beneficial as professors try to find the right balance of helpfulness, fairness, and integrity to the academic objectives of the game.

### Area III: Wrap-Up/Debrief and Grading/Measuring Outcomes

A final area of uncertainty for the marketing instructor is how best to end the participants’ experience in the simulation and then measure participant outcomes. While this area could certainly be considered as two areas (wrap up and debrief being one area and grading/feedback being another), it is considered here as one because of the potentially high interdependence between the wrap and the measurement processes. Just as the marketing professor has a myriad of options for game complexity, game involvement, and game format, he/she also faces many options for the debriefing process. Gentry et al. (1993) stress the importance of debriefing the participants while simultaneously expressing concern over how little attention many marketing instructors give it. They contend that the debrief session is “crucial to integrate the experience with the underlying theories on which the educational objectives are based” (p. 31).

Integrating the educational objectives with the debriefing session also allows grading to be integrated with the debriefing as well. Gentry et al. (1993) strongly recommended grading the participants’ process instead of their financial outcomes. Their argument is based on the benefits of experiential learning as well as the fact that there are factors outside of the participants’ control (such as competitors’ successes or mistakes for example) that could affect any given team’s financial performance. They argue that a better measure of success is left to the individual instructor’s subjective evaluation of the teams’ soundness of marketing strategy and their implementation of that strategy. One could also argue for an evaluation of a given team’s performance based on the team’s ability to identify why it was – or was not – successful in

achieving its objectives. Such evaluations would necessitate that each team offer some summarization, either written, oral, or both, of its strategy, of its strategy implementation and of the factors that led to its success or its lack thereof. A significant benefit for utilizing oral presentations would be that they can simultaneously offer a format for debriefing the entire class while also offering a platform for grading the students' levels of understanding of the marketing concepts that the simulation utilized.

Other than written or oral analyses, other debriefing options would include class discussions, individual group discussions, written feedback to each group, and/or peer evaluations within group members. To varying degrees, any of these options also could be tied directly into the grading or performance measurement process. Conversely any (or all) of these options could also be utilized independently of a grading/feedback mechanism that could be based on some other option such as an exam. Again, current research offers individual marketing instructors little to no guidance on the implications of each option for various student groups or for various course objectives. Which groups, for example, would respond better to which methods?

#### DIRECTIONS AND IMPLICATIONS OF FUTURE RESEARCH AGENDA

While future research into each of the three areas of simulation usage should prove to be quite valuable, it will certainly not come easy. Although other starting places may also be appropriate, certain research directions would seem to offer immediately important insights. Initial research should consider the opinions of simulation participants (in many contexts these are actual marketing students). An important focus of initial research, therefore, would be to measure the opinions of participants after they have taken part in such simulations. Researchers, for example, could measure the extent to which various approaches to simulations enhanced the participants' learning processes as well as their overall satisfaction levels.

A second particularly important area of focus would

be to measure the opinions of instructors who have administered simulation exercises within a marketing educational context. Researchers, for example, could provide their opinions of how much learning they observed within the participants as measured by a wide variety of measurement techniques. A particularly compelling comparison could then be made between the responses provided by the simulation administrators and the simulation participants. Other areas of interest could include comparing data measured from either/each of these two groups across various course levels, student types, and/or specific simulations.

Certainly, an individual marketing professor may not, and perhaps should not, desire to look to research alone in making decisions regarding simulations. Research could, however, serve as an important source in providing the professor with some guidelines in making simulation determinations. As an added benefit, such research could also assist the simulation developers in understanding how various simulation components and levels of complexity serve the needs of various course objectives and various students. Such research, for example, could assist the developers in designing forthcoming simulations that provide the professors with more options for adjusting the simulation components (and thereby the complexities of these components) than they are currently offering. In offering these benefits, research should not simply focus solely on evaluating specific simulation games, but should evaluate how simulation characteristics and formats fit the needs of various students and of various courses.

Despite being such a widely utilized educational resource, the research into this tool still has many gaps in considering differences in participants and differences in class objectives. As marketing professors continually strive to improve their students' educational experiences, additional research into these gaps could lead to an improved understanding of these questions and save a great deal of time and frustration as compared to a traditional *purely* trial and error process.

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