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THE IMPACT OF LEADER AND TEAM MEMBER CHARACTERISTICS UPON SIMULATION PERFORMANCE: A START-UP STUDY

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ABSTRACT

Educators who utilize simulations to enhance business pedagogy have long been concerned about the behavioral aspects of their students. This research project investigated the impact of the leadership style demonstrated by the team president along with locus of control and team cohesiveness measures of all simulation participants upon team performance variables. This study found that a democratic leadership style and internal locus of control measures significantly impact simulation profitability variables during a simulation startup.

INTRODUCTION

The advances that are being made in computer processing are greatly aiding in the development of business simulation software. Currently, it is possible for an educator to design a course around a business simulation that allows students to experience many "real world" activities without leaving the classroom. Not only does the current generation of business simulations provide many avenues to the educator in terms of enhancing the realism of the simulated experience; but they also provide guides for the educator to evaluate student performance in these simulations for grading purposes. However, evaluating the extent to which student performance is a function of the simulation and how much is a function of individual behavioral aspects, is still no easy task. Researchers have known for some time that particular aspects of thinking and personality, which differ between people, influence the mannerisms in which they tackle business related situations; for example - along with their decision making styles and their judgements - will greatly influence how they prepare their p1ans for the future (Loveridge, 1979). Therefore, it is imperative, for simulations to become a truly effective learning experience, that more is learned about how the behavioral aspects of students effect the outcome of simulation performance measures. This is particularly true in those courses that startup the simulation every term.

Toward this end, this study investigated what effect - if any - that leadership style, team cohesiveness, and locus of control would have on performance measures during a simulation startup. There exists in the Management literature more than ample evidence suggesting that these particular variables are important to the foundation, growth and prosperity of business organizations. In addition, these particular behavioral aspects can be enhanced through training and practice in the business classroom.

A discussion of the theoretical underpinnings of these three behavioral aspects is presented next followed by a presentation of the research project and its findings.

LEADERSHIP STYLES

There are many examples of where the difference between success and failure of a business organization has been directly attributed to the leadership style of its chief executive officer. Thus, the importance of leadership styles to the growth and prosperity of an organization cannot be understated. Successful leaders must be effective change agents. They must be able to deal with the changing expectations of their constituents by moving their organizations from current to future states (Bennis & Nanus, 1985). The leadership style, that an effective leader employs to accomplish this objective of change, varies a great deal from leader to leader.

Thus, leadership styles have been investigated in many different studies yielding a variety of typologies stating what is and what is not effective leadership behavior (Bass, 1981). However, fairly consistently, most studies show that effective leaders tend to employ a leadership style that encourages and allows employees to share visions and information and to participate in the decision-making process. In general, a participative or democratic leadership style tends to be found more often in successful organizations than a non-participative or autocratic style (Haire, Ghiselli & Porter, 1966).

TEAM COHESIVENESS

Team cohesiveness is the degree to which members are attracted to and motivated to remain active team members (Schermerhorn, Hunt & Osborn, 1988). Normally, team cohesiveness is affected by open communication channels, clear roles and expectations, and a known and agreed upon decision-making process. Congruency of personal goals and work values with team goals and work values often results in high team cohesiveness which in turn yields low levels of conflict, positive feelings about team affiliations, and a high energy level.

A high degree of team cohesiveness, therefore, tends to determine how concerned the team members are about their team's actions and achievements. Teams, who are highly cohesive and have a high achievement norm, normally will set higher goals and record higher levels of attainment then will teams who are not highly cohesive (Buller & Bell, 1986). In a prior study investigating team cohesion and business game performance (Wo1fe & Box, 1988), cohesion was found to be positively related to a team's economic performance.

LOCUS OF CONTROL

The locus of control notion states that work behavior can be explained whether employees perceive outcomes as controlled internally or externally.

Individuals with an internal locus of control believe their accomplishments are attributed to internal forces, over which they have control, such as ability and effort. While individuals, who have an external locus of control, feel their accomplishments are simply a function of forces over which they have no control - such as luck or fate (Rotter, 1966).

The importance of locus of control to business management behavior is that internals are more likely to exhibit those entrepreneurial qualities that are necessary for the survival and growth of a business enterprise than are externals (Shapero, 1975). Studies conducted by Miller, Kets De Vries and Toulouse (1982) have revealed that internals will more often introduce new products and services, invent more production technologies, and make more dramatic changes to product lines than will externals.

RESEARCH DESIGN

Sample Population

Data were co1lected from 99 graduate students seeking a Masters of Business Administration degree from a medium, south-eastern university. All students who happened to enroll in the Fall 1988 sections of Business Policy and Planning took part in the research project.

The Simulation

The simulation employed in this research project is a modified version of the original Carnegie-Mellon game. It is one of the most complex simulations of business enterprises in a competitive industry known to exist today. It is designed to provide students with a compressed and integrative, but realistic experience in the management and operations of a medium sized, multinational, publicly held corporation. In this two-semester, intensive course, the students are exposed to the problems, uncertainties, stress and opportunities, which arise in managing a company for a simulated period of two years. The simulation program duplicates the actual manufacturing, marketing, and financial transactions encountered in competitive business operations, but also the internal problems of operating in a management group under conditions of limited time and resources, rewards and penalties, and high stress. The students who complete this Management simulation should possess a far higher level of skill in the management of organizations than could ever be acquired through traditional classroom work.

Simulation Performance Variables

Three performance variables were employed in this study: sales, return on sales, and return on assets. In this study, absolute amounts of sales dollars generated by each firm were determined for the study period involved. By and large, in the "real world", successful firms tend to be those who can maximize their sales potential. Return on sales was used as evidence of the team's ability to properly control costs in light of revenues generated. Lastly, return on assets was used as a measure of the team's ability to effectively utilize its assets. These three simulation performance variables were selected for this study because of their importance to a firm's survival and growth.

Control for the Demand Characteristic

In this type of research, a common cause of serious bias comes from respondents telling researchers the things that the researchers seem to want to hear (Rosenthal, 1976). This "demand characteristic" poses a special threat when using students as subjects. Students love to play games and will try to "win" if they can figure out the objective of the exercise. To minimize the effects of demand, the leadership style instrument (Haire, Ghiselli & Porter, 1966), the team cohesiveness questionnaire (Wheatley & Armstrong, 1988), and the locus of control questionnaire (Rotter, 1966) were administered along with other "bogus pipeline" instruments to eliminate any demand compliant responses (Rosnow & Davis, 1977). In addition, at no time was the true intent of this study revealed to the students.

RESULTS

Analysis

The leadership style, autocratic or democratic, was determined for each team president. All team members were then classified highly cohesive or highly non-cohesive whi1e the locus of control sample was divided into internals and externals. This process is congruent with research projects utilizing these instruments.

Then, because of the relatively large number of variables involved in this study, a multivariate analysis of variance procedure was conducted utilizing the Statistical Analysis System (SASS). This overall test for effect generated Wilk's Lamdas and associated F ratios and p-values for all of the independent variables involved. From this test it was determined that the behavioral variables, that may have significant impact upon the simulation performance variables, are leadership style (F ratio 7.22; P-value - .0002) and the interaction effect of leadership style and locus of control (F ratio 2.52; P-value - .0630).

Having determined that there were elements of significance in this model, univariate analyses of variances were then generated for each dependent variable utilizing a General Linear Model (GLM) procedure from SASS. This method was used instead of the one-way ANOVA routine because of the unbalanced cell sizes. Tables 1, 2, and 3 reflect the results of these tests. Table 1 suggests that leadership style (P-value - .0372) and the interaction effect of leadership style and locus of control (P-value - .0089) have a very significant impact on the generation of sales.

From Table 2 it can be seen that leadership style is mildly significant (P-value - .0744) while the interaction effect of leadership style and locus of control is very significant (P-value - .0144) in regards to the return on sales variable. Table 3 indicates that leadership style (P-value - .7741) does not have a significant impact on the return on assets variable while the interaction effect of leadership style and locus of control did (P-value - .0208).

Discussion

The results of this study suggest that some

behavioral aspects do effect simulation performance variables - at least in a startup situation. The teams in this study, that had a team president with a democratic leadership style, outperformed those teams having a team president with an autocratic leadership style in generating sales and controlling costs. On all three performance variables, those teams having a democratic leader and a majority of members possessing an internal 1ocus of control, significantly performed better than those teams having an autocratic leader and a majority of members possessing an external locus of control.

It was somewhat of a surprise to these researchers to find that team cohesiveness did not play a stronger role in this study. However there are some plausible explanations for this being the case. First of all, the instrument has just recently been designed and may need to be refined even further. Secondly, even with a democratic president, those teams that may have been predominately internal may have generated a level of synergism necessary to overcome intra-team conflicts and thus allowing the team as a whole to be successful. Other possible answers may lie in some theoretical and/or methodological limitations to this study, which is currently unknown to the researchers.

While this study did not find significant findings with all of the elements in the model tested, the fact that behavioral aspects impact the outcomes of simulations is of great interest to educators who utilize simulations as training and development tools. Couple this knowledge with what is already known about the effects of prior training and gender differences (Wheatley, Anthony & Maddox, 1987); it becomes evident that the variables that impact the results of a simulation outcome are as complex as the environmental variables that are designed into simulations. Just like the "real world" that simulations try to emulate, it might be necessary for educators to conduct some preliminary testing, training and selection. This process might be considered a prerequisite if teams are to be built in order to enhance the simulation "experience".

CONCLUSION

The purpose of this study was to investigate the impact of leadership style, team cohesiveness, and locus of control measures upon the simulation performance variables of sales, return on sales, and return on assets. This study, utilizing a large sample size and controlling for demand bias, was able to detect a significant impact of a democratic leadership style and an internal locus of control upon the simulation performance variables during a simulation startup. Future studies, of this nature, should examine the impact of these behavioral variables upon profitability measures in longitudinal settings and should investigate other types of team performance variables that take into account team synergism.

Table 1

Analysis of Variance

Sales by Leadership Style, Locus of Control, and Team Cohesiveness

	Sum of Squares	Degrees of Freedom	F ratio	P value
Leadership Style	3146.52	1	4.67	.0372*
Locus of Control	1145.26	1	1.61	.2052
Team Cohesiveness	1693.02	1	2.41	.1242
Leadership Style by Locus of Control	5033.24	1	7.16	.0089**
Leadership Style by Team Cohesiveness	2361.08	1	3.36	.0702
Locus of Control by Team Cohesiveness	881.07	1	1.25	.2660
Leadership Style by Locus of Control by Team Cohesiveness	231.39	1	0.33	.5676
Error	63995.63	91		

* P - .05
** P - .01

Table 2

Analysis of Variance

Return on Sales by Leadership Style, Locus of Control, and Team Cohesiveness

	Sum of Squares	Degrees of Freedom	F ratio	P value
Leadership Style	.72359	1	3.26	.0744
Locus of Control	.08168	1	0.37	.5457
Team Cohesiveness	.56856	1	2.56	.1131
Leadership Style by Locus of Control	1.38236	1	6.22	.0144*
Leadership Style by Team Cohesiveness	.67756	1	3.05	.0841
Locus of Control by Team Cohesiveness	.75702	1	3.41	.0681
Leadership Style by Locus of Control by Team Cohesiveness	.04134	1	0.19	.6672
Error	20.21029	91		

* P - .05

Table 3

Analysis of Variance

Return on Assets by Leadership Style, Locus of Control, and Team Cohesiveness

	Sum of Squares	Degrees of Freedom	F ratio	P value
Leadership Style	.02509	1	0.08	.7761
Locus of Control	.01479	1	0.05	.8256
Team Cohesiveness	1.71156	1	5.65	.0195*
Leadership Style by Locus of Control	1.67492	1	5.53	.0208*
Leadership Style by Team Cohesiveness	.83896	1	2.77	.0994
Locus of Control by Team Cohesiveness	.46633	1	1.53	.2187
Leadership Style by Locus of Control by Team Cohesiveness	.22159	1	0.73	.3945
Error	27.54917	91		

* P - .05

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