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ADMINISTRATION AND DESIGN OF SIMULATION MATERIALS FOR A SPECIALIZED MANAGEMENT TRAINING PROGRAM

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ABSTRACT

A series of management simulation games in a library setting were designed to be part of a one-week seminar in Management for Librarians, a program funded by HEW. This paper describes design considerations in setting up a program for a quite different group than those usually exposed to simulation gaming. The results secured, a general evaluation, and plans for future seminars are discussed.

students, engineering students and middle management industrial groups all played relatively well, enjoyed the games, and learned a great deal about problem solving and inter-personal relationships from them. They tended to be competitive in nature, attuned to concepts of winning and optimizing, and accustomed to working with mathematical relationships. In addition, they tended to perceive the relevance of the decision-making process in the games and were not overly concerned if some relationships were necessarily simpler than might be found in a real-life situation.

INTRODUCTION

For some time there has been an interest at our institution in training groups from other disciplines in the essence of management problem solving using simulation gaming techniques. One such group is professional librarians who manage and administer libraries and who are just beginning to recognize the need for sound management skills and practice in their field.

Joint efforts by faculty with research interests in library management coupled with faculty with research interests in simulation gaming produced a series of management simulation exercises in the library administration setting. These games were developed and tested with local library managers and then offered as part of a one-week seminar in 'Management for Librarians' in the summer of 1978. The program was funded by the Department of Health, Education and Welfare and was attended by a full complement of library managers from the north-eastern United States.

The week-long program was an unqualified success, receiving excellent evaluations from the participants. Many of them have written to express their appreciation for the program, indicating that the program was a challenging and personally valuable experience in problem solving. The results were very rewarding and have encouraged us to conduct further programs in this area. Evaluations made by seminar participants combined with our own observations have led us to revise and restructure the simulation games. This paper examines what we did, attempts to evaluate what we learned, and explains the changes we are planning to make.

PREVIOUS EXPERIENCE IN SIMULATION AT OUR INSTITUTION

Our college has been active in simulation gaming for some 20 years, with five books and numerous articles on simulation authored by our faculty. Facilities include a well-equipped laboratory area for gaming with team rooms, observation rooms, and an unwire room. Computer facilities permit the umpiring of games online, which allows games to be played from start to finish in one session.

Online games have been played in two-hour laboratory periods for some years and offered to freshman, junior-senior, and graduate students in management. We have also offered simulation gaming to engineering students and to middle-management personnel in industry. The management

THE PARTICIPANTS IN THE PROGRAM

Funding of the program by HEW made it possible to circulate notices to libraries throughout the northeast and to be able to select the 18 participants from a large number of applications. This made it possible to secure a diversity of backgrounds, with the final group being about 2/3 female and 1/3 male, about 50-50 between relatively small and relatively large libraries, about 50-50 between academic and public libraries, and with an age range from the late 20's to the late 50's. All had Master's degrees in library science and all had some level of management responsibility in their libraries, with over one-third of them being library directors.

The level of mathematical sophistication was considerably below that of other groups we had worked with, but in terms of total educational background and experience in management positions, the participants appeared to be the equivalent of other groups. Accordingly, we set out to design games that had a library setting, that were fairly simple mathematically, that would introduce the participants to quantitative analysis, and that would have a reasonable level of complexity in organizational relationships, particularly in negotiation situations.

THE GAMES DEVELOPED

Six games were developed for use in the seminar. Game 1 - THE ALLOCATION DECISION - was designed to introduce the participants to simulation and to mathematical formulas. The setting called for a decision about the percentage of the total budget to be spent on documents as opposed to other services, with the goal being to maximize the number of document exposures. A relatively simple formula was given and teams of three were asked to make the allocation decision with results for all teams shown to each team via television monitors. Prior to playing the game, the participants attended lectures in which mathematical formulas and the use of mathematical modeling in management was discussed. The goals of this game were to give the participants some experience in analyzing a simple model and making a good decision, illustrating that effective analysis and decision making yield desirable results.

Game 2 - PERSONNEL SCHEDULING - was designed to follow up Game 1 and introduce the additional complexities of a random demand and an inventory while still keeping

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the mathematics quite simple. The game called for scheduling personnel to process documents, with the number of documents to be processed randomly generated between 150 and 250 each week. Scheduling too few personnel resulted in lost exposures and an inventory of unprocessed documents, while scheduling too many personnel resulted in inefficiency and was considered to be effectively three times as costly as under-scheduling. This game was also designed to be played by teams of three people with results provided by TV monitors. Twenty-five decisions were made in the session. The goals were similar to those of Game using a somewhat more complicated setting.

Game 3 - PROGRAM SELECTION - was designed to be played by teams of six in individual team rooms. Teams were given 15 programs each period with the program cost, the first year benefits, and the yearly percent decline in benefits randomly generated for each program. Teams were to select up to five programs, using their budget to secure the maximum benefits over a 10-year planning horizon. As not enough time was given to make all the calculations necessary to get the best answer each time, the teams had to make judgments about which factors were most important in order to determine the programs to be selected. Goals of the game were to combine analysis with judgment in making decisions and to introduce more effectively than in previous games the elements of small group dynamics in arriving at a team decision.

Game k - CONTRACT NEGOTIATION - was designed to be played by teams of three, representing library administrations, each negotiating directly with a team of three, representing a union of the professional staff. A game consisted of negotiating three successive contracts covering salary, a benefits package, conference attendance allotments, and tenure. The importance of each factor to each side was randomly generated and given to the team as privileged information. Union team results were compared with other union teams, while administration results were compared with those of other administration teams in deciding which team fared the best. Thus it was possible for an administration and union team negotiating with one another to obtain either poor results for both or good results for both. This game was played twice with teams changing their roles from union to administration or vice versa for the second play. Goals of the game were to give the participants experience in direct negotiation coupled with need for analysis of the value structures given to secure a good result. It was hoped that the second play would lead teams to see the value of understanding the point of view of the team they were negotiating with.

Game 5 - FUTURISTIC EDUCATIONAL RESOURCES CENTER - was designed to be played in teams of six in direct competition with other teams. This game is much closer to typical business games than the others in that the assumption is made that libraries are charging for their services and thus a pricing decision is important and profits determine the winner of the game. The demand equation had a share-of-the-market element, a pricing element, and a percent satisfied element. Percent satisfied represented the percent of customer requests satisfied immediately from current holdings rather than being secured elsewhere with appropriate delay. This meant that a decision to make major investments was required in order to build up percent satisfied. Goals of the game were to introduce the participants to a highly competitive business simulation while retaining a library setting with a reasonably complex investment decision underlying the analysis of strategy to be followed. It was hoped that the experience gained in the previous games would permit reasonably good analysis and decision making in this game.

Game 6 - BUDGET NEGOTIATION AND ALLOCATION - was designed to be a negotiation game similar to Game k and played in a similar way but with a considerably more complex set of conditions requiring analysis. Negotiating teams represented a university administration and their library administration. Library teams could allocate their funds among three different library programs. Relative weights of each program was privileged information to the library teams. An analysis determining equal marginal rates of return was called for to get optimum allocations and resulting maximum benefits. The money each library had to invest came from securing an allocation from the administration. All benefits the library earned also accrued to the administration, who, in addition to the library, had two other programs to invest in. Relative weights for these programs was privileged information to the university administration. Goals of the game were to put the teams in a reasonably realistic situation of justifying allocation of funds based on benefits to be provided. The relatively complex analysis provided an opportunity to combine analysis and negotiation skills in one game.

EXPERIENCE WITH THE GAMES

While the results overall were very good and many of the participants were particularly laudatory about the mind-expanding potential of the games, the play was somewhat below the caliber of play of other groups. Some of the reasons for this were that, on the average,

1. The mathematical abilities of the participants was lower than other groups.
2. The competitive spirit of some participants was lower than expected and some just did not want to compete or felt uneasy about playing to win.
3. Adequate time was not provided to prepare participants for the games prior to playing them.
4. Many participants felt considerable frustration if they were unable to do things "right."
5. As a group, they found the games very intense and demanding and were surprised at how tired they were after a gaming session.

Results with individual games were varied.

Game 1 Many questions were raised in this game about the relevance to libraries. In addition, people tended to be somewhat confused about what was wanted. The game was designed to be simple and self-explanatory and was too simple to explain what to do without taking all the play out of it. Despite this, many were not ready to come up with an analysis on their own. In general, the progressive learning achieved with simple games in other groups was not duplicated here.

Plans for future seminars call for eliminating this game from the program.

Game 2 The concepts of long-run probability and how to make good decisions in the face of uncertain demand were more than some participants were prepared to cope with and in practice we had to help people with their decision making. They were then very pleased with their ability to make reasonable decisions but the game provided a vehicle for having the instructor explain

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how to play rather than having the participants learn by doing.

Plans for future seminars are to eliminate this game a 1 so.

Game 3 This game worked particularly well. Participants by and large seemed to understand what was being asked for and those who did not learned from others on their team. More time was given for making decisions than normal' and this served to give reasonably good decisions.

Plans for future seminars are to make this the first game played. The learning about simulation that took place the first two games contributed to this game. To substitute for this learning, the need for preparation ahead of time will be stressed and more time will be devoted initially to explaining the game, endeavoring to ensure that everyone understands what is expected of them before beginning to play.

Game 4 This game also proved to be very effective and most teams took to the negotiating feature very. However, most teams did not combine analysis and negotiating but rather bypassed analysis and set out to negotiate a settlement without really understanding the importance to the results of individual issues.

This game has been used with labor relations classes as part of and since its development, and those students tend to play better than the librarians, usually analyzing the game effectively and using negotiation skills to supplement the analysis.

Plans for the future are to retain the game in much its present form but to spend considerably more time discussing the analysis of the issues and their importance in securing a good result. The participants will then be walked through" one negotiation only and this analyzed before beginning regular play.

Game 5 This game was enjoyed by the participants but they experienced considerable frustration in deciding how to play well. Considerably more time was spent at the beginning of the game explaining the various calculations, which helped participants a good deal. Nevertheless, the combination of a share-of-the-market feature with a pricing decision and an investment decision was really beyond most of the participants' capabilities at this stage of their training. We had expected considerable resistance to using pricing in a library game, but were pleasantly surprised to find very little, although some did object to using profits as the criterion to determine the winner of the game.

Plans for the future are to have a similar but more simplified game. If time permits, this game could be retained as a follow-up to the simpler game, although it is somewhat doubtful' that this could be worked into a one-week program.

Game 6 While in many ways the best and most realistic of the games, this game was just too difficult for all but a handful' of the participants. In practice the playing time was limited to allow for a thorough review of the concepts of equating marginal rates of return. However, those that worked on the analysis concepts usually had little 'left over for negotiating and those that concentrated on negotiation usually spent too little time on getting optimum allocations. This game was much more complex than the previous games, although participants did rate it fairly high and seemed to enjoy it.

Plans for the future are to retain this game in much its

present form but to add another game preceding it that solely involves allocating funds to programs without any element of negotiating to get these funds. After this lesson has been reasonably learned in a preceding game, it is hoped that participants will be able to use the learned analysis in the negotiation part of the game, as the game appears to be too valuable to be discarded.

SUMMARY

While the paper has tended to detail some of the problems experienced, we would like to stress that we believe the overall results to be most favorable. The participants were exposed to the challenges, frustrations, and the complexities of management decision making while needing to combine the analytical and behavioral aspects of management in order to get good results. We believe that a great deal' was accomplished using management simulations that could not have been achieved through straight classroom presentations. Evaluations by the participants seemed to reinforce this conclusion.

The changes planned should make the simulations an even more important part of the program and we look forward to putting on another seminar in 'Management for Librarians.'