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INTRODUCTION

This study replicated a study undertaken in 1997. It was exploratory, and its purpose was to find out why some participants learn more than others in TE simulations. Put another way, the purpose was to identify which variables are associated with greater learning in the simulation environment.

METHOD

Subjects and Procedures

The subjects of this study were 97 seniors enrolled in an Administrative Policy course. Each author taught two sections, and industry composition and game procedure differed somewhat by author. For the first author, simulation play began in teams, but after five quarters, teams were abandoned and students continued as single-member firms. For the second author, teams remained intact throughout play. Team size ranged from two to four players, with 68% of the teams beginning the simulation three members. Simulation length was 12 quarters. Performance was based on Net Income, ROS, and ROA. The game was worth 25% of the course grade, and 5% course grade reflected the score on the post-test exam measuring learning.

Variables and Variable Measurement

Learning. We measured learning in two ways. We measured consciously-simulation-related learning with two forms of our multiple-choice and short-essay examination. There was a pretest and a post-test. Learning was defined as the percentage score for the post-test minus the percentage score

for the pre-test. The second learning measure was open ended. We simply asked students what they were learning.

Antecedent Variables. Seven variables were chosen as potential predictors of learning in the simulation. They were chosen for common sense reasons, because they were thought to influence learning by educational, management, or simulation scholars, or because of previous research. The seven were motivation, cohesion, organization, goals, struggle, perceptions of the simulation, and feelings toward the simulation.

Student goals, degree of struggle, feelings and perceptions toward the simulation, along with the open-ended learning questions were measured via questionnaire given after the third and sixth rounds of play--goals and learning with open-ended questions, struggle questions with a Likert scale, and perception and feeling information with 15 bi-polar semantic-differential items. Motivation, organization and cohesion were measured with an adjective check list, given after quarters 4 and 7 asking students which items characterized their experience in the simulation.

Content analysis of student goals and self-reports of learning was undertaken by the senior author.

RESULTS AND DISCUSSION

Stepwise multiple regression analyses were performed with simulation-related learning scores as the dependent variable and all the continuous antecedent variables as independent variables, including motivation, struggle, cohe-

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sion, organization, and feelings about and perceptions of the simulation. F-tests were performed comparing simulation related learning scores of those expressing certain goals for the simulation with the learning scores of those not expressing such goals. Correlations were calculated between open ended learning and continuous antecedent variable measures.

The results from this and last year's studies show enough similarity to suggest that there is a finite, definable set of concepts and skills, conceptually different from each other, that participants learn in the simulation.. Those mentioned most frequently in both studies were: 1) building financial statement analysis skills, 2) learning to plan strategically and make decisions which adapt to the game's circumstances, 3) learning the game's cause and effect principles, 4) the importance of anticipating and planning for predictable and unpredictable future events, and 5) learning that the game (and business in general) requires consideration of complex phenomena.

We have begun to identify variables that influence the degree to which undergraduates (at least) learn in the simulation. The results of both studies suggest that learning scores are greater when simulation teams are organized, when players want to reduce expenses, and when players want to finish high in the game standings. Curiously the results indicate that those less motivated learn more and those from teams unequally prepared learn more. In both studies, students who learned about financial principles expressed a feeling of confidence and accomplishment towards their simulation experience, and those who were learning about strategic planning felt disorganized and confused early in the simulation. In the present study (but not in last year's), those who felt as if they were improving learned more and those who said they were learning about decision making felt alert and charged.

This and last year's studies have been extensive; the purpose of both was to explore the relationship of each of numerous antecedent variables to learning. Some findings from those two studies were clear and repeated. But many relationships occurred in one study and not in the other. It is likely that future studies more or less identical to the present one will yield results unique to that section or game. Generalizable results may be hard to come by. So, it is time to drift away from extensive, exploratory study, such as the present one, and use its results to generate questions to answer and hypotheses to test in future studies.

A complete text including references and tables can be obtained from the senior author.