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EDUCATIONAL EFFECTIVENESS OF BUSINESS SIMULATION GAMING:
A COMPARATIVE STUDY OF STUDENT AND
PRACTITIONER PERSPECTIVES

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ABSTRACT

The purpose of this study is to clarify some of the issues surrounding the educational value of business simulation gaming. It examines and compares student and practitioner perceptions of simulation effectiveness in enhancing participants' appreciation of, and skills in, such areas as interpersonal relationships, theory application to real-world problems, planning, decision making/problem solving, conceptualization/integration of business functional issues, and environmental analysis.

INTRODUCTION

More than three decades have passed since in 1956 the first practical business game was introduced by the American Management Association. Since that time, the number of available collegiate-level business games has mushroomed. By 1980, the field's major sourcebook identified and described 228 different business games available for use in education and training (Horn & Cleaves, 1980). Surveys report that simulation game usage among AACSB member schools increased from 71 percent of respondents in 1962 to over 95 percent in 1987 (Faria, 1987).

The growth of simulation game usage has provided the impetus for the emerging body of research literature concerning this instructional pedagogy. To date, researchers have examined such related issues as organizational learning (Cangelosi & Dill, 1965); influences on learning in business games (Chisholm, Krishnakumar, & Clay, 1980); the effect of information (Biggs & Greenlaw, 1976); the effects of advisors (Starbuck & Kobrow, 1966); real-life applicability of learning through simulations (Wolfe & Roberts, 1986); the impact of game complexity on learning (Wolfe, 1978; Butler, Pray, & Strang, 1979); and performance and behaviors of undergraduate and graduate business students in simulation games (Hemmasi, Graf, & Kellogg, 1989).

The types of managerial skills (e.g., problem solving/decision making, teamwork/interpersonal) that students are expected to learn through this instructional tool also have been a subject of continuing inquiry in the above stream of research. Keys (1976), and Wolfe (1985) provide excellent reviews of the more rigorous studies on the above subject. These comprehensive reviews, however, point to the inconclusive and contradictory findings of such investigations. In regard to the issue of skills transfer, Partridge and Sculli (1982), for example, found simulation gaming to be most effective in developing decision making and information

processing skills, but ineffective in developing peer and leadership skills. Conversely, Roderick, Wilterding, and Eldredge, (1979) reported simulations to be a highly effective means of improving interpersonal skills, while Miles, Biggs, and Schubert, (1986) found simulations to be less effective than other methods in improving problem solving skills.

Such clear inconsistencies in the literature can be attributed, in part, to methodological and research design imperfections (Stone, 1982). Some studies, for example, involved "comparing simulations to other pedagogies in the abstract, mixed diverse groups such as MBAs and undergraduates, and did not use statistical analysis" (Miles, et al., 1986: 11). Others have based their conclusions solely on surveys of business school deans (e.g., Faria, 1987). Such considerations have prompted critics to call for use of standardized questionnaires and reporting procedures, more rigorous research designs and methods of analysis, and collection of data from both students and practitioners (Parasuraman, 1981; Wolfe, 1985; Miles et al., 1986). The research reported here is a step in that direction.

RESEARCH QUESTIONS AND OBJECTIVES

Specifically, the present study was designed to overcome the above mentioned shortcomings. It examines and compares student and practitioner perceptions of the educational effectiveness of simulation gaming in enhancing participants' appreciation of, and skills in, such areas as teamwork/interpersonal relationships, theory application to real-world situations, planning, problem solving/decision making, conceptualization and integration, and environmental analysis. The student and practitioner perspectives on the subject were obtained through a survey of both business students participating in an all enterprise simulation game, as well as business alumni (hereafter called practitioners) who, prior to employment, had been exposed to the same simulation experience as students.

We expect that the years of experience that practitioners have gained since graduation will put them in a unique position to retrospectively, and perhaps more realistically, judge the true educational value of their collegiate simulation experience. In addition, as was mentioned earlier, it is conceivable that the inconsistencies in the existing literature are, at least in part, attributable to the different types of research subjects (i.e., students, practitioners, deans) used by different investigators in previous studies. By simultaneously studying and comparing the student and practitioner data in this study, we may

have the unique opportunity both to examine the plausibility of the aforementioned contention and, then, perhaps explain and put to rest some of the controversy that surrounds the subject. Finally, this study will ascertain practitioner/student perceptions concerning the extent to which each of the skills and concepts learned through simulation gaming has been/will later be helpful in their performance on the job.

The research propositions to be tested are presented below. Notice that because of the exploratory nature of the study and the inconclusiveness of evidence in the existing literature, these propositions are stated in a non--directional form.

Prop 1. There is a significant difference between student and practitioner perceptions regarding educational effectiveness of business simulation gaming in teaching various managerial skills.

Prop 2. There is a significant difference between student and practitioner perceptions regarding the importance of various managerial skills to job performance.

METHODOLOGY

Sample and Data Collection

The sample for this study is composed of two groups-l46 senior business students at a large midwestern university and 124 of the university's business alumni. Student data were collected (over two semesters) at the conclusion of the semester through a standardized questionnaire from capstone business policy/strategic management course sections that employed the Micromatic all-enterprise business simulation (Scott & Strickland, 1985). The practitioner data were obtained by mailing the same questionnaire to approximately 550 employed business alumni who, as college seniors (in the five years prior to the survey), were also exposed to the same simulation by the same instructors.

Variables and Measurement

Overall educational effectiveness of simulation gaming as an instructional pedagogy was measured through a 7-point scale item ranging in response options from 1 = not at all effective, to 7 = most effective. Effectiveness of simulation gaming in teaching the various managerial skills (i.e., teamwork/interpersonal, theory application to real world situations, planning, conceptual/integrative, problem solving/decision making, and environmental analysis) were operationalized through multi-item Likert scales. Specifically, for each of the above variables, respondents were first asked to rate their agreement/disagreement (on a 7-point scale) with a number of statements concerning effectiveness of the business simulation in developing their skills in that area. Responses on related items were then aggregated to compute the respondent's score on the corresponding variable. Chronbach's alpha reliability coefficients on these items were quite high and ranged from 0.71 for conceptual/integrative to 0.88 for

problem solving/decision waking.

Next, respondents were asked how important (1 = not at all important, 6 = extremely important) they thought issues presented in the same questionnaire items (as above) were/will be to their performance on the job. Again, related items were aggregated to compute scores on the importance of corresponding management skills. Cronbach's alpha reliability coefficients for these variables were also high and ranged from 0.67 for conceptual/integrative to 0.86 for planning.

Data Analysis

Analysis of variance was the primary method of data analysis for this study. One-way ANOVA was applied to the data to test the differences in mean values of the variables for the student and practitioner groups.

RESULTS AND DISCUSSION

Results of the one-way ANOVA on simulation gaming's overall effectiveness and effectiveness in teaching specific management skills are presented in Table 1.

TABLE 1

Effectiveness of Simulation Gaming
in Teaching Managerial Skills:
Results of One-Way ANOVA

Managerial Skills:	Means		F-value
	Students (n = 146)	Practitioners (n = 124)	
Teamwork/ Interpersonal	4.65	5.22	14.91***
Theory Application	4.28	4.46	1.35
Planning	4.67	4.91	2.67*
Conceptual! Integrative	4.44	4.67	1.92
Problem Solving/ Decision Making	4.43	4.72	3.68**
Environmental Analysis	4.78	4.89	0.47
Overall Effectiveness	4.52	5.11	7.13***

* $p < 0.10$
** $p < 0.05$
*** $p < 0.01$

In general, both student and practitioner subjects have reacted favorably to the pedagogical benefits of

the simulation experience. The mean ratings in all managerial skill areas are larger than 4 (on a 1 to 7 scale) for both groups. It also is clear from the table that the mean rating of overall simulation effectiveness is significantly higher ($p = < 0.01$) for practitioners than it is for students. Furthermore, mean scores for practitioners in all specific skill areas are consistently higher than those for students. In addition, the differences between mean scores for the two groups on teamwork/interpersonal, planning, and problem solving/decision making are statistically significant ($p = < 0.01$, $p = < 0.1$, and $p - < 0.05$, respectively). Finally, comparing the mean scores of various skills for the practitioner group indicates that this group views the opportunity to work in a team context and the interpersonal skills learned from it as the most tangible outcome of the simulation experience.

All of this clearly suggests that practitioners, as compared to students: a) attribute significantly greater overall educational utility to business simulation gaming as a teaching pedagogy, and b) view business simulation as particularly more effective in teaching such essential managerial skills as teamwork, planning, and problem solving/decision making. In short, results of this study seem to provide strong support for the hypothesized relationships implied in Proposition 1 stated earlier. It appears that the practitioners' maturity and work experience provide them with a significantly greater appreciation for the true value of collegiate simulation experiences. The above results also indicate that some of the inconsistencies in the findings of previous research with respect to simulation gaming effectiveness are, in fact, attributable to the differences in the type of study participants used by different researchers.

Table 2 presents the results of ANOVA on importance of various management skills to job performance as perceived by students and practitioners. The results from Table 2 appear to partly support the relationships hypothesized in Proposition 2 stated above. According to this table, differences in student and practitioner mean scores on teamwork/interpersonal and environmental analysis are both statistically significant ($p = < 0.01$ and $p = < 0.1$, respectively). That is, when asked to rate the importance (to job performance) of managerial skills that were developed through the simulation, practitioners reported teamwork/interpersonal skills to be significantly more important than did students, while students perceived environmental analysis skills to be more important than did their practitioner counterparts. This result suggests that, compared to students, practitioners attach significantly greater importance to interpersonal/teamwork skills as a requirement for effective performance on the job. The fact that students (in comparison with practitioners, who are more realistic and speak from experience) underestimate the significance of such skills is a reflection of their naivete and bias stemming from lack of real-world professional experiences.

Table 2 also indicates that students perceive environmental analysis to be significantly more important to job performance than do practitioners. This 'nay be attributable to a combination of: a) the competitive nature of the simulation experience requiring participants' constant awareness of competitive and other environmental factors, b) the recency of the students' experience in the competitive simulation exercise, and c) predominance of entry-

TABLE 2

Importance of Various Managerial Skills
to Job Performance: Results of One-Way ANOVA

Managerial Skills:	Means		F-value
	Students (n = 146)	Practitioners (n = 124)	
Teamwork/ Interpersonal	4.61	4.93	7.59***
Theory Application	4.31	4.27	0.10
Planning	4.54	4.71	1.83
Conceptual/ Integrative	4.47	4.46	0.01
Problem Solving/ Decision Making	4.56	4.70	1.60
Environmental Analysis	4.54	4.31	2.84*

*$p < 0.10$
**$p < 0.05$
***$p < 0.01$

to mid-level managers and business professionals in our practitioner subsample (environmental/competitive forces may not be highly relevant to job responsibilities at these organizational levels).

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