AN OVERVIEW OF SIMULATION GAMES AND COMMENTS ON THEIR USE IN BACCALAUREATE NURSING EDUCATION

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A myriad of sociological and technological changes have shaped the development of nursing education, and current concerns are related to problems of supply and demand for nurses, changes in nursing roles and functions, and changes in nursing education programs.

One of the current concerns in baccalaureate nursing education is the effective use of the clinical laboratory. Part of this concern stems from the complaints of employers who feel that baccalaureate graduates lack basic clinical competence, presumably because of abbreviated clinical experience (Hurd, 1979); and part stems from changes in nursing curricula away from a focus on separate subjects.

Some nursing education programs, e.g., the University of Manitoba, have changed from a content to a process focus where emphasis is placed on a variety of processes through which understanding and knowledge can be developed. Underlying this approach is the assumption that the learner must discover for himself through the active process of inquiry, and that the objectives of education cannot be achieved by looking directly to content (Parker & Rubin, 1966). The process model incorporates four considerations: 1) it is a way of selecting only essential content from the masses of data being generated by the knowledge explosion; 2) it teaches a logical, precise cognitive process that is easily applied to simulated nursing problems; 3) it responds to the immediate concerns of students for immediate relevance and usefulness; and, 4) it uses teaching personnel and classroom time in the most economical way (Bevis, 1973). As a result of these considerations there has been a change in thinking about the use of the clinical laboratory and the nature of the learning activities that might be employed to prepare the student for the clinical laboratory experience.

One possible learning activity that could be employed is the use of simulation games. Before implementing such a learning activity however, it is useful to consider what simulation games are and are not, and how they have evolved. The purpose of this paper is to present an overview of simulation games and to discuss briefly their use in baccalaureate nursing education.

DEFINITIONS

In order to understand the current uses and intents of simulation games, it is first necessary to define several terms.

Games: A game, according to Cruickshank (1977), is a contest usually among opponents who operate under rules to gain an objective; games may be non-academic, i.e. primarily for fun, or academic, i.e. primarily for or based on learning. Games have been played in every culture across time and two reasons have been put forth for their popularity: games reflect important life situations and thus allow players to practice life and games are an instinctive activity which has a serious practice intent important to the development of the human. Both of these perspectives acknowledge the purpose of a prior safe experience as preparatory to dealing with future, important, real-life situations.

Gordon (1972) says the term "game" connotes fun and that the fun lies in the combination of reality, make-believe, and safety since the only penalty for poor judgment is losing the game. Games however encompass more than fun. Chess, originating 1500-2000 years ago, was developed as a war representation game. War games were further developed in the 19th century by the Germans as a means of experimenting with different military strategies under varying conditions. The second World War saw further refinement, by all countries, of the military games approach. Military games represented a method of analyzing problems, and an opportunity to experiment with solutions and evaluate their effectiveness without the potentially dangerous consequences of a mistake in the real world of war (Gordon, 1972).

Business games were developed after World War II to provide opportunities for businessmen to experience decision making under varying conditions. Experience gained through a game situation was seen to be less costly than real-life decision making and, as a teaching method, it was felt to be more effective than the traditional book and lecture method. Thus, what has happened is that games, although not entirely losing the element of fun, have become serious endeavors.

Simulation: Dawson (1962) points out that the term "simulation" has both a popular and a technical meaning. Popularly, it denotes the assumption of the appearance of something without having its reality, or the assumption of false appearances for the sake of decep-

tion. In a tighter technical sense simulation most often refers to an operating model of an object, e.g. for testing hull shapes.

Several definitions of simulation appear in the litterature and are discussed by Beck and Munroe (1969). The definition offered by Greenblatt (1971) — an operating model of central features or elements of a real or proposed system, process, or environment — combines elements from several of the earlier definitions of simulation. Cruickshank's (1966) definition of simulation makes the transition from games and simulations perceived as discrete, separate entities, to simulation games as a hybrid. He defines simulations as realistic games to be played by participants in order to provide them with life-like problem solving experiences related to their present or future work.

Currently the terms simulation and game-simulation are very often used synonymously and it has been suggested that an avoidance of the term "game," in discussing academic games, is due to a desire to eliminate the connotation of frivolity. For the purposes of this paper the definition of simulation game developed by Cruickshank (1977) is used, i.e., realistic games to be played by participants in order to provide them with life-like problem solving experiences related to their present or future work, and a simulation game will be understood to be an academic game in which players are given a role in a simulated environment in order to learn how the environment works.

DIFFERENCES AMONG ROLE PLAY, GAMES, AND SIMULATION

Role playing is said to differ from games and simulations in several important ways. One, role play is an element of simulation, but simulations also include other components. In role play the player is assigned a role and given only the general outline of a situation. In simulation, in addition to the role and the scenario, or script, the participant is also given goals to orient his behavior, the resources to attempt to meet these goals, the rules to govern his behavior, the order of play, the consequences of violations, and the environmental responses (Greenblatt, 1971). Further, in role play not all class members participate in the role play but observe the unfolding of this extemporaneous activity. Beck and Monroe (1969) classify role play as a limited form of simulation.

Simulations differ from games in that the strategies of gamesmanship are rather specific to the particular game involved. Simulations used for educational purposes are seen to be transferable so that the learner, after experiencing a simulation, is better prepared to cope with real events (Beck and Monroe, 1969). Five further distinctions between simulations and games are made by Dawson (1962). These are in regard to: the purpose of the process, the role of humans versus the role of machines, the element of competition, the tightness or looseness of interactions within the system, and the type of language in which the experience is expressed. These distinctions, made in 1962, appear to be present in Duke's (1974) definition or gaming/simulation as a gestalt communication mode combining a game specific language and appropriate communication technologies with the multilogue interaction pattern.

Simulations, role play and games thus differ in the degree of structure used, the learning focus of the activity, and the involvement required of the participant. Simulation is a more inclusive representation of some process that is to be understood by the student.

USES OF SIMULATIONS

Dawson (1962) says that simulations can be used by social scientists for a wide variety of purposes which include design, development of a body of knowledge, training and teaching. However, for design purpose it is probably more accurate to use the terms model or simulation. Development of a body of knowledge can be facilitated by the use of simulation which allows testing of hypotheses, as in many instances it is impossible or unrealistic to test the hypotheses upon the real system. As a training device, simulations are intended to have the student learn how to perform various functions in a simulated situation. The teaching purpose of simulation is to teach students about complex systems by having the student handle information, make decisions, and experience the consequences in the simulation of these decisions.

Simulation games are increasingly used in teaching management and political skills. One of the first important management simulation games was the American Management Association's "Top Management Decision Game" developed in 1956. Formulation of political games was undertaken by the RAND Corporation in 1954 as a result of earlier experiences with war games. More recently, the use of management and political game simulations has spread to the university where they are used for both research and teaching.

Greenblatt (1971; 1975) describes the use of several simulation games, e.g. Community Land Use Games, Democracy, Ghetto, and SIMSOC, used in teaching sociology, foreign policy, and social work at the collegiate level. Godejohn, Taylor, Muhlenkamp, and Blasser (1975) described the use of simulation games in undergraduate nursing courses.

Based on a review of the literature and the number of games and simulation games listed in instructional materials catalogues, games and simulations appear to have been more widely used in elementary and secondary education. However, there has been an escalating interest in the use of simulations at the post-secondary level and increasing demand, at the doctoral level, for training in this area.

CLAIMS MADE FOR SIMULATION GAMES

The following summary points are from an article by Fletcher (1971) who succinctly presents the claims made for the use of simulation games in education: 1) they are self-judging: the outcome decides the winner and a player knows he has lost or won by his own actions; 2) the role of the teacher is transformed from the role of judge back to the original function of teacher as helper; 3) learning is more relevant for two reasons: the simulation games provides an immediate goal, to which the content of learning in the classroom relates and simulation games provide opportunities to practice roles which the student sees as important to his future life; 4) participants are freed from the consequences of their acts; 5) they motivate; 6) interpersonal and information-manipulation skills are taught; 7) increased self-awareness occurs; 8) attitudes are changed; and, 9) understanding is increased. Fletcher, however, plays devil's advocate with all of these claims, and he concludes that there is a need to put some kind of order into the total area of research into simulation games as a first step to accepting or rejecting any of the above listed claims.

ADVANTAGES AND DISADVANTAGES OF SIMULATION GAMES .

Advantages: Beck and Monroe (1969) identify the following advantages of simulation games over lecture-reading methods: 1) they can provide experience in a wider range of educational objectives—affective as well as cognitive, process as well as content oriented, and elaborated concepts of cause and effect; 2) there may be a greater transfer of knowledge from the training situation to the life situation; 3) simulation games provide a responsive environment which may give learners a sense of immediacy and involvement; 4) simulation games can provide experience of a high cost environment in a low cost model; 5) they can provide short time experience and feedback in longterm processes and allow practice in decision making in a timeless environment; and, 6) they can provide a practice field for using successive strategies in problem solving, and systematic exercises in inquiry training.

Research findings: The question, however, must be raised: how well do these claims and perceived advantages of simulation games hold up under the scrutiny of research studies?

Boocock and Schild (1968) state that, as a result of simulation games, the players did acquire information, a real feeling for the processes simulated, an appreciation of the complexity of the real life situation, and an increased confidence in their own abilities to act effectively in such situations.

A study by Dukes and Seidner (1973) found that subjects tend to re-design the simulation game to validate their own conception of reality, and that playing an incongruent game role may interfere with the individual's ability to develop an effective game strategy.

Fisher (1976) concluded, on the basis of a study of competition in gaming, that at present there is no evidence to support the idea that winning players learn more or improve their skills more than losing players, nor is there any evidence to the contrary.

A claim is made by Inbar (1970) on the basis of a sample of 256 players that, in addition to being a powerful motivational device, simulation games have an important teaching potential.

Godejohn and associates (1975) report that as a result of a simulation game experience the experimental group of subjects demonstrated "compelling evidence as to the value of simulation in effecting attitude changes toward mental illness."

Cruickshank and Broadbent (1969), examining the use of simulation with student teachers, found only one of five predicted consequences to be statistically significant.

How can this disparity among study outcomes and among the previously made claims of the advantages of simulation and simulation games for education be explained? Four general reasons for this have been delineated by Fletcher (1971). First, very few simulation games are developed to the point where they even work as simulation games and, until a set of games is developed to a point where standardized use is possible, research can have little meaning. (It might be well to say at this point that this statement by Fletcher was made several years ago and it may not be as pertinent a criticism now in view of the increase in the number and use of simulation games and in experience with them.) Second, the games which do exist vary enormously in terms of skills required, technology used, and focus, and there is no concensus about which differences are important. Third, there is often no clear relationship between the structure of the game and the learning objectives of the game. Fourth, there is a lack of agreement on the mechanisms of game administration, i.e. student preparation, role of the teacher, and follow-up of learning attributed to the game process. Fletcher concludes that simulation games research has been done primarily on single studies on a particular game using individual tests of measurement — very often subjective — and this is a shot-gun approach that must be corrected. Twelker (1972) adds to this litany the following points to be considered: the lack of a close fix on all the variables that contribute to the success, or failure, of a simulation game; and, a need to develop strong training programs for those using, or developing, simulation-gaming techniques.

Disadvantages: Most of the identified disadvantages of simulation games can be obtained from the foregoing comments. There are some disadvantages, however, which need to be more concretely identified; they fall generally into the two categories of design and cost. The difficulties, and thus disadvantages, of designing a simulation game stem from the problem of achieving fidelity to the real situation in the variables relevant for transfer to life situations and the problems of validating simulation as an effective medium for learning (Beck and Monroe, 1969). The cost disadvantages include the costs for the initial development and testing of the simulation, the installation of equipment, and the training of personnel in the effective use of the technique.

CONSIDERATIONS IN THE DEVELOPMENT OF A SIMULATION GAME

Four underlying principles of a good educational environment have been identified (Duke, 1974) and should apply to the preliminary considerations for developing a simulation game: 1) the perspective principle: the environment will be more productive if it facilitates the taking of more perspectives towards a problem; 2) the autotelic principle: the environment must be safe for experimentation; 3) the productive principle: the environment is logically and coherently structured; and 4) the personalization principle: the environment permits responsiveness to the learner's activities. These principles should underlie the development of a simulation game and simulations used in education.

Maidment and Bronstein (1973) have developed a paradigm for developing a simulation game. This paradigm includes seven basic sequential steps: 1) elect a game approach in light of course objectives and student needs; 2) prepare game objectives; 3) collect game data; 4) design a game model; 5) develop game materials; 6) execute the game; and, 7) evaluate the game. Although this paradigm appears very practical there are two important preliminary steps identified

by Cruickshank (1977) that are not overtly stated in the Maidment paradigm: selecting the object system to be simulated, and determining and describing how that object system works.

The suggestion made by Fennessey (1973) that the director's manual should be developed along with the game itself appears to be well founded and practical and, if followed by the game developer, could contribute to diluting some of the earlier criticisms made by Fletcher about the difficulties in researching the use of simulation games and their outcomes.

CONSIDERATIONS IN THE USE OF SIMULATION GAMES

There appear to be several considerations in the use of simulation games in education. First, the simulation game must be an integral part of the curriculum, relevant to other curriculum content and purposes. This point has been mentioned by several writers and is a reiteration of one of Dewey's basic assumptions about games — that games are to be considered an integral part of the curriculum. Thus, simulation games are to be looked upon as an adjunct to other teaching methods and not as a replacement for them nor as a panacea to convert unmotivated students and dull teachers into their opposites.

Twelker (1976) identifies other considerations that may contribute to the success or failure of a simulation game and these include the number of players, the composition of the player group, the mental set of the students, the instructor, the instructions given prior to the simulation game, and the debriefing or discussion which follows the actual play. The debriefing — its perceived and also its questioned value in learning — are mentioned by several writers (Fletcher, 1971; Inbar, 1970; Fennessey, 1973) and it must be considered, at least at this time, an important aspect of the use of simulation games in education.

Other considerations when using simulation games relate to costs in terms of time, equipment, and personnel required to implement the simulation game.

SIMULATIONS IN BACCALAUREATE NURSING EDUCATION

A review of the more popular nursing journals and several nursing education textbooks reveals a paucity of material on the use of simulation games in nursing education. Simulators and simulations are used but not, apparently, simulation games. One research study was reported in 1975; in 1975 and 1977 a total of three brief, general articles about simulation techniques was published. The textbooks discussed the value of games in general education but had no specific

suggestions to make for nursing education. This lack of published discussion is discouraging in light of the direction that nursing curricula have gone. Minimal published consideration has been given in nursing to the use of a technique — simulation games — that may have potential for assisting in the achievement of curriculum goals.

Although the perceived, subjective advantages of simulation games have not been empirically demonstrated the potentials seem sufficient for nursing educators to consider seriously simulation games as a teaching aid. Generalizing from the recommendation made by Cruickshank and Broadbent (1969) regarding the combined use of student teaching experience and simulated teaching experience as reinforcers, it can be suggested that simulation conditions may assist student nurses in preparing them for their nursing functions. Hayman (1977) sees simulation games in nursing education as occupying a middle ground between lecture and clinical experience and feels that simulations and simulation games augment both as long as they are used as an integral part of the total curriculum.

If, as Duke (1974) states, the player actions in simulation games are valuable for making explicit the relationships among the components of a system, then simulation games seem appropriate for nursing education. Nursing education views man holistically and his level of health or illness as influencing and being influenced by his social and physical systems. Instructional methods that facilitate the nursing student's comprehension of relationships seem very appropriate for consideration and use.

Gordon (1972) states that nursing is an area where there is a great need for training in interpersonal skills and attitudes, and that some schools have considered the use of simulation games to provide students with practice in the non-technical, non-medical aspects of care. For the nursing faculty considering the use of simulation games, several possibilities are open: purchasing already developed games; adapting existing games; or developing their own games. Before attempting either to adapt or develop games it is necessary for nursing faculty to gain some theoretical and experiential knowledge about simulation games.

A game library could be developed by buying from the listing of health care games in Horn (1977). These would provide simulation experiences in community health, family planning, administration and management of patient care, and a few skills in nursing fundamentals. Consideration might also be given to using some simulation games developed for the social sciences which are appropriate for nursing students.

I have used the simulation game Ba Fa Ba Fa as an integral part of a course unit dealing with cultural differences in values and in behaviors and, subjectively, found it very effective for reinforcing and clarifying lecture content. The game experience was intended to create a situation which allows students to explore the idea of culture; to create within the students feelings similar to those one would likely encounter when in a different culture; and to provide students with experience in observing and interacting with a different culture. The gaming experience encourages the surfacing and subsequent discussion and analysis of the misconceptions and counter-productive attitudes of people who are required to interact with another culture or sub-culture. It is designed to help game participants realize that people with whom they interact may belong to a different culture or subculture and may be operating according to another set of rules. It appears to accommodate the development of new insights by active participation in a learning experience.

The simulation game Ba Fa Ba Fa took approximately twelve hours of instructor time to prepare for the game and set up the game artifacts. This was however the first time the game was used and on subsequent use of the game the preparation time was approximately two hours. The game takes three hours to complete: this includes a forty-five to sixty minute debriefing session with the class upon completion of actual play. The 130 students who thus far have participated in the simulation game overwhelmingly endorsed the use of the game and recommended its continued use.

Two points must be made, however. First, although subjectively I felt the game experience was a success relative to the intended purposes of using the game, was it? No formal pre or post-game measures of student awareness of the influence of cultural differences was made. Although the post-game responses during the debriefing session indicated the participants' heightened awareness of the influence of culture on attitudes and behavior, they may reflect the immediacy of the experience and not, necessarily, a long-term appreciation.

Second, was the simulation game an efficient use of class and instructor time or could the intended learning from the experience have been achieved in another manner requiring less time? Also, a game experience may not be a method of learning comfortable for all students nor useful to all students. As well, a minimum of two faculty members were required to direct the game and the question of efficient use of faculty time must be considered.

Several topic possibilities for simulation games more specific to

the needs of baccalaureate programs can be identified: counseling in human sexuality; parenthood as a potential crisis situation; dealing with death and dying; life stresses and social support systems. The educational needs of the baccalaureate prepared nurse are different from those of the diploma or associate degree nurse. There is additional emphasis on communication skills, interpersonal skills and relationships, problem solving, and decision making as necessary skills for delivering quality health care in a variety of episodic and distributive settings, and to a variety of recipients. Based on the subjective experiences reported with simulation games in the social sciences, but bearing in mind the presently scanty valid research on simulations and simulation games in education, nursing educators should consider introducing simulation games into the nursing curriculum and attempting to evaluate their effectiveness.

APPENDIX A

The Family Adaptation System Test (FAST) Directions, Interpretations and An Example

1. Allowing a family member to upset the routines of the family if something is very important to him or her.

2. Dealing with small problems as they occur.

Deciding to do what is best for the family, even though it will add burdens to some family members.

4. Risking disapproval from others in order to achieve important goals for

5. Having to readjust fairly frequently as the children change and grow up.

6. Helping individual family members to solve their problems.

Having a realistic idea of what it is possible to do and staying within

8. Recognizing problems that lie ahead and planning to deal with them.
9. Keeping each family member doing the jobs and responsibilities that he

should do.

10. Trying to push the family at times in order to accomplish things that might seem impossible.

DIRECTIONS

1. This sorting is done early in an interview, well before any discussion of factors related to these items. Read to the parent, "I am going to give you some cards to sort. Each contains a statement about families. For the ideal family in a situation like yours please put the most important card first, then the next most important, etc. It is best to order the cards rapidly. They do not have to be in perfect order." Do not indicate that she will be asked to sort a second time later.

2. List the resultant sorted item numbers on the cards by most important first in the column marked Sort I.

3. The next sort is done at the end of the interview or the next day or visit. This time the directions are, "Please sort these cards again but this time put the cards in order by what is happening in your family right now. Remember to put the most important cards first.

4. List the resultant sort numbers by most important first in the column

5. The score is calculated by counting the difference in ordinal ranks for each member and recording this number in the difference column. Then this difference is multiplied by its *rank* to result in item discrepancy scores, the total of which is the FAST score. See example on next page. It may sound complicated but it is easy to do once you practice it a time or two.

INTERPRETATION OF THE FAST

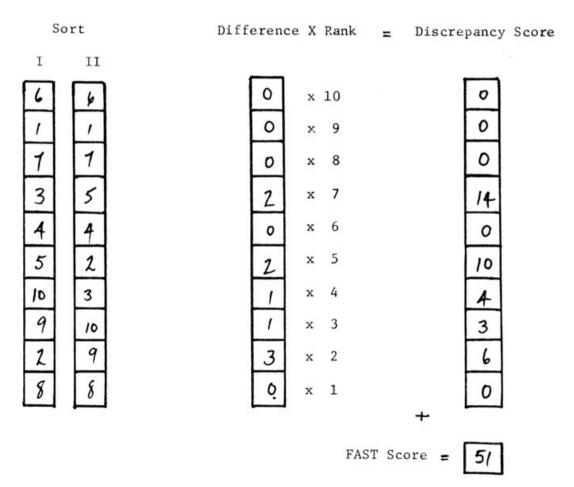
In conjunction with traditional methods of family assessment, where strain within the families appears moderate, a FAST score of 105 or more would indicate a familial strain level high enough to place the children's optimal developmental progress at risk. Alternatively, in the absence of other indicators, a FAST score of 225 or greater would tentatively indicate a familial strain level high enough to place the children's optimal developmental progress at risk.

In the example, this family's FAST score of 51 does not place the children at risk. However, it is clinically helpful to know which areas have the greatest

discrepancy scores (see Column I).

For example, in this family decisions that are best for the whole family even though they all add burdens to individuals are ideally *important*. And, as these decisions are not being made, some strain may result (item number 3 from Column I with a discrepancy score of 14). Another likely source of strain is the frequent adjustment that the family must make as the children change and grow up (item number 5 from Column I with a discrepancy score of 10). This family reported that these changes were fairly frequent but does not ideally think that they should have such a high priority. Items number 2, 9 and 10 could also be sources of strain but probably not as severe a strain given their relatively lower discrepancy scores.

FAST Score Sheet
An Example of Scoring Procedure



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RESUME

APERCU DES JEUX DE SIMULATION ET REMARQUES SUR LEUR EMPLOI DANS LE CADRE DU BACCALAUREAT EN SCIENCES INFIRMIERES

Il semble que l'on devrait davantage avoir recours aux jeux de simulation comme moyen d'enseignement dans le cadre des programmes de baccalauréat en sciences infirmières. Toutefois, avant d'utiliser cette approche, il est indispensable de bien comprendre subjectivement et objectivement, non seulement la façon de la développer mais aussi les avantages et inconvénients d'une telle stratégie. Les enseignants peuvent décider de mettre au point leurs propres jeux de simulation mais, compte tenu du temps que cela prend et des avantages non prouvés de cette technique en tant qu'expérience d'apprentissage, il semble préférable d'adapter ou d'adopter les jeux qui existent déjà. Il est souhaitable que le corps enseignant ait davantage recours aux jeux de simulation et contribue aux recherches qui aideront à déterminer la valeur de cette stratégie d'enseignement dans le domaine de la formation en sciences infirmières.

NATIONAL NURSING RESEARCH CONFERENCE

The National Nursing Research Conference will be held on October 22-24, 1980 in Halifax, Nova Scotia. The theme of the conference is "A Research Basis for Nursing in the 80's."

Nurse researchers in Canada will present papers on basic and applied research in the practice of nursing. Each paper will be followed by a presentation by a discussant. Nurses will have an opportunity to comment, ask questions and share their thinking.

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