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The changing nature of business simulation/ gaming research: A brief history

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The Association for Business Simulation and Experiential Learning (ABSEL) has recently passed its 25th birthday, and a review of the 25 years of ABSEL conference proceedings starting with Oklahoma City in 1974 provides a good overview of the changing nature of business simulation/gaming research. This article reviews the history of business simulation/gaming research through the eyes and articles of ABSEL members over the past 25 years. The review is limited to several areas of major research interest and examines research in the area of business gaming but not experiential learning.

KEYWORDS: *ABSEL; comparative studies; computerized business games; learning; performance measures; research history.*

Now that the Association for Business Simulation and Experiential Learning (ABSEL) has passed its 25th year and business simulation/games as we know them are approaching their 45th birthday (Faria, 1990), it might be time to examine some changes that have occurred through the years with regard to basic simulation/gaming writing and research. Although a review of business games themselves would be interesting, this is not the purpose of the current article and has been adequately undertaken by Keys and Biggs (1990).

There are many sources that might be used to examine the changing nature of business simulation/gaming research over the years. For example, one might examine all past issues of *Simulation & Gaming*, which has recently passed its 30th anniversary. However, *Simulation & Gaming* covers all forms of simulation/gaming and experiential exercises, not just business gaming, which is the focus of the present article.

As an alternative, another good source is the 25 conference proceedings of ABSEL dating back to the first ABSEL conference in Oklahoma City in 1974. ABSEL, as its name would suggest, is limited to business gaming papers. This report will explore the changing nature of business simulation/gaming research over the past 25 years through the papers presented at ABSEL conferences.

Although it would be nice to examine all ABSEL research, that undertaking would be too difficult for one article. As such, this article is limited to three important research areas of ABSEL members: (a) correlates of simulation performance, (b) the effectiveness of business simulation/games in strategic management courses, and (c) what business games teach. These topics were selected due to the large number of

ABSEL papers (more than 100) written on these three subjects, as will be documented in the following pages. Other topic areas are left to other articles and other researchers. As well, this article deals with only research on simulation/gaming and does not cover the many articles in the area of experiential exercises.

The Beginning

The first two ABSEL conferences (1974 in Oklahoma City and 1975 in Bloomington, Indiana) were dominated by papers on how to effectively use business simulation/games, how to administer simulation/games, how to evaluate performance, descriptions of simulation/games then in use, and discussions of the personal experiences of instructors with their classroom use of business games. This was natural as business game use in university classes was relatively new at that time, and presenters were exchanging experiences during these early years of ABSEL.

In the first year of ABSEL, only 4 papers reporting research findings were presented. By the second year, this number had grown to 14. Years 3 and 4 (1976 and 1977) carried ABSEL from mostly descriptive papers to research-oriented papers. The following pages will examine research contributions to the field of business simulation/gaming through the articles of ABSEL members.

Correlates of Simulation Performance

Many studies during the early years of ABSEL examined the relationship between performance (as measured by company earnings) in a business simulation competition and participant characteristics or the manner in which the simulation was administered. These studies examined such variables as participant personality characteristics, grade point average (GPA), gender, ethnic origin, team size, simulation grade weighting, decision time pressure, the degree of simulation explanation provided, method of team formation, previous business experience, student major, previous business courses taken, degree of team organization and planning, cohesion, locus of control, leadership, attitude toward simulations, and instructor interest, among other variables.

As evidence of the importance of this type of research in the early years of ABSEL, only four articles presented at the first ABSEL meeting in Oklahoma City were based on research findings, and three of these dealt with participant characteristics and game success (Armenakis, Field, & Holley, 1974; Johnson & Landon, 1974; Napier, 1974). Among other things, these studies concluded that simulation/game success is related to dominant personality types, sociables, and teams that exercise democratic decision making. Simulation/game performance was not found to be related to time spent on decisions, average team GPA, or team size.

Factors related to simulation performance became one of the big research areas over the next 3 years among ABSEL members. More than 20 articles presented at the 1975, 1976, and 1977 ABSEL conferences were devoted to this topic area. Among

other things, it was reported that greater instructor involvement improved simulation performance (Biggs, 1975; Nulsen & Faria, 1977; Schreier, 1977), more cohesive teams perform better (Biggs, 1975; Etnyre & Wolf, 1975), teams outperform individuals (Nielsen, 1975), debriefing after each decision period improves performance (Hodgetts & Kreitner, 1975), teams under no time pressure outperformed teams under time pressure (Barone, Dauner, & Rakich, 1975), stress artificially introduced by the simulation administrator lowers performance (Parish, 1975), using simulation/game-related outside assignments improves performance (Faria & Nulsen, 1975), a positive attitude and commitment to the simulation improved performance (Brenenstuhl, 1975; Schneier & Beatty, 1977), smaller teams outperformed larger teams (Hoover, 1976), AE and AC personality types performed better in simulations (Brenenstuhl & Catalanello, 1977), and conflict among team members did not hamper performance (King, 1977). As well, no relationship between locus of control and achievement motivation and simulation performance was reported in two studies (Brenenstuhl & Badgett, 1978; Butler & Parasuraman, 1977).

By 1977 and 1978, many replications of earlier studies on correlates of performance were being presented to corroborate or refute earlier findings. As might be expected, a number of contradictory findings were reported, but consensus was achieved on several issues through well-conceived studies with large numbers of students. For example, Wolfe (1978) concluded that "evidence has been produced that a student's performance in a business game conforms to past academic achievement" (p. 321). This relationship was further supported by Wolfe and Box (1986) and by Lynch and Michael (1989). Wolfe and Box (1986) further concluded that simulation performance is correlated with team cohesion (see also Wolfe & Box, 1987) and strong team leadership. In a study involving more than 300 student simulation/game players, it was concluded by Faria (1986) that teams of three outperformed larger teams (see also Wolfe & Chacko, 1982), greater instructor involvement resulted in better game performance, and teams in high simulation/game grade-weighted sections outperformed teams in lower grade-weighted sections.

Although individual studies reporting on selected correlates of performance continued to appear, the focus of this type of research began to change from the late 1970s through the early 1980s. This change gradually took the form of attempting to use participant characteristics to predict simulation performance (e.g., Brenenstuhl & Badgett, 1978; Schneier & Beatty, 1977) and from examining individual participant characteristics to team characteristics (e.g., Curran & Hornaday, 1987, 1989; Hornaday & Curran, 1987, 1988; Hornaday & Wheatley, 1986; Wellington & Faria, 1989). The studies attempting to predict simulation performance based on participant characteristics achieved mixed results. Gosenpud (1987) summarized the findings from many of these studies and attempted to explain the mixed findings.

According to Gosenpud (1987), the difficulty with using participant characteristics to predict team simulation performance was due to the mixture of characteristics that is to be found on teams of three to six or more members. As such, team characteristics (e.g., degree of planning, formal decision-making organization, cohesion) have proven to be slightly better predictors of performance than individual characteristics

(e.g., GPA, major, personality type). Two studies can be cited in support of Gosenpud's conclusions.

Lynch and Michael (1989), using single-player teams, found that they were able to successfully predict company earnings performance in the simulation based on individual-player GPA. In the same fashion, using single-player companies, Anderson and Lawton (1991) replicated a study undertaken by Patz (1990). When using five-person teams, Patz was unable to predict company performance based on Myers-Briggs personality types. However, with single-person teams, Anderson and Lawton (1991) were able to correctly predict that "thinker" personality types would outperform "feeler" personality types.

Several research findings using teamwide characteristics were quite clear. For example, Hornaday and Curran (1988), Curran and Hornaday (1989), and Wellington and Faria (1989) all report that team performance in a simulation competition is related to the team's degree of formal planning. Hornaday and Wheatley (1986) reported that teams with conceptual decision styles, as measured by the Rowe Decision Style Inventory, outperformed other decision styles. Hornaday and Curran (1988), when replicating this study, reported similar, although not statistically significant, results.

Ultimately, research in this area has culminated in a series of articles by Gosen and Washbush presented at ABSEL conferences from 1993 to 1998. These articles are based on 5 years of classroom experimentation involving 401 student simulation/game participants. From a review of the ABSEL literature, Gosen and Washbush (1998) concluded that eight participant characteristics are most likely to be related to simulation/game performance. These are academic ability, participant motivation, team cohesion, degree of team organization, team goal setting, degree of team competitiveness, perceptions toward the particular simulation, and perceptions about simulation/games as a learning tool.

Viewed over a 25-year period, research in the area of correlates of simulation performance has moved through five stages: (a) an examination of individual participant characteristics and business game performance (1974 to 1977), (b) replications of earlier research and a move to team and game administration characteristics (1978 to 1981), (c) predictions of team performance based on characteristics of team members (early 1980s), (d) some success in predictive studies based on team characteristics (late 1980s), and (e) the reaching of some consensus on characteristics related to business game success (1990s). Likely due to the large number of papers presented in this topic area at ABSEL conferences over the past 25 years, research in this area now seems to be on the decline.

The Effectiveness of Games in Strategic Management Courses

The teaching and learning effectiveness of business simulation/games versus other teaching methods has been an ongoing concern of business game users right from the beginnings of ABSEL. Being newer and different from lectures and cases, it was

important to establish that simulation/games were as effective as other teaching approaches.

Although ABSEL members have been major contributors to the study of the effectiveness of business games in strategic management courses, significant research in this area predates the formation of ABSEL (see, for example, Greenlaw & Wyman, 1973, and Raia, 1966, for early reviews of studies in this field). The first study findings by an ABSEL member comparing the use of a simulation/game with some other teaching approach were presented by Fritzsche (1974) at the first ABSEL meeting. Fritzsche examined common midterm and final exam scores in a game-centered introductory business course section versus a lecture-centered section. At a .01 level of significance, the game-centered section students outscored the lecture-centered students on both the course midterm and final exams.

The next 3 years of ABSEL produced nine articles comparing the effectiveness of business games to more traditional teaching approaches (Brenenstuhl, 1975; Catalanello & Brenenstuhl, 1977; Certo, 1975; Fry, Kidron, & Schriesheim, 1975; Mancuso, 1975; Roberts & Field, 1975; Sampson & Sotiriou, 1977; Scott, 1977; Wolfe & Byrne, 1976). In seven of these nine studies, students in the simulation section either scored higher on common exams or felt that they learned more than students in traditional lecture or lecture/case sections did. No differences were found in the other two studies.

Keys (1976) was the first ABSEL member to present an overview of studies comparing the effectiveness of business games in strategic management courses to traditional teaching approaches. For his review, Keys examined "only articles which utilize definite criteria for the measurement of learning and professionally acceptable research techniques" (p. 173). Keys's review covered 13 articles appearing between 1962 and 1975. Across the studies reviewed, simulation/game sections of courses produced superior results (generally on course final exams) in 9 of the studies, case sections were shown to be superior in 2, and there were no significant exam score differences between the business game sections and the case sections reported in the other 2 studies.

Although individual studies continued to appear comparing business games to traditional teaching methods in business strategy courses, Wolfe (1976) and Parasuraman (1978) presented articles providing guidelines and a framework that should be used for such comparative studies. As well, Wolfe (1985) updated the Greenlaw and Wyman (1973) overview by examining all comparative studies using a rigorous research design published between 1973 and 1983, whereas Miles, Biggs, and Schubert (1986) reviewed studies examining student perceptions of learning. Across 39 studies reviewed by Wolfe (1985), 19 showed simulations to be superior to other teaching approaches, 10 showed traditional approaches to be superior to simulations, and no learning differences were reported in the other 10 studies.

Miles et al. (1986) reviewed 16 studies and found that students perceived simulations to be a superior learning tool in 10 of the studies, cases were perceived as being superior to simulations in 4 of the studies, and no differences were reported in 2 of the

studies. Based on a detailed overview of the 61 studies covered in the Greenlaw and Wyman (1973) and Wolfe (1985) reviews, Hsu (1989) concluded, "The message that the management game is a powerful tool for the learning of managerial skills is rather unequivocal" (p. 428).

The results of 25 years of ABSEL research and more than 30 years of research overall on this topic have been most recently summarized by Wolfe (1997). Once again, Wolfe reviewed only studies that used a rigorous research design, an objective learning measure, and at least one treatment group and one control group. Furthermore, Wolfe divided the research studies into two types: (a) substantive evaluations and (b) procedural evaluations.

Substantive evaluations are those that concentrate on the results produced by the teaching method, whereas procedural studies are those that examine what practices in a simulation/game lead to the best performance results. Examined here will be Wolfe's (1997) conclusions with regard to the substantive studies. Although conceding that there are many confounding variables that enter the picture, Wolfe concluded that

Ample evidence has been presented authenticating the effectiveness of computer-based general management games as vehicles for teaching strategic management. In every study cited, the particular business gaming application produced significant knowledge-level increases. When the business game method was pitted against the case approach, the game approach was superior to cases in producing knowledge gains. (p. 369)

Research over the past 25 years of ABSEL on the effectiveness of business games as a learning tool can be divided into five periods: (a) initial studies comparing business games to other teaching approaches (1974 to 1977), (b) reviews of all comparative studies (1978 to early 1980s), (c) the development of guidelines for future comparative studies (mid-1980s), (d) further reviews and updates on comparative studies (mid- to late 1980s), and (e) conclusions on the effectiveness of business games (1990s).

With regard to the overall effectiveness of business games, ABSEL members have undertaken, or reported on, 78 studies comparing business simulation sections of courses with sections taught through some other approach (generally cases). On common exams, students in simulation/game sections of strategic management courses have outperformed students in the control sections in 46 of the studies, the control sections have outperformed the game sections in 16 of the studies, and there were no statistically significant exam score differences reported in the other 16 studies. Business games have thus been shown to be as effective as or more effective than more traditional teaching approaches in strategic management courses.

Although comparative studies continue to appear and the issue of the effectiveness of business games continues to be discussed, as ABSEL moves through the 1990s, as with correlates of business game performance, comparative studies are declining in number and importance at current ABSEL conferences.

What Business Games Teach

From the very beginning, a concern among ABSEL members has been “What do business games teach”? In the very first year of ABSEL, an article appeared talking about the most obvious thing taught by business games: how to make decisions and develop strategies (Baldwin, 1974). Baldwin (1974) related his experiences in using the HARVARD BUSINESS GAME and the CARNEGIE-MELLON UNIVERSITY GAME as alternatives to cases and lectures and the basic advantage that business games offered—participants are placed in a decision-making role.

Articles presented in the second year of ABSEL reported that business games could teach ethics and social responsibility (Smith, 1975) and the application of mathematical models (Beldt, 1975). However, it was in the third year of ABSEL that this topic area hit its peak with 15 papers devoted to the issue of what is taught or learned through the use of business games.

The many subjects/topics that are taught through business simulation/games, as suggested by 1976 ABSEL articles, included entrepreneurial skills (Schreier & Komives, 1976); inventory management (Ferguson, 1976; Gentry & Reutzel, 1976); specific job skills such as personnel administration, hiring, motivating, and leading (Schreier, 1976a); mathematical modeling (Sewall, 1976); job-hunting skills (Beatty & Schneier, 1976); research and data analysis skills (Burns, 1976a; Stanton, 1976; Whatley, 1976); collective bargaining (Brenenstuhl & Blalack, 1976); mail survey techniques (Burns, 1976b); recruiting and applicant evaluation skills (Schreier, 1976b); creating advertisements (Dube, 1976); basic financial concepts (Jauch & Gentry, 1976); and basic economic concepts (Cowles & Hauser, 1976). Added to these in the next year were leadership skills (Hunsaker, 1977), interpersonal skills (Certo & Newgren, 1977), communication skills (Connolly, Connolly, Pounds, & Wiebe, 1977); problem-solving skills (Beatty & Kulisch, 1977), economic forecasting (Napier, House, & Paralkar, 1977), conflict resolution (King, 1977a, 1977b), and the relationship between distinct business decision-making areas (Fritzsche, 1977).

Through the remainder of the 1970s and 1980s, articles illustrating specific topics or issues taught through the use of business simulation/games continued to appear. In a slightly different vein, Teach and Govahi (1988) surveyed business executives who had participated in business simulation/games while students. The business executives rated simulation/games a very effective approach to teaching communication skills, group behavior skills, decision-making skills, how to adapt to new tasks, how to organize, and how to assess new situations quickly. It should also be pointed out that several studies suggest that less skilled students learn more from simulations than do students with greater skills (e.g., Washbush & Gosenpud, 1994; Wolfe & Chanin, 1993). Further to the learning possibilities of business simulation/games, studies reviewed by Malik and Howard (1996) indicate that students have more positive attitudes toward learning from business games than from other teaching approaches, and 69% of the business policy teachers surveyed by Williams (1987) felt that business games are the best way to teach policy.

In one overview, Gosenpud (1990) reviewed 18 rigorous studies measuring learning or behavior change through the use of a business simulation exercise. In 17 of the 18 studies reviewed, the authors reported positive results in that certain skills were acquired or certain behavior was changed.

As general agreement emerged that learning does occur through the use of simulation/games, the questions raised by many ABSEL researchers changed from "What (specifically) is learned?" to "What type of learning occurs?" and "How does learning occur?" Although learning is too broad an issue to be discussed in depth here, the interested reader can examine an excellent overview by Wolfe (1990).

With regard to the issue of what type of learning occurs through the use of business simulation/games, in an early ABSEL article, Hoover and Whitehead (1975) stated, "Experiential learning exists when a personally responsible participant cognitively, affectively, and behaviorally processes knowledge, skills, and/or attitudes in a learning situation characterized by a high level of active involvement" (p. 25). Borrowing from Hoover and Whitehead, the type of learning that might occur through participation in a business simulation/game can be categorized into cognitive learning, affective learning, and/or behavioral learning.

Cognitive learning might be viewed in several different ways but, from the perspective of business game users, cognitive learning might best be thought of as developing an understanding of basic facts and concepts so that sound decisions can be made (Wellington, Faria, Whiteley, & Nulsen, 1995). Much past research suggests, as the earlier discussion has shown, that basic facts of many types are learned through simulation/games. In addition, reviews of past research by ABSEL members comparing business simulation/game sections to traditional lecture or lecture/case sections of a class have shown that simulation/game section students scored better on course final exams in the great majority of cases reviewed (Faria & Whiteley, 1990; Keys, 1976; Wolfe, 1985). Finally, a number of studies have shown that simulation participants do, over time, begin to understand the nature of the marketplace environment in which they are operating (Dickinson & Faria, 1997; Faria & Dickinson, 1990; Wellington & Faria, 1997; Whiteley, Faria, & Dickinson, 1990). All of this would support the contention that simulation participants learn basic facts or concepts.

Affective learning might best be thought of as what the simulation/game participants perceive that they learn (Parasuraman, 1980). Again, as described in numerous research studies cited earlier and in more recent research overviews (Anderson & Lawton, 1997; Gentry, Commuri, Burns, & Dickinson, 1998; Gosen & Washbush, 1997; Gosenpud, 1990; Malik & Howard, 1996), business game participants generally express a positive attitude toward simulation/games and the perceived learning from business simulation/games. This positive feeling continues, as well, years after business simulation/game participants have finished their simulation exercises and moved into the business world (Teach & Govahi, 1988).

Behavioral learning might be described as the simulation participant taking the facts or concepts that have been learned and formulating correct decisions or actions or exhibiting changes in behavior in light of the new information learned (Byrne & Wolfe, 1974; Wellington et al., 1995). Research results attempting to measure

behavioral change have been mixed (Anderson & Lawton, 1988; Armstrong, 1978; Fry et al., 1975; Gosenpud, 1982; Kelley, 1982; Savage, 1979).

The most ambitious attempt to measure behavioral learning was undertaken by Wellington et al. (1995). Using 68 students participating in a strategic marketing simulation/game, the researchers, through the use of questionnaires and quizzes completed after each decision round, attempted to determine what game participants were learning (cognitive learning). Based on what participants were learning, the decisions of the game participants were closely monitored to see if what was being learned was translated into "correct" decisions (behavioral learning). The results of this study were only moderately successful. Although game participants were able, over time, to correctly understand the marketplace environment in which they were operating (evidence of cognitive learning), they did not always translate their knowledge into the "right" decisions, or strategies, for their markets (only partial evidence of behavioral learning).

Continuing the strong research interest in this topic area, at the present time, Gosen, Washbush, Patz, and Wolfe (1999) are attempting to construct a test bank, categorized according to predetermined learning objectives, that will be designed to assess learning from business simulation/games. If such a test bank can be constructed, this might finally bring about the consensus in this research area that is currently lacking.

Viewed over the past 25 years, research on the teaching/learning dimensions of business simulation/games has progressed through six periods: (a) many studies identifying specific issues learned through business games (1974 to 1976), (b) extension of basic learning studies from students to business executives and simulation administrators (late 1970s and early 1980s), (c) overviews of learning studies (mid-1980s), (d) agreement that some form of learning takes place with the use of business simulation/games (late 1980s), (e) a shift in research from what is learned to how learning takes place (early 1990s), and (f) attempts to design studies that will prove cognitive and behavioral learning occurs through the use of business games (late 1990s).

Unlike the previous two topic areas that seem to have peaked and are now in decline when measured through number of papers at current ABSEL conferences, this topic area is still very important to ABSEL members. It is likely that research on the learning aspects of business simulation/games will continue into the new millennium.

Summary

The 25 years of ABSEL conference proceedings provide a rich history for viewing the changing nature of business simulation/gaming research. Three important areas of research for ABSEL members, as determined by number of papers presented, have been (a) correlates of simulation performance, (b) the effectiveness of business games, and (c) what games teach. This article has demonstrated that ABSEL members have reasonably clearly identified a number of factors that are correlated with simulation/game success, are able to use these factors to predict simulation/game performance,

have shown that business simulation/games are a powerful teaching tool, and have identified many variables that can be taught/learned through the use of business simulation/games. Although research on the correlates of game success and comparative studies are in decline at ABSEL, how learning occurs and the types of learning that occur through the use of business simulation/games remain very strong and very important to ABSEL members.

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