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QUALITATIVE DETERMINANTS OF TEAM PERFORMANCE IN A SIMULATION GAME

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ABSTRACT

The purpose of this paper is to report how different group processes and decision-making styles affect overall team performance. Since the prime source of game learning is derived from the personal experiences of the participants and their interactions a distinction must be made between the simulated and stimulated aspects of games. The simulated aspect attempts to replicate company and industry characteristics by specifying such environmental and operating factors as the economy, markets, plants, and products. Since performance often depends upon these predetermined game parameters, the ability to make realistic decisions is not improved by games with artificial or limited conditions that may bear little resemblance to actual organizations.

There is also a very real, or stimulated, aspect of games that should be encouraged. Participants surely experience emotions, feelings, and attitudes; they undergo decision-making processes and witness leadership and motivation (or the lack thereof); and some even become bored, anxious, or angry. In contrast to prior studies that attempted to validate the terminal results of game learning, this research is concerned with appraising what transpires throughout the course of play. Only such a formative evaluation can test whether or not appropriate behaviors are rewarded and reinforced, and lead to successful game performances.

BACKGROUND

A version of The Management Game [3], one of the most complex simulations, is used in a required three-credit hour M.B.A. course at a major state university. This particular game specifies the tasks to be performed in an organization structure. In addition, the game meets the following criteria for successful implementation of the gaming experience [7, pp. 110-111]: performance measures are defined by the instructor and the course objectives; the model allows for quantitative techniques; formal analyses are submitted and reviewed; and behavior is experienced under conditions of stress and uncertainty.

The game is played during two weeks in the middle of the spring semester of the first year, at which time no other courses are taken. A "memorandum" (i.e., syllabus) sent to all members of the M.B.A. class a week prior to the start of the game notified the seventy-four students that they would form six teams, consisting of twelve or thirteen members per firm. Since these teams are normally too large to obtain complete input, the majority of decisions were made by one of the subgroups assigned to three functional areas.

As a result of the group formation process, most of the students selected their own teams, but there were enough unassigned students left to form the final team. Although the interpersonal dynamics might differ between assigned and voluntary groups, the presumed greater cohesion arising from prior member familiarity does not necessarily lead to

higher levels of performance than appointed teams achieve. A positive correlation does exist between team results and cohesion, but differences in performance, satisfaction, and learning depend as much on the game characteristics and member abilities as on the team selection process [6]. Indeed, McKenney and Dill have found that poor team results, even by voluntary groups, can lead to low morale and dissatisfaction [4]. The only potential biasing factor of voluntary groups, then, is the possible inequality of starting positions.

The "formal" component of the game integrates the functional areas of finance, marketing, and production that are necessary to carry out a firm's policies over twelve decision periods simulating three years of operation. Games have not proven to be very effective in teaching the nature and implications of organization structures and control mechanisms [9]. In spite of this, there is also an "informal" component that enables students to better appreciate the processes inherent in human interactions. One game objective of teaching the significance of such informal systems and interpersonal relations is accomplished by developing conflicts between formally differentiated functions while retaining strong interdependencies that encourage integration.

Each team was differentiated into three formal tasks that were then physically separated during the day. The only method of communication was via the telephone. Corporate headquarters was to develop the firm's strategy and then make the key financial decisions in support of that strategy by raising funds and approving budgets. As investment centers, these units were to forecast the firm's rate of return, asset valuation, and change in surplus value. The divisions determined the demand for the particular market in which they were operating, and then attempted to satisfy that demand. As profit centers, they were to forecast market share, total sales revenue, and net income. The plants provided the divisions with up to three different products at the lowest possible cost. Therefore, the plants were responsible for forecasting volume produced, labor efficiency rate, and finished goods inventory.

Integration of these units was necessary because of forced interdependencies throughout the organization. For example, forecasting accuracy of each department was evaluated in part on how well other units in the organization forecasted. Performance also was enhanced if decisions were consistent with organization goals and complemented those of other units, as well as by the quality of individual decisions. Requiring performance to be contingent upon the ability of individuals to work as teams pursuing common purposes conforms with the results of several previous studies. For instance, Sins and Hand concluded that successful teams understood how personal goals contributed to organization goals, and had members that believed their efforts had a direct bearing on team results [7, p. 111]. Hutte found that a free exchange of opinions, rather than the offerings of facts, lead

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to high performance, whereas centralization of decision making did not [2]. This is similar to Wolfe's results; that is, a group's ability to set goals, plan, assimilate information, adapt to changing conditions, work well with others, and internalize a top management perspective leads to high performance (8, p. 880J. In other words, success basically depends more upon the decision making atmosphere than on rigorous analysis per se [9, p. 50].

METHODOLOGY

It is expected that high-performing teams will understand the social processes that are required to make good decisions. In some circumstances, this will entail an atmosphere of openness, trust, and full participation in offering suggestions and giving feedback. There will be those occasions, however, where team members will prefer greater formal structure and firmer direction in order to be successful. This decision-making style would require a greater willingness to take orders and know what is expected of the members.

During the second week of game play (decisions 3 through 8), the various groups and subgroup units were observed by four second-year M.B.A. students, concentrating in Human Resources and Organization Administration, who had played the game the previous year. Leadership styles and interpersonal dynamics were recorded at decision-making sessions, with the observers instructed to note such behaviors as the concern individuals had with their group members' performance, the extent of information sharing or work facilitation, how much the members let others know what was expected of them, the amount of praise or recognition given, and the different planning and decision making styles. These observations were used to gather descriptive data about behavioral patterns that distinguished each of the teams.

Since student competition for grades is a very "real" part of the simulation, some may be tempted to "play the game" in order to achieve this objective. Therefore, the criteria used to rank team performance consisted of efficiency measures, forecasting effectiveness, and trade-off variables; they were at the organization, group, and Individual levels; and included both objective and subjective data (see Table 1).

TABLE I.
Criteria for Ranking Team Performance

Level	Criteria	Proportion of Final Grade
Organization level	Profits	10%
	Stock Price	10%
Group Level	Written Analyses	30%
	Forecasting Accuracy	30%
Individual Level	Final Report	20%

According to the observers, the first-place group consisted of individuals who were cohesive and cooperative and had open communication flows among them. The leader, by relying on the expertise of others and allowing the group members a great deal of autonomy, served primarily

as the coordinator by reconciling differences and providing direction. Hence, this team will be referred to as the Contributors.

The runner-up team was generally comprised of older students, and many of them had been awarded student assistantships. As such, they were considered to be bright and ambitious. They were observed making decisions in a manner similar to that of the Contributors: ideas were shared to benefit the group as a whole, and the role of the leader was to solicit ideas for agreement and to provide comfort and support to individual members. strategies were carefully formulated and clearly communicated. Although not suggesting alternatives as eagerly as did the Contributors, their relations were equally harmonious, generally enjoyable, and a very friendly atmosphere pervaded their activities. This team will be called the Consensus group.

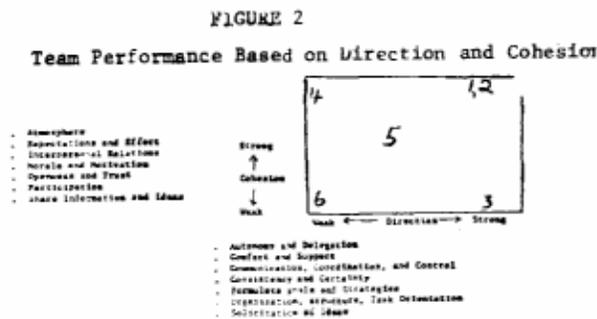
The third-place team was reported to be distinctly different from either the Contributor or Consensus groups. The formal leader took charge by demanding that the members work long hours, was methodical in making decisions, and was determined to obtain member acceptance of those decisions. Although the team individuals got along well, the leader did not require them to interact or communicate. Indeed, they were often encouraged to work alone. Effort and sociability were minimal. This team will be referred to as the Compliers.

The team that placed fourth was considered by the observers to be congenial and friendly towards one another, as were the Contributors and Consensus groups. Unfortunately, they failed to establish the well-organized structure of the Compliers. As a result, their brainstorming sessions that would have normally allowed for the sharing of information and the review of alternatives did not provide any useful information. This team can be characterized as being Flounders since their goals, policies, and strategies were inconsistent, indecisive, vague, unrealistic-and frustrating. They exerted little effort and held minimum expectations. Based on this results in the game environment, it appears that the group cohesion or participation they displayed was not as important as the unity of direction which characterized the Compliers.

The fifth-place team reflected the problems of a group whose members had not been preselected; hence they will be referred to as the Leftovers. A vacuum of leadership was encountered from the start allowing for political rivalries and misunderstandings to develop. Possibly because many of the members had been imposed, they had developed little trust in one another. The result, as described by the observers, can be called leadership by default, and the constant changing of management styles increased the turbulence in the group and the antagonism among its members. The consequence was an inappropriate organization, low morale and motivation, and limited coordination or control over direction. Hence, instances of neither participation nor direction stem from or prevent the development of openness among team members, making it extremely difficult to perform well.

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The last-place team will be called the Country-Club because their meetings consisted more of nonthreatening and irrelevant conversation than of formulating strategies and policies. Although they were similar to the Flounders in that the members were observed as being friendly and informal, their extremely lackadaisical attitude resulted in a slow learning process, numerous errors, and difficulty in catching up to the other teams. When it came time to make a decision, the individuals chose to work autonomously without communicating their actions to one another. The result was a lack of integration, with leaders that did not delegate, schedule, or allocate tasks, and members that did not support one another through the selling or suggesting of ideas, training, or coaching. In this case of limited participation and direction, the decision-making process did not lead to quality results. (Figure 2 conceptually summarizes these observations.)



DISCUSSION

Participative decision making coupled with unity of purpose leads to a high level of performance and satisfaction, as when there is a strong leader willing to provide direction yet share power with group members. The opposite may also be true: the organization slack arising from good results may allow leaders to take the risk inherent in greater member involvement. A strictly interpersonal approach that attempts to develop group cohesion can lead to an atmosphere of openness and trust and contribute to a large number of ideas, recommendations, and alternatives. If economical results are not forthcoming, however, the individuals may decide to compensate for their failure by enjoying one another's company in an attempt to maximize their "social wealth". On the other hand, a task orientation that clearly defines roles and clarifies goals so that decisions are internally consistent can lead to high performance when the environment is well structured and relatively certain. Such an approach, however, could be dysfunctional under rapidly-changing conditions where it would be more appropriate to simply "muddle through".

The results of this study confirm prior findings of simulation games that neither rigorous analysis by the group members nor specific direction from a strong leader alone result in as high performance as does an open decision-making atmosphere. Nevertheless, group members must somehow agree on direction and provide consistency of action, even if it originates from the ability of the dominant individual at the expense of group cohesion. Changing goals,

policies, and strategies too frequently, even when it does not damage morale, detracts from high performance. A lukewarm compromise between specifying tasks and developing good working relationships is not as effective as a strong commitment to either one.

These findings result from the characteristics of the simulation itself. Other games with different parameters and settings should repeat this study so that the results can be compared. Several limitations need to be pointed out, however. First, the role of the administrator might have contributed to differences in performance to the extent that the interactions, direction, and instructions differed among the teams. The administrator's enthusiasm may have changed with each group, affecting the members' motivation. Second, the course objectives might have diverged from the purpose of either the game or the experiment, and so the teams could have been pursuing different ends. It is not certain to what extent decisions were made to satisfy course requirements that could have been at odds with the game's parameters. Third, the student demographics may explain the different team results, or with results reported elsewhere. Further analysis considering the composition of groups is warranted. Finally, observed data is inherently subjective in measuring the results reported in this study. Hopefully, the results will prove to be as valid as using more conventional data gathering instruments.

CONCLUSIONS

Computer printouts used to evaluate performance do not allow students to reflect on their behavior, interpret their rationales, or understand their personal goals and assumptions. Hence, comparisons of team results with observed data will enhance the gaming experience of students by providing for and rewarding both the simulated and stimulated aspects of gaming [5]. Based on the results of this study, the successful teams understood the significance of processes involved in making decisions, cohesion in setting direction for the group, and leadership in controlling members.

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