

Developments In Business Simulation & Experiential Exercises, Volume 22, 1995

ARE GOOD STRATEGIES CONSISTENTLY GOOD?

Donna Green and A. J. Faria, University of Windsor

ABSTRACT

One of the conclusions from the ongoing stream of PIMS research is that business strategies are successful if their fundamentals are good, unsuccessful if they are not. The implication is that successful strategies in a particular marketplace/economic environment will continue to be successful strategies in similar environments - even if competition is changed. The study presented here tests this conclusion in a business simulation competition and finds that successful strategies in one industry will, indeed, be successful in another.

INTRODUCTION

It has now been over 35 years since the first business simulation game was used in a college class at the University of Washington in 1957 (Watson 1981). Since that time, the number and variety of business games available for classroom use has grown enormously. Interest among academics in the teaching and learning possibilities of business games has clearly grown as well. Presently, over 200 business games are being used by nearly 9,000 teachers at over 1,700 colleges offering business programs (Faria 1989). Empirical research in the area has been extensive. Comprehensive reviews can be found in Greenlaw and Wyman (1973), Keys (1976), Wolfe (1985), Miles, Biggs and Shubert (1986), and Randel, Morris, Wetzel and Whitehill (1992).

Despite the widespread use of business simulations, an important and vexing issue regarding business games is whether or not participation is a meaningful experience. This article introduces an original criterion for assessing the validity of simulation participation that relates to the strategy planning research undertaken over the past thirty years by the Strategic Planning Institute. Specifically, whether the successful performance of simulation teams is consistently successful when applied to new simulation environments. If this is true, a case can be made for the internal validity of simulation gaming models and the meaningfulness of participation in simulation exercises.

PAST RESEARCH

Meaningfulness, as applied to business simulations, has taken on a number of specific interpretations as reflected in past research including: (1) the learning, or skills training, aspects of simulation gaming, (2) the relative merit of

simulation games versus other teaching methods, (3) the external validity of business simulations, and (4) the internal validity of simulation game participation.

Research into the learning or skills training aspects of business simulation gaming dates back a number of years. The reported types of learning brought about through simulation participation include goal setting and information processing (Philippatos and Moscato 1969; Greenlaw and Biggs 1974; Biggs 1975; Biggs and Greenlaw 1976), organizational behavior and personal interaction (Cangelosi and Dill 1965; Chisholm 1979), sales forecasting (Edwards 1987; Hall 1987; Neuhauser 1976; Snow 1976), financial analysis skills (Faria and Nulsen 1976; Hall 1987), basic economic concepts (Edwards 1987), and selected quantitative skills (Whiteley and Faria 1989).

The relative merit of simulation games versus other teaching approaches has been investigated by a number of researchers (Greenlaw and Wyman 1973; Keys 1976; Snow 1976; Waggener 1979; Wolfe 1985; Miles, Biggs and Shubert 1986; Hall 1987; Specht and Sandlin 1991; Washbush and Gosenpud 1991; Randel, Morris, Wetzel and Whitehill 1992). Several comprehensive reviews, as cited earlier, have summarized the bulk of these comparative studies. Across all of the reported studies, simulation games were found to be more effective than conventional instructional methods (generally cases and lectures) in 75 of the comparisons, conventional methods of instruction were found to be superior in 27 of the comparisons, while no differences were reported in 58 of the comparisons. The reported studies included business as well as social science simulations.

The external validity of a simulation model has generally been viewed as a measure of how well the model matches its real-world counterpart (Carvalho 1991; Mehrez, Reichel and Olami 1987; Parasuraman 1986; Stanislaw 1986; Watson 1981; Wolfe and Roberts 1986). In the classroom setting, two approaches have been used to investigate external validity. The first approach has focused on the correlation between a business executive's simulation performance and his/her real-world performance. If the simulation is externally valid, a successful business executive should also be successful when participating in the simulation competition. A number of studies of this nature have generally supported the external validity of the simulations being examined

Developments In Business Simulation & Experiential Exercises, Volume 22, 1995

(Babb, Leslie and Van Slyke 1966; McKinney and Dill 1966; Vance and Gray 1967; Wolfe and Roberts 1986). The second approach to measuring external validity uses a longitudinal research design. In this approach, a student's business game performance is compared to some measure of subsequent business career success (e.g., number of promotions, salary level, etc). Using this approach, Norris and Snyder (1982) did not find a significant correlation between business game performance and career success although two more recent, and more comprehensive, studies have reported such a correlation (Wolfe and Roberts 1986; Wolfe and Roberts 1993).

The internal validity of simulation games has been examined in three ways. The first approach basically states that if a simulation exercise is to be internally valid, better students should outperform poorer students. Several studies have supported this view of the internal validity of the simulations being tested (Gray 1972; Vance and Gray 1972; Wolfe 1987). A second, and more reasonable view of internal validity, examines whether participant decisions in a simulation competition, over time, conform to the environment of the simulation. While the dynamics of the simulation and the actions of competing companies will certainly influence participants' decisions, the simulated environment too must be considered and, ceteris paribus, participants' decisions should reflect or adapt to this environment. If this type of adaptive decision making does occur, the simulation can be said to be internally valid. Several studies of this nature (Faria, Dickinson and Whiteley 1992; Whiteley, Faria and Dickinson 1991; Dickinson, Faria and Whiteley 1990) have been mildly supportive of the internal validity of the simulations examined. The third approach used examines whether logical, systematic strategies formulated by real participant teams will be superior to random strategies generated by a computer (Dickinson and Faria 1994). The results of this study showed real participant strategies to be significantly superior to random strategies when examining earnings and ROI performance.

While past research approaches have considerable merit, a new approach to examining simulation validity and meaningfulness is presented. This approach relies on the reported findings of the PIMS project of the Strategic Planning Institute and other recent simulation research.

REPEATED USE OF WINNING STRATEGY

The PIMS (Profit Impact of Marketing Strategies) project was initiated in the 1960s within the General Electric Company. In order to expand the program, the project

was moved to the Harvard Business School in 1972 and, to facilitate the further growth and evolution of the program, the Strategic Planning Institute was formed in 1975 to administer the project.

The PIMS program is a multi-company activity designed to provide an improved and innovative database for business planning. Each member company of the PIMS program contributes information about its business conditions and strategies to the PIMS database each year. The PIMS staff analyzes the data to search for general laws that seem to govern the business environment much as there are general laws of nature (Henderson 1980). Currently there are over 3,800 businesses contributing data on a yearly basis to the Strategic Planning Institute.

In a recent publication of the Strategic Planning Institute, several findings from the very large PIMS database were put forth. These findings included the following: (1) Business situations generally behave in a regular and predictable manner; (2) All business situations are basically alike in obeying the same laws of the marketplace; (3) The laws of the marketplace determine about 80 percent of the variance in business performance; and (4) Business strategies are successful if their fundamentals are good, unsuccessful if they are unsound (Schoeffler 1993).

In one major format of simulation gaming, participants are grouped into companies and companies are, in turn, grouped into industries. Companies within a given industry compete against each other with the simulation participants managing the contesting companies. The winning company in the simulation competition is generally the one with the highest overall earnings. The simulation team with the highest earnings, in turn, is the one that has developed the best strategy in relation to the simulation environment in which it is operating.

Past simulation research has suggested that teams that have engaged in more detailed formal planning tend to perform better (Smith and Golden 1989; Wolfe and Gosenpud 1989; and Gosenpud and Washbush 1991). Further, a survey of business policy instructors indicated that goal setting and strategy formulation are the most important business concepts to be taught in management courses (Boyd and Summers 1984). If the findings reported from the PIMS project and past simulation research are correct and simulation games do, in fact, possess internal validity, successful simulation strategies should be consistently successful over time. As such, successful simulation strategies should continue to be successful when applied to new competitive environments provided that the basic marketplace environment is

Developments In Business Simulation & Experiential Exercises, Volume 22, 1995

similar.

HYPOTHESIS

Based on the research cited above, the following general hypothesis is put forth for testing.

H1: A successful business strategy as measured by highest earnings performance in an industry will continue to be a successful strategy when employed in similar simulation/industry environments.

Past simulation research has suggested that the simulation models tested possess both external and internal validity. That is, more successful business executives outperform less successful executives in the simulation competition, better performing students in the simulation competition have more successful business careers, better students (as measured by GPA) outperform poorer students, participant decisions (over time) tend to conform to the simulation environment, and logical/consistent strategies outperform random strategies.

Given these conditions, and the findings reported from the PIMS project, it would seem that a successful strategy in a simulation competition would continue to be a successful strategy when applied in a different competition in which the general nature of the marketplace environment was unchanged.

DATA COLLECTION

The subjects for the research reported here are undergraduate students in a marketing management course. The course is built around case analyses and a simulation competition. The simulation game used is COMPETE: A Dynamic Marketing Simulation (Faria, Nulsen and Roussos 1994). This is a widely used marketing simulation available in five languages and in use in well over 250 universities. Participants in the COMPETE simulation take on the roles of the top marketing managers for their company and are responsible for the entire marketing strategies for their firms. This includes product, price, place, and promotion decisions. All told, the participants are responsible for making 73 separate decisions. In addition, fifteen separate marketing research studies may be purchased during each period of the competition.

COMPETE proceeds on a period by period basis. Participants formulate their strategies and receive the results of those strategies in the form of updated financial statements, market share reports, sales force and inventory

summaries, advertising reports, product and production reports, and other types of information. With these results, and considering the new status of their company, participants again formulate their strategies for the next competition period.

As is normal in a simulation competition, the approximately 430 students in all sections of the marketing management course used for this research were divided into 125 teams of three or four students. The 125 teams were further divided into 25 industries of five companies each. The students made twelve decisions in the simulation competition, representing three years of business operation, and were graded on the basis of their earnings per share (EPS) performance. The simulation counted towards 25 percent of each student's final grade in the course.

At the completion of the twelve periods of the COMPETE simulation, results were collected from the 25 industries. The winning team (highest cumulative EPS) from each industry was identified and was removed from its industry. Each winning team was then randomly assigned to "compete" in another industry. In other words, each winning team was moved to another industry, the new industry consisting of the four remaining teams after the removal of that industry's leader.

Once new assignments were made, the twelve periods of the simulation competition were re-run. The re-run included the decisions of the new company (a leader from another industry) and the original decisions of the other four companies. In effect, the original industry leaders were now placed into new industries in which the marketplace environment was the same as in their original industry but in which they had no opportunity to react to their new competitors. This would result in a pure test of their original strategy and the effectiveness of that strategy in a similar marketplace, but likely differing competitive environment.

RESULTS

One would expect, given a random assignment of a new team into an industry, that about 20 percent of the former industry leaders would again wind up as industry winners, 20 percent would end up in second place, and 20 percent would end up in each of third, fourth and fifth places in their new industries. This distribution would be expected because each replacement team should have an equal chance of finishing in each industry position. As can be seen in Table 1, however, this is not at all what occurred when the original industry leaders were moved into another industry.

Developments In Business Simulation & Experiential Exercises, Volume 22, 1995

As shown in Table 1, a full 18 out of 25 original industry leaders (72 percent) remained in first place (that is, once again had the highest EPS in their industry) after their random assignment to a new industry. This is far above chance and is significant at the $p < .001$ level using the binomial distribution as the statistical test. In applying the statistical test, the most restrictive case was used, i.e., probability of being a winner again being 20 percent.

TABLE 1
RESULTS OF SIMULATION RE-RUN

<u>New Industry</u> <u>Finish</u>	<u>Number</u> <u>of Companies</u>	<u>Percent</u> <u>of Companies</u>
First Place	18	72%
Second Place	3	12%
Third Place	1	4%
Fourth Place	2	8%
Fifth Place	1	4%
	25	100%

Beyond the 72 percent of industry leaders who repeated as industry leaders, another 12 percent of the original leaders came in second place in their new competitions while only three original leaders fell to either fourth or fifth place in their new industries. The successful strategies of industry leaders remained dramatically successful in their new competitions.

DISCUSSION

The results reported in Table 1 strongly support the acceptance of the research hypothesis put forth for this study. That is, a successful marketing strategy will remain a successful strategy as long as the marketplace environment remains relatively similar.

With such strong results (even 10 repeat winners would have occurred by chance less than one time in one hundred tries), the question arises as to why some teams did fall to fourth and fifth place in the re-run. The explanation for one team was inappropriate sales forecasts and shipping schedules. In COMPETE the actions of all teams in an industry influence overall industry demand. While the original industry leader had developed good sales forecasts and shipping schedules in its original industry, the forecasts were not appropriate for the new industry. Had the re-run included this team's original strategy but with more appropriate forecasting, it may have repeated as an industry leader.

Each of the other two teams falling from first to fourth or

fifth place had withdrawn from one of the three markets teams can serve in the COMPETE simulation. While apparently an appropriate strategy in their original industries, withdrawing from a particular market resulted in excessive lost revenues for these companies in their new industries.

For the bulk of the companies that continued to perform well in their new industries, the implication seems to be that a successful marketing strategy in one industry will continue to be a successful strategy in another industry with a similar marketplace/economic environment. This would suggest, as have the PIMS findings, that adjusting to your market is more important than adjusting to your competitors (although a truly successful strategy would involve adjusting to both). While understanding your competitors is important, understanding your marketplace environment is more important. PIMS findings have suggested that 80 percent of the variance in a company's performance can be explained by its environment. The findings from this research would support the conclusion that some strategies are inherently better than others. Further, if the focus of a course is on establishing sound objectives and strategies, which is the case with many business management courses, this can be done through the use of a simulation competition.

Many simulation administrators have witnessed the use of "copycat" strategies. This involves simply adopting the decision-making approaches of more successful competitors. While leading competitors are presumably most in tune with the marketplace, "copycat" companies are always lagging at least one period behind the successful companies they are emulating. The results from this study suggest that detailed attention to competitors may be misplaced, unless adequate attention is also being directed to the marketplace. Do industry leaders have a long-term vision while others are simply reacting in a short-term fashion to current conditions? This may be another area for future research.

CONCLUSIONS

As described in the research findings of Boyd and Summers (1984), one of the major objectives of business management courses is to teach sound strategy formulation. Most marketing, top management and international simulation games give participants the opportunity to formulate and test business strategies. Are the strategies formed in simulation competitions based on sound principles? The results reported in this paper show that a winning strategy remains a sound strategy even when transferred to a new competitive environment.

Developments In Business Simulation & Experiential Exercises, Volume 22, 1995

REFERENCES

- Anderson, P. H. & Lawton, L. (1990) The Relationship Between Financial Performance and Other Measures of Learning on a Simulation Exercise. *Developments in Business Simulation and Experiential Learning*, 17, John Wingender and Walt Wheatley (eds.), Association for Business Simulation and Experiential Learning, 6-10.
- Babb, E. M., Leslie, M. A. & Van Slyke, M. D. (1966) The Potential of Business Gaming Methods in Research. *Journal of Business*, 39, (Winter) 465-472.
- Biggs, W. D. (1975) Some Impacts of Varying Amounts of Information on Frustration and Attitudes in a Finance Game. *Developments in Business Simulation and Experiential Learning*, 2, R. H. Buskirk (ed.), 23-30.
- Biggs, W. D. & Greenlaw, P. 5 (1976). The Role of Information in a Functional Business Game. *Simulation & Games*, 7, 53-64
- Boyd, C. W. & Summers, I. (1984). Business Policy Course Content: A Survey of Professors. *Developments in Business Simulation and Experiential Learning*, 11, David Currie and James Gentry (eds.), 1-3
- Butler, R. J. & Parasuraman, A. (1977) Degree of Uniformity in Achievement Motivation Levels of Team Members. *Developments in Business Simulation and Experiential Learning*, C. E. Neilsen (ed.), Association for Business Simulation and Experiential Learning, 163-168.
- Cangelosi, V. E. & Dill, W. R. (1965) Organizational Learning: Observations Toward a Theory. *Administrative Science Quarterly*, 10, (2), 175-203.
- Carvalho, G. F. (1991). Evaluating Computerized Business Simulators for Objective Learning Validity. *Simulation & Gaming*, 22, 328-347
- Chisholm, T. A. (1979). An Examination of the Perceived Effectiveness of Computer Simulations in a Classroom Setting as Affected by Game, Environmental and Respondent Characteristics *Developments in Business Simulation and Experiential Learning*, 6, S C. Certo and D. C Brenenstuhl (eds.), 103-109.
- Dickinson, J. R. & Faria, A. J. (1994) A Random-Strategy Criterion for Validity of Simulation Game Participation *Developments in Business Simulation and Experiential Learning*, 21, Precha Thavikulwat and John Overby (eds.), 35-40.
- Dickinson, J. R., Faria, A. J. & Whiteley, T. R. (1990) The Impact of Market Structure, Versus Competitor Strategy, on Simulation Outcomes *Developments in Marketing Science*, B. J. Dunlap (ed.), Academy of Marketing Science, 279-284.
- Edwards, W. F. (1987) Learning Macroeconomic Theory and Policy Analysis via Microcomputer Simulation. *Developments in Business Simulation and Experiential Learning*, Lane Kelley and Pat Sanders (eds.), Association for Business Simulation and Experiential Learning, 50-53.
- Faria, A. J., Dickinson, John R., & Whiteley, T. R. (1992). A Measure of the Internal Validity of a Marketing Simulation Game *Simulation/Games for Learning*, 22, (December), 351-66.
- Faria, A. J. (1987). A Test of Student Performance and Attitudes under Varying Game Conditions *Developments in Business Simulation and Experiential Learning*, Al Burns and Lane Kelley (eds.), Association for Business Simulation and Experiential Learning, 70-75.
- Faria, A. J. (1987). A Survey of the Use of Business Games in Academia and Business *Simulation & Games*, 18, (2), 207-225.
- Faria, A. J., Nulsen, R. O., & Roussos, D. S. (1994) *COMPETE: A Dynamic Marketing Simulation*. Burr Ridge, IL: Richard D. Irwin, Inc.
- Faria, A. J. & Nulsen, R. O. (1976). Student Reactions and Evaluations Towards Differing Assignment Levels in a Marketing Simulation Competition. *Developments in Business Simulation and Experiential Learning*, 3, B. H. Sord (ed.), 26-35
- Gosenpud, J. (1989) The Prediction of Simulation Performance as It Is Affected by Time. *Simulation & Games*, 20, 319-350
- Gosenpud, J. & Washbush, J. (1991) Predicting Simulation Performance: Differences Between Groups and Individuals *Developments in Business Simulation and Experiential Learning*, 18, Walt Wheatley and Jerry Gosenpud (eds.), 44-48.

Developments In Business Simulation & Experiential Exercises, Volume 22, 1995

- Gray, C. E. (1972). Performance as a Criterion Variable in Measuring Business Gaming Success *Proceedings of the Southeastern Conference of the American Institute for the Decision Sciences*, T. S. Macklin (ed.), 146-151
- Greenlaw, P. S. & Biggs, W. D. (1974). Finansim: From Genesis to Revelations *Proceedings of the Thirteenth Annual Symposium of the National Gaming Council*, Ralph Day (ed.), 445-449.
- Greenlaw, P. S. & Wyman, F. P. (1 973). The Teaching Effectiveness of Games in Collegiate Business Courses *Simulation & Games*, 4, (2), 259-294.
- Hall, D. R. (1987) Developing Various Student Learning Abilities via Writing, the Stock Market Game, and Modified Marketplace Game. *Developments in Business Simulation and Experiential Learning*, Lane Kelley and Pat Sanders (eds.), Association for Business Simulation and Experiential Learning, 84-87.
- Henderson, Bruce (1980) *The PIMS Program*. Cambridge, MA: The Strategic Planning Institute.
- Keys, B. (1976). A Review of Learning Research in Business Gaming *Developments in Business Simulation and Experiential Learning* C. E. Neilsen (ed.), Association for Business Simulation and Experiential Learning, 76-83.
- McKinney, J. L. & Dill, W. R. (1966) Influences on Learning in s Simulation Game. *American Behavioral Scientist*, 10, (Summer), 28-32.
- Mehrez, A., Reichel, A. & Olami, R. (1987) The Business Game Versus Reality. *Simulation & Games*, 18, (3), 488-500.
- Miles, W. G., Biggs, W. D. & Schubert, J. N. (1986) Student Perceptions of Skill Acquisition Through Cases and a General Management Simulation *Simulation & Games*, 10, (1), 75-86.
- Morrison, Donald F. (1967) *Multivariate Statistical Methods* New York: McGraw-Hill Book Company.
- Neuhauser, J. J. (1976) Business Games Have Failed. *Academy of Management Review*, 1, 124-129
- Norris, D. R. (1985) Management Gaming: A Longitudinal Analysis of Two Decades of Use in Collegiate Schools of Business. *Proceedings of the 45th Annual Meetings of the Academy of Management* C. Furillo (ed.), 253-259.
- Norris, D. R. & Snyder, A. (1 982). External Validation: An Experimental Approach to Determining the Worth of Simulation Games *Developments In Business Simulation and Experiential Learning* W. D. Biggs and Lee Graf (eds.), Association for Business Simulation and Experiential Learning, 247-250.
- Parasuraman, A. (1986) *Marketing Research* Reading, MA: Addison-Wesley Publishing Company.
- Philippatos, G. C. & Moscato, D. R. (1969) An Empirical Study of the Learning Aspects of Experimental Game Playing *AIIE Transactions*, 1, 343-348
- Randel, Josephine, Morris, B. A., Wetzel, C. D. & Whitehill, B. V. (1992) The Effectiveness of Games for Educational Purposes: A Review of Recent Research *Simulation & Gaming*, 23, 261-276
- Schoeffler, Sidney (1993) *Basic Findings on Business Strategy* Cambridge, MA: The Strategic Planning Institute.
- Smith, J. & Golden, P. (1989) Strategic Planning and Organizational Performance in a Business Simulation *Developments in Business Simulation and Experiential Learning*. Tom Pray and John Wingender (eds.), 16, 188-1 90
- Snow, C. C. (1976). A Comment on Business Policy Teaching Research *Academy of Management Review*, 1, 133-1 35
- Specht, L. B. & Sandlin, P. K. (1991) The Differential Effects of Experiential Learning Activities and Traditional Lecture Classes in Accounting. *Simulation & Gaming*, 22, 196-211
- Stanislaw, H. (1986) Tests of Computer Simulation Validity *Simulation & Games*, 17, 173-1 92
- Vance, S.C. & Gray, C. F. (1967) Use of a Performance Evaluation Model for Research in Business Gaming *Academy of Management Journal*, 10, 27-37
- Waggener, H. A. (1979) Simulation vs. Case vs. Text: An Analysis of Student Opinion *Developments in Business Simulation and Experiential Exercises*. Bernard Keys (ed.), 1, 11 3-1 1 8.

Developments In Business Simulation & Experiential Exercises, Volume 22, 1995

- Washbush, J. B. & (Gosenpud, J. J. (1991). Student Attitudes About Policy Course Simulations. *Developments in Business Simulation and Experiential Learning* Walt Wheatley and J Gosenpud (eds.), 18, 105-110.
- Watson, H. J. (1 981). *Computer Simulation in Business* New York: John Wiley & Sons.
- Wellington, W. E. & Faria, A. J. (1991) An Investigation of the Relationship between Simulation Play, Performance Level and Recency of Play on Exam Scores. *Developments in Business Simulation and Experiential Exercises*. Walt Wheatley and Jerry Gosenpud (eds.), Association for Business Simulation and Experiential Learning, 111-116.
- Wellington, W. E. & Faria, A. J. (1990) The Effect of Decision Format and Evaluation on Simulation Performance, Decision Time and Team Cohesion *Developments in Business Simulation and Experiential Exercises*. John Wingender and Walt Wheatley (eds.), Association for Business Simulation and Experiential Learning, 1 70-1 75.
- Whiteley, T. R. & Faria, A.J. (1989) A Study of the Relationship Between Student Final Exam Performance and Simulation Game Participation *Developments in Business Simulation and Experiential Exercises*. Tom Pray and John Wingender (eds.), Association for Business Simulation and Experiential Learning, 78-83.
- Whiteley, T. R., Faria, A. J. & Dickinson, J. R. (1991) An Empirical Investigation of the Adaptive Behavior of Single-Player Teams to Simulation Game Parameters. *Proceedings of the International Simulation and Gaming Association*, 103-109.
- Wolfe, J. (1976) The Effects and Effectiveness of Simulation in Business Policy Teaching Applications *Academy of Management Review*, 1, 47-56
- Wolfe, J. (1978) The Effects of Game Complexity on the Acquisition of Business Policy Knowledge *Decision Sciences*, 9, 143-1 55
- Wolfe, J. (1985) The Teaching Effectiveness of Games in Collegiate Business Courses: a 1973-1983 Update. *Simulation & Games*, 16, (2), 251-288.
- Wolfe, J. & Roberts, C. R. (1986) The External Validity of a Business Management Game *Simulation & Games*, 17, (3), 45-59.
- Wolfe, J. & Roberts, C. R. (1993) A Further Study of the External Validity of Business Games: five-year Peer Group Indicators. *Simulation & Gaming*, 24, 2 1-34.
- Wolfe, J., Bowan, D. D. & Roberts, C. R. (1 989). Team-Building Effects on Company Performance: A Game Based Study. *Simulation & Games*, 20, 388-408.
- Wolfe, J. & Gosenpud, J. (1989) Strategy Design, Process and Implementation in an Unstable/Complex Environment *Developments in Business Simulation and Experiential Learning*. Tom Pray and John Wingender (eds.), 16, 111-116.