Insights into Experiential Pedagogy, Volume 6, 1979

THE USE OF INTENSIVE SIMULATION IN EXECUTIVE DEVELOPMENT AND ACADEMIC SETTINGS

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ABSTRACT

Extended simulations used in management and policy contexts have frequently been associated with dysfunctional consequences such as boredom and apathy, excessive uses of time, group disintegration, and goat displacement. An intensive simulation is proposed in order to minimize these undesirable side effects. Data gathered from executives and two student groups suggest the intensive simulation may result in attainment of desired pedagogical objectives.

INTRODUCTION

Business simulations are frequently employed in finance, marketing, production, and systems design settings as vehicles for increasing technical competency of participants. These applications generally are successful, in part, because of their emphasis on the development and refinement of specific skills which can be readily measured. Moreover, these simulations are focused upon the content of the simulation itself, rather than the process whereby managerial decisions are obtained. The latter focus is typically found in courses and developmental seminars designed to impart managerial skills, and to assist in the framing of administrative policy.

When used in general management and business policy contexts, simulations are normally designed to improve the conceptual and human skills needed in managerial assignments (Katz, 1974). The development of these nontechnical skills is complicated because of the inability to accurately evaluate or measure changes in these relatively ambiguous areas. Consequently, an instructor who adopts a simulation in these topical areas is choosing a pedagogical technique which combines an ill-structured learning methodology with generalized content material. To achieve the goal of developing generalized managerial insight and skills (Miner, 1977), the instructor commonly establishes a manageable set of supporting objectives. The major objectives attempt:

…to encourage an integrated view of the major functional departments of a business, and the methods for coordinating their activities.

…to create an organizational setting in which participants can experience the interpersonal dynamics of managerial decisions.

…to provide a situation wherein strategic planning techniques can be adopted and evaluated.

…to encourage delegation of responsibility and simultaneously structure an opportunity to observe both individual and group behavior.

Anyone who has implemented a simulation in a conceptual area (versus a technical area), is aware of the problems encountered. The simulation can be very effective, but it is an extremely sensitive device. Many minor environmental disturbances can mediate the success of even the best simulation exercise. It is useful to note the more significant barriers that can interfere with the simulation.

EVOLUTION OF THE SIMULATION

The authors have been involved in a graduate management course designed to address issues of managerial decision making and to isolate principles of organizational theory and behavior. During recent years a computer-based simulation has been included in the instructional methodology. The simulation has undergone an evolutionary transition. To enhance its educational value, revisions have been annually incorporated into the basic program and the simulation procedures. These revisions have occurred as a result of student feedback, interaction with other faculty (who subsequently enroll the students in their courses), and the author's assessments of success in achieving stated goals.

The simulation evolved from being the major component of the course (involving 12 decision trials over 16 weeks) to a more limited factor (requiring five decisions over 6 weeks). At the current time, the exercise is an "intensive" session structuring four decisions into two week-long modules.

The decrease in the amount of time (to the intensive sessions) was undertaken because there are a number of dysfunctional products associated with extended simulation exercises. There are at least four major problems which emerge during the latter periods of an extended simulation experience. These problems include:

Boredom and Apathy - Initial periods of most simulations require participants to master the rules and procedures of the simulation, and to simultaneously gain understanding of the decision environment. Participants can quickly master the rules of the simulation, and after a number of trials, begin to make sense Out of the decision environment itself. Once this occurs, the decision procedures become fairly structured, and decision making emphasizes operational issues. After the maintenance period is achieved activities become routinized and boredom can follow. Most simulations have a range of decisions wherein this "shift" takes place. Marginal increases in knowledge are slight after the shift.

Competing Time Demands - Simulation exercises lend credence to Parkinson's Law; that work expands to occupy the time available. Students and participants in these exercises can become engrossed in details of the decision process, and may devote inordinate amounts of time on non-critical functions. The desire to succeed leads some to believe that sheer volume of effort w-ill compensate for a lack of understanding. Potential conflicts with other courses and work requirements are apparent. Resultant conflict may produce resentment toward the simulation or may encourage participants to neglect other demands.

Group Disintegration - Whenever groups are formed in real or simulated businesses, one can expect a variety of interpersonal crises to arise. This is especially true when groups are employed in educational activities. Inadequate leadership skills, variations in participant abilities, motivation and commitment, inability to differentially reward performance, and the lack of supervision over group processes are likely to lead to significant declines in the quality of group functioning.

This problem is further aggravated as groups which **ex**perience internal struggles frequently manifest lower performance. Participant complaints about group activities and specific members become an impediment to continued interaction.

Goat Displacement - The instructor in a management or policy session uses a simulation as a vehicle for imparting understanding about organizational functioning and decision making. Extended simulations make it likely that participants will lose sight of the goal and focus on mastering the simulation. This goal displacement can lead to increased motivation, but nonetheless, it detracts from the true goal of developing managerial competency. It is particularly frustrating when students portray a management class as a "course in simulation," an unfortunately common occurrence.

The concept of an 'intensive" simulation experience emerged in an attempt to balance the educational goals of the business simulation with the frequently encountered barriers. Obviously, if the educational goals can be achieved at a lower cost, the overall value of the simulation can be increased.

THE INTENSIVE SIMULATION CONCEPT

The intensive simulation has been used during an executive development program and during the regular academic year as part of two required MBA management courses. The mechanics of the simulation were essentially the same for all applications. A week before the simulations were to begin, the simulation manual was distributed. The manual explained the nature of the simulation and the decisions required each operating period.

The session before the simulation involved the instructor reviewing the rules and procedures. Some time was left for questions. Simulation team members were instructed to select a president and establish an organizational structure.

The four subsequent class meetings were simulation workshops. The instructor served as a resource while groups worked toward their decisions. Decisions were due two to three hours after the workshop. Feedback (in the form of computer printout) was provided approximately three hours following receipt of the decisions. Participants received balance sheets, income statements, product demand information, and a summary of their competitors' decisions and outcomes.

EVALUATIONS OF THE INTENSIVE EXPERIENCE

In order for the intensive simulation to be considered a success, a number of factors stressed in management and policy courses should be associated with effectiveness. More specifically, the most effective teams should report; 1) a high degree of mutual trust among team members; 2) open and authentic communications among team members; 3) a high degree of mutual support and assistance among team members; 4) clear team objectives; 5) working conflicts through to resolution; 6) full utilization of members' skills and talents; 7) internalized control systems; 8) consensus decision-making procedures (versus pressure and forcing); 9) a supportive organizational environment wherein differences are allowed; 10) concern for team success; 11) satisfaction with good performance; 12) and a workload shared equally by all members.

A questionnaire was developed to assess participant perceptions of the twelve factors listed above. A seven point response format allowed all individuals in the simulations to express their perceptions of the pervasiveness of each of the twelve items.

Initial data collected from the executive development program were encouraging (see Table 1). Teams were ranked according to the average of their net income and net income forecasting error. Clear team objectives, utilization of members' skills, internalized control, and satisfaction with performance appeared to be associated with success.[1] Although firm conclusions cannot be reached from these data, the results were sufficiently encouraging to cause continuation of the project.

TABLE 1
MEAN EXECUTIVE "CLIMATE" RESPONSES PER RANK

	Team Ranking Groups		
Question Area	Top 10	Mid. 10	Bottom 5
1) Trust	5.83	5.48	5.93
2) Communications	5.93	6.04	5.03
3) Support/Assistance	5.56	5.30	5.30
4) Team Objectives	5.06	4.30	4.17
5) Conflict Handling	5.51	5.48	5.10
6) Skill Utilization	5.84	5.06	4.70
7) Control Methods	5.76	5.10	4.40
8) Decision Making	5.61	5.20	5.70
9) Environ. Openness	6.00	5.60	5.90
10) Concern for Success	5.93	5.78	4.96
11) Satisfaction $\bar{c}$ Perf.	6.12	3.88	3.96
12) Workload Balance	4.46	4.00	4.10

Note:
1. Each scale ranged from 1 (low) to 7 (high).

The intensive simulation was subsequently used in two M.B.A. classes. Simulation teams of four or five members were formed such that each class represented an industry." Industry A consisted of twenty three teams and industry B consisted of twenty teams. Team effectiveness in Industry A was based upon several equally weighted factors that included demand forecasting error, net income forecasting error, net income, return on investment, return on sales, market share and cash management. Effectiveness in Industry B depended upon a weighted average of net income (3/4) and net income forecasting error (1/4). After the simulations were finished, the students completed the same questionnaire administered to the executives.

The data in Table 2 suggest the desired objectives were generally achieved with the intensive simulation. Teams were grouped according to their performance quartile. Responses to the questionnaire were analyzed using ANOVA that involved quartile (1 through 4) and industry (A or B) as independent factors. The twelve questionnaire items served as dependent measures.

Significant differences were found for all items except the trust and workload measures.[2] Across both industries, students whose teams finished In the first quartile generally reported significantly higher mutual

[1] unfortunately, statistical tests were not possible because the researchers were obligated to return all data to the participants before the executive program ended.

[2] A significance level of a=.05 was required for all main or interaction effects. Main or simple effects were further analyzed by using the Newman-Keuls technique. Pairwise comparisons were performed at the **a=.** 05 level.

support among team members, clearer team objectives, better utilization of members' skills, more internalized control, more consensus in decision making, a more supportive environment, greater concern for team success and higher satisfaction with performance than students in lower quartiles. In addition, within Industry B, students in Q1 generally reported significantly more openness in their communications and a greater propensity to work conflict through to resolution than Students in lower quartiles. Finally, students in industry B reported that their objectives were significantly more clear than students in Industry A.

TABLE 2
MEAN STUDENT "CLIMATE" RESPONSES PER QUARTILE

	Quartile (Q1 high, Q4 low)			
Question Area	Q1	Q2	Q3	Q4
1) Trust	6.17	5.92	5.77	5.72
2) Communications	6.50	6.08	5.91	5.80
3) Support/Assistance	5.96	5.42	5.47	5.36
4) Team Objectives	5.44	4.83	4.74	3.80
5) Conflict Handling	5.50	5.13	5.11	4.30
6) Skill Utilization	5.85	5.08	4.91	4.18
7) Control Methods	5.81	4.65	4.95	4.16
8) Decision Making	5.81	5.31	5.00	4.91
9) Environ. Openness	6.04	5.48	5.44	5.09
10) Concern for Success	6.25	5.23	5.44	4.36
11) Satisfaction w/ Perf.	6.42	5.36	3.83	2.27
12) Workload Balance	5.08	4.36	4.71	5.14

Note:
1. Each scale ranged from 1 (low) to 7 (high).

CONCLUSIONS

Since extended simulations used in general management and policy contexts have frequently been associated with dysfunctional effects, an intensive simulation experience is proposed. Data gathered from the students who participated In the intensive simulations suggest many of the desired effects were achieved. Many of the management and policy principles that instructors typically recommend in the classroom were associated with success in the simulations. Additional evidence suggests a limited number of "bottom line" criteria (such as those used in Industry B) may be more functional than a multitude of forecasting, profit, and cash management criteria.

Further research is needed before an unqualified endorsement of the intensive simulation can be made. Cause-effect links are difficult to establish in this type of study. However, feedback to the students of the results found in this study was helpful in showing students that some of the more general managerial skills are in fact associated with team effectiveness. This "experiential" learning may be more valuable than many of the so-called expert opinions that the students read in their textbooks. Furthermore, this paper suggests that this learning may be accomplished in a relatively short amount of time with a relatively limited commitment of resources.

REFERENCES

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