RESEARCH INTO HOOVER'S THREE DOMAINS OF EXPERIENTIAL LEARNING: THE IMPACT OF BUSINESS SIMULATION GAMING

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ABSTRACT

At the inaugural ABSEL meeting, Hoover (1974) presented a definition of Experiential Learning which has set the tone for ABSEL research ever since. Hoover conceptualized that experiential learning involved a continuum of three domains which were: cognitive, behavioral, and affective. A research review of empirical studies by two marketing educators to assess the level of impact that business simulation gaming as an instructional methodology has on the three domains of experiential learning was undertaken. The findings from the review uncovered evidence in support of an experiential learning impact from business simulation gaming as being: weak for the cognitive domain, medium for the behavioral domain, and strong for the affective domain. The conclusion drawn from this research review was that business simulation gaming has a presence in all three of Hoover's domains of experiential learning and is thus an effective instructional methodology.

INTRODUCTION

In an early Friday morning ABSEL board meeting, a Past-President of ABSEL once proposed the consideration of a name change for ABSEL from the Association of Business Simulation and Experiential Learning to the Association of Business Simulation and Educational Learning. The notion behind it was to broaden the scope and the appeal of the academic association to increase its membership. The idea didn't resonate at the time and two key counter arguments were presented. The first was that the organization's founding history was focused on Experiential Learning and this needed to remain in the name. When the Past-President responded that ABSEEL could be an alternative adjustment to the first argument (Association of Business Simulation, Experiential and Educational Learning), the second argument was raised. The organization was proud of its broader appeal whereby practitioners could feel as welcome coming to the conference as academics. Also, imagine some accompanying seal squawks for a moment, and thus the E in ABSEL remains alone and continues to stand for "Experiential" which will be the subject of this paper.

Name notwithstanding, since its founding, ABSEL has presented itself as being: "an organization for academics and professionals that develops and promotes innovative and effective teaching methods in the disciplines of business, management and related fields" (ABSEL.org, accessed October 26, 2022). There are also four goals presented, one of which will be the focus of this paper, "to augment techniques used for the assessment of education and the development of learning theory." In this paper a review of research studies by the authors into experiential learning associated with using business simulation games as instructional tools will be presented. This review will be conducted within the context of Hoover's (1974) original conceptualization of experiential learning as having three domains. The purpose of this review is to determine which domains of experiential learning are most impacted by business simulation game play.

This paper will be divided into the following sections: what is experiential learning?; how do we learn?; applying experiential learning to marketing education; a review of the author's business simulation gaming research associated with Hoover's (1974) three domains of experiential learning; and conclusions.

WHAT IS EXPERIENTIAL LEARNING?

The American Psychological Association defines learning as: "the acquisition of novel information, behaviors, or abilities after practice, observation, or other experiences, as evidenced by change in behavior, knowledge, or brain function. Learning involves consciously or nonconsciously attending to relevant aspects of incoming information, mentally organizing the information into a coherent cognitive representation, and integrating it with relevant existing knowledge activated from long-term memory" (American Psychological Association, 2022).

In a discussion of the types of learning researched at ABSEL, Cannon and Smith (2004, p. 302) present a definition of active learning drawn from Szczerbacki et al (2000) which is: "learning where the student takes a strong role in guiding the educational experience." Gentry (1990) provides a definition of experiential learning which is: "where students learn by doing and in the context of business education through a kind of simulated experience."

Hoover (1974) presents Rogers' definition of experiential learning which was: "It has a quality of personal involvement — the whole-person in both his feeling and cognitive aspects being in the learning event" (Rogers, 1969, p. 5). Building upon Rogers, Hoover (1974) proposed a definition of experiential learning as a continuum. He broke down experiential learning into three domains: behavioral, affective and cognitive. These three domains are in accordance with the work of Bloom et al (1956). Hoover (1974, p. 33) describes the three domains as being part of a continuum such that they are "combinatorial, co-existent, and perhaps even synergistically interactive."

Kolb (1984) defines experiential learning as a cyclical "process whereby knowledge is created through the transformation of experience." The transformation of experience consists of two processes, each composed of two elements. There is the grasping process, which is made up of the elements of concrete experience and abstract conceptualization. Then there is the transformation process, which is composed of the elements of active experimentation and reflective observation.

The unique aspect of Kolb's (1984) experiential learning cycle is that it can begin with any one of the four elements. Typically, it might begin with a person having a concrete experience of some type (eating a cake someone else baked), which they would then try to conceptualize abstractly (What kind of cake did I just eat and how might I bake one for myself?). Then they may carry out some active experimentation (Getting a recipe, undertake baking the cake). Then you undertake the concrete experience of eating the cake you baked. Finally, you undertake some reflective observation (how did the cake turn out, how did it taste, and would I care to try baking one again?). Of course, one might just see a picture of a cake along with a recipe so there is no concrete experience. You proceed to bake the cake according to the recipe and then you look at how it turns out from the oven. You eat the cake and then reflect on how it turned out.

Gentry et al (1998) describe how ABSEL researchers have conducted studies on learning with measurements in these three different domains during its first 25 years. They criticized ABSEL researchers for being imprecise in their use of the term learning in their research because in many of the writings, the researchers use the term learning without defining it, as if it had one universal meaning and interpretation.

The lack of agreement on a universally accepted definition of learning has not dissuaded investigators from studying the concept. The meaning of the L for learning in ABSEL aside, the authors have spent a great deal of their careers in both studying and undertaking learning. As part of this, the conceptual and operational definition of learning that the author's have been adhering to throughout all their research, which is also is encompassed in the American Psychological Association (2022) definition, is: "A change in behavior as a result of experience."

HOW DO WE LEARN?

The discipline of psychology has focused a great deal on the manner in which people learn and its practitioners have presented a number of different learning theories which can guide instructors with respect to the manner in which they teach. Cherry (2022) indicates that learning theory is applied in education, parenting and psychological therapy and that different approaches are useful in different situations. Cherry (2022) presents five current learning theories from Psychology which are: 1) Behavioral Learning; 2) Cognitive Learning; 3) Constructivist Learning; 4) Social Learning; and 5) Experiential Learning.

According to Cherry (2022), "behavioral learning is centered on the environmental influences on the learning process. Environmental influences include associations, reinforcements, and punishments." She describes Pavlov's classic research on feeding dogs and teaching them to salivate to the sound of a bell. The work of behaviorist B.F. Skinner in operant conditioning with behavior being responsive to receiving rewards or punishments for undertaking, or failing to undertake desired behaviors is also discussed. The evidence of learning involves an obvious behavioral change in a person.

Cognitive learning "focuses on how attention, memory, and information processing contribute to the acquisition of knowledge" (Cherry 2022). The use of reporting activities on the part of people to assess whether they have internalized information and can relate it coherently after exposure is evidence that learning has occurred.

Constructivist learning "characterizes learners as active participants in the process who play a role in constructing their knowledge" (Cherry 2022). This means that the learner is exposed to new information or data which is then combined with

their previous knowledge and experiences and thus create a personalized perspective of the knowledge. In essence, learning would be measured by asking the person to provide their own thoughts or interpretations of what the information or data means to them.

Social learning "takes place through observation" (Cherry 2022). People watch what other people do and may observe the consequences of their behavior. Afterwards, they may imitate this behavior. There can be a long delay before the imitation occurs and thus it may be hard to link the behavioral change to this type of learning.

Experiential learning "focuses on learning via hands-on experience" (Cherry 2022).

More recently, learning theory has moved away from thinking about applying particular learning theories to instruct students in favor of recognizing that people learn in a variety of manners or styles. Some people are prone to use some styles more often and more effectively than others to learn. When an instructor recognizes that individuals will employ different styles to learn it behooves them to try and employ different instructional techniques to appeal to the different styles.

The most established research on learning styles is the VARK approach (Visual, Auditory, Reading/Writing, and Kinesthetic) which was developed by Fleming and Mills (1992). However, in a recent online article Choudhary, (2021) subdivided these four into ten distinct learning styles as follows:

1. **Physical (Kinesthetic) Learning** - Physical or kinesthetic learners prefer a hands-on experience rather than listening to lectures or sitting in a class. They like interacting physically with things that are tangible in nature. Role playing is good way for them to learn.

2. **Visual (Spatial) Learning** - Visual or spatial learners learn best with the help of visual cues like charts, images, diagrams, graphs, etc. These learners respond best to colours and mind maps. They use their visual memory to retain information for longer periods of time. Many visual learners possess characteristics like frequent planning and doodling, they have a good attention span and are extremely observant, and they prefer visual directions. Graphic presentations of information resonate best with them.

3. **Auditory Learning**- People who tend to understand and retain information by hearing it or saying it out loud (oral). These types of learners can quickly notice the change in someone's pitch, tone, and other voice qualities. They usually prefer discussing topics, participating in debates, and conversing about things to remember them. Most auditory learners are easy to distract and might even hum, sing, or talk to self frequently. Class presentations, debates and discussions are good learning approaches.

4. **Verbal (Read/Write) Learning** - These types of learners prefer traditional methods like using multiple written resources for learning. Verbal learners learn best through written material or by writing the material themselves. They usually possess a broad vocabulary and might even like using tools like acronyms, rhymes, tongue twisters, among others. Verbal learners are known to be bookworms. Get them to write down their thoughts.

5. **Logical (Mathematical) Learning** - Logical or mathematical learners tend to categorize information into groups to learn them better. They have a knack for quickly recognizing patterns and sequences; and understand equations, numbers, and relationships easily. These learners love structure and logic to things. Naturally, mathematics comes easy to them. Present information in classifications or grouping.

6. **Musical Learning** - Where music or background noise is a distraction to most of us, musical learners prefer them. They tend to learn better with music, beats, and rhythm. Like logical learners, they too find patterns and relationships, but between different sounds. Some sources say they even think in sounds and rhythms instead of words and pictures. Refer them to podcasts.

7. **Naturalist Learners** - Naturalist learners learn best through experimentation and practical experiences. They like making observations of the world around them. Field trips and active exercises work best.

8. **Linguistic Learners** - Linguistic learners are the combination of auditory and verbal learners. They absorb knowledge best by writing, reading, and sounding the material out. These learners can use the traditional methods of learning just like verbal learners and also prefer listening to the information. Linguistic learners also make their own notes while studying. They will learn well if given written projects and assignments to do.

9. **Interpersonal (Social) Learners** - Social or interpersonal learners learn best while working in groups or with other people. They often make good leaders and others even come for advice to them. Social learners learn by relating their ideas and thoughts to the lives of other people. These learners are usually empaths and possess qualities like sensitivity to others,

excellent communication, leadership skills, and problem-solving skills. They can be engaged through group activities and role playing.

10. **Intrapersonal (Solitary) Learners** - In a complete contrast to interpersonal or social learners, intrapersonal or solitary learners prefer solitude while studying. They are more independent and introspective by nature and prefer to be with their own thoughts and ideas without too much external interference. Usually, you can find these types sitting at the back of the class or you might refer to them as the "quiet kid" but they may end up acing the exam. Solitary learners need to be checked with to be engaged.

The predominant learning theory applied in Business Schools is one of experiential learning where one learns by doing. This approach has been the focus point and the raison d'etre of the ABSEL Conference from its inception. As one examines each of the ten learning styles as presented by Choudhary (2021), it seems very clear that in general, an experiential learning approach has a good fit with all the learning styles reported on. Having said this, it is important to recognize that as described by Choudhary (2021), the verbal, linguistic and intrapersonal learners might not engage as fully as desired.

APPLYING EXPERIENTIAL LEARNING TO MARKETING EDUCATION

Marketing educators face many challenges. The first is that the majority of students have been exposed to the mass commercialism of society for a great portion of their lives. They have come to believe that marketing involves only personal selling and advertising. Educators have to dispel them of their prior conception of the discipline and then make them realize that marketing is the focal point of most business activity. Students need to both learn and then apply principles from business strategy, information technology, accounting, and finance when they create marketing programs. In light of this, in their role as marketing educators, the authors set out to accomplish the following overall program goal with their students: To provide them with sufficient and appropriate knowledge and experiences to enable them to successfully pursue careers in the business discipline of marketing.

In their role as instructors, educators first need to ensure they are instructing the appropriate pedagogy of the course subject. After that, the decision to employ any particular instructional method or tool in teaching a business discipline subject is usually predicated upon the learning outcomes of the course at hand. In the current environment of business education, the models for designing and instructing courses are being driven very strongly by the assessment and continuous improvement approaches which are in line with the Assurance of Learning initiatives of external educational accrediting bodies such as the Association for the Accreditation of Collegiate Schools of Business (AACSB).

As an example of this, the authors' institution developed and expressed institutional learning goals for their students as part of their strategic planning processes. The authors' business school then developed its learning goals which were linked to the institution's learning goals. Individual instructors were then tasked with developing learning objectives in compliance with the school's degree program learning goals. Having set the course learning goals, instructors are required to identify the kinds of instructional tools they will employ to achieve their course learning objectives and disseminate them to their students in their course syllabus. An example of this is provided in Table 1. (on the following page)

As stated, the achievement of learning objectives in a particular course, tied to particular degree program's goals, needs to be articulated before selecting an instructional tool. The key takeaway is that the learning environment instructors are operating in is an objective and outcome based one. These are the kinds in which experiential learning approaches are often central. The learning processes through which the outcomes are achieved are dependent on the methodologies of instruction. Collectively, the authors have employed computerized business simulation gaming as a methodology of instruction to teach marketing for more than 50 years. Over this time-frame, the following represent the main learning objectives that have been communicated and whose outcomes the authors have sought to measure as part of their business simulation gaming assignments:

1) To experience the nature of business competition in an environment which is subjected to recurring decisions.
2) To develop decision making skills in support of achieving profit maximization.
3) To demonstrate decision making ability in support of achieving profitability.
4) To experience dealing with uncertainty.
5) To develop and implement marketing strategies in support of achieving profit maximization.
6) To learn by doing (the essence of experiential learning).
7) To undertake applications of marketing principles in support of achieving profit maximization.
8) To undertake and experience iterative decision making.
9) To learn retrospectively from the outcomes of decision making in support of achieving profit maximization.
10) To understand and implement sales forecasting methods.
11) To set and achieve marketing and business objectives in support of achieving profitability.

Table 1: Example of Degree Program AoL Goals and Course Objectives

Program Learning Goals	Course Learning Objectives	Tested using
1: Decision Making/Problem Solving 1.1 Identify Problems	Describe marketing research, methodologies and applications.	Essay Exam Questions & MCQs
1.3 Analyze data; 1.4; 1.5 Propose alternative solutions; 1.6 Implement appropriate decisions	Provide a basic outline of a marketing plan & practise marketing decision making consistent with the plan.	Essay Exam Questions, MCQs & Simulation Game
1.4 Integrates knowledge with data	Describe the role of the marketing manager.	Essay Exam Questions & MCQs
2: Interpersonal Capacity 2.2 Participate in team activities	Develop a marketing plan and engage in marketing decision making as part of team.	Simulation Game & CAT-ME Tool
2.3 Oral communications	Evaluate the results of the teamwork experience.	CATME Tool
	Develop and deliver a formal presentation of a marketing plan and the results of its implementa-	Simulation Game, Presentation & CATME Tool
3: International Industry Knowledge 3.1 Dynamics and Economic drivers of International Business.	Describe the impact of various environments on marketing strategies.	Essay Exam Questions & MCQs
	List the elements of the marketing mix and discuss their relationships and applications.	Essay Exam Questions & MCQs
3.2 Role of Consumers	Identify and describe consumer and business buying behaviour and their implications on marketing strategy.	Essay Exam Questions & MCQs
4: Social Responsibility 4.1 Social Responsibility & Philanthropy	Define the goal of marketing and explain the marketing concept.	Essay Exam Questions & MCQs
	Define and explain the concept of sustainability	Essay Exam Questions &

BUSINESS SIMULATION GAMING RESEARCH INTO HOOVER'S THREE DOMAINS OF EXPERIENTIAL LEARNING

Earlier, Hoover's (1974) conceptualization and definition of experiential learning as having three domains categorized as cognitive, affective and behavioral was introduced. Hoover's (1974) definition has set the tone for ABSEL researchers ever since. This assertion is supported by Faria and Wolfe (1999) who surveyed the literature of the first twenty-five years of the ABSEL proceedings. They identified the following six topic areas as being the most written upon up till then: 1) the correlates of high game performance for game players; 2) the effectiveness of games in teaching strategic management; 3) the effectiveness of games in teaching marketing; 4) the theoretical and practical validity of the mathematical models employed in various business games; 5) the question of what games teach? and 6) how learning can and should be measured in experiential learning environments?

The sixth area identified by Faria and Wolfe (1999) is one in which the authors have conducted a considerable amount of research in their careers in support of determining whether they were accomplishing their course learning objectives or not by using business simulation games. The motivation behind this research was very basic. The authors wanted to reach an

understanding of the best means by which they could create learning experiences to educate their students, as well as assess and validate these learning experiences. This paper will now review a number of these studies to evaluate the impact of business simulation gaming on experiential learning. The review is organized within the context of the three domains of experiential learning: cognitive, behavioral, and affective/attitudinal (Bloom et al, 1956; Hoover 1974).

Cognitive Learning Domain Investigations

Six dimensions of cognitive learning - The cognitive learning domain of Bloom et al (1956) is summarized by Sincero (2011) and offers six dimensions that involve mental skills applied to the acquisition of knowledge. These dimensions are: knowledge (able to recall data and/or information); comprehension (able to understand the meaning of what is known); application (able to utilize an abstraction or to use knowledge in a new situation); analysis (able to differentiate facts and opinions); synthesis (able to integrate different elements or concepts in order to form a sound pattern or structure so a new meaning can be established); and evaluation (able to come up with judgments about the importance of concepts).

Research into the cognitive learning domain - Nulsen and Faria (1977) discuss how simulation games allow students to face uncertainty and take responsibility while making decisions under pressures which are similar to what practicing business executives must face. They believed that their students were integrating their knowledge from their business courses and putting it into practice to make decisions. They likened simulations to being experimental decision-making laboratories. In order to support this assertion, the authors have pursued a series of empirical studies over the years in search of substantive evidence of a link between acquired marketing discipline knowledge and business simulation gaming experiences. The purpose behind these studies was to provide validation for marketing simulation gaming to support the notion that the experience of game play would have a significant relationship to the level of knowledge a student possessed.

Studies relating marketing simulation play to marketing knowledge acquisition - Whiteley and Faria (1989) employed a controlled setting to see if the use of a marketing simulation game would improve the acquisition of marketing knowledge. Students undertaking the same class with the same instructor in the same semester were split into two groups, one group participating in a marketing simulation exercise in a team format, and a second group not participating at all. The two groups of students took the same final examination. The findings were that there were no significant differences between the two groups on overall final examination score performances. However, on a predesignated subset of quantitative final exam questions, the game playing group did perform significantly better than the non-players. It was concluded that the simulation gaming experience was an effective approach to improving quantitative business skills. This was taken as evidence that the analysis dimension within the cognitive learning domain was impacted by the simulation experience.

In a follow-up study, Faria and Whiteley (1990) once again studied the relationship between marketing simulation game play and final examination performance, but this time they did so with varied conditions of team size. They carried out game play with companies operated by individuals and then teams of two people. There was also a control group of non-players. On the final examination they measured three categories of knowledge: theoretical, applied, and quantitative. Based on their previous work they expected to find differences in performance on quantitative knowledge between the groups. The results of the study indicated that for individual players versus individual non-players, the individual players performed better on theoretical questions. The team players performed better than individual non-players on quantitative questions, while there were no differences between individual players and individual non-players. There were no differences between the groups in terms of their performances on applied questions. The study results reinforced Whiteley and Faria (1989) and provided an indication that for individuals, the simulation gaming experience impacted the knowledge dimension of the cognitive domain.

A further investigation into the relationship of marketing simulation game play and examination performance was undertaken by Wellington and Faria (1991). They report finding no relationship between simulation game performance and examination performance when GPA was controlled for. The conclusion they came to was that marketing content knowledge was not related to marketing simulation game performance and as such, the cognitive domain of marketing simulation play was tapping into a different space than that of content examinations.

A study of marketing game simulation play and financial principles - Wellington et al (2011) employed a pretest-marketing simulation treatment-post-test design to study a group of 454 introductory marketing students who were in their second year of business studies. At the start of the semester, and before undertaking any marketing simulation orientation or play, the students were administered a 14 question MCQ accounting/finance test. The questions were centered on an understanding of definitions and making calculations for concepts such as: unit contribution margin, inventory carrying costs, working capital, gross margins, return on sales, breakeven calculations, current ratio and mark-ups. A total of 368 students agreed to participate in the study and 308 usable responses were collected. The average pretest score was 42.4% (32.7% corrected for guessing) and the average post-test score was 55.5% (43.7% corrected for guessing). A t-test of pre and post scores was

significant at the .000 level, indicating a gain in knowledge of these principles over the course of the simulation. The finding was taken as evidence that the experience of playing the simulation game was associated with an improvement in the knowledge and application of accounting/finance principles for the participants.

Assessment of the impact of simulation play on the cognitive learning domain - The outcomes of the research and experiences into the relationship between cognitive learning and marketing simulation game play was mixed. Regardless, the authors believe the research results are sufficient. There is enough of a relationship between aspects of the cognitive learning domain associated with marketing simulation game play to indicate a weak learning impact and this can be taken as a partial justification for their use.

Behavioral (Psychomotor) Learning Domain Investigations

Dimensions of behavioral learning - Strictly speaking, Bloom et al (1956) did not present a behavioral domain (Hoover, 1974), but rather a psychomotor domain. Sincero (2011), reports that this domain involves using and coordinating motor skills. One might not think of the learning skills in this domain as being central to academic business subjects like marketing or many other business disciplines. That is, until you consider the dimensions of this learning domain, which are: perception (able to apply sensory information to motor activity); set (the readiness to act); guided response (able to imitate a displayed behavior or to utilize trial and error); mechanism (able to convert learned responses into habitual actions with proficiency and confidence); complex overt response (able to skillfully perform complex patterns of actions); adaptation (able to modify learned skills to meet special events); and origination (able to create new movement patterns for a specific situation).

Research into the cognitive learning domain - Marketing simulation gaming would seem to be relevant to the first six of the dimensions in the behavioral learning domain because the participants engage in interactive and repetitive game play. The authors have conducted a considerable number of studies focused on the behavioral learning domain, often combined with measures of cognitive learning elements.

Environmental adaptation studies - Dickinson, Whiteley and Faria, (1990) looked at the adaptation of student team decision making to two different environments in a medium complex marketing simulation game. Teams were asked to make marketing decisions in the face of one of two opposing marketing environments, a push parameterized environment or a pull parameterized environment. The cognitive perceptions of the teams about their environments were not measured, only their behaviors. A post-competition analysis of the decisions of the teams indicated that on the whole, participants in the pull parameterized environment did not make operational or strategic decisions that were significantly different from teams that were facing the push parameterized environment. There were only a few decisions that seemed to indicate an appropriate adaptation to the environment.

In a replication study, Whiteley, Dickinson and Faria (1992) altered the unit of analysis from teams to individuals to examine the adaptive behavior of players to different push and pull parameterized environments. Once again, the cognitive perceptions of the individuals concerning their environments were not measured, only their behaviors. The findings were essentially the same as the earlier work using teams. Individual participants in the pull parameterized environment did not demonstrate adaptive learning by making operational or strategic decisions that were significantly different from those facing the push parameterized environment.

Wellington et al (1995) undertook a combined study of the behavioral and cognitive responses of students to investigate if students could learn to understand the true nature of the marketing simulation environments in which they were competing. They studied a large cohort of students who were randomly assigned to one of two opposite types of marketing environments (push or pull) that would respond best to two different marketing promotion and channel strategies. As in earlier studies, the researchers examined the decisions the students made over time to see if they were consistent with the nature of the environments they were operating in. Additionally, the researchers asked the students to report on what they perceived the nature of their environments to be. The study found that although the actual behavior of the two groups differed in terms of some of their decisions, they were only partially able to correctly identify some of the key differences. As such, they demonstrated some behavioral adaptation and learning, but not cognitive learning.

A follow-up study by Wellington, Faria and Whiteley (1998) presented students with four different environments instead of just two. Once again, the students seemed to perceive differences and behave accordingly. However, they could not accurately articulate the nature of their environments.

Finally, Wellington and Faria (2001) attempted another investigation using a relatively simple marketing simulation game which had only two manipulated parameters and five marketing decision variables. The researchers believed that if students

were at all able to, this would be the kind of an environment they would be able to comprehend. The findings were much the same as the earlier studies, only a partial understanding was evident.

Manipulated adaptation – In a design intended to demonstrate behavioral differences, Wellington and Faria (1997) undertook a manipulated study of student teams involving a comparison of a two control groups versus two treatment groups using two divergent push and pull environments. The treatment groups had an artificial market leader team operated by the investigators. The market leader team knew the environment and decision by decision would 'lead' the industry in the direction of making decisions that fit the environment best. Active student teams were provided full access to all the industry market research so that they could observe the actual decisions of the market leading teams and learn from them. Consequently, the team players in the treatment groups adapted more appropriately to the actual environment than the control groups. And yet, despite having an ideal example to follow, there were misalignments in their adaptations in that they did not appropriately adjust their decision making for decision variables that were not highly responsive. The findings indicated that behavioral learning adaptation does indeed take place in marketing simulation competitions, but it is not a perfect adaptation.

Assessment of the impact of simulation play on the behavioral learning domain - The overall conclusion from these studies is that well performing teams were capable of coming to a better relative understanding of their environments with some behavioral adaptation, but not an absolute understanding in terms of a cognitive comprehension. The outcomes of these studies caused the authors to express the following opinion in an ABSEL panel discussion on learning: "By making decisions that are more consistent with the environment defined by the game parameters, it is assumed that the game player has learned how best to adapt to the simulation environment. The results of the study suggest that simulation play primarily results in operant conditioning (behavioral learning) with cognitive learning playing a secondary role" (Gentry et al, 1996). The overall evaluation from the preceding review is different from that of cognitive learning domain. There is a medium impact of business simulation gaming on the behavioral learning domain of experiential learning and this supports their use.

Affective (Attitudinal) Learning Domain Investigations

Dimensions of affective learning - Sincero (2011) interprets Bloom (1956) by describing this domain as relating to feelings, emotions and attitudes. The affective learning domain has five related dimensions which are: receiving phenomena (awareness of feelings and emotions as well as the ability to utilize selected attention); responding to phenomena (active participation of the learner); valuing (able to see the worth of something and express it); organization (able to prioritize a value over another and create a unique value system); and characterization (able to internalize values and let them control the person`s behaviour).

Research into the affective learning domain - The authors have pursued a wide variety of studies in the affective learning domain and have at one time or another queried on all five dimensions. The first such study was by Faria and Nulsen (1975) who surveyed their students and asked them to apply a 10-point scale (0 low to 10 high) to self-rate their interest (valuing dimension) and learning (characterization) from their course experience using a marketing simulation game. The investigators also touched upon the organization dimension by asking students to provide a comparative rating of the various teaching approaches. The students provided the following ratings: using a marketing simulation (mean: 9.3 interest, 9.4 learning), case studies (mean: 8.1 interest, 8.9 learning) and topic lectures (mean: 6.4 interest, 7.1 learning). The students were also asked to rate simulation related learning enhancement exercises on the same ten point scale providing interest and learning ratings (valuing and characterization dimensions of affective learning) as follows: formulating financial statements (mean: 6.1 interest, 8.6 learning), marketing consulting (mean: 8.7 interest, 8.1 learning), simulation stimulators (mean: 9.1 interest, 9.4 learning), team objectives reports (mean: 7.4 interest, 8.4 learning), one page reports (mean: 6.3 interest, 7.1 learning), final reports (mean: 6.7 interest, 7.6 learning), and creating video tape commercials for simulation products (mean: 9.1 interest, 9.4 learning). One of the interesting findings of the article was that student learning was often rated higher than student interest. Faria and Nulsen (1975) report anecdotally on student enjoyment (characterization dimension) stating there was more enjoyment when the simulation experience was enhanced with related assignments.

Attitude and game performance studies - Using strongly agree – strongly disagree anchors on a 1-7 attitude scale, Wellington and Faria (1990) examined team cohesion (responding to phenomena dimension), perceived learning benefits (valuing dimension), the proposition that simulation performance reflected managerial ability (valuing dimension), and simulation enjoyment (characterization dimension). They analyzed the reported attitude information along with simulation earnings performance with an ANOVA statistical procedure in relationship to two different team decision making formats: committee decision making versus regional management decision making. They found that there were no statistically significant differences in team cohesion related to decision format. However, earnings performance and other attitudes towards the simulation experience were statistically significant in being affected by team organization. The committee decision making teams had higher earnings performances, enjoyed the experience more, perceived it as a more beneficial learning experience,

and were more agreeable to the proposition that their simulation performance reflected their managerial ability. The findings indicated that a committee decision making approach was more conducive for affective learning than a regional manager approach of team organization.

Wellington and Faria (1991) undertook another study of student attitudes towards the experience of marketing simulation game play by comparing two groups: one of which engaged in the activity in the first half of the semester versus a group who experienced game play in the second half. They measured attitudes of team cohesion, simulation enjoyment, value of simulation playing versus other learning experiences, the proposition that their simulation performance reflected their managerial ability, and attitudes towards teamwork. They found that there were no significant differences between the two groups with respect to their attitudes towards marketing simulation game play in relation to the timing of when they played the game. The conclusion was that the timing of the introduction of a marketing simulation game for introductory marketing students would not impact its learning benefits.

Attitude change and game performance studies - The use of post-experience attitude measures provides investigators with the subjective opinions of the students as to what they think they have learned. However, learning is about change. The authors were curious about the degree to which marketing simulation gaming could be a transformative learning experience for students. As such, Wellington and Faria (1992) undertook pre and post attitude measures towards a marketing simulation gaming experience to see what kind of affective learning might be occurring amongst marketing students. They wondered if there might be some key mindsets or personality traits that might predispose students towards more or less success from the outset of the game experience? How might these mindsets or traits be changed or affected by the marketing simulation gaming experience?

They studied 389 students who were grouped onto 108 different teams competing in 18 different industries of six competitors. The participants were asked to complete survey reports for each decision prior to receiving performance results. The surveys contained attitude measures for expected team ranking at the end of the competition (receiving phenomena dimension); team cohesiveness (responding to phenomena dimension); simulation enjoyment (characterization dimension); simulation experience relative to lectures, cases, and readings (characterization dimension); perceived appropriateness of the simulation evaluation method being used (responding to phenomena dimension); the degree to which the students felt that their simulation performance reflected their managerial abilities (valuing dimension); and a perception of the benefits of group work (valuing dimension).

The research findings indicated that team cohesion was a relatively stable attitude that did not change over the course of the simulation. Further, teams that were highly cohesive at the start of the simulation tended to outperform teams that were less cohesive at the start of the simulation. In addition, students with lower performance expectations at the outset of the simulation game more often performed worse than students who had higher expectations at the outset. In general, all the other student attitudes towards simulation play changed over time in response to performance, becoming more positive for players whose teams had good earnings performances, and less positive for players whose teams had poor earnings performances.

In a replication study involving 555 marketing students playing on 161 marketing simulation teams, Wellington and Faria (1995) focused on whether good simulation performance represented a repeatable skill or if it was merely due to luck. As part of this, they once again measured pre-competition and post-competition attitudes in response to the simulation experience. Contrary to Wellington and Faria's (1992) findings, beginning performance expectations and team cohesiveness ratings were not related to final game performance. However, as before, the attitudes of good and poor performers changed over time with good performers becoming more positive and poor performers less so. The evaluation of the quality of their learning experience is clearly affected by the competitive performance of the players.

Seeking to understand the conflicting findings from two different studies on the relationship of team cohesiveness to marketing simulation game performance, Faria and Wellington (1996) undertook a comprehensive examination of the team cohesiveness construct as being multi-dimensional with inter-personal relationships and task related elements. They sought to determine if it was a stable trait of teams and whether it was related to performance or not. They conducted pre and post marketing simulation game play attitude measures of 316 introductory marketing students formed into 91 simulation teams. They determined that cohesiveness involved interpersonal relationships that were stable and did not change in response to performance outcomes. In contrast, task cohesiveness was a flexible attitude that did change in response to performance. Pre-competition cohesiveness did not relate to final performance results.

Managerial traits and simulation performance studies – Research into the attitudes towards the simulation experience led to the desire for a deeper look into the ability of the experience to develop and transform managerial traits. Anderson, Lawton and Wellington (2008) used a pretest-post-test design to examine an organization dimension of affective learning by studying if

student attitudes towards marketing simulation game performance were being moderated by whether student's had a learning goal orientation or a performance goal orientation. A total of 114 students (69% response rate) provided responses on four variables measured in the study: (1) performance on the simulation, (2) student attitudes toward the simulation, (3) student perceptions of how much they learned from participating in the simulation, and (4) student goal orientation classification as performance oriented versus learning oriented. The investigators discovered a weak, but significant relationship between simulation game performance and attitude change. There was no compelling evidence that goal orientation was a moderator of the relationship of attitudes towards the simulation experience and the simulation performance.

Wellington, Hutchinson and Faria (2009) conducted a study on the ability of a marketing simulation game to have a transformative impact (organization learning dimension of affect where one is able to prioritize a value over another and create a unique value system) on the attitudes and traits of participants. In this investigation they were interested in understanding if the experience of playing a marketing simulation game could enable students to become more decisive. They discovered that this trait is not measureable. Instead, psychologists measure its opposite, indecisiveness. After identifying established psychometric scales for indecisiveness and securing permission for their use, they undertook a study to investigate if a marketing simulation experience could transform student indecisiveness attitudes. Employing a pre-test/post-test experimental design on a sample of 348 introductory students they measured changes in participant indecisiveness, competitiveness and attitude toward the simulation experience to determine its impact.

The study uncovered a significant reduction in indecisiveness amongst game players. There were no significant differences in pre-test indecisiveness and attitudes toward the simulation experience in relation to ending rank order performance, but there was a significant difference in simulation performance for highly competitive students versus low competitive students. The post-test measures of indecisiveness, competitiveness and attitude toward the simulation experience showed a significant difference in relation to ending rank order performance. It was concluded that participation in a marketing simulation game produced a significant reduction in indecisiveness and that well performing students reported being less indecisive and more competitive than poorer performing students.

Wellington, Hutchinson and Faria (2010) continued to investigate the affective learning domain impact of playing marketing simulation games and they measured an organization dimension part of this learning domain. Would student performance outcomes affect their confidence in themselves? Would a good performance reinforce the confidence of those who felt highly positive in their abilities? Would a poor performance deflate others? Would a good performance elevate those who had a poor perception and a bad performance simply reinforce that of students with a poor perception? A pretest/post-test experimental design was used to measure the change in participant perceptions and attitudes about their decision making abilities in relation to a marketing simulation game experience. The study findings, involving 275 students, showed that the simulation experience "shook" the confidence in the decision making ability of poor performing students and reinforced it in the well performing students. Well performing students reported a positive and significant change in their perception of their decision making abilities and indicated that they developed decision making approaches or systems while poorer performing tended to not report doing so. This was taken as evidence that there was more learning taking place in the organization dimension of the affective learning domain for good performers than for poor performers.

Finally, Wellington, Hutchinson and Faria (2012) conducted a comprehensive investigation into whether simulation game performance impacted the decision making styles, and the managerial and personality traits of student game players. They employed a pretest/post-test experimental design on a group of 325 marketing students who played as individuals. They surveyed eighteen individual trait measures including: ambiguity intolerance; locus of control; competitiveness; decision-making style; openness; self confidence; extraversion; indecisiveness; basis of decision-making; attitude towards the simulation; decision tool usage; risk averseness; optimism; gaming interest; agreeableness; conscientiousness; work drive; and neuroticism.

They discovered that throughout the simulation experience there were a number of changes in participant managerial and personality traits and decision making styles, for which the extent of change appeared to be related to performance level. They identified a wide range of findings concerning the traits they measured. For example, the traits: basis of decision making (rational or emotional) and self confidence; changed over time within subjects, and also changed over time within subjects in relation to performance. The variables of gaming interest, decision style, and attitude towards the simulation experience changed over the course of simulation play in a positive direction for good simulation performers, and in a negative direction for poor simulation performers, and thus were affected by game performance. In contrast, a number of traits became negative for poor performing simulation participants who became less agreeable, less conscientious, less extraverted, more neurotic and less open. Interestingly, good performers did not gain in these traits despite doing well.

Conscientiousness, indecisiveness, locus of control and optimism were related to the performance level between subjects and while these traits changed over time within subjects, they did not seem to be interacting with performance. This indicates that these traits transformed in response to the experience and not because of performance.

The variables, usage of decision tools, risk averseness, and work drive were unaffected by either simulation participation or simulation performance. Finally, the traits of extraversion and competitiveness did not change over time within subjects. However, they exhibited a significant relationship to performance indicating that they might represent stable predictors of simulation game performance.

Assessment of the impact of simulation play on the affective learning domain - The implications of all these findings from the review of studies in the affective domain is that a simulation gaming experience is associated with managerial trait changes in marketing students which is evidence for the occurrence of affective learning.

The authors' research study results and the experiences with the affective learning domain have tended to be highly rewarding. Marketing simulation games seem to offer transformative experiences for the students who have engaged in them. The only disquieting finding from the studies into the affective learning domain is that when students make positive reports of learning, they are most commonly associated with good simulation performance results. Good simulation performances seem to imbue students with confidence in their abilities while negative ones reduce it. The assessment of the review of research into the affective learning domain is that business simulation games have a strong impact on affective learning.

In an anecdotal report of how a business simulation game experience can be transformational for a student, Wellington wishes to share the story of a student who was in the second semester of his second year and playing a business simulation game for the first time. This student became highly engaged with the simulation and began to make frequent office hour visits to talk about the game. Wellington encouraged the interchanges but did not advantage the student with extra information that his competitors didn't have. During one of the office visits the student admitted that prior to taking the marketing class, he had been feeling highly unmotivated and unrewarded in his business studies. He stated that he had been placed on academic probation and threatened with program dismissal if he didn't improve his grades. He declared that his experience of the simulation, along with his team's exceptional performance, had given him the confidence and motivation to believe that he could succeed as a business student in marketing. Wellington was in attendance at convocation when this student graduated!

CONCLUSIONS

Marketing simulation game performance abilities do not correlate well with general marketing knowledge as measured on MCQ examinations (Wellington and Faria 1991) but, they may correlate with particular capabilities such as quantitative analysis skills (Wellington et al, 2011). The research findings of most of the studies reviewed were negative as to whether business simulation games were truly able to improve the collective decision making abilities of students. This was probably the most disappointing discovery. The very intent of business simulation gaming is to provide students with experiences to enable them to improve their decision making skills. At the same time, some of the studies offered evidence that business simulation games could reveal individuals who already had good decision making abilities. If one takes the position that certain talents and abilities are inherent to individuals and cannot be conferred upon them, then perhaps the learning that is occurring is that of discovery. Consequently, one of the notions this suggests is that business simulation games might be useful as a form of aptitude testing for decision making abilities. Wolfe and Roberts (1986, 1993) conducted studies along this line although they report mixed results.

Even though they are far less complex than real world situations, business simulation games present enough challenges that students have difficulty fully comprehending them. The review of the authors' research and experiences in using marketing simulation games over the past 50 years provides evidence that even when playing the most basic marketing simulation game, the players have difficulty coming to a true understanding of the nature of their simulation environments. In general, student players cannot accurately articulate the parameters the games are functioning under. As such, it can be asserted that the experience of business simulation gaming has a weak impact in the cognitive learning domain of students.

Interestingly, although they generally cannot articulate an accurate understanding of the dynamics of their business simulation gaming environment, on a relative basis, good simulation performers adapt their decision making to their environments better than poorer performers, and they accomplish this faster. This is evidence for learning occurring in the behavioral domain that confers a relative advantage which decides the outcome of simulation competitions. The ability to make appropriate adjustments to even a few of the important response variables of their business simulation gaming environments is clear evidence for learning in the behavioral domain. The review of research findings in this learning domain are compelling enough to rate the learning impact of playing a business simulation game as being medium.

The review of research into the impact of the experience of business simulation gaming on the affective learning domain provided the most encouraging results. The majority of the studies undertaken revealed changes in the mental states of the students in response to the business simulation gaming experience. The research studies consistently report that the affect for the marketing simulation gaming experience correlates positively with the simulation performance outcome. In addition, the many of the studies report trait changes in individuals as well. The conclusion of the review of experiences and research outcomes of the studies into the affective learning domain is that the impact of business simulation gaming on the affective learning domain is strong.

Measuring attitude and trait changes that students have experienced in the affective learning domain as a result of the business simulation gaming experience fits into the Assurance of Learning framework that AACSB accredited schools operate under. The review examined a number of studies in which students provided self-reported experience surveys related to business simulation games. The outcome of these studies indicates that the application of surveys using a pretest-simulation experience-post-test design, while employing psychometric scales to measure attitudes, individual traits, and managerial traits, and accompanied by knowledge measures, offers the best means by which to assess changes in affective and cognitive learning.

As a result of the review undertaken, the final conclusion is that business simulation gaming has an impact in all three of Hoover's (1974) domains of experiential learning.

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