AN INVESTIGATION OF THE RELATIONSHIPS BETWEEN FORMAL PLANNING AND SIMULATION TEAM PERFORMANCE AND SATISFACTION

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ABSTRACT

This paper examines the relationship between simulation team planning, performance, and satisfaction. Students in five sections of business policy participating in the Business Management Laboratory constituted the sample. Results of the data analysis indicated no difference in the performance of planning and nonplanning teams. The results showed no difference between the planners and nonplanners satisfaction with the simulation. However, planners seemed to be more satisfied with their teammates than did nonplanners. Implications of the results are discussed and directions for future research are examined.

INTRODUCTION

"Businesses which engage in formal long range strategic planning are more effective than those which do not." Similar statements can be found in most popular Business Policy/Strategic Management text books (see for example [16]; [181;[2]; [11]). Without commenting at this point about the accuracy of such a statement, it is clear that business policy writers consider formal long range planning to be an important organizational process that students need to understand.

Top-management or functionally integrated simulation games are often used within a Business Policy/Strategic Management course to provide students with some semblance of what is entailed in running a "real world" corporation. Within such games student teams are challenged to manage a simulated company. Decisions made by any one team affect the performance of its company and also impact the success of other companies. The objective of each team is to outperform the other teams on one or more measures of performance. Based on the touted value of formal long-range strategic planning presented in popular text books, it is logical to assume that simulation teams that engaged formal planning would exhibit better performance than those that did no formal planning.

The purpose of this paper is to explore the effect that formal strategic planning has on the performance and satisfaction of student teams participating in a comprehensive business simulation game.

FORMAL PLANNING AND ORGANIZATIONAL PERFORMANCE

Organizational Research

A number of studies have attempted to relate organizational performance to firms classified as planners or nonplanners. The Stanford Research Institute [19] examined 210 firms with exceptional growth rates in sales and earnings. These 210 firms were compared with 169 firms whose growth rates were significantly below average. The study concluded that planners outperformed nonplanners. Karger and Malik [7] and Malik and Krager [10] studied firms in the chemical and drugs, electronics, and machinery industries. Those companies practicing strategic management were contrasted with those who didn't (planners with nonplanners). Both studies concluded that the formal planners outperformed the nonplanners on 9 out of 13 financial performance variables. Thune and House [17] paired 36 medium to large companies on the basis of industry, size, and growth rate. One member of each pair used formal planning and one did not. Over the seven years of the study, the formal planners significantly outperformed the informal planners in every area measured. Herold [4] replicated the Thune and House [17] study and supported the original findings. Additionally, Herold found that formal planners had increased their performance margin over the informal planners since the original study was conducted.

A study by Ansoff, Avner, Brandenburg, Portner, and Radosevich [1] employed a more complex methodology. This study reported that firms using operational and strategic planning perceived a more substantial accomplishment of their objectives than those firms in nonplanning catagories. Formal planners significantly outperformed nonplanners on all the study's financial performance variables. Wood and LaForge [23] surveyed a number of large banks with regard to formal planning and financial performance. The banks were classified as nonplanners, partial planners, and comprehensive planners. Wood and LaForge found that banks with comprehensive long-range plans performed significantly better than the partial planners, nonplanners, and a randomly selected control group.

The literature is not unanimous in its support of formal planning. A few studies have cast doubts on its value. Fulmer and Rue [3] found no concrete formal relationship between formal planning and performance in a longitudinal study of 386 firms. The firms were categorized into four groups ranging from those using no planning to those developing formal objectives and three year plans. The groups were compared on 60 financial performance measures. The only consistent finding was that nonplanners outperformed planners in service industries. Kudla [8] examined the relationship of formal planning to stockholders' returns. In a survey of 348 companies, Kudla found no performance differences among nonplanners, incomplete planners, and complete planners. In other studies by Kallman and Shapiro [6] and Leontiades and Tezel [9] no positive relationship appeared between planning and performance.

The inconsistency of results in regard to the formal planning-performance relationship does not become any clearer in the small business environment. In a summary of the literature concerning the positive impact of planning on small firm performance, Robinson and Pierce [13] found limited supporting evidence. Contrary to the results of their review, these same two authors in a longitudinal study found that small banks did not financially benefit from formal strategic planning [12].

Simulation Research

It appears that there has been very little research done regarding the impact of using strategic long-range planning in conjunction with a computer simulation game. In a very thorough review of the simulation literature, Wolfe [22] does not cite any research studies examining the formal planning-performance relationship in simulation gaming. In addition there were no studies cited which researched the impact of formal planning on student satisfaction with the game or with their fellow teammates. In evaluating this category Wolfe concluded that little is known and basic research is still needed.

Conclusion and Hypotheses

The literature review of both organizational and simulation research provides no consensus on the existence of a relationship between formal long-range planning and organizational (or simulation team) performance. Most of the studies showing a strong relationship between planning and performance were conducted in the 1960s and early 1970s. Since the late 1970s, no studies have found a positive relationship between planning and corporate performance. Also, the simulation literature lacks research examining the affects of formal planning on student satisfaction with the simulation game or with their game teammates.

The purpose of the present paper is to investigate the relationship between formal planning and the performance of student teams competing in a comprehensive business simulation game. A secondary objective of the research is to determine if the requirement of developing a formal long-range plan will affect participants' satisfaction with either the simulation or their teammates. Based on the literature review, the following three hypotheses will be examined:

Hypothesis 1. There is no difference in the performance of student simulation teams that develop formal long-range strategic plans and those that do no formal planning.

Hypothesis 2. There is no difference in the satisfaction of planners and nonplanners with regard to the simulation game.

Hypothesis 3. There is no difference in the satisfaction of planners and nonplanners with regard to their teammates.

METHOD

Simulation.

The simulation game used in this research study was The Business Management Laboratory (BML) developed by Jensen and Cherrington [5]. BML is a moderately complex [20] simulation of the stainless steel flatware industry. As used in this research, participants were free to make over 50 separate decisions each quarter of play. because BML is limited to a maximum of eight firms per industry, each class section simulated two different industries. BML firms competed within an industry of either six or seven firms. Scale values relating to overall market potential were adjusted so that the overall potential within the different size industries was proportional to the number of teams.

Sample.

Students in five sections of business policy at a mid-sized Southeastern university constituted the sample.

The first author taught two of the sections; the second author the remaining three. The authors grouped the participants into three member teams [21]. Whenever possible, each team was constituted so that a competitive balance was achieved in terms of functional expertise. Due to attrition, nine of the teams finished the competition with only two members. A total of 14 decisions were made during the course of the simulation [22]. Four practice decisions were completed for familiarization with BML. Following these trials, a new start up position was created and ten graded decisions were made over a ten week period. The BML team score counted for 20% of each student's course grade. All participating teams realized that their grade on the simulation was going to be based on their performance in the areas of growth, profitability, liquidity, and leverage.

In two of the sections (One section taught by each author) all teams wrote a formal long-range plan before the start of the ten graded decisions. The plan covered the entire ten quarter time frame of the simulation. Contents of the plan included a section outlining the overall goals to be accomplished during the 10 decision cycles and a formal statement of the strategies that were to lead to the accomplishment of the overall goals. A breakdown of the specific functional policies to be utilized by the company was also presented. The final requirement for each planning team was to provide a pro forma income statement and balance sheet covering all ten quarters of the simulation.

Three of the sections had no formal planning requirement. These sections, through the course of normal discussion of the simulation exercise, were told that they should consider what strategy they were going to use. However, they were never asked to describe or present this strategy in any written or oral format.

Performance Measures.

At the completion of the 10 simulated quarters eight financial performance measures were calculated for each team. These eight measures were (1) total earnings, (2) average stock price, (3) average earnings per share, (4) average return on investment, (5) average debt/equity ratio, (6) total forced loans, (7) ending plant capacity, and (8) ending total assets. Of these measures only number six may need some explanation. Total forced loans represent automatic loans which are given to a team when they encounter a cash shortage due to improper budgeting.

Satisfaction Measures.

At the completion of the 10 simulated quarters student satisfaction with the BML game and with their teammates was measured using a slightly modified self-report measure of satisfaction developed by Scott and his colleagues [14;15]. The questionnaire is a semantic differential where factor scores were calculated for each subject based on their response to bipolar adjective pairs set against topical headings of "The BML Simulation" and "My Team Members." The response to each scale was scored from one to seven, with seven assigned to that response which indicates the most preferred condition. Based on the work of Scott and Rowland two satisfaction factors (intrinsic worth of BML and BML complexity) were derived from the "The BML Simulation" section and three factors (group attractiveness, group affective tone, and group emotionality) were derived from the "My Team Members" section.

RESULTS

Hypothesis 1 which stated that there is no difference between the performance of formal planners and nonplanners was tested by using the Wilcox on Rank Sum Test. This test evaluates the mean ranks between small samples with unequal distributions. The results of this test are shown in Table 1. The performance of the BML teams taught by the two authors are evaluated separately. This approach became necessary when it was realized that, although both instructors used growth as an evaluation criterion, Instructor A required his teams to build a second plant whereas Instructor B imposed no such requirement. The authors believe that this inadvertent difference in procedure may make direct comparison of the performance of all sections inappropriate.

In examining the results of Table 1, it can be observed that for Instructor A's sections there are no significant differences in the performance of the formal planning and nonplanning teams on the eight performance measures. For Instructor B's classes, only two of the eight performance measures showed a significant difference. The results showed that for Instructor B's sections planners had a significantly higher average earnings per share and a significantly lower dollar amount of forced loans than did the nonplanners. Overall, therefore, Hypothesis 1 was supported.

In evaluating Hypotheses 2 and 3 the responses of all students were considered together. Table 2 shows the results of the analysis of variance used to examine the differences between planners and nonplanners on the satisfaction indexes. Hypothesis 2 suggested that there would be no difference between the satisfaction of planners and nonplanners with the BML simulation game. This hypothesis was supported. There was no difference in planners and nonplanners general satisfaction with BML (Intrinsic Worth of BML) or their view of the difficulty of the simulation (BML Complexity). Hypothesis 3 stated that there would be no difference between planners and nonplanners satisfaction with their teammates. It appears that this hypothesis should be rejected. On two of the three factors dealing with student satisfaction with their group there was a statistically significant difference. Planners found the groups to be more appealing (Group Attractiveness) and to have better morale (Group Affective Tone) than did the nonplanners. There was no perceived significant difference in planners and nonplanners judgments of the general emotional state (i.e. relaxed, excited, etc.) of their groups (Group Emotionality).

DISCUSSION

The results of the data analysis indicate that on the whole there is no difference in the performance of planning and nonplanning teams (Hypothesis 1.) This finding tends to be in line with the more recent research studies conducted in both large ([8];[6];[9]) and small [121 "real world" organizations. In regard to the use of formal planning within a simulation environment, it appears that faculty members need to be careful and consider their purpose. The results of this study would indicate that the requirement of a formal plan as a means of illustrating to students the beneficial effect of planning on performance would be a mistake.

On the other hand their may be some positive value to requiring a formal plan before the start of the simulation. Our results indicated that a difference existed between planners and nonplanners in regard to the dollar amount of forced loans. This difference was significant for Instructor B's sections and approached significance for Instructor A's classes even with their added problem of balancing funds flows for the new plant. It appears that the requirement of the formal plan with proforma income statement and cash flow analysis resulted in the planning teams doing a superior job at cash management. Therefore, if an instructor is concerned with developing student understanding of cash management, a formal strategic plan as described in this paper may be a useful pedagogical tool.

The present study did not find any difference between planners and nonplanners satisfaction with the simulation (Hypothesis 2). However, it did appear that planners had greater satisfaction with their teammates than did those in nonplanning groups (Rejected Hypothesis 3). This area of group satisfaction looks like one where their may be an opportunity for further research. In considering this unexpected result, the authors tried to determine if there were any other variables which could have impacted on the difference in satisfaction. Separate analysis of variance procedures were conducted on the satisfaction of students by instructor, by academic major, and by sex. (The tables showing these analyses were not included due to space constraints.) The results indicated no differences on any of the satisfaction measures. Thus, the indication is that the only variable accounting for the difference in satisfaction with team members is the planning requirement. It appears, therefore, that the formal planning process impacts on satisfaction with the group. Such a result may be do to the forced interaction and possible bonding effect that such an early, nebulous, and taxing assignment may have. Certainly this is only conjecture and further research is needed.

In considering the discussion in this section the usual caveats must be observed. Generalizations should not be made from a single study. Also one needs to be careful when dealing with different student populations. It is necessary, therefore, for replications of this study before any definitive findings and/or pedagogical recommendations can be made.

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Table 1

Wilcoxon Rank Sum Test[a]

Input Method by Planning

Selected BML Team Results

	Instructor A			Instructor B		
	Plan	No Plan	p.[b]	Plan	No Plan	p.[b]
	n=13	n=22		n=13	n=12	
Total Earnings						
Median ($ 000s)	292	317		423	337	
Mean Rank	17.88	18.07	.95	14.23	11.67	.38
Average Stock Price						
Median ($)	1.93	2.04		2.37	1.83	
Mean Rank	19.07	16.19	.42	14.88	10.96	.18
Average Earnings Per Share						
Median ($)	.50	.48		.68	.53	
Mean Rank	17.23	18.45	.73	15.31	10.50	.10#
Average Return on Investment						
Median (%)	12	12		18	16	
Mean Rank	16.77	18.73	.58	15.00	10.63	.15
Average Debt/Equity Ratio						
Median	.50	.56		.22	.33	
Mean Rank	19.15	17.32	.60	11.85	14.26	.41
Total Forced Loans						
Median ($ 000s)	188	257		46	291	
Mean Rank	14.69	19.95	.14	10.31	15.92	.05#
Ending Plant Capacity						
Median (Hours)	17223	20386		15045	15278	
Mean Rank	14.58	20.02	.12	12.62	13.42	.78
Ending Total Assets						
Median ($ 000s)	990	928		892	901	
Mean Rank	19.54	17.09	.49	12.08	14.00	.51

[a] A nonparametric statistical procedure that evaluates mean ranks rather than mean values. Appropriate for small samples with unequal distributions.
[b] 2-tailed probability of no difference.
p. < .05 (1-tailed equivalent).

Table 2

Analysis of Variance

Detailed BML Plan Students versus No Plan Students

Criteria	Mean Score		F	p.
	Plan	No Plan		
	n=76	n=98		
Intrinsic Worth of BML	29.42	29.74	0.264	.608
BML Complexity	10.09	10.09	0.000	.999
Group Attractiveness	52.62	50.14	4.272	.040#
Group Affective Tone	16.74	15.81	3.956	.048#
Group Emotionality	11.01	11.47	1.097	.296

p. < .05