

# Developments In Business Simulation & Experiential Exercises, Volume 17, 1990

## AN ANALYSIS OF IMPROVEMENT IN BUSINESS DECISION OUTCOME WITH SEQUENTIAL USE OF TWO SIMULATION GAMES

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### ABSTRACT

This study attempts to assess whether or not residual management learning occurs when two simple business simulation games are sequentially played. If players (students) learn something about management while playing one game, a measurable residual effect should accrue when playing the other game. Conversely, if no performance improvement occurs, players apparently have learned to play a game but fail to inculcate the management theory and principles represented in the simulation.

### RESEARCH ENVIRONMENT AND METHODOLOGY

To study residual or carry-over learning from one simulation game to another required selection of two games that utilized similar decisions, objectives, and complexities; however, the games cannot be too similar. If the games are too similar, the task would be like playing the same game twice. If the games are too different in decisions, objectives, and complexities, any concepts or principles learned in one game might not be applicable in a different decision environment, hence no measurable learning. In this study, two quite different games were selected in the belief that management theory; and practice are universal in nature and, once learned, can be applied in a variety of decision environments.

The games selected. Lemonade Stand and Hamurabi, are both elementary business games requiring three business decisions each: product price, quantity produced, and advertising for Lemonade Stand; and buying or selling acreage acres of grain to plant, and amount of grain to feed the population for Hamurabi. The objective in Lemonade is to increase net worth; in Hamurabi the objective is to increase production to nurture an increasing population.

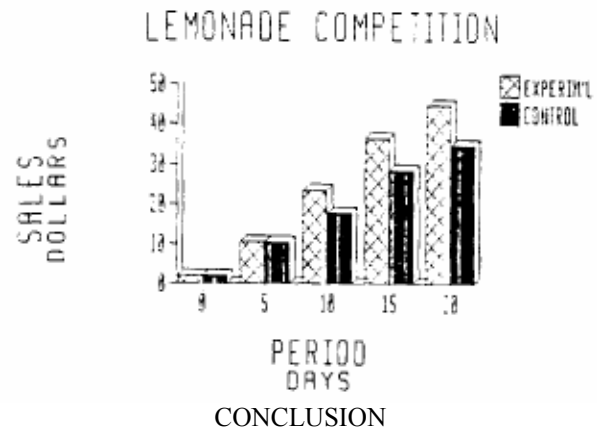
One hundred twenty-three undergraduate students, about equally divided by sex and age/maturity, from several sections of a senior level management science class, were divided randomly into two groups. After trial periods to familiarize the player with game structures, each game was played for twenty periods. Group A played the Lemonade Stand simulation game first and then played Hamurabi. Group B followed a reverse sequence. The performance of the group that played Lemonade Stand first was compared to the group that played Lemonade Stand after playing Hamurabi and conversely, the assumption here is that if any "learning" occurred other than simply learning to play a game, it should result in improved performance of the group who had some direct and related prior experience. If the groups show no improvement, then it can be assumed that learning to make "business decisions" under one set of circumstances does not carry over to another decision situation.

### RESULTS

A two-way ANOVA was used to analyze the results. Total

assets after 20 periods of play were compared between groups (main effects), by age/maturity of students, and by sex. Total assets for Lemonade Stand were measured in dollars; for Hamurabi the measure is in total bushels of grain.

The figure compares the performance of the two groups: those playing Lemonade Stand for the first time, without prior management/gaming experience (control group), and those playing the same game for the first time but with prior experience (experimental group). The experimental group performed significantly (P.05) better than the control group indicating that some management skills were acquired in the previous game, which carried over to the second simulation. Using the Hamurabi game, the result is still in favor of the experimental group but is not statistically significant (P.26). No significant differences were detected between levels of student maturity (age) or sex. However, the older students performed better in both games (P.31). Two comments are in order. First, the trend toward a sizable difference seems to be underway, but the number of play periods is not sufficient to allow the difference to materialize statistically. Second, Hamurabi is a more difficult game to play. Playing Hamurabi first seems to prepare the participants for the more simple simulation, but playing the easier game first did not produce a statistically significant difference.



As with similar studies, the results support the contention that students learn management concepts in an experiential learning environment. Also, as with most studies, the results are not irrefutable. However, one can conclude that experience is an asset in decision-making and that relevant experience can be gained in a more complex business environment and that experience can be applied to problems associated with a less complex environment.

A single paper of this scope cannot prove or disprove that generalized decision-making skills are enhanced or that learning occurs in all games. Rather, this research should encourage others to replicate the approach and utilize these and other simulation games in the assessment of games as a learning medium for business decisions.