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THE RELATIONSHIP BETWEEN TOTAL ENTERPRISE SIMULATION PERFORMANCE AND LEARNING

John Washbush & Jerry Gosenpud
University of Wisconsin-Whitewater

ABSTRACT

This study examined the relationship between learning and simulation performance. It had two purposes; 1, to examine the degree to which learning and simulation performance co-vary: 2) to explore the performance-related correlates of learning. Using a researcher-developed learning measure, we found no positive correlation between learning and simulation performance. Additionally we believe the data suggest that learning is associated with the extent to which a team struggles to improve its performance standing

BACKGROUND

There is a relatively extensive literature dealing with the topic of student learning in the simulation environment. In general, simulations are considered valid for use in a strategic management course, but the implication from these papers for the present study's purposes is that learning and performance are unrelated. Previous papers have dealt with the specific kinds of learning goals accomplished in a simulation, including improving quantitative skills and the acquisition of applied or theoretical knowledge. There have also been papers on the development and acquisition of decision-making and interpersonal-communication skills and on general concerns applicable to development of learning validation models. The question remains about what specific types of learning are affected by the use of simulations.

METHOD

The formal hypotheses were: (1) Students who acquire more learning over the period of simulation play attain superior performance in the simulation: 2) Students who struggle effectively with the dynamics of playing the simulation exhibit superior learning performance. Subjects were enrolled in three sections of the required undergraduate Administrative Policy course at the University of Wisconsin-Whitewater during the spring, 1992 semester. All sections played Micromatic. We structured the players into teams in live industries. Although the period of play ranged from 9-13 quarters we used identical decision factor weights and evaluative criteria for all industries. Game performance was worth 200 of the course grade. At the fifth week of play, one researcher abandoned teams and each of his students continued as single-member firms using the team's past performance as a historical basis. To measure learning the researchers developed two parallel forms of a multiple-choice and short-essay examination. Questions were constructed using issues and situations routinely confronted by companies competing in Micromatic. and they tapped analytical, synthesis and application skills of Bloom's Taxonomy Form 1 was administered as a pre-test at the beginning of the semester. Form 2 was administered at the end of the semester. Learning over the period of play was defined as the difference in percentage score far Form 2 minus percentage score far Form 1

RESULTS AND DISCUSSION

We found no direct, positive linear relationship between simulation performance and learning. Though not statistically significant, our data displayed a tendency for those who performed more poorly in the simulation to learn more. Additionally, our data also suggested that those who learned the least were members of tennis that dropped in ranking over the course of the simulation.

In general, those who performed best did not learn the most; those who performed the worst did not necessarily learn the least. This does not invalidate simulation use. We found that simulation players did learn and they learned what the game intended to teach--namely data and financial statement analysis understanding the consequences of decisions, and applying that understanding to subsequent decision-making situations. In addition, the results of this study indicate that learning was not entirely random but was associated with the struggle to maintain position in a competitive industry and the effort to improve even after severe declines in performance. Thus, while not verified, this study suggests some of the behaviors associated with learning, namely struggle and the effort to improve. That these behaviors are generally associated with learning in a variety of situations adds credibility to these findings and offer an important avenue for further research efforts. Previous work on the correlates of learning in the simulation has focused on variables under the control of game administrators, such as game complexity, reward for performance, and team size. This study suggests focusing on another set of variables, those associated with the performance-related behavior of the players. Even though these variables are not easily controlled by researchers, this study indicates that they are probably measurable, researchable, and useful in explaining why some people learn and others do not.

That learning and performance are not positively correlated is important to teachers who use simulations in grading students. The results suggest that a teacher who believes that grades should reflect only learning should not use simulation relative performance standing as a basis for grading. This study indicates that simulation performance does not reflect the degree to which a student has learned. Does this result suggest that grading on simulation performance is invalid? Clearly not! Real managers are evaluated on performance outcomes all the time and rarely on learning.

In this study, learning was measured by parallel pre-and post-tests, which reflected what the researchers believed students should learn in the Micromatic simulation experience. At this early stage of development these tests exhibited marginal statistical reliability, and their validity depends on our best judgement about appropriate content. However, in a recent study comparing students exposed to the simulation experience with others who were not, the present authors found that those experiencing the simulation performed better on the present study's tests, thus providing evidence of face validity. These results add credibility to this paper's conclusions. The results of our research, tentative though they may be, strongly argue for continuing research along the lines outlined here.

For copies of the full paper, data analysis tables, learning tests, or the reference list, contact;

John Washbush
Management Dept
UW-Whitewater
Whitewater, WI 53190
(414) 472-3902