

AN EXPERIENCE DEVELOPING AND USING WRITTEN SIMULATIONS AS A METHOD OF TEACHING

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NATURE AND USE OF WRITTEN SIMULATIONS

The characteristic feature of a written simulation of a clinical nursing problem is that it focuses on the student's ability to problem solve. This method presents the problem solver with a short written description of a situation and then enables him/her to work through the problem on paper by presenting a number of sections which correspond to steps in problem solving. Some of these sections are for the purpose of deciding on broad strategies, e.g., gather data, seek consultation, or take action. Other sections present and enable the selection of data or specific nursing actions.

In each section of the problem, a number of options are available among which the problem solver makes a choice. They are accompanied by responses which are not visible until a particular option is selected. The response to each option may contain information that is requested, the results of the action chosen in the option, or directions as to how to proceed through the problem.

This technique provides a great deal of flexibility, in that branching among sections allows problem solvers to take a number of different routes. There is no one right or wrong path, but an optimal route, on a continuum with less than optimal ways of solving the problem. Thus, a more realistic type of problem solving situation is offered in comparison to programmed instruction or multiple-choice tests. In every possible way an effort is made to offer the student a situation which is realistic in the actual problematic situation presented, the context of the problem, responses to options, and patient records.

The accompanying example (pp. 24-25) illustrates the structure of a written simulation. Other media may also be incorporated, e.g., an audio-tape as a patient response, a video-tape to present the initial situation.

Written simulations may be used in formative evaluation, summative evaluation, or as a method of teaching. The character of the simulation is modified depending on the purpose for which it is intended. If it is to be used in independent learning, a good deal of

reinforcement and feedback is given in the responses. When it is designed for the purpose of evaluation, options are scored to allow quantitative measurements to be made and feedback in the responses is kept to a minimum.

A few nursing educators have described the ways in which they have used written simulations. De Tornay (1968) designed a simulation in order to test the use of factual knowledge in problem solving. McIntyre *et al.* (1972) used the written simulation method as a research tool in examining the influence their curriculum, which stresses problem solving and decision-making, had had on the problem solving abilities of their students. Curtis and Rothert (1972) developed a written simulation to give students practice in nursing assessment.

DEVELOPMENT OF THE METHOD

Dr. Christine McGuire and her staff at the Center for Educational Development, University of Illinois College of Medicine, have done extensive work in designing written simulations (1967). It was through this Center that Dr. Nora Parker of our faculty became acquainted with written simulations. Subsequently, there was enough interest two years ago in this structure to have a resource person come from the Center to our faculty and conduct a four-day workshop. At that time it became apparent that for the novice the development of a problem into a simulation was a complex and demanding task. A few staff, myself among them, were quite intrigued with this simulation method and have continued developing their problems.

PROBLEM SITUATIONS IDENTIFIED

In my teaching experience, I have usually found methods which pose a realistic situation, such as case studies, one of the most exciting methods of teaching theoretical material. Consequently, the possibilities of written simulations fascinated me. This has kept my motivation high for working through the difficulties facing a beginning developer of simulated problems.

I recorded basic details of situations in the clinical setting that might be suitable for later development into written simulations. The types of events recorded were those which seemed to pose conscious problematic situations to myself, students, or other nursing personnel. Most of these situations were specific to patient care problems, such as the following: (a) finding a patient was taking unordered Codeine tablets from a supply he had brought from home; (b) finding an elderly patient with a number of health problems trying to turn over to rest on his hands and knees in bed — his oxygen mask hanging

down around his neck; (c) discovering that a patient on a fluid restriction of 800 ml. per day was confused about the amount of the restriction, had had great difficulty learning how to measure fluids, but was to be discharged in two days. Problems which involved a great deal of non-verbal data, e.g., identifying anxiety, had been found difficult to develop during the workshop and therefore were not recorded.

USE OF THREE WRITTEN SIMULATIONS

Over the last two years I have developed three situations into written simulations and have used them in teaching theoretical material to second and third year basic students.

During the first year, technical problems were a great impediment because many methods for keeping the responses to options out of sight initially were found to be either too expensive or too time consuming to prepare. Those methods finally selected remained extremely time consuming in preparation and seemed unrealistic to be used more than once with ten students.

It was decided that use of the latent image duplicator was the only method which seemed feasible in terms of time and expense. Responses duplicated by this method remain invisible until they are rubbed over with a special pencil. With access to this equipment I was able to use two of the simulations with a group of sixty students.

Since the simulations were not designed as independent learning tools and there was not a lot of feedback built into the simulation responses, after students worked through each simulation in class their different approaches and rationale for solving the problems were analyzed in group discussion. As well, information was solicited from the students as to confusing aspects of simulation structure, realism and completeness of options and responses, and the advantages and disadvantages they found in the use of the simulations as learning tools.

STUDENT RESPONSE

Most students were very enthusiastic about the written simulations and suggested that more be available. They thought that the primary advantages were that (a) it made the content area studied more real, (b) it gave a better idea of the important information to be learned, (c) problem solving and decision making were involved in addition to factual knowledge, (d) they received immediate feedback about their decisions, and (e) there was less anxiety than in a real patient situation. They were free to make decisions and see the effects without the patient suffering from poor decisions. This last

advantage supports De Tornyay's recommendation for the use of written simulations as teaching aids.

In relation to these advantages, students commented that working through the simulations and discussing them was an interesting way to begin to apply theory in a realistic manner. It made them realize the importance of planning their decisions and gave them a better understanding of how to set priorities. They could see how goal-directed problem solving led to a better solution than non-directed efforts. This learning could be done within a non-pressured atmosphere which students felt was good for building confidence.

Students identified as disadvantages the cost of the simulations and the time required to work through and discuss them. Some students also felt confined by having a limited number of courses of action available. As well, a number of students said that when doing their first simulation they did not take it very seriously or think carefully about their decisions until they found something grossly abnormal about the patient as a result of their choices.

TEACHER ASSESSMENT

From the teaching viewpoint, I think the simulations provided an excellent basis for analyzing various approaches in the application of factual material. They were particularly helpful in assisting students to selectively identify in different situations such things as what should be assessed about a patient, what information was most appropriately gained from patient records, and when it seemed appropriate to consult with other personnel. As an example, the patients in two simulations had an abnormal radial pulse. Contrast could be made between the two situations as to what further assessment and/or action was indicated when one patient was found to have a radial pulse rate of 40 per minute with a regular rhythm, as compared to the other patient who was found on assessment to have a radial pulse rate of 80 per minute with the irregularly irregular rhythm characteristic of his previously diagnosed atrial fibrillation.

The simulations provided a common patient situation in which initially all students had the same objective informative information. In analyzing each student's choices throughout the problem, it was found that short verbal or written comments might be a very effective individual feedback mechanism to help the student identify areas of strengths and weaknesses. Some weak areas which seemed to emerge were ritualistic aspects of patient assessment, use of extraneous information, poor theoretical knowledge, and taking action on the basis of inadequate information. This feedback would seem particularly useful if the simulations were used for formative evaluation.

*MODEL OF AN OPENING STATEMENT AND TWO
SECTIONS IN A HYPOTHETICAL WRITTEN
SIMULATION*

You are a second-year nursing student having clinical experience in a University teaching hospital. Your student group is to report to the medical ward at 8 a.m., just after the night report has been given. On the morning of March 16, 1976, you are assigned to care for Mr. Anthony. Your instructor tells you that your patient is 70 years old and has a diagnosis of thrombophlebitis. He is in Room 410. This is the first time you will have had any contact with Mr. Anthony, and you have not seen his Kardex or chart. *Now continue with Section A.*

SECTION A

You would NOW (Choose ONLY ONE of the following items, unless otherwise directed in a response):

OPTIONS	RESPONSES (These are not visible until the student selects the corresponding option).
A01 Go to Mr. Anthony's Room.	A01 You find Mr. Anthony lying in bed with his head elevated about 30 degrees. He has an I.V. running into his right forearm. He greets you with a smile, says he had a restful night, and is just waiting for breakfast. <i>Go to Section E.</i>
A02 Look at Mr. Anthony's Kardex.	A02 <i>Go to Section I.</i>
A03 Look at Mr. Anthony's Chart.	A03 <i>Go to Section H.</i>
A04 Begin gathering supplies for morning care.	A04 This is accomplished in 10 mins. <i>Now make another choice in this section.</i>

Certainly the time needed to develop, have reviewed, revise, and test out written simulations is quite lengthy and is the major disadvantage from my point of view. With increased practice, it is hoped that the time needed will be greatly reduced.

I would not see using written simulations as a substitute for actual clinical experience because of the limitations of the structure in the amount of stimuli which can be incorporated, the restricted number of options to action which can be offered, and the fact that problem solving under situational stress cannot be simulated. I do think that they offer an excellent way of helping students think through the process they use in applying theory.

SECTION E

You would NOW (Select AS MANY as you consider indicated AT THIS TIME):

E01	Get a thermometer and take his temperature.	101	36.8°C. orally.
E02	Get equipment and take his blood pressure.	E02	128/80 mm. Hg.
E03	Take his radial pulse.	E03	48/min.; irregularly irregular rhythm. Pulse volume varies between strong and weak.
E04	Take his apical pulse.	E04	64/min.; irregularly irregular rhythm.
E05	Take his respirations.	E05	16/ min; regular rhythm no objective dyspnea.
E06	Look at contents, volume, and rate of I.V.	E06	Dextrose 5% in water running at 55 cc. per hour. 200 cc. left in bag.
E07	Look at I.V. site.	E07	Taped securely in place. No unusual contours or discoloration.
E08	Examine his legs.	E08	Muscular and hairy. Appear equal in size. No discoloration. Right leg lying on a pillow. Complains of tenderness when right calf touched
E09	Ask him to turn over and examine his back and coccyx.	E09	Skin smooth. Slight redness over coccyx.
E10	Ask him when he last had a bowel movement.	E10	He says he had one yesterday.
E11	Ask him about subjective feelings of dizziness.	E11	He says he feels fine.
E12	Ask him about subjective feelings of pain.	E12	He says he only has slight discomfort in his right calf.

Unless otherwise directed, proceed to Section F.

FUTURE WORK

As well as planning to develop more simulations, I am continuing to revise the three which have been used. Each time students have used the simulations, very valuable information has been gained for refining them. As well as revising content and structure, any suggested scoring scheme can be assessed by analyzing the different routes students take through the simulations.

I have yet to find a good enough fit between initial learning objectives and the actual, ripe problematic situations I have recorded for possible development into simulations. Pearson (1975) validly sees this fit as crucial in the future development of a wide variety

of simulation techniques. Perhaps as a volume of pooled recorded situations is built up, this larger number will enable a more discriminating selection to be made. The other alternative is to construct problem situations artificially to fit the learning objectives. While a certain amount of alteration of real events is only practical, I would hope that real events could form the nucleus of most simulations.

Sharing of ideas among those in various schools of nursing who are involved in written simulation construction would be very valuable. Constructing these tools can at times be a most frustrating task, and the discussion of ideas and difficulties among those in our faculty who have continued to pursue written simulation construction has been of great mutual support.

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