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ABSTRACT

A national survey was designed to obtain information in four principal areas of concern: (1) what preparation medical faculty members had for their roles as teachers; (2) instructional practices of medical faculty; (3) where faculty are experiencing difficulties in teaching; and (4) in what areas they are interested in receiving help. A stratified random sampling of 2,700 faculty (representing over 28,000 full-time medical school faculty members) was used for the survey. Findings show that: (1) faculty have had little formal preparation for their teaching roles, with only 21 percent having taken education courses and 39 percent having attended an educational workshop; (2) faculty make considerably more use of traditional than innovative teaching techniques such as lecturing; (3) faculty are not thorough in their management of the instructional process; and (4) they express interest in improving their teaching by reading and attending educational workshops, especially in the area of instructional evaluation. (Author/MSE)



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# FACULTY DEVELOPMENT SURVEY

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# FACULTY DEVELOPMENT SURVEY

FINAL REPORT

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## PURPOSE

This national survey was designed to obtain information in four principle areas of concern:

1. What preparation medical faculty members have had for their roles as teachers,

2. What instructional practices faculty members use in their teaching,

3. Where faculty are experiencing difficulties in their teaching, and

4. In what instructional areas faculty are interested in receiving help.

The intention was to derive findings that could be useful: to the sponsoring agencies in allocating future resources in support of faculty development, to the Division of Faculty Development in guiding plans for programs for Association of American Medical Colleges constituents, as a "base-line" against which future comparisons can be made, and to individual medical schools in guiding the design of faculty development activities.

## METHODOLOGY

The total population represented in this study is the 28,393 full-time medical school faculty with teaching responsibilities for undergraduate students. A matrix sampling design was used to sample on a stratified random basis 2,700 faculty from the population and to randomly assign three from a group of eight survey packages to sub-groups of the sample. A ninth package went to the full sample.

The surveys were distributed and followed up by representatives at each school. Usable responses were received from 71% of the sample.

Special computer programs were written to analyze the data and to present estimated population values based on the statification techniques. The basic results, without interpretation, were distributed in three

preliminary reports (including data for the total population, and for groupings according to school size, school ownership, departmental affiliation and academic rank). This report is almost totally restricted to analyses and interpretations for the total population.

## MAJOR FINDINGS

The major findings presented and discussed in this report are:

1. Faculty have had little formal preparation for their roles as teachers. It is estimated that only 21% have taken courses in education and that only 39% have ever attended an educational workshop.

2. Faculty make considerably more use of traditional than "innovative" instructional methods. For example, 56% use lecturing on a frequent basis, while only 1% use computer assisted instruction frequently.

3. Faculty are not thorough in their management of the instructional process. They gather little background on their students, are not explicit concerning their expectations for students, and are less than systematic in their evaluation practices.

4. Faculty express a considerable interest in improving their teaching through reviewing printed material and attending educational workshops. For example, 84% would like printed material on evaluating their effectiveness as teachers and 39% would attend a workshop on this topic.

## CONCLUSION

The high response rate (71%) provides a basis for considerable confidence in the findings presented. There is also a basis for encouragement for the future quality of American medical education in the high interest faculty members indicate in receiving help in improving their instruction. The study succeeds as well in identifying several areas of high need for instructional improvement, some of which are also areas of high faculty interest. The next tasks will be the promotion and implementation of faculty development activities in those areas where there are both high need and high interest.

# I. INTRODUCTION

## BACKGROUND

In August, 1974 the Association of American Medical Colleges (AAMC) created the Division of Faculty Development (DFD). The charge to the Division's staff was to design and undertake programs to assist with the improvement of instruction in U.S. medical schools. As members of the staff, we decided that an appropriate first step should be a survey of medical faculty members to secure information on current teaching and to identify areas of need for faculty development programs. This is the Final Report of that Survey.

The detailed compilation of findings from the Survey, without interpretative analysis was presented in three Preliminary Reports (March, June and July, 1977), which were distributed to the sponsoring agencies and to each United States and Canadian Medical School. The present report provides a more detailed analysis and interpretation of selected findings.

This Final Report is a free-standing document: the reader does not need access to the Preliminary Reports to understand the narrative. The Final Report, however, is less complete than the Preliminary Reports in some respects: it focuses exclusively on the findings for the total faculty population, omitting analyses by subgroups such as professorial rank, department, type of school, and size of school. The basic findings of these sub-analyses were presented in the Preliminary Reports and further analyses were considered beyond the scope of the present report. Selected findings of additional analyses of those and other sub-groups will be reported in other publications.

Support for this project came from a contract with the Bureau of Health Manpower (BHM), grants from the Kellogg Foundation and The Commonwealth Fund, and the AAMC.

## FOCUS OF SURVEY

Little solid information is available on the teachers, or teaching, in schools of medicine. There have been a few direct observational studies of medical

teaching,[1] but they dealt with relatively small samples and may now be out of date. The information on faculty members that is gathered for the AAMC Faculty Roster[2] is demographic or restricted to their professional disciplines, it does not include the faculty members' preparation for or views about teaching, or activities as teachers.

The survey reported here was designed to obtain information in four principle areas of concern:

1. We sought, through this survey, to learn what preparation medical faculty members have had for their roles as teachers. This information came from self-reports of: their formal training in teaching, their participation in workshops, and how these and other experiences had influenced them.

2. The survey sought to identify the specific instructional practices that are used by faculty members in particular situations. We wished to know, for example, what specific strategies they use and the order in which they sequence those strategies when managing an instructional task.

3. The survey undertook to identify problem areas in instruction. This was accomplished both by respondents identifying problem areas in their own teaching and by our interpreting the survey results.

4. Finally, the survey sought to identify those problem areas where faculty members would welcome outside assistance.

The findings from this survey can be useful to our sponsoring agencies in allocating future faculty

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[1]Hilliard Jason, "A Study of Medical Teaching Practices," J. of Med. Educ., 37: 1258-1284, Dec., 1962 and "A Study of the Teaching of Medicine and Surgery in a Canadian Medical School," Can. Med. Assoc. J., 90: 813-819, April 4, 1964.

[2]AAMC, "General Description of the Faculty Roster System," Spring, 1977. (Brochure available from the AAMC, 1 Dupont Circle, N.W., Washington, D.C. 20036).

development resources, to DFD in planning appropriate programs for AAMC constituents, as "base-line" data against which comparisons can be made in future studies of medical instruction, and in guiding the selection of areas of focus for faculty development programs at individual medical schools.

## DEVELOPING THE SURVEY INSTRUMENT

With the four preceding areas in mind, possible formats for the survey instrument were identified and reviewed. We rejected techniques involving direct observation of teaching and the use of open-ended questions: these techniques were too costly and time consuming to be used with a sample of respondents large enough and broadly based enough to provide both precise information and the degree of generalizability we required.[3]

We settled on two formats. The first is the classical forced-choice item (question), which was used in inventories (e.g., respondents indicated in which of a list of settings they frequently taught), to report demographic information, and to indicate attitudes (e.g., respondents indicated their degree of agreement or disagreement). The second format is the written simulation. This format allowed us to create situations that: are sufficiently interesting to faculty to enhance the likelihood of their taking the time to respond, are representative of the kinds of problems medical faculty members actually face, and are consistent in presenting each respondent with the same instructional problem.

In a written simulation the respondent is presented with a problem and asked which of a series of first steps s/he would choose in solving the problem. Depending on which is chosen, the respondent is either given additional information or instructed to turn to another section in the simulation booklet. That next section provides new information (which is particular to the step selected) and again asks him/her to make a branching choice from a set of options.

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[3]We did, however, use open-ended questions to collect comments from respondents on the survey instruments and on the process involved.

The branching nature of the written simulations allows respondents to choose different routes through each simulation. Routes vary according to their length (i.e., the number of sections), the range of information requested, and the order in which sections are selected.[4]

The choice of item format was related to the areas of research focus addressed by the survey. Respondents' preparation for teaching, for example, was reported using forced-choice questions while information on instructional problems was collected through the use of written simulations. Identification of instructional practices was made through both forced-choice questions and simulations.

Areas in which faculty members would be willing to accept outside assistance were identified through forced-choice questions and questions appearing at the end of each simulation on the tail-sheet--a page of questions asking respondents to report how they felt about the simulation they had just completed and the instructional issues it raised.

The development of the survey instrument followed standard procedures. For the forced-choice questions, issues of currency and relevance were identified through a review of literature (the last three volumes of the Journal of Medical Education and the proceedings of the Research in Medical Education Conference for the past 3 years). Items were formulated and reviewed by DFD staff and then field tested, first among AAMC staff and then at medical schools around the country. The field trial results were used as a basis for item revision and selection for inclusion in the final form of the survey instrument.

The simulations were produced in a similar manner. A large body of literature on instruction-related activities was reviewed and a comprehensive outline of the instructional process was produced. This outline was then reviewed and topics for the simulations identified. A workshop was convened with consultants selected to help

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[4]The design of the written simulations is explained more fully later in this chapter.

write the simulations. The workshop and additional efforts by our staff after the workshop produced draft simulations which were field tested.

One outcome of the simulation writing was the determination that evaluation, the substantive area covered in the 2nd Preliminary Report, was better suited to forced-choice questions than to the simulation format. Questions on evaluation were therefore written in the forced-choice format, using the procedures described above.

Field trials for the forced-choice questions, simulations, instructions to respondents, and the tail sheet questions for the simulations were conducted at 7 medical schools, covering a range of sizes (small, middle-sized, and large) and types of ownership (public and private). A senior administrator at each school was asked to identify individual faculty members who would be willing to respond to the questions and simulations as well as to participate in a debriefing session. Protocols for the debriefing contained questions which allowed us to identify ambiguities in the items and simulations, difficulties in the instructions, and other problems which might hinder the survey.

In the field trials each forced-choice question and each simulation was administered to 10 persons, covering a variety of academic ranks and departments. After they completed the instrument, each respondent was interviewed by a DFD staff member to identify ambiguities and other problems in the draft versions of the materials.

The field trials were completed in late Spring, 1976. The results were tabulated and used to identify weaknesses in the items and simulations, and to suggest appropriate revisions. These revisions were made and simulations and items were selected for the final version of the survey instrument.

## SAMPLING DESIGN

The instrument covered a variety of topics, and, as anticipated, was very long. It was composed of nine parts: one common package, made up of forced-choice questions encompassing demographic information, information on preparation for the teaching role, and information on certain aspects of teaching (e.g., the

setting in which the respondent teaches); plus eight substantive packages dealing either with problem situations in simulation format or forced-choice questions on evaluation. Each respondent was asked to take the common package and only three of the eight other packages, with the particular combination of three being determined randomly.

Thus, each respondent was given only a sample of the packages, and the respondents were themselves sampled from the population of teaching faculty members. This design, the multiple matrix sampling approach[5] provided an optimal balance of breadth and depth. The sampling of faculty members was begun by eliminating from consideration those persons on medical school faculties who had no undergraduate teaching responsibilities (e.g., full-time administrators and librarians). Next, the remaining 28,393 individuals were classified into homogeneous groups (called strata) according to those variables described in the literature as important:[6] size of school, ownership of school, basic versus clinical science department, and academic rank. Forty-eight strata were thus produced, ranging in size from 86 persons (basic science instructors at small, public schools) through 1602 persons (assistant professors in clinical areas at medium-sized private schools).

Fifty-six persons were randomly selected from each stratum to be respondents in the survey. We decided to sample 56 people by considering the number of packages to which each respondent could respond without feeling that we were imposing unduly on his/her time. We decided that four packages (the common package plus three of the eight dealing with specific instructional issues) would take less than one hour to complete and an hour was the maximum we could expect from the busy people who constitute our population. Further, there are 56 unique combinations of eight packages, taken three at a time: we would need 56 people to exhaust all the possible

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[5] K.A. Sirotnik, "Introduction to Matrix Sampling For The Practitioner," in W. J. Popham, Ed., Evaluation in Education, Berkeley: McCutchan, 1974, pp. 451-530.

[6] Importance was defined operationally as maximizing the differences among groups.

combinations of packages we planned to administer to each stratum in the survey.

We also entertained other possibilities (such as drawing substantially more or less than 56 persons from each stratum) but rejected them because they would either make the survey too expensive or provide insufficient information. Finally, 56 per stratum would permit meaningful results even if the rate of return was as low as 67%. In fact, usable responses have been secured from just over 71% of the sample.

## ADMINISTRATION OF THE SURVEY

We sought to assure a high return rate by various administrative strategies. For example, members of the DFD staff attended each of the regional meetings of the Group on Medical Education during the Spring of 1976 to explain the survey and how it would be conducted. But most importantly, we were assisted by coordinators at each school who distributed and collected the survey materials and sent out follow-up requests, as necessary.

The local coordinator was nominated by the Dean at each school. We contacted these nominees and described the kinds of activities expected of them and explained that their first task would be to review the list of respondents at their schools to verify that each was indeed on the faculty, taught undergraduate medical students, and had been correctly identified according to their rank and academic department.

Through this review we found that a number of those originally drawn for our sample needed to be replaced. We drew additional names, repeated the verification process, and came up with a sample that was representative of the teaching faculty at United States medical schools. The respondents that had been identified by this process were sent letters a week before the survey materials arrived explaining the project and asking for their cooperation.

The packets for each respondent (the common package, the three additional packages, instructions, and the envelopes and pens needed to complete and return the packages) were assembled at DFD and mailed to the coordinators who then handled the internal distribution at their medical schools. At the same time, the

coordinators were sent sets of follow-up reminders to be sent to respondents who had not returned their completed materials by specified times, along with instructions on how and when to send them out.

Everyone--the Deans, the coordinators, and the respondents--was told that appropriate precautions were being taken to establish and preserve respondent anonymity. For example, we asked respondents to hand carry their completed, sealed packets to the coordinator so that their names could be checked off (and they would thus not be sent reminders) without having to write any identifying marks on the returned material. Using this procedure, we knew who had returned materials without knowing which packet was whose. The completed packets were mailed by the coordinators to DFD, where they were logged in and entered into the computer in preparation for analysis.

In logging in the data and entering it into the computer, we checked for a variety of errors, illegal responses (such as picking two alternatives in forced-choice questions when only one choice was allowable), key-punching and other data entry errors. These checks were done both manually and, when possible, by machine and identified errors were verified by checking the original response. If the error was due to data entry, it was corrected. If it was an error made by the respondent it was coded as "bad data."

We also verified a random 4% of the data comparing the information in our data base with the raw data in the returned booklets. This was to determine the rate of "subtle errors" which were not gross enough to be picked up either in the scan during data logging or by our data-cleaning computer programs. If the error rate had not been acceptably low, we would have had to verify each item in our computer data base. As it turned out, the error rate was about 1% and we did not need to review the balance of the data.

## ANALYSIS OF THE DATA

The stratified random sampling procedure and the use of written simulations created analysis requirements which precluded the use of available computer programs. Consequently, special programs were written. These programs attended to the particular features of our

stratified sampling procedure, so that we could generalize appropriately to the full population,[7] and the scoring requirements of the simulations so that data on routings[8] would be provided. The analysis began in February, 1977 and was done on the 1910 sets of usable data that were available at that time.

## STATISTICS USED IN THIS REPORT

The findings in this report are presented as two types of percentages, as explained below. Most findings are presented as estimated population values (estimated parameters); that is, the proportion of all 28,393 full-time teachers of undergraduate students in U.S. medical schools that we estimate would have selected a particular route if we had conducted a census rather than a survey.

Generalizing from survey responses to full population estimates requires specific calculations, based on the sampling procedures. For example, a sample of professors in basic science departments at small[9] private schools represents a population of 234 persons. A sample of professors in clinical departments at large[10] public schools, by contrast, represents a population of 1220 persons. In both cases we randomly selected 56 people to be part of our sample, and usable responses were received from 39 persons in the first group and 43 in the second. As can be seen, a percentage of the 39 respondents who selected a particular option does not have the same implications for the full population as

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[7]For a fuller discussion of this issue, please see the next section of this Chapter.

[8]Which includes consideration of both the particular options selected and the order in which they are selected.

[9]Defined as having an entering class size of less than 100 students. (There are 36 such schools)

[10]Defined as having an entering class size of 150 or more students. (There are 34 such schools)

the percentage of the 43 who selected that option. The statistical procedures used for conversion from sample results to population findings are standard, as described by Cochran.[11]

Although the more useful findings of this survey are those for the full population, frequently interest and clarity are enhanced by the presentation of findings for particular groups of respondents. For example, in each simulation it is useful to know both the estimated proportion of the population that would select a particular option and the actual proportion of respondents that made a particular choice, in the face of particular circumstances. To illustrate: it is estimated that 15% of the full population has attended workshops on clinical supervision. Of those respondents who did attend, 87% found the experience valuable. The 15 is a population percentage. The 87 is a sub-group percentage. Both can be useful to know. As a consequence, two types of percentages are used throughout this Report, and are distinguished from each other as follows:

1. Estimated population percentages are always preceded by the symbol (#); so that "#61%" should be read as, "an estimated 61% of the population of U.S. medical school faculty members that teach undergraduates..."

2. Percentages of sub-groups of respondents are not preceded by any symbol, so that "61%" should be read as, "61% of the group under consideration..."

Frequently both types of percentages are presented, so that both the proportion of respondents and the implications for the full population can be readily seen. Standard errors associated with estimated population percentages are reported at the end of each of the six chapters presenting findings for the simulations.

## INTERPRETATION OF RESULTS OF SIMULATIONS

Chapter 2 of this Report summarizes the key findings from the "forced-choice" packages and presents no special

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[11] W. G. Cochran, Sampling Techniques, 2nd edition (New York: Wiley, 1963), pp. 106-107.

difficulty in interpretation. Chapters 3-8, however, report findings from the written simulations, which are data collection devices that depart considerably from conventional survey instruments, and require an explanation of how to interpret the results. These results are reported for the population as a whole (all full-time faculty members at U.S. medical schools who teach undergraduate students).

Most of the findings are reported as percentages of the population that we estimate would choose each option in each simulation. Additional results involve linkages among options within a simulation that are called "routes". Routes are pathways through a simulation, and include a particular set of options, in any order, a particular sequence of options, or both. The discussion below will help with interpretation of the findings from the simulations.

Figure 1 is a flowchart showing the responses for one of the simulations. The blocks in the diagram correspond to sections in the simulation--a paragraph or two of prose followed by sources of information the respondent might wish to use and/or next steps in the solution of the simulation's problem the respondent might wish to pursue.

Each simulation begins with an "opening scene" (designated as Section "A" in the flowchart). In "Research Supervision", the opening scene is:[12]

RESEARCH SUPERVISION

Your medical school has instituted a series of required Research Projects for students with a supervised opportunity to become familiar with the [illegible] student is paired to a faculty member who will supervise the [illegible] of three students you will supervise [illegible] are currently conducting research on the problem he selected. When you first [illegible] told him of your colleagues that he is something of a dud.

Cont'd...

[12]This section from the simulation, reproduced differs from those used in the survey in that responses to the options in the survey were presented in the "latent image" form; that is, the responses next to the selected options (such as "GO TO SECTION J" in A1) were not visible to the respondent and had to be developed with the use of a special pen.

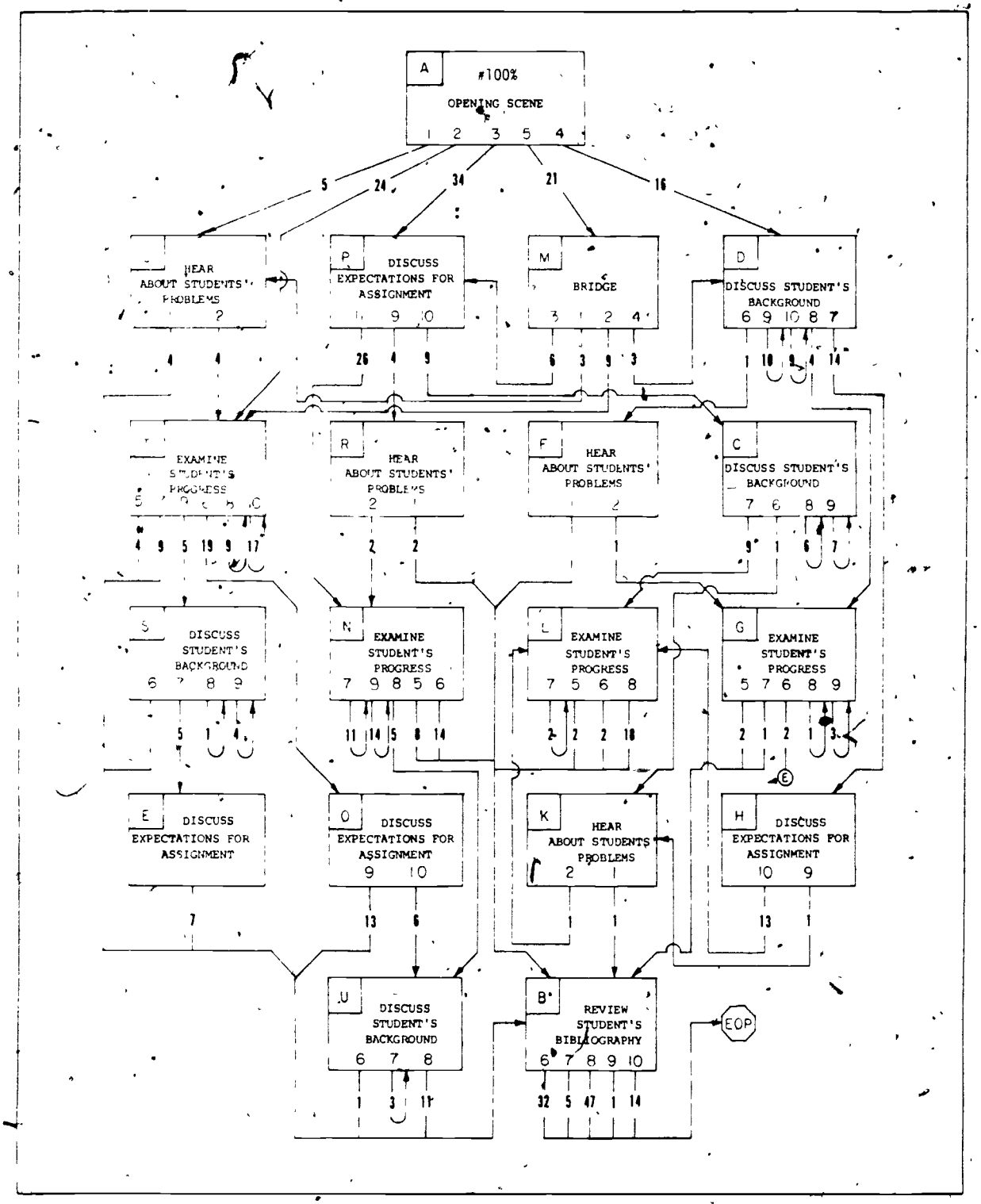



FIGURE 1 TOTAL POPULATION RESULTS FOR "RESEARCH SUPERVISION" SIMULATION (Numbers are estimated percentages of the population selecting the option indicated.)

Opening scene of "Research Supervision" continued:

Jim has recently completed a brief course entitled "Introduction to Research and the Scientific Method" and has been told that good research begins with a review of the pertinent literature. When Jim comes to his first meeting you provide him with a current article to help him begin his literature search. Within two weeks he is to prepare an annotated bibliography for your review. Your tasks are to evaluate Jim's bibliography, to give him feedback, and to arrange whatever follow-up instruction is appropriate before he begins his actual research work with you.

**You would now (CHOOSE ONLY ONE)**

| | | |
|---|---|---|
| A1 | Encourage Jim to begin and to contact you if he has any problems. Otherwise you will see him in two weeks | GO TO SECTION J ** |
| A2 | Encourage Jim to begin and arrange to meet with him after one week to review his progress | GO TO SECTION T ** |
| A3 | Discuss with Jim your expectations for his work on this assignment | GO TO SECTION P ** |
| A4 | Ask Jim to discuss his background in interpreting and conducting research | GO TO SECTION D ** |
| A5 | Ask Jim if he has any questions before beginning | GO TO SECTION M ** |

The options in the opening scene (designated by the numbers 1-5 in the opening scene box on the flowchart[13]) each lead to a different section, as revealed to the respondent when a choice is made (e.g., GO TO SECTION J). Each connection between sections is represented on the flowchart by an arrow from the option number to the box representing the next section.

Note that respondents do not move through the sections in alphabetical order; the letters serve simply as a device for identifying sections and bear no relationship to either the content of the sections or the order in which they are selected by the respondents.

Most arrows on the flowcharts are interrupted by numbers. For example, in Section A, option 5 has the number 21 associated with it. This means that we estimate that #21% of medical faculty members would choose this option ("Ask Jim if he has any questions before beginning") if we were to do a census. Thus, approximately #21% of the population would move from the opening scene (Section A) to Section M, a bridge section.

[13]Numbers do not always appear in ascending order in the flowcharts though they do in the simulation booklets. The departures from natural order were used to simplify the flowchart layout.

Bridges are a mechanism for directing respondents from section to section and on to a point which ends the problem, as shown in the following example:

**SECTION M**

Jim asks whether you want his bibliography to follow a particular format. You tell him he can use the citations in the article you have given him as a guide. He has no further questions. You would now **(CHOOSE ONLY ONE)**

M1 Encourage him to begin and to contact you if he has any problems. Otherwise you will see him in two weeks.

M2 Encourage him to begin and arrange to meet with him after one week to review his progress.

M3 Discuss in greater detail your expectations for his work on this assignment.

M4 Ask Jim to discuss his background in interpreting and conducting research.

Not everyone reaching Section M would select the same option. On the basis of the survey responses we estimate that #9% of the total population would ask the student to begin working and schedule a meeting with him in a week (option M2). The value, #9% (indicated simply as "9") can be found on the flowchart in the arrow under the number 2--corresponding to the option M2.

The total percentage of people "entering" any section equals the sum of the values exiting. This can be seen in Section M where #21% of the population enter, and #21% leave (6 + 3 + 9 + 3).

This equality may be obscured, in some cases, because the options leading to a section are not always readily apparent. One way in which this may happen is shown in Section B, where the arrows have to be backtracked some distance to identify all the respondents who enter that section. The second way is seen at Section E, which appears to have only #5% entering by one option (S7) yet #7% leave. The remaining #2% come from option 6 in Section G at the right hand side of Figure 1.

A symbol ( (E) ) is used at G6 to keep the figure from being overly crowded by lines. The letter inside the circle indicates the section to which the option leads

and the arrow head points in the general direction of that section.

The equality of percent entering and leaving a section may appear not to be precise. In Section U, for example, #11% of the population enter (#5% from N8 and #6% from O10) and #12% leave (#1% via option 6 and #11% through option 8). This seeming discrepancy is due to rounding error, attributable to the computational procedures used in analyzing the data.

Option U7 differs from others described so far. Specifically, any respondent who selected the option:

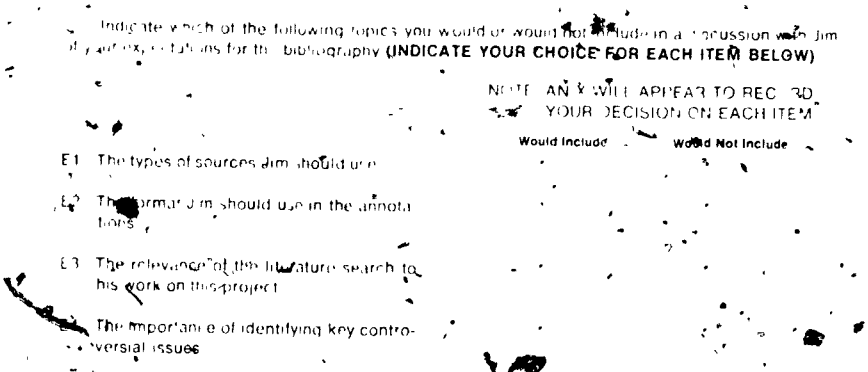
> U7. Briefly describe the research you are conducting.

would have developed the following response:

> Jim appreciates this background and says he is anxious to begin the actual research phase. MAKE ANOTHER CHOICE.

The phrase MAKE ANOTHER CHOICE is the instruction which turns respondents back and asks them to select from the remaining options. On the flowchart, MAKE ANOTHER CHOICE is indicated by the U-shaped arrow ( ), as shown under option U7.

Some sections, such as Section E, have only a single arrow leading out of them. In these cases, all respondents are directed to a specific section (e.g., NOW GO TO SECTION B), as shown in the following example:


Indicate which of the following topics you would or would not include in a discussion with Jim of your expectations for the bibliography (INDICATE YOUR CHOICE FOR EACH ITEM BELOW)

NOTE: AN X WILL APPEAR TO RECORD YOUR DECISION ON EACH ITEM

| | Would Include | Would Not Include |
|---|---|---|
| E1. The types of sources Jim should use | | |
| E2. The format Jim should use in the annotations | | |
| E3. The relevance of the literature search to his work on this project | | |
| E4. The importance of identifying key controversial issues | | |

Cont'd...

Section E continued:

E5 The depth of research you expect to see reflected in the annotations

E6 The standards you will use to evaluate his work

E7 The number of citations he should include

E8 The relevance of this assignment to his future as a physician

**NOW GO TO SECTION B**

Note that Section E represents one kind of "shopping list"--a section where the respondent is asked to make a response to each individual option. A second kind of shopping list section is also used. While the first part of the section gives the respondent a list of options to choose among, the second asks him/her to select an option which leads to another section. The following is an example of such a section:

Jim talks briefly about the introduction to Research and the [illegible] and gives a superficial overview of the [illegible] about **(CHOOSE AS MANY AS ARE APPROPRIATE IN ANY ORDER)**

D1 His opinion of research in general

D2 His prior experience reading scientific articles and reports

D3 His ability to interpret technical information

D4 His reasons for selecting the particular research topic

D5 His expectations for this course

Cont'd...

Section D continued:

In view of this discussion, you would now (CHOOSE ONLY ONE)

D6 Encourage Jim to begin and to contact you if he has any problems. Otherwise you will see him in two weeks

D7 Discuss with Jim your expectations for his work on this assignment

D8 Encourage Jim to begin and arrange to meet with him after one week to review his progress

D9 Briefly describe the research you are conducting

D10 Review with Jim the major steps in the process of conducting systematic research

Since only D6-D10 require the respondent to choose one of a number of options, they are the only ones represented in the flowchart. Percentage values for the options in the shopping list portion of the section are reported in separate tables preceding each flowchart at the end of each chapter. In the case of Section D, the table looks like this:

TABLE 1

Example of Reporting for a "Shopping List" Section From the Simulation "Research Supervision"

| TOTAL POPULATION | SECTIONS | | | | TOTAL |
|---|---|---|---|---|---|
| DESCRIPTION OF OPTIONS | C | D | S | U | |
| 1 Opinion of research | 7 | 12 | 3 | 7 | 29 |
| 2 Prior experience reading scientific articles | 7 | 13 | 5 | 9 | 34 |
| 3 Ability to interpret technical information | 5 | 10 | 2 | 6 | 23 |
| 4 Reasons for selecting topic | 9 | 17 | 4 | 10 | 40 |
| 5 Expectations for this course | 9 | 16 | 4 | 10 | 39 |

Section D is one of the four parallel sections giving the respondent the opportunity to discuss the student's research background.[14] These sections are parallel in that the options in C are the same as in D, S, and U. Thus values can be added across and, for example, it can be estimated that #29% of the population would like to know the student's opinion of research (under the circumstances of the simulation) when supervising this kind of student activity.

Those sections which ask respondents to choose first among "shopping list" options AND THEN branching options will tend to have parallel forms only for the shopping list portion (as reported in Table 1). These sections have different options in the CHOOSE ONLY ONE set of options. Note, for example, that there are 4 such options in Sections C and S, 5 in D, and 3 in U. The point in the simulation where each section occurs accounts for these differences. The appropriate "next step" depends on where the respondent is in his/her solution of the simulation's problem, and that position is reflected in the number and character of the CHOOSE ONLY ONE options that are made available.

Finally, the symbol (EOP) is used to indicate that the respondent has reached the "end of the problem." In the case of "Research Supervision" there is only one EOP (located at the lower right-hand corner of Figure 1) while in other simulations there may be several points at which the problem can end. Note that EOP means that the respondent has come to the end of his/her approach to the problem's solution, not that all the sections available in the booklet have been considered.

There is one other consideration in interpreting the results on an option-by-option basis. In Figure 1, for "Research Supervision" for example, we see that #1% entered Section G via Option F1 and #4% by D8, but we cannot tell how these two groups of respondents proceeded subsequently; both groups become "mixed" at this point in

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[14] Parallel sections are necessary in the design of the simulations whenever there are a series of steps that can be followed in various orders. This design feature makes it possible to know the particular sequence selected by the respondent.

the analysis. It is not possible, therefore, to determine from that figure what percent of the population selects any given total route through the simulation. For that, a different analysis of the routes themselves is necessary, and is reported separately in each chapter and, when appropriate, represented on a separate Figure.

## REACTIONS TO THE SIMULATIONS

When respondents reached the EOP, they were asked to turn to a "Tail-sheet," located inside the back cover of the booklet, to complete some questions about the simulation and the way it relates to their teaching responsibilities. On the basis of the findings from those questions[15] we are able to draw the following conclusions:

1. The different simulations were perceived consistently by the respondents. Specifically, the responses to the questions about each simulation were very similar to the responses about each other simulation, although no one faculty member responded to more than 3 of the 6 simulations, and many responded to only 1 or 2.
2. The simulations have high face validity. Respondents reported that the simulations are realistic and allowed them (the respondents) to show how they actually handle similar instruction and instruction related problems.
3. The simulation format works acceptably. Respondents indicated that they understood how to use the simulations and had little difficulty working through them. (This is confirmed by the finding that fewer than 4% of the responses were blank or improperly executed.)
4. Most faculty members found these simulations on instructional problems sufficiently interesting to indicate their interest in working on others.

## CAUTIONS

On the basis of the procedures used in this survey, we feel compelled to provide three cautions about the results presented in this report.

1. The results are based on pencil-and-paper self-reports, which may not be a fully accurate reflection of

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[15] Reported in detail in the Third Preliminary Report, July, 1977.

what people actually do when they teach; there may be a discrepancy between what our respondents say they do and what they actually do under the pressures of real teaching. We did stress that we were seeking reports of actual teacher behavior by including the following instruction at the start of each simulation: "Your task is to choose the option(s) which best reflect(s) what you would actually do if you were faced with that problem in the teaching you do." Yet, we recognize that under real world constraints it is possible that a teacher would do one thing (or not do another) which s/he would do differently if more time were available or other opportunities were provided, and self-reports might tend toward the latter rather than the former. It is probably best to interpret the reported results as either an estimate of the "upper bound" of teaching in U.S. medical schools, or as an estimate of what faculty members think they should be doing. We have concluded, however, that there is no reason to suspect purposeful distortion; there are too many examples of instructional behavior reported that are not consistent with sound instructional principles.

2. The results reported reflect both the feelings of the respondents and the measurement procedures, formulae, statistical assumptions, etc., used in designing and executing the study. To the degree that certain kinds of information can be collected using forced-choice questions, and described using percentages, our results can be used for drawing conclusions about the population of teaching faculty members.

3. Since we collected small amounts of data from each respondent, and since we dealt with a limited number of respondents at each medical school, we did not (and will not) report our findings on either an individual or school basis. We did not collect enough information to warrant our drawing inferences at either of these levels.

Within the constraints of these three cautions, and given the procedures we have described in this chapter, we are satisfied that the findings in the Report are interpretable and meaningful.

## II. U.S. MEDICAL SCHOOL FACULTY - AN OVERVIEW

This Chapter presents descriptive information and general findings from the survey of full-time faculty members who teach undergraduate students in United States medical schools. As explained in Chapter I, the statistics reported are estimated percentages of the total population of 28,393. The areas of focus are: demographic variables (age, sex, mobility), preparation for teaching (courses taken, workshops attended), teaching settings and methods, and educational issues (from whom assistance is sought, experience with new developments in medical education).

### DEMOGRAPHIC VARIABLES

#### A. Age

Table 2 presents the percentages of age groupings for the total population. There are essentially no differences from this age spread pattern among members of basic science or clinical departments. There are

TABLE 2

Age

| 55+ | 45-54 | 35-44 | 25-34 | <25 |
|---|---|---|---|---|
| #12[16] | #26 | #39 | #23 | #0 |

differences, in expected directions, according to academic ranks: only 21% of Professors are below age 45, while 61% of Associate Professors and 87% of Assistant Professors are. Conversely, 32% of Professors, 8% of Associate Professors, and 2% of Assistant Professors are 55 or older.

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[16]See Chapter I, p. 9 for an explanation of the two types of percentages (with # for full population; without # for sub-groups) used in the report.

B. Tenure

Forty-six percent (#46%) of faculty members hold academic tenure. The relationship between this variable and academic rank is as expected: only 10% of Assistant Professors hold tenure, while 66% of Associate Professors and 91% of Professors do. There is a relationship between departmental affiliation and tenure: 55% of basic science faculty hold tenure, while only 42% of full-time clinical faculty do. Possibly, this may be explained by differences in the way tenure is granted in the two areas (in lieu of salary or on a different time scale), a tendency for promotions to be granted earlier in the basic sciences (see C, below), or a tendency for some physicians to interrupt their full-time academic careers with periods of clinical practice.

C. Academic Rank

Table 3 presents the proportions of faculty at each academic rank. There is a relationship between rank and departmental affiliation, which parallels the relationship between department and tenure (see B, above).

TABLE 3

Academic Rank

| Prof. | Assoc. Prof. | Asst. Prof. | Inst. & Others |
|---|---|---|---|
| #29 | #24 | #34 | #14 |

Among basic science faculty 58% are Professors or Associate Professors, while among clinical faculty 49% hold these ranks.

D. Sex

The large majority of full-time medical school faculty members are men (#84%). This proportion is the same among basic science and clinical faculty, but varies according to academic rank (Table 4). The inverse relationship between academic rank and the percentage of faculty who are female might be attributed to one or more of the following: the small number of qualified female graduates available for academic appointments until

recent years,[17] a tendency for more women than men to postpone and/or interrupt their progress on the career ladder, or differential treatment of men and women in the promotion process. These factors were not investigated in the study.

TABLE 4

Sex of Faculty, By Rank

| | Male | Female |
|---|---|---|
| Professors (#29%) | 95% | 5% |
| Associate Professors (#24%) | 88% | 12% |
| Assistant Professors (#34%) | 82% | 18% |
| Instructors & Others (#14%) | 62% | 38% |

E. Teaching "Load"

The number of weeks per year and the number of hours per week that full-time faculty members spend with medical students are summarized in Table 5. It is emphasized that these findings do not include the time these instructors may spend teaching graduate students, house officers, nurses, or other students, or pursuing other responsibilities (such as patient care, research, or administration). It is striking that nearly one-third (#31%) spend less than 10 weeks per year, and more than one-third (#35%) spend less than 5 hours per week teaching

[17] In medicine, for example, prior to 1967 there was only one year (1950) in which the proportion of female graduates of U.S. medical schools exceeded 6.9%, so the #16% of faculty members that are female exceeds that part of the pool, with the increased numbers in the lower ranks possibly reflecting a recently enlarging pool and the effects of "Affirmative Action" programs. (Datagram, J. of Medical Education, 48: 186-189, 1973.)

TABLE 5

Hours Per Week and Weeks Per Year
Spent Teaching Medical Students

Hours per Week

| | ≤5 | 5-9 | 10-14 | 15+ |
|---|---|---|---|---|
| All | #35 | #29 | #18 | #17 |

Weeks Per Year

| | <10 | 10-19 | 20-29 | 30-39 | 40+ |
|---|---|---|---|---|---|
| All | #31 | #20 | #12 | #10 | #28 |
| Basic Sciences | 30 | 35 | 20 | 9 | 6 |
| Clinical | 30 | 13 | 9 | 9 | 37 |

medical students.[18] Further, it should be noted that almost two-thirds (#64%) of the faculty teach medical students less than 10 hours per week and more than half (not necessarily the same people) teach less than 20 weeks per year. It is also noticeable and understandable that clinicians tend to teach year-round (more than 40 weeks) considerably more than do basic scientists ( 37% vs. 6%). There are virtually no differences in teaching "load" according to academic rank.

F. Mobility

Contrary to popular assumptions, U.S. medical faculty members are not typically on the move between institutions. The large majority (#68%) have held a salaried appointment at only one school and #58% have been at their present school five years or longer (Table 6). Sixty-five percent (#65%) of faculty have held salaried academic appointments at medical schools for five or more years. There are no differences of any

[18] Not all faculty who teach less than 10 weeks per year are the ones who teach less than 5 hours per week. The correlation between these two groups is 0.47.

TABLE 6.

U.S. Medical Faculty Mobility

No. of Medical Schools at Which Salaried Appointments Have Been Held:

| 1 | 2 | 3 | 4 | 5+ |
|---|---|---|---|---|
| #68 | #23 | #7 | #2 | #1 |

No. of Years as Salaried Faculty at Present Medical School:

| 1 | 1-4 | 5-9 | 10-14 | 15-19 | 20+ |
|---|---|---|---|---|---|
| #5 | #37 | #32 | #12 | #7 | #7 |

consequence according to departmental affiliation and variations by rank follow the expected pattern: #21% of professors, #11% of associate professors, and #3% of assistant professors have held appointments at 3 or more schools.

PREPARATION FOR TEACHING

It is generally felt that securing competence in a field or discipline is a necessary part of preparing for teaching. In contrast, only recently have any medical faculty members considered it necessary or desirable to complement that preparation with efforts to develop their instructional effectiveness. Indeed, only in the past decade have instructional development opportunities (courses, workshops, seminars) begun to be fairly widely available.

Almost no prior data are available for comparison to the findings of this survey. The only known data on faculty efforts to secure help in preparing for their teaching, per se, come from a study conducted two decades ago. This study found that virtually no one in a sample of 350 teachers at 7 U.S. medical schools had undertaken any special preparation for teaching.[19] Although the

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[19] H. Jason, "A Study of Teaching Practices at Seven Selected U.S. Medical Schools," Unpublished doctoral dissertation, The University of Buffalo, 1961.

subjects in the study had not been selected to be a representative national sample, the finding was probably indicative of the national situation. Considering that almost none of the medical faculty pursued systematic preparation for teaching 20 years ago, it is striking to find that now #21% of faculty have taken one or more formal college courses on education/teaching, #39% have attended workshops or training sessions on instruction, and the majority of those who were involved in these activities feel positively about the relevance and value of the experience for their own teaching (Tables 7 and 8).

TABLE 7

Preparation for Teaching: Formal Courses

Have Taken One or More Formal Courses on Education/Teaching . . . . . #21%

View of Value of Specific Course(s) for Own Teaching:

| Topic | %[20] | Relevant | Not Relevant |
|---|---|---|---|
| Educational Psychology | #15 | 78[21] | 22[21] |
| Instructional Design | #13 | 90 | 10 |
| Teaching Methods | #16 | 87 | 13 |
| Evaluation/Testing | #14 | 86 | 14 |
| Sociology | #12 | 60 | 40 |
| Anthropology | # 7 | 61 | 39 |

[20] Numbers in this column are estimated percentages of all faculty (e.g., #15% of faculty have taken a course in Educational Psychology).

[21] Numbers in this column are percentages of those faculty who have taken a course on that topic (e.g., 78% of the #15% who took a course on Educational Psychology found it relevant).

TABLE 8

Preparation for Teaching: Workshops

Have Attended One or More Workshops/Training Sessions on Design, Implementation and/or Evaluation of Instruction in the Health Professions: #39%

| Time Spent in Workshops: | | |
|---|---|---|
| | 1 day - | 10[22] |
| | 1 - 7 days - | 59 |
| | 1 - 4 weeks - | 23 |
| | 1 - 3 months - | 5 |
| | 3+ months - | 4 |

View of Value of Specific Workshops for Own Teaching:

| Topic | %[23] | Valuable[24] | Not Valuable[24] |
|---|---|---|---|
| Instructional/Course Design | #26 | 86 | 14 |
| Lecturing | #13 | 81 | 19 |
| Small Group Discussion | #23 | 91 | 9 |
| Laboratory Teaching | #9 | 83 | 7 |
| Clinical Instruction/Supervision | #15 | 89 | 11 |
| Interpersonal Skill Development/Sensitivity Training | #16 | 88 | 12 |
| Evaluation of Clinical Performance | #14 | 91 | 9 |
| Simulation Techniques | #14 | 89 | 11 |
| Development of Programmed Instruction/Self-Instructional Materials | #21 | 87 | 13 |
| Computer Assisted Instruction (C.A.I.) | #11 | 74 | 26 |
| Use of Media in Instruction | #20 | 91 | 9 |
| Evaluation/Testing | #23 | 90 | 10 |

[22]Numbers in this column are percentages of the #39% of faculty who have attended workshops.

[23]Numbers in this column are estimated percentages of all faculty (e.g., #26% of faculty have attended a workshop on Instructional/Course Design).

[24]Numbers in this column are percentages of those who have attended a workshop on that topic (e.g., 86% of the #26% who attended a workshop on Instructional/Course Design found it valuable).

## INSTRUCTIONAL SETTINGS AND METHODS

### A. Settings

The setting in which instruction occurs can exert a considerable influence on the range of experiences available to students and, hence, on the quality of their learning. Although teachers can arrange exceptions, it is generally true that there are particular opportunities available in each separate instructional setting. For example, in a laboratory or a patient examining room opportunities exist that tend not to be available in a classroom, and vice versa.

Table 9 presents the findings based on self-reports from medical faculty on the instructional settings in which they teach, for the total population, and according to academic rank and departmental affiliation. As expected, most teaching occurs in classrooms and conference rooms, with the interesting finding that the incidence of "frequent" use appears to be related to academic rank. This parallels the finding for "frequent" use of lecturing, in Table 10. For reasons based on both subject matter and tradition, basic science teaching is distributed among the settings differently from the pattern for the clinical sciences. Office-based teaching is fairly common, even among members of basic science departments. Not surprising, but perhaps disappointing, is the finding that basic scientists almost never teach in patient-care settings.

### B. Methods

Various factors can contribute to a teacher's selection of particular instructional methods. Experience in working with medical teachers suggests that the most important factors are the method's appropriateness for the subject matter, the teacher's familiarity with the method, departmental/institutional expectations and traditions, class size, and available resources.[25] Even if the selection of an instructional method is under its user's control, once selected, the method brings constraints on the uses to which it can be put. There

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[25]Findings that bear on some aspects of how faculty members make decisions on these matters are presented in Chapter VII.

TABLE 9

Instructional Settings

| Setting | Response | Total Population | Assistant Professor | Associate Professor | Professor | Basic Science | Clinical |
|---|---|---|---|---|---|---|---|
| Classroom/Conference Room | Freq[26] | #61[27] | 59 | 69 | 75 | 78 | 54 |
| | Occa | #33 | 37 | 28 | 23 | 18 | 39 |
| | Never | #6 | 4 | 3 | 2 | 3 | 7 |
| Office | Freq | #27 | 27 | 24 | 30 | 20 | 30 |
| | Occa | #47 | 47 | 51 | 49 | 59 | 42 |
| | Never | #26 | 26 | 25 | 21 | 21 | 28 |
| Laboratory | Freq | #26 | 26 | 29 | 27 | 53 | 13 |
| | Occa | #30 | 29 | 33 | 35 | 34 | 29 |
| | Never | #44 | 45 | 38 | 38 | 13 | 57 |
| Patient Bedside | Freq | #33 | 32 | 35 | 1 | 2 | 48 |
| | Occa | #20 | 20 | 18 | 19 | 7 | 26 |
| | Never | #47 | 49 | 47 | 40 | 92 | 26 |
| Patient Examining Room | Freq | #27 | 25 | 29 | 30 | 1 | 39 |
| | Occa | #21 | 20 | 21 | 23 | 4 | 29 |
| | Never | #53 | 55 | 50 | 47 | 95 | 33 |

[26] Key: Freq = Teaching is done FREQUENTLY in this setting; Occa = Teaching is done OCCASIONALLY in this setting; Never = Teaching is NEVER done in this setting.

[27] For all percentages in this table the standard errors are 2 or less.

TABLE 10

Instructional Methods

| Method | Response | Total Population | Assistant Professor | Associate Professor | Professor | Basic Science | Clinical |
|---|---|---|---|---|---|---|---|
| Lecturing | Freq[28] | #56[29] | 65 | 61 | 64 | 78 | 46 |
| | Occa | #36 | 38 | 35 | 34 | 18 | 44 |
| | Never | #8 | 7 | 4 | 2 | 4 | 10 |
| Small Group Discussion | Freq | #65 | 63 | 69 | 74 | 54 | 71 |
| | Occa | #28 | 31 | 27 | 23 | 39 | 23 |
| | Never | #6 | 6 | 4 | 3 | 8 | 6 |
| Laboratory Teaching | Freq | #26 | 25 | 29 | 27 | 54 | 14 |
| | Occa | #30 | 27 | 33 | 34 | 32 | 29 |
| | Never | #44 | 48 | 38 | 39 | 14 | 58 |
| Clinical Instruction/Supervision | Freq | #44 | 43 | 40 | 48 | 3 | 63 |
| | Occa | #17 | 17 | 20 | 15 | 11 | 19 |
| | Never | #39 | 40 | 40 | 37 | 87 | 18 |
| Tutorial Instruction | Freq | #20 | 16 | 24 | 24 | 13 | 22 |
| | Occa | #47 | 48 | 48 | 51 | 57 | 43 |
| | Never | #33 | 36 | 28 | 25 | 30 | 35 |
| Programmed Instruction/Self-Instruction Materials | Freq | #6 | 5 | 7 | 7 | 6 | 6 |
| | Occa | #27 | 25 | 26 | 36 | 30 | 25 |
| | Never | #67 | 69 | 67 | 56 | 64 | 69 |
| Computer Assisted Instruction (C.A.I.) | Freq | #1 | 0 | 1 | 1 | 1 | 1 |
| | Occa | #7 | 6 | 6 | 9 | 11 | 4 |
| | Never | #93 | 94 | 93 | 90 | 88 | 95 |

[28]Key. Freq = This method is FREQUENTLY used.

Occa = This method is OCCASIONALLY used.

Never = This method is NEVER used.

[29]For all percentages in this table the standard errors are 2 or less.

are, for example, instructional goals that can be more readily fulfilled in a small group discussion than in a lecture, and vice versa. Indeed, the method used may shape, or even determine, some of the goals that are pursued.

Table 10 presents the extent to which faculty in general, and according to academic rank and departmental affiliation, use various instructional methods. Lecturing and small group discussion are the most commonly used methods, with the newer approaches of programmed instruction and self-instruction still not in wide use. Computer assisted instruction is rare. The pattern of utilization of the various methods among basic science and clinical faculty members is largely as expected. There is more frequent use of lectures and laboratory teaching in the basic sciences and more frequent use of small groups and clinical supervision among clinicians.

## ADVICE AND ISSUES

### A. Seeking Advice

One indication of the importance that people attribute to an activity is the extent to which they seek advice or assistance in the execution of that activity. Responsibilities which professionals consider central to their work (say, their research) tend to be discussed fairly often with colleagues and others who may provide fresh perspectives and suggestions. It is recognized that factors other than perceived importance may influence the seeking of advice, such as the availability of appropriate advisors, local traditions regarding instructional autonomy, and risks associated with acknowledging a need for help.

Questions on patterns of "advice-seeking" can also provide some indication of the value teachers attach to various potential "advice-providers." Table 11 presents the findings based on the responses of faculty members to the question, "How often do you seek assistance/advice on instructional issues and problems from the sources listed?" Data are not presented according to professorial rank or departmental affiliation, as the findings for these groups do not depart significantly from the total population values.

TABLE 11

Seek Advice on Instructional Problems

| Source | Response | Population |
|---|---|---|
| Faculty Colleagues in Own Dept. | Freq[30] | #42[31] |
| | Occa | #51 |
| | Never | #7 |
| Faculty Colleagues Outside Dept. | Freq | #12 |
| | Occa | #62 |
| | Never | #26 |
| Dept. Chairperson | Freq | #14 |
| | Occa | #47 |
| | Never | #38 |
| Educational Specialist | Freq | #4 |
| | Occa | #24 |
| | Never | #72 |

| Source | Response | Population |
|---|---|---|
| Asst./Assoc. Dean for Education | Freq | #1 |
| | Occa | #11 |
| | Never | #88 |
| Current Students | Freq | #37 |
| | Occa | #56 |
| | Never | #17 |
| Former Students | Freq | #17 |
| | Occa | #56 |
| | Never | #27 |
| The Literature | Freq | #33 |
| | Occa | #40 |
| | Never | #27 |

[30]Key: Freq = This source is turned to FREQUENTLY.
Occa = This source is turned to OCCASIONALLY.
Never = This source is NEVER turned to.

[31]For all percentages in this table the standard error is 3 or less.

It appears that a large majority of faculty members do seek some advice, primarily from departmental colleagues and current students. From the way the question was asked it is not possible to know what the proportional concerns of faculty are between instructional design and subject matter content in the advice they seek. It may be possible to infer that they are more concerned with content than process since the primary advisors they choose (departmental colleagues) are likely to be most helpful in the content area, while those who are more likely to help with the instructional process (educational specialists and deans for education) are turned to infrequently. The relative frequencies of contact with colleagues versus others may also be a function of ease of access.

B. Educational Issues

People are not free to choose among options they do not know exist. A central component of faculty development is "consciousness raising", helping faculty members become aware of alternatives to accustomed practices so they can exercise a greater degree of control in making instructional decisions. The number of available alternatives has been growing.

During the past two decades there has been considerable activity in the design and adoption of instructional alternatives in medical education. The utilization of, and attitudes toward, these approaches provide a rough barometer of the movement of medical education out of its traditional patterns and the extent of the diffusion of various innovations. It can also serve as a guide to areas that deserve special attention in faculty development programs.

Tables 12A-I present data based on faculty indications of their use of, familiarity with and views about, a variety of contemporary educational issues and instructional innovations.

The range of responses enhances our confidence in their validity. The estimates that #80% of all faculty have used "Student evaluation of faculty," or #61% have used the "Formulation of instructional objectives" might appear inflated, if there were not a large number of faculty acknowledging their lack of familiarity with such issues as "Criterion-referenced evaluation" (#75%) and

"Formative evaluation (#80%): Similarly, very little negative expression toward most issues might be suspect, except that a substantial proportion of faculty (#49%) does express negative views on one area, the "Three-year curriculum." This is consistent with the currently widespread devaluing of such programs.

A brief comment should be made concerning the interpretation of these data. The analytic methods used in preparing this report do not permit any conclusions about the connections between experience with an issue and views about it. It is not known, for example, if those who have used instructional objectives are more or less positively disposed toward them than those who have not. That is, the figures for "Involvement" cannot be tied to those for "Appropriateness/Value." There is, however, a striking pattern worth noting. In every instance, the proportion of those who are "Uncertain" about the value of an issue is larger than the proportion of those who are "Not Familiar" with an issue. It is suspected that people who are unfamiliar with a topic may be withholding value judgments.

The following findings are felt to be particularly noteworthy:

1. Instructional Objectives. (Table 12A) It is a reasonable postulate that two decades ago most U.S. medical faculty had not heard the term "instructional objectives." In dramatic contrast, now #83% know about the issue, #61% have actually made some use of objectives,

TABLE 12A

Instructional Objectives

| Involvement | Total Population | Appropriateness/ Value | Total Population |
|---|---|---|---|
| USED | #61[32] | POSITIVE | #73 |
| HEARD OF | #22 | NEGATIVE | #5 |
| NOT FAMILIAR | #17 | UNCERTAIN | #22 |

[32] For all percentages in Tables 12A-12I the standard errors are 1% or less.

#73% are positively disposed toward the idea, and only #5% feel negatively about its value.[33] These findings are seen as an indication of the willingness of current medical faculty to consider new educational ideas.

2. Three-Year Curriculum. (Table 12B) Although a quarter of the faculty (#26%) have had experience with a three-year medical curriculum and an additional half (#51%) are familiar with the idea, only #11% are positively disposed toward it, and #49% have a negative view of its appropriateness or value. These findings reflect the fact that while 26 U.S. medical schools have experimented with the three-year curriculum during the past decade, only 6 schools retain it as their exclusive pattern, and 3 offer it as an alternative to their regular 4-year program. Further, the idea is now in dispute at most of these institutions.[34]

TABLE 12B

Three-Year Curriculum

| Involvement | Total Population | Appropriateness/ Value | Total Population |
|---|---|---|---|
| USED | #26 | POSITIVE | #11 |
| HEARD OF | #52 | NEGATIVE | #49 |
| NOT FAMILIAR | #22 | UNCERTAIN | #40 |

3. Problem-Oriented Medical Record (POMR). (Table 12C) Unlike the other issues being considered here, the POMR was not borrowed from another field, but was developed within medicine, and its date of origin

[33] #40% of faculty include objectives in their design of a course segment in one of the problems in this survey (Chapter VII).

[34] AAMC, "Three-Year Curriculum Study." In process.

can be roughly identified. While the work on which it is based has a considerably longer history, two publications[35] mark the approximate beginning of national visibility for the idea as within the past decade. It is impressive to find that #48% of faculty have now used this system, an additional #30% have some familiarity with it, and only #22% are unfamiliar. This is an additional confirmation that current faculty members are open to learning about and trying new ideas.

TABLE 12C

Problem-Oriented Medical Record (POMR)

| Involvement | Total Population | Appropriateness/ Value | Total Population |
|---|---|---|---|
| USED | #48 | POSITIVE | #50 |
| HEARD OF | #30 | NEGATIVE | #12 |
| NOT FAMILIAR | #22 | UNCERTAIN | #38 |

4. Special Curricular Features. (Table 12D) In contrast to the 3-year curriculum which focuses on time not process, the three innovations discussed here all refer to alterations in the way in which the medical curriculum is organized without regard to its length. The "Problem-based" curriculum, in which the springboard for student learning is problems to be solved rather than didactic presentations, is being experimented with at a small number of schools. "Vertical integration," which involves efforts to find ways for the basic and clinical sciences to be learned in direct relation to each other, rather than in vertical

[35] L.L. Weed, "Medical Records That Guide and Teach," New England J. of Med. 278: 593-599, 652-657, 1968 and L.L. Weed, Medical Records, Medical Education, and Patient Care: The Problem-Oriented Record as a Basic Tool, Cleveland: Case Western Reserve University Press, 1969.

sequence in separate years, is being tried in parts of the programs at some schools. The "Competency-based" curriculum is probably the newest and least tried of the major curricular modifications. It is an extension of the thinking behind the use of instructional goals:

TABLE 12D

Special Curricular Features

"Problem-Based Curriculum"

| Involvement | Total Population | Appropriateness/ Value | Total Population |
|---|---|---|---|
| USED | #14 | POSITIVE | #28 |
| HEARD OF | #42 | NEGATIVE | #9 |
| NOT FAMILIAR | #44 | UNCERTAIN | #63 |
| "Vertical Integration" | | | |
| USED | #9 | POSITIVE | #14 |
| HEARD OF | #25 | NEGATIVE | #7 |
| NOT FAMILIAR | #65 | UNCERTAIN | #80 |
| "Competency-based Curriculum" | | | |
| USED | #6 | POSITIVE | #19 |
| HEARD OF | #29 | NEGATIVE | #4 |
| NOT FAMILIAR | #65 | UNCERTAIN | #77 |

once the intended educational outcomes have been specified, the focus of students' effort is expected to be on acquiring the specified competencies, not on simply putting in a predetermined amount of time (say, 10 hours per week, for 8 weeks) in a particular discipline. Faculty members acknowledge a low level of experience and

a fairly low level of familiarity with these approaches.[36] Encouragingly, their predominant posture is to withhold judgment, indicating uncertainty, and only small numbers express negative views.

5. Simulation. (Table E) The use of simulation for instruction has been commonplace outside of medicine (e.g., in the U.S. space program, in military and civilian training of pilots) and has been used in a growing number of ways in medical education. These uses range from written forms, as in the "patient management problems" incorporated into the National Board examinations and the six used to collect data in this survey; to sophisticated technology, such as "Sim I," developed by Denson and Abrahamson, and "Harvey" developed by Gordon;

TABLE 12E

Simulation

| Involvement | Total Population | Appropriateness/ Value | Total Population |
|---|---|---|---|
| USED | #25 | POSITIVE | #48 |
| HEARD OF | #47 | NEGATIVE | #7 |
| NOT FAMILIAR | #28 | UNCERTAIN | #45 |

[36] It is reasonable to wonder for these issues (as for the issues in item 8, below) whether the faculty members are unfamiliar with the terms used, but are familiar with the concepts or programs that the terms represent. While that situation is possible, it is not likely; the terms used here are the technical labels attached to these issues throughout the literature of medical and general education, so that it is improbable that a person would be acquainted with an issue without knowing the way it is referenced by those who write about it or do work in the area.

to live "programmed patients."[37] While #25% of faculty have used simulations, it is curious that as many as #28% are unfamiliar with the idea, given the national publicity that some of the more dramatic examples of instructional simulation have received. Although nearly half the faculty (#45%) remain uncertain, only #7% have negative views and #48% are positively disposed toward this development.

6. Student Evaluation of Faculty. (Table 12F) It is striking that most faculty (#80%) have had experience with the evaluation of faculty by students, and that #76% are positively disposed toward this idea.[38] It is likely that two decades ago many medical faculty would have resisted the notion of their teaching being evaluated in any way, possibly asserting that it would be an infringement on their "academic freedom", and a fair number would have been offended at the possibility that students might be the evaluators. While there are no data to quantify the extent to which views have changed in the past 2 decades, it seems justifiable to hypothesize that a substantial positive change has occurred, and that the increasing cultural focus on accountability has been a contributing factor. In any case, there is presently a climate in which the design of regular programs of instructional evaluation seems possible.

TABLE 12F

Student Evaluation of Faculty

| Involvement | Total Population | Appropriateness/ Value | Total Population |
|---|---|---|---|
| USED | #80 | POSITIVE | #76 |
| HEARD OF | #18 | NEGATIVE | #8 |
| NOT FAMILIAR | #2 | UNCERTAIN | #16 |

[37] H.S. Barrow, Simulated Patients, Springfield, Ma.: C.G. Thomas Publishers, 1971.

[38] In their design of a course segment, in a problem used in this survey, #49% of faculty arrange for students to evaluate faculty (Chapter VII).

7. Course Entry Evaluation. (Table 12G) While not new in the field of education generally, it is only in the past decade that there has been much discussion of determining the students' levels of competency by pretesting prior to their beginning an instructional program in medical education. Although a third of the faculty (#34%) have experience with this practice, we do not know how often they use it.[39] That a majority (#52%) are positively disposed toward it suggests that faculty development efforts could lead to its wider use.

TABLE 12G

Course Entry Evaluation

| Involvement | Total Population | Appropriateness/ Value | Total Population |
|---|---|---|---|
| USED | #34 | POSITIVE | #52 |
| HEARD OF | #47 | NEGATIVE | #7 |
| NOT FAMILIAR | #19 | UNCERTAIN | #40 |

8. Approaches in Evaluation. (Table 12H) Two approaches to evaluation, "Formative" and "Criterion-referenced" evaluation, are discussed together here because they are companion issues and the findings are parallel. "Formative" evaluation refers to the process of continuous monitoring of a program in order to guide mid-course corrections, and is typically counterposed to "Summative" evaluation, the process of determining outcomes that permits concluding or certifying decisions to be made. Only "Formative" evaluation was asked about as an index of faculty familiarity with this way of conceptualizing evaluation.

[39] Thirty-three percent (#33%) of faculty choose to include pretesting in their design of the segment of a course in one of the problems used in this survey (Chapter VII).

"Criterion-referenced" evaluation may be contrasted to "norm-referenced" evaluation.[40] The first compares each student's performance to a set of defined standards or "criteria", while the second is based on students being compared to each other or to some other group of students.

Both formative and criterion-referenced evaluation are departures from conventional practice. They are, however, backed by a considerable body of research and experience outside of medicine, and some within medical education. Faculty experience and familiarity with these concepts are low.[41] However, as there is mainly a posture of uncertainty (#90% and #84%) and little negativity (#2%), these would seem to be important areas of focus for future faculty development programs.

TABLE 12H

Approaches to Evaluation

"Formative"

| Involvement | Total Population | Appropriateness/ Value | Total Population |
|---|---|---|---|
| USED | #5 | POSITIVE | #8 |
| HEARD OF | #14 | NEGATIVE | #2 |
| NOT FAMILIAR | #80 | UNCERTAIN | #90 |
| | "Criterion-Referenced" | | |
| USED | #8 | POSITIVE | #14 |
| HEARD OF | #17 | NEGATIVE | #2 |
| NOT FAMILIAR | #75 | UNCERTAIN | #84 |

[40] It is assumed that most faculty members are not familiar with domain-referenced evaluation, an even newer notion.

[41] See footnote 36, p. 38.

9. Peer Review/Quality Assurance. (Table 12I). These terms are subject to more than one interpretation. For many clinicians they are technical terms, referring to legislatively mandated programs for monitoring aspects of patient care. At the same time, these words have their own meanings, which could pertain to any situation, not necessarily clinical. Indeed, these notions have been discussed in the literature in reference to the instructional process. There is no way of knowing which definition(s) respondents had in mind when expressing the views on which the findings in Table 12I are based. All that we can conclude is that these concepts are familiar to #79% of faculty, the majority (#56%) are positively disposed to the idea, and very few (#6%) feel negatively.

TABLE 12I

Peer Review/Quality Assurance

| Involvement | Total Population | Appropriateness/ Value | Total Population |
|---|---|---|---|
| USED | #32 | POSITIVE | #56 |
| HEARD OF | #47 | NEGATIVE | #6 |
| NOT FAMILIAR | #21 | UNCERTAIN | #39 |

## CONCLUSIONS

This Chapter has presented a variety of findings about who serves as full-time faculty in U.S. medical schools, the preparation they have had for their teaching responsibilities, the settings in which they teach, the instructional methods they use, how they seek assistance, and their familiarity with, and attitudes toward, several contemporary issues in medical education. From all of this it can be concluded that faculty members, in general, have had minimal preparation for their work as instructors, tend to follow fairly conventional patterns in their teaching, and have had little experience with most of the new developments in medical education. It

would be reasonable to expect these circumstances to be reflected in the way medical teachers approach and solve instructional problems. This is precisely what is found in their responses to the written simulations, presented in the next six chapters.

The encouraging finding presented in this Chapter is the largely positive attitude of faculty to many of the newest features of medical education. An important complimentary finding is the small numbers of faculty who express negative views about these innovative issues. This is consistent with indications of faculty openness to learning more about aspects of instruction, reported in Chapter IX.

PLEASE NOTE:

IN THE FOLLOWING SIX CHAPTERS, THE DISCUSSIONS OF FINDINGS FROM THE SIMULATIONS WILL BE BEST UNDERSTOOD IF THE ROUTES IDENTIFIED ARE TRACED ON THE FLOW CHART PROVIDED AS A FOLDOUT AT THE END OF EACH CHAPTER. THE NARRATIVE CAN BE DIFFICULT TO FOLLOW BECAUSE OF THE BRANCHING NATURE OF THE SIMULATIONS. RESPONDENT GROUPS BECOME DIVIDED INTO SUBGROUPS THAT ARE FURTHER SUBDIVIDED AS THEY PROGRESS THROUGH THE AVAILABLE ROUTES.

YOU ARE REMINDED THAT A PERCENTAGE PRECEDED BY "#" IS AN ESTIMATED PROPORTION OF ALL FACULTY. PERCENTAGES WITHOUT THE "#" ARE PROPORTIONS OF THE GROUP UNDER DISCUSSION. WHENEVER NECESSARY FOR CLARITY BOTH PERCENTAGES ARE PROVIDED.

# III. CLINICAL SUPERVISION

## INTRODUCTION

The supervision of individuals or small groups of students in the clinical setting represents a substantial portion of the total instructional effort in medical schools. From the responses to the survey, it is estimated that #61%[42] of medical school faculty members serve at least occasionally as clinical supervisors. As will be seen with each of the other instructional activities described in the Report, the amount of preparation that teachers have had for this responsibility is small; only #15% of faculty have attended any workshops or other training sessions on clinical supervision. Of those who did have such preparation, 87% found the experience valuable.

Fifty-eight percent (#58%) of faculty express an interest in receiving printed information that would help them improve their work in this area, and #22% are interested in attending a workshop on the topic. This level of interest has encouraging implications for future activities in faculty development, as will be discussed in Chapter IX.

The written simulation that provided the data reported in the chapter was distributed differently from the other five simulations used in the survey. Rather than being sent to a sample representing all 28,393 medical school faculty members who have undergraduate teaching responsibilities, it went only to a sample drawn from the 19,307 members of clinical departments. Seventy-six percent (#76%) of the clinical faculty are estimated to consider their responses to this simulation reflective of the way they manage problems they actually face as teachers. Further, #90% believe that medical school clinical faculty members should be able to manage the the problems presented.

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[42] For a discussion of the percentage symbols in this report, see Chapter I, pages 9 - 10.

## KEY FEATURES OF THE SIMULATION

The primary purposes of this simulation are to examine the way clinical faculty members:

A. perceive their responsibilities as clinical supervisors (e.g., how available to be to the student, whether to directly observe the student's work);

B. view the process of clinical instruction (e.g., the importance of determining the student's background, establishing a relationship, communicating expectations);

C. relate and provide feedback to students in the clinical setting (e.g., critical, supportive, harsh).

The problem situation is defined as follows, in the simulation's opening scene:

You are a clinical preceptor responsible for supervising medical students toward the end of their Introduction to Clinical Medicine course just prior to beginning their first clinical clerkship. In this course they have so far had general instruction in the conduct of history taking and physical examination. This morning you will work with Jim Scott who will be doing his first complete new-patient workup. The other day you heard a passing comment from another faculty member that this student is something of a dud. Your tasks today are to evaluate his performance, to give him feedback, and to arrange whatever follow-up instruction you feel is appropriate. It is 9:00 a.m. and while the student is scheduled from 9-12 you can use as much or as little of the morning as you wish. You do want to find up to an hour to complete a project report that is due by noon. You and Jim greet each other and begin to plan the morning's activities.

**You would now (CHOOSE ONLY ONE)**

A1 Tell Jim to go ahead and examine the patient and to come to your office when he is ready to report his findings. You explain that you think that one hour should be all the time he will need.

A2 Tell Jim to go ahead and examine the patient and to call you if he runs into any problems. You explain that you think one hour should be all the time he will need.

A3 Ask Jim if he has any questions before he begins the workup.

A4 Engage Jim in a discussion of his prior experiences in this course.

A5 Ask Jim to begin the workup, explaining that you will sit in and observe what he does.

The following are the key features of the situation that faces the respondent.

1. This is the student's first complete new-patient workup, which suggests that it may be a difficult and a critical experience for the student, and that the supervisory responsibility is different from that required for an experienced student.

2. While it is not possible to know the meaning of the observation that the student is "something of a dud," it can reasonably be taken as a signal that some extra supervisory attention may be desirable. In particular, it would seem more than usually necessary that the teacher's expectations be made clear, so the student can know where to direct his efforts, as a basis for a fair and accurate assessment of his capabilities.

3. The "something of a dud" observation may also suggest that the student may be more uncomfortable than most beginning students in the clinical situation. This would make it even more important to determine this student's sense of readiness for the morning's assignment. A skillful teacher uses such information to focus on the kind of help which the student most needs.

4. The need for an hour to complete a report is introduced as a probe to discover the respondent's commitment to the task of clinical supervision. On one hand, in real life, other obligations do intrude on scheduled teaching time. On the other hand, it can be asserted that a teacher's first obligation is to a scheduled student, much as a clinician's first obligation is to a scheduled patient. As will be seen later, the additional complication of a telephone interruption is also introduced to gather information on the respondent's judgment of the relative priority of the instructional responsibility.

5. The supervisor's tasks are to evaluate the student, provide feedback, and arrange for appropriate follow-up instruction.

MOST COMMON ROUTES (See Figure 3[43])

A. Determining Student's Background/Establishing a Relationship

Before the student begins the workup, most faculty members (#58%) engage him in a discussion, either by asking if he has any questions (#37%) (A3)[44] or by reviewing his prior experiences (#21%) (A4). The remaining #40% have the student begin the patient workup immediately, although 65% of them (#26%) do accompany the student (A5) with the intention of observing the full workup. The other 35% (#14%) have the student begin the workup immediately, on his own, without discussion of any kind. Seventy-nine percent of this group (#11%) invite the student to call if he has any problems (A2), but 21% (#3%) simply explain that he is to come and report his findings when done (A1). They either have no intention of being available during the student's workup or assume the student will know to call if he has problems.

There are some differences in subsequent behaviors between those who invite the student's questions (Section E) and those who pursue a discussion of his prior experiences (C). Of those faculty members who invite questions, 63% (#24%) have the student begin the workup without a discussion of the teacher's expectations (E1 + E3 + E4). Of those faculty who review the student's prior experiences, 48% (#10%) (C3 + C5 + 04) have the student go ahead with the workup without reviewing the expectations. There is a further difference between those two groups; among the teachers who invite questions 34% (#13%) have the student do the workup on his own (E1, E3), while only 5% (#1%) of those who review expectations leave the student on his own (C5).

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[43]The overall flow-chart of the simulation is a fold-out found at the end of the chapter.

[44]The capital letters refer to sections of the simulation, the numbers to options in the sections on the flow-chart.

B. Communication of Expectations

Only #24% of clinical faculty members share their expectations for the morning's work with the student. The specific expectations that the respondent is asked to consider are listed in the excerpt from the simulation below. Of those respondents who do communicate expectations, the proportion selecting each of the 10 items is indicated under the column, "Would Include."

| | | Would Include |
|---|---|---|
| R1. | His method of asking questions. | 97%(#24%) |
| R2. | His elicitation of the "Chief Complaint" and "History of Present Illness." | 96%(#24%) |
| R3. | His conduct of the review of systems. | 91%(#23%) |
| R4. | His approach to the social and family history. | 91%(#23%) |
| R5. | His mental status exam. | 80%(#20%) |
| R6. | His technique of palpation. | 85%(#21%) |
| R7. | His technique of auscultation. | 85%(#21%) |
| R8. | His technique of eliciting reflexes. | 81%(#20%) |
| R9. | His method of giving instructions. | 82%(#20%) |
| R10. | His diagnostic formulation. | 85%(#21%) |

Very little selectivity is exercised in choosing among the 10 possible areas for the morning workup, despite the fact that this student is in the earliest stages of learning clinical work.[45] While it is

[45]It is possible that some respondents assumed that this list was a duplicate of the "outline of a complete workup" that the student reports having been given earlier in the course. These respondents may have automatically decided that all elements should be included.

reasonable to expect a beginning student to undertake the basics of the history and the physical examination (items R1 - 4, 6 - 8, above), it is surprising that so many teachers also expect such advanced skills as giving instructions and formulating a diagnosis (R9 and 10). Nonetheless, the student does at least have the benefit of knowing in advance what is expected, even if it is beyond his current capabilities. As will be seen in the next section, there are instances in which some faculty members evaluate the student in areas that he was told would not be expected. Also, those faculty who do not explain their expectations at all still evaluate the student on virtually the same range of competencies as those who do convey their expectations.

C. Relationship of Expectations to Observations

The essence of the process of supervision involves three steps: observing student performance, for the gathering of evaluative information, as a basis for providing the student helpful feedback. A desirable prior step is conveying expectations to the student, so s/he can focus on those issues that are regarded as important at this time by this teacher. It is reasonable to expect clinical supervisors to excercise discretion in their expectations and observations, according to the goals of the program and the level of readiness of the student. In the supervisory problem of this simulation, most faculty members observe most components of the patient workup, exercising discretion only under a few circumstances (Tables 13 and 14). Some faculty members who send the student off to begin the workup on his own and join him for only the last 20 minutes, apparently recognize that they would have missed the early moments of history taking (R2, R3, R4). Even so, there are 45% of each of the two sub-groups of faculty (#14%) (those that did and those that did not explain their expectations) who do evaluate the elicitation of the "chief complaint" and "history of present illness" (R2)--which invariably occur in the first few minutes of a patient workup, which they had missed.

In addition, it is interesting to note that 96% of those who convey their expectations (Table 13), indicate an interest in item R2 (elicitation of "Chief Complaint and History of Present Illness"); yet, 100% (#14%) of those within this group who miss the first ten minutes of the workup (in response to the telephone interruption - Section M) still evaluate the student on this skill,

TABLE 13

EXPECTATIONS AND OBSERVATIONS (#24%)

| Components of the Workup: | R1[46] | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 | R10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Conveyed Expectations: | 97[47] | 96 | 91 | 91 | 80 | 85 | 85 | 81 | 89 | 85 |
| Observe: Last 20 mins. (#7%) | 97 | 45 | 48 | 59 | 62 | 83 | 83 | 83 | 83 | 76 |
| " : Miss 1st 10 mins. (#14%) | 100 | 100 | 91 | 100 | 91 | 100 | 100 | 91 | 100 | 64 |
| " : Full workup (#3%) | 100 | 90 | 96 | 93 | 91 | 91 | 91 | 91 | 88 | 91 |

TABLE 14

OBSERVATIONS WITHOUT HAVING CONVEYED EXPECTATIONS (#71%)

| Components of the Workup: | R1[46] | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 | R10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Observe last 20 mins. (#25%) | 100[47] | 45 | 30 | 30 | 64 | 88 | 82 | 82 | 88 | 79 |
| Miss 1st 10 mins. (#30%) | 100 | 100 | 100 | 95 | 91 | 95 | 95 | 95 | 95 | 91 |
| Full workup (#16%) | 100 | 92 | 92 | 92 | 95 | 97 | 92 | 92 | 90 | 85 |

[46] See page 62 for the list of workup components.

[47] Each number in this Table is a percentage of the subgroup of faculty that pursued the particular option listed (such as R1) under the conditions specified (such as observing the full workup, after having conveyed expectations, in Table 13, or without having conveyed expectations, in Table 14).

even though it was undoubtedly applied while the instructor was out of the room.

There are a few remaining general observations on the way faculty members respond to the issues of communicating expectations to a student and observing the student's work. While only #24% of faculty members communicate their expectations to the student, fully 95% of faculty members do undertake to observe at least part of the workup. It seems clear that most clinical faculty members are persuaded that they should directly witness the student in action, at least during the early stage of clinical instruction.

D. Commitment to Full Observation

It can be seen in Figure 3, section F that #64% of faculty set out to observe the full workup by the student. As a small challenge to the teacher's level of commitment to this, a complication is introduced; just after the introduction to the patient, the instructor is paged and finds that s/he must step out for five or ten minutes for an emergency call. At this point in the simulation, the respondent is given a choice between asking the student to wait or to begin the workup (saying that s/he will be back as soon as possible). Thirty percent of those faced with this choice (#19%) elect to have the workup delayed so that no part will go unobserved. The other 70% (#45%) choose to miss the first ten minutes of the workup.

E. Managing the Introduction

Those respondents who intend to witness the full workup accompany the student to the examining room where they are faced with a choice between introducing themselves and the student to the patient or inviting the student to proceed, watching to see how the student introduces himself and the instructor to the patient. By waiting, the teacher gains an additional opportunity to provide helpful feedback. The point of requiring the decision on the introduction is to determine if the respondent recognizes this instructional potential in the student-patient encounter. Of the #64% of faculty faced with this choice, 59% (#38%) manage the introduction themselves. While selecting this option seems to reflect a lack of awareness of the instructional potential of the situation, it could reflect a concern for the patient's welfare. The instructor may feel that the initial introduction requires a sensitivity that they alone can

provide.

## F. Feedback to the Student

The concluding step in this simulation's problem is the "wrap up" feedback that the instructor provides to the student. (Section N, below.) The #3% of faculty who never observe the student directly during the patient encounter all select feedback which does not criticize any aspect of the student's work, is generally supportive, and provides for no follow-up. Almost all the remaining faculty are somewhat critical of the student's performance, but in a way that is supportive, not harsh. Eighty-nine percent of this group (#86%) provide feedback which includes a constructive effort to provide follow-up instruction. Only 9% (#9%) are critical of the student's performance in a harsh or intimidating way. Their arrangements for follow-up are perfunctory.

At the completion of the workup you ask Jim to summarize his findings and views He indicates he s 'glad it s over and that she was a difficult patient He then gives a fairly systematic if mechanical review of his findings On the basis of the information you now have you tell him **(CHOOSE ONLY ONE)**.

N1 That he is performing at a reasonable level given his stage of training and that with more experience he should continue to progress satisfactorily No immediate follow-up seems necessary

N2 That you were impressed with his thoroughness He did a nice physical exam, is clearly trying hard, and if he is a little more understanding with patients, he should become a good clinician No immediate follow-up seems necessary

N3 That you had heard he wasn't doing well in the clinical area and you have little basis for changing that view He is mechanical and rather insensitive and had better make an effort to improve in the future You advise him to seek help

N4 That you were satisfied with how he managed parts of the physical and parts of the history But before he can get to be a good clinician there are some issues that need attention You provide some specific suggestions and conclude by scheduling an appointment for another meeting

N5 That if you are to be helpful, you've got to come right to the point and say that he really treated that patient quite badly He was insensitive and harsh at times, and must be quite insecure to be arguing with a patient the way he did You ask how you can help with these problems

Nearly all faculty (#85%) select the feedback statement which is most closely related to the student's actual performance, appropriately supportive, and linked to follow-up. This is the preferred choice. However, many faculty members arrive there with limited primary data about the student's actual capabilities (#32% witnessed only the last 20 minutes). In addition, #75% do not convey their expectations to the student. While N4 is the preferred feedback choice, it can be (and was) selected for incomplete or even incorrect reasons. If we impose the stipulation that feedback, to be meaningful, should be based on previously conveyed expectations and on observation of most of the student's performance, we find that only #16% of faculty undertake the appropriate sequence of steps that culminates in the provision of the preferred feedback to the student.

OPTIMAL ROUTE (See Figure 2)

The recommended routes through this simulation are shown with darkened lines in Figure 2. The rationales for the choices have been discussed in the review of the most commonly selected routes, but are repeated here briefly as a summary of the issues contained in this simulation.

Options A3 (encouraging student questions) or A4 (exploring the student's prior experiences) are preferred over the others in Section A; they provide an opportunity for the teacher and student to begin to know each other, establishing a basis for their subsequent communications. Those who select A4 have the possibility (C2) of discovering whether he had previously run into any problems with patients. This is a reasonable inquiry to make to any student, but especially this one, considering the faculty comment that this student is "something of a dud."

Whether the route followed is through A3 or A4, the optimal next steps, either directly via E2 or C4, or indirectly through C2 to O5, include an explanation by the teacher of his/her expectations for the student's work. This amounts to sharing the objectives of the morning's instruction with the student. Without them the student is at a disadvantage. He can only guess at whether some aspects of a total workup can be disregarded, leaving him free to concentrate on fundamentals, or whether this teacher's expectations are concordent with

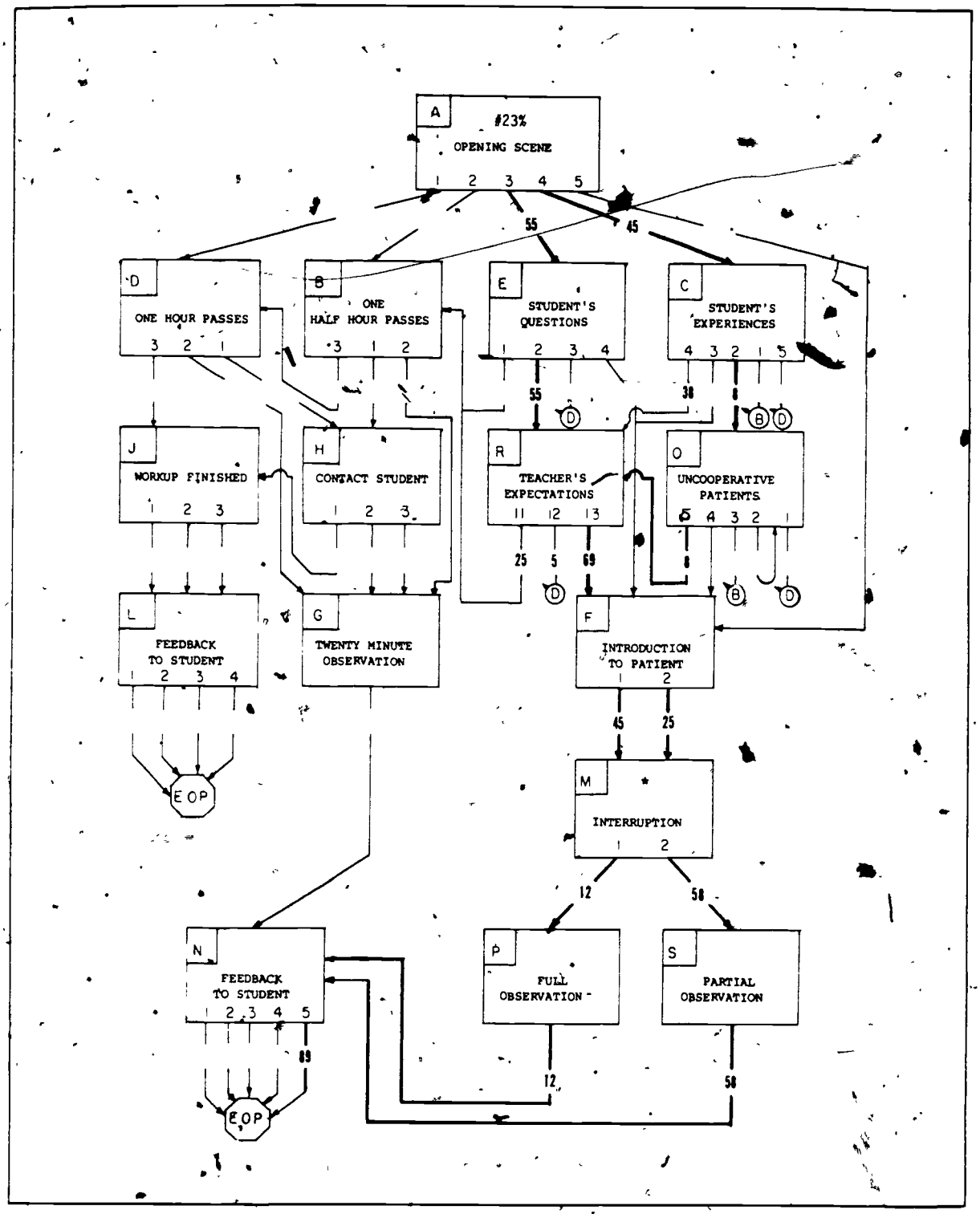


FIGURE 2: "PARTIAL OPTIMAL*" ROUTE FOR CLINICAL SUPERVISION SIMULATION

*The choices in Sections F and M are not included in the statistics calculated for the "Partial Optimal" Route, as explained further in the text.

those of former teachers. Twenty-three percent (#23%) of faculty members select one of the optimal routings that leads to the conveying of their expectations.

After explaining their expectations, instructors should choose to observe the entire workup (R 13) to be able to gather first-hand information on all aspects of the student's performance. Direct observation is important because a student may not be aware of his/her own difficulties and, consequently, will be unable to report to the instructor that the problem exists. For example, a student whose belligerance has antagonized a patient may report the patient as antagonistic, but is unlikely to recognize his/her own contribution to the situation. Apparently, most faculty members agree with this principle; through various routes (R 13, E4, C3, A5) #64% of clinical faculty undertake to sit in on the entire workup (Figure 3) although only #23% get there by one of the recommended routes.

Before the student begins interviewing the patient, two problems are introduced. First, the respondent is asked to decide if s/he will handle the introductions or wait and see what (and how) the student does. The recommended approach is that the teacher wait, as this provides a valuable instructional/supervisory opportunity. Whatever the student does, or does not do, can later be used for reinforcement or constructive critique. The second problem is an emergency call for the instructor. The delay is expected to last less than 10 minutes. It is recommended that the start of the workup be delayed so that the instructor will not miss the opening parts of the student-patient exchange, which are often crucial in determining the quality of much that follows. Of the #23% of faculty who take a recommended route to Section R, 69% (#16%) undertake to do a full observation. However, only 25% (#6%) have the student manage the introductions (F2), and only 12% (#3%) delay the workup while they respond to the emergency call (M1).[48]

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[48]The choices at F2 and M1 were not included in the calculations of the proportions of faculty pursuing the "optimal route"--hence the designation "partial optimal." So few faculty selected the combination of both these preferred choices (less than #1%) that the findings on the other choices in this route would not have been meaningful.

The final step in the optimal route is the provision of feedback to the student. While nearly everyone (#86%) selects the recommended choice, N4 (Figure 3), only #16% (69% of those who pursue the "partial optimal" route in Figure 2) arrive at that option on the basis of the appropriate background steps.

## CONCLUSIONS

The supervision of medical students in the clinical setting involves a substantial proportion of faculty effort; indeed, it may be the most expensive component of the teaching program in medical schools. It is the dominant instructional method for at least half of most programs and is conducted on a 1-to-1 or very small group basis. The findings of this survey suggest that there is considerable room for improvement in the way clinical supervision is done.

### A. The Primary Areas of Concern

1. A fair number of clinical teachers (#40%) do not have a discussion with a new student before the patient workup begins.

2. More than three quarters of clinical teachers (#76%) do not convey their expectations for the instructional experience to the student.

3. Few teachers seem to exercise discrimination in setting expectations.

4. From items (2) and (3) above it may be reasonable to infer that most clinical teaching is conducted spontaneously, without much, if any, planning prior to the student's involvement in clinical tasks or the instructor's review of the student's work.

5. Less than half (41%) of those faced with a choice of who manages the introductions with a new patient permit the student to do it (#26%). This suggests that many clinical faculty are not extracting the full instructional potential from the supervisory situation.

6. Less than one-third (31%) of those faced with an interruption ask the student to delay the start of the

workup (#19%). It would seem that many clinical faculty do not fully appreciate the importance of the first few minutes of a clinical encounter in setting the stage for much of what follows.

B. Encouraging Findings

1. Most clinical faculty (#64%) when serving as a supervisor, seem to understand the importance of direct observation of student performance.

2. Most clinical faculty (#58%) have sufficient interest in improving their skills as supervisors to want written material on the subject.

3. A reasonable number of clinical faculty (#22%) have a fairly high interest in improving their supervisory skills, as indicated by their stated readiness to attend a workshop on the subject.

TABLE 15

EXPECTATIONS

TOTAL POPULATION

| DESCRIPTION OF OPTIONS | | SECTION R |
|---|---|---|
| 1 Question Asking | A. Include | 23 |
| | B. Not Include | 1 |
| 2 "Chief Complaint" & Present Illness | A. Include | 23 |
| | B. Not Include | 1 |
| 3 Review of Systems | A. Include | 22 |
| | B. Not Include | 2 |
| 4 Social & Family History | A. Include | 22 |
| | B. Not Include | 1 |
| 5 Mental Status Exam | A. Include | 19 |
| | B. Not Include | 4 |
| 6 Palpation | A. Include | 21 |
| | B. Not Include | 2 |
| 7 Auscultation | A. Include | 21 |
| | B. Not Include | 2 |
| 8 Eliciting Reflexes | A. Include | 20 |
| | B. Not Include | 3 |
| 9 Giving Instructions | A. Include | 20 |
| | B. Not Include | 3 |
| 10 Diagnostic Formulation | A. Include | 21 |
| | B. Not Include | 2 |

TABLE 16

COMPONENTS OF WORKUP OBSERVED

| TOTAL POPULATION | SECTIONS | | |
|---|---|---|---|
| DESCRIPTION OF OPTIONS | G | P | S |
| 1 Question Asking | 31 | 19 | 45 |
| 2 "Chief Complaint" & Present Illness | 14 | 19 | 40 |
| 3 Review of Systems | 11 | 19 | 41 |
| 4 Social & Family History | 12 | 19 | 41 |
| 5 Mental Status Exam | 20 | 18 | 41 |
| 6 Palpation | 27 | 19 | 42 |
| 7 Auscultation | 26 | 19 | 41 |
| 8 Eliciting Reflexes | 26 | 18 | 40 |
| 9 Giving Instructions | 27 | 18 | 40 |
| 10 Diagnostic Formulation | 24 | 17 | 38 |

TABLE 17

Standard Errors for the "Clinical Supervision" Simulation

| OPTION | STANDARD ERROR | OPTION | STANDARD ERROR |
|---|---|---|---|
| A1 | 1 | O1 | 0 |
| A2 | 2 | O2 | 0 |
| A3 | 3 | O3 | 0 |
| A4 | 3 | O4 | 1 |
| A5 | 2 | O5 | 1 |
| B1 | 1 | P1 | 2 |
| B2 | 1 | P2 | 2 |
| B3 | 2 | P3 | 2 |
| C1 | 0 | P4 | 2 |
| C2 | 2 | P5 | 2 |
| C3 | 1 | P6 | 2 |
| C4 | 2 | P7 | 2 |
| C5 | 1 | P8 | 2 |
| D1 | 2 | P9 | 2 |
| D2 | 1 | P10 | 2 |
| D3 | 1 | R1A | 3 |
| E1 | 2 | R1B | 0 |
| E2 | 2 | R2A | 3 |
| E3 | 1 | R2B | 1 |
| E4 | 2 | R3A | 3 |
| F1 | 3 | R3B | 1 |
| F2 | 3 | R4A | 3 |
| G1 | 3 | R4B | 1 |
| G2 | 2 | R5A | 2 |
| G3 | 2 | R5B | 1 |
| G4 | 2 | R6A | 3 |
| G5 | 2 | R6B | 1 |
| G6 | 2 | R7A | 3 |
| G7 | 2 | R7B | 1 |
| G8 | 2 | R8A | 2 |
| G9 | 2 | R8B | 1 |
| G10 | 2 | R9A | 3 |
| H1 | 1 | R9B | 1 |
| H2 | 2 | R10A | 3 |
| H3 | 1 | R10B | 1 |
| J1 | 1 | R11 | 2 |
| J2 | 0 | F12 | 1 |
| J3 | 0 | R13 | 3 |
| L1 | 1 | S1 | 3 |
| L2 | 0 | S2 | 3 |
| L3 | 1 | S3 | 3 |
| L4 | 0 | S4 | 3 |
| M1 | 2 | S5 | 3 |
| M2 | 3 | S6 | 3 |
| N1 | 1 | S7 | 3 |
| N2 | 1 | S8 | 3 |
| N3 | 1 | S9 | 3 |
| N4 | 2 | S10 | 3 |
| N5 | 2 | | |

## IV. RESEARCH SUPERVISION

### INTRODUCTION

The supervision of individuals or small groups of students in a laboratory setting or in a research project is an educational task engaged in, at least occasionally, by #56%[49] of medical school faculty. In addition, #65% feel that they are apt to find themselves in a situation like the one described in the simulation. Only #9% of the faculty, however, have attended a workshop or training session on the subject. Of that group 83% consider those experiences to have been valuable for their teaching.

The survey findings also indicate that #58% of all faculty would like to receive printed information to assist them in improving their supervision of students and that #22% would attend a workshop addressing this topic.

The above findings demonstrate that many faculty have little formal preparation for the particular teaching responsibilities they have been asked to assume. It also seems clear that many of them are open to receiving assistance in improving their effectiveness in this area. The following analysis of this simulation will suggest areas in the supervision of individual students where such assistance to faculty would be helpful.

### KEY FEATURES OF THE SIMULATION

The primary purposes of this simulation are to examine how medical faculty members:

A. perceive the process of instruction (e.g., the importance of communicating expectations, the value of determining a student's background, the need to establish a relationship),

B. view their responsibilities as a supervisor (e.g., how available to be, whether to monitor a student's progress),

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[49] For a discussion of the percentage symbols in this report, see Chapter 1, pages 9 - 10.

C. relate to a student (especially one experiencing difficulty) as a supervisor in an independent study situation (e.g., supportive, detached).

The situation is defined by the opening scene:

> Your medical school has instituted a series of required Research Preceptorships to provide medical students with a supervised opportunity to become familiar with scientific research. Each student is assigned to a faculty member who will supervise his or her work.
>
> Jim is one of three students you will supervise this term. He was assigned to you because you are currently conducting research on the problem he selected. While you do not know Jim, you are told by one of your colleagues that he is "something of a dud."
>
> Jim has recently completed a brief course entitled "Introduction to Research and the Scientific Method" and has been told that good research begins with a review of the pertinent literature. When Jim comes to his first meeting you provide him with a current article to help him begin his literature search. Within two weeks he is to prepare an annotated bibliography for your review. Your tasks are to evaluate Jim's bibliography, to give him feedback, and to arrange whatever follow-up instruction is appropriate before he begins his actual research work with you.
>
> **You would now (CHOOSE ONLY ONE)**
>
> A1 Encourage Jim to begin and to contact you if he has any problems. Otherwise you will see him in two weeks.
>
> A2 Encourage Jim to begin and arrange to meet with him after one week to review his progress.
>
> A3 Discuss with Jim your expectations for his work on this assignment.
>
> A4 Ask Jim to discuss his background in interpreting and conducting research.
>
> A5 Ask Jim if he has any questions before beginning.

The following are the key features of the situation that faces the respondent:

1. The faculty member does not know the student and has only minimum information regarding his background.

2. This is a required course in which students are assigned to faculty.

3. There is a need to supervise the student and to evaluate his work and his readiness for the research phase of the course.

MOST COMMON ROUTES (See Figure 5)

This section will discuss how faculty members manage this instructional problem, by identifying the most frequent sequence of decisions associated with the three major options presented in the opening scene. There is a

fourth option (A5) which is to ask Jim if he has any questions before beginning. While #21% choose this option, 85% of these respondents (#18%) then proceed to sections that parallel A2, A3, or A4. Since this represents only a slight diversion from selecting A2, A3, or A4 directly, this #18% is included in the three routes described below. The three main options are:

A2. Encourage Jim to begin and arrange to meet with him after one week to review his progress.

A3. Discuss with Jim your expectations for his work on this assignment.

A4. Ask Jim to discuss his background in interpreting and conducting research.

A. Determining the Student's Background/Establishing a Relationship

The determination of a student's readiness for learning a new skill or course content is a necessary prerequisite for quality instruction. Often, however, a student's background and readiness for a particular instructional activity are assumed; the faculty member makes an intuitive judgment about the skill or knowledge level of the class and proceeds from that point. This approach is undesirable because student backgrounds are often highly variable: some students, like the one described in this simulation, are minimally prepared to begin instruction, while others may have already mastered most or all of what is expected. In this problem, the respondent has no prior knowledge of the student's ability to operate in an independent learning context, and a discussion of background and readiness is needed.

In this simulation, only #44% of the faculty discuss the student's background with him at any point and even fewer (#28%) secure this information in time to make appropriate plans. There are six separate opportunities to engage the student in such a discussion, three of which are before the student begins having difficulties. Thirty-seven percent of those who do discuss the student's background (#16%) make this decision right from the opening scene, 20% (#9%) after discussing expectations for the assignment, and 5% (#3%) following a general

discussion of the student's questions. In all, 63% (#28%) of the faculty gain an early insight into the student's background and are thereby in a position to anticipate and respond to particular problems. In contrast, however, 37% (#16%) discuss the student's background only after the student is already experiencing difficulties, and #56% never begin such a discussion. That is, #72% of the total faculty do not attend to this basic instructional consideration prior to having the student begin his assignment.

Those who decide to discuss the student's background are also asked to indicate what aspects of the student's prior experiences are relevant to this assignment. The findings are summarized in Table 18. While 87% (#38%) and 84% (#37%) are interested in his reasons for selecting the research topic or his expectations for the course, only 50% (#22%) inquire into his ability to interpret technical information--the basic skill required for

TABLE 18

Student's Background

| Background Information | Percent Selecting Each Option |
|---|---|
| His opinion of research in general. | 64% (#28) |
| His prior experience reading scientific articles and reports. | 74% (#33) |
| His ability to interpret technical information. | 50% (#22) |
| His reasons for selecting this particular research topic. | 87% (#38) |
| His expectations for this course. | 84% (#37) |

preparing an annotated bibliography on the research topic. Thus, #78% of the faculty ask the student to proceed without any knowledge of his ability to conduct the required literature search.

B. Expectations for Student Performance

It is likely that a full-time faculty member's views about, and commitment to basic research is different from that of an undergraduate medical student, especially in a required course. It is important, therefore, for instructor and student to discuss their views ~~of the natufe and~~ purpose of this research assignment before beginning so that both are clear about what is expected. The time spent clarifying expectations and resolving differences will help avoid subsequent misunderstandings and enhance the quality of the teaching-learning process.

Recognition of the need to discuss expectations is central in the process of providing supervision and feedback. The independent study approach is not intended to be an unstructured experience for either the student or the faculty member. If a faculty member is to be helpful, there must be an explicit understanding of the learning objectives and a plan for assessing student progress during and at the end of the course. Unless the faculty member is prepared to be both available and involved with a student on this basis, it is likely that the amount of constructive feedback provided will be insufficient.

In contrast to only #44% of the faculty who discuss the student's background and readiness for instruction, #81% discuss their expectations for the assignment, although not all do so before the student runs into difficulty. Forty-two percent (#34%) review expectations immediately in the opening scene. Another 17% (#14%) discuss the student's background first, and 7% (#6%) voice their expectations after first addressing any questions the student might have. Thus, 66% (#53%) of the faculty who discuss expectations for the assignment do so prior to the student beginning his work. Thirty-four percent (#28%), however, wait until they learn that the student is having difficulties. If this #28% is combined with the the #19% who never present their expectations, we find that almost half the faculty (#47%) do not address this issue in a helpful manner.

Once the respondent decides to discuss his/her expectations for the course, s/he is asked to decide what,

specifically, will be expected of the student. Table 19 provides a summary of the percent of faculty selecting each of the eight options. While 93% (#75%) indicate they would discuss the relevance of this assignment to the research phase of the course, only 65% (#53%) are prepared to discuss how the student's work will be evaluated. Thus, #47% of the faculty, with the stated tasks of evaluating the student's bibliography and providing feedback, proceed without establishing a basis for that evaluation with the student.

TABLE 19

Expectations for the Annotated Bibliography

| Expectations | Percent Selecting Each Option |
|---|---|
| 1. The types of sources Jim should use. | 90% (#73) |
| 2. The format Jim should use in the annotations. | 56% (#45) |
| 3. The relevance of the literature search to his work on this project. | 93% (#75) |
| 4. The importance of identifying key controversial issues. | 78% (#63) |
| 5. The depth of research you expect to see reflected in the annotations. | 61% (#49) |
| 6. The standards you will use to evaluate his work. | 65% (#53) |
| 7. The number of citations he should include. | 20% (#16) |
| 8. The relevance of this assignment to his future as a physician. | 54% (#44) |

C. Monitoring the Student's Progress

Another decision that respondents are asked to make relates to whether they think it would be valuable to have a progress meeting with the student after one week. This issue is included to determine how faculty view their supervisory role in an independent study context. The

results indicate that while #91% decide to meet with the student to review his progress, there are major differences within the group. Sixty-six percent (#60%) believe the assignment should be discussed before the student begins his work. The remaining 34% (#31%) have their discussion with the student only after the student has begun his project. This latter group reflects a rather limited view of their responsibilities in the instructional process; while they are prepared to monitor the student's progress and to evaluate his work, they do not consider it necessary or appropriate to determine the student's readiness for the assignment or to share their expectations for the work they will evaluate.

The second difference among the #91% who arrange a progress meeting relates to the comprehensiveness of their discussions with the student. While 66% (#60%) meet with the student prior to his beginning the assignment, only 52% of that group (#47%) discuss their expectations for the course. Ten percent (#9%) simply ask Jim if he has any questions before beginning and 4% (#4%) inquire only about his background. However, almost half (#47%) discuss their expectations with the student prior to meeting with him to review his progress. These faculty have a valid basis for reviewing Jim's progress and evaluating the bibliography he prepares.

OPTIMAL ROUTE (See Figure 4)

The recommended routes through this simulation are shown by darkened lines in Figure 4. They are considered optimal because they meet three basic criteria of effective instruction. First, they recognize the existence of individual differences among students and the importance of determining a student's readiness for the educational experience. Second, they attend to the need to begin the instructional process with the clarification of expectations. And, third, they recognize the faculty's responsibility for providing effective feedback and supervision. Each of these aspects will be illustrated as the optimal routes are described.

Option A4 (discussing Jim's background in research) or A5 (asking for questions) are recommended as initial steps. Discussing expectations (A3) represents an effort to clarify objectives, but is premature as it is not based on information about Jim's background and readiness

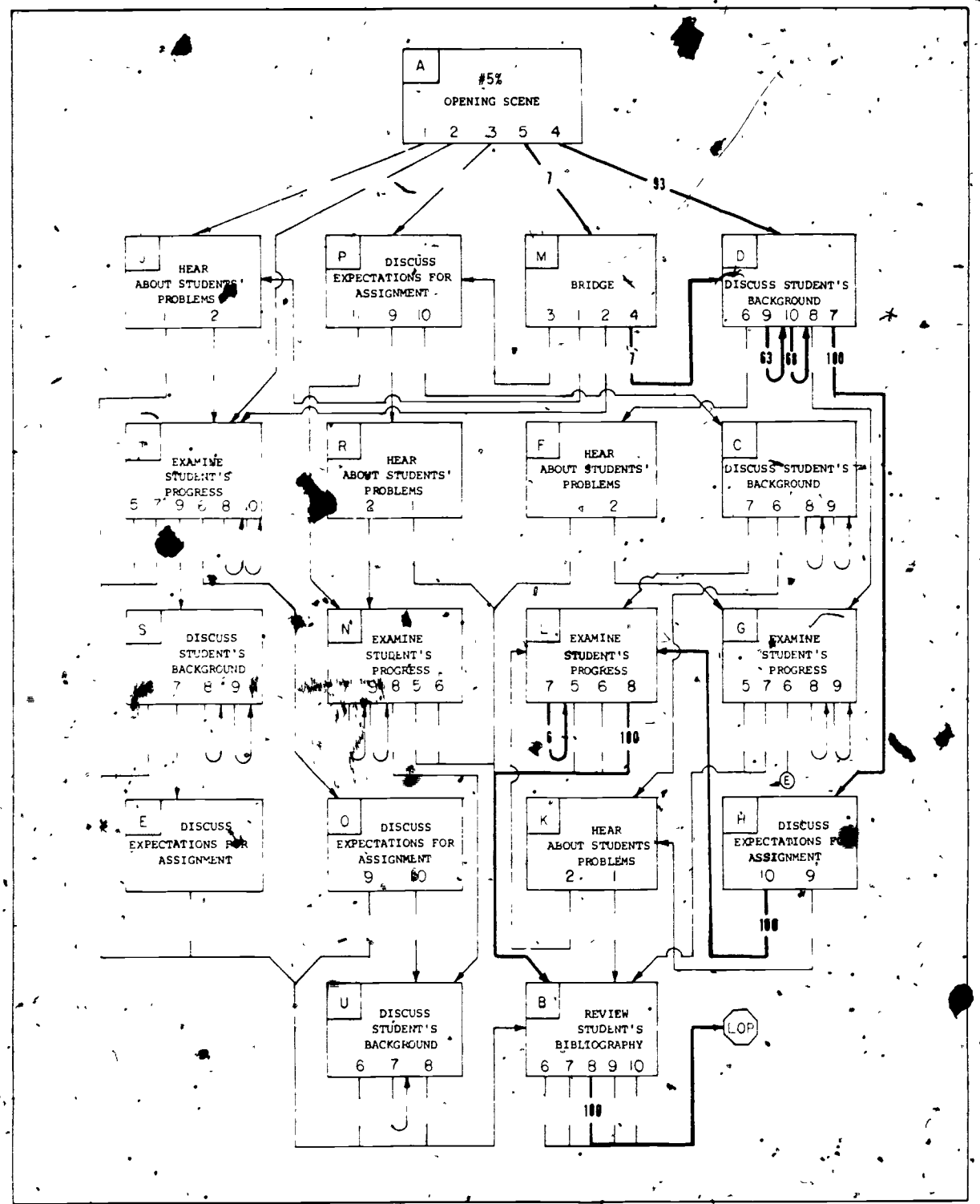


FIGURE 4 "OPTIMAL" ROUTE FOR RESEARCH SUPERVISION SIMULATION

to begin the assignment. Once the faculty member has become familiar with the student's experiences in the introductory course and his attitude toward research, by asking or inviting questions, s/he has some basic data that will facilitate a discussion of expectations. As in the preceding simulation, this is particularly important when a student has been described as "something of a dud." While an instructor should not accept this appraisal as necessarily true, s/he should, at least initially, be especially attentive to the student's background.

Asking the student to begin immediately (A1 or A2) is inappropriate since it disregards both the possibility that he may have particular needs and the premise that students and faculty should jointly establish an understanding of course objectives at the start of any instructional experience.

It is important, at this point, that an explicit statement of expectations (D7) be included before the student begins the assignment. Briefly describing the research being conducted (D9) and reviewing the major steps in conducting research (D10) only temporarily diverts the respondent from the need to make a decision on whether or not a discussion of expectations is warranted.

It is reasonable to anticipate that, despite an explicit statement of expectations, the student may encounter difficulties. It is important, therefore, to schedule a meeting with him to review his progress (H10). Simply reminding him of the deadline and meeting in two weeks does not provide any opportunity for feedback or the timely and constructive resolution of any problems that might occur.

The primary purposes of the meeting are to review the student's progress and to assist him in preparing for the actual research phase of the course. (See the simulation text for Section L, below.) Once the student reveals his difficulty getting time to work on the assignment (L2), it is helpful to explore in more detail the progress he has made (L1) and what approach he is using in the literature search (L3). It is not likely that he is ready to address the more specific issue of relating his reading to his research at this time (L4).

Once the nature of the student's difficulties are understood, the instructor must decide what positive steps can be taken to assist him and what responsibility s/he, as supervisor, should assume. The offer to extend the assignment period (L7) communicates a desire to be helpful, but suggests that the only issue is time. Option L8 is the recommended response because it not only communicates a desire to be of assistance, it includes the possibility of addressing issues other than lack of time. Option L5 confronts Jim with his level of progress, but implies an unwillingness to be of any assistance in resolving the problem. Option L6 fails to confront the issue at all.

**SECTION L**

Jim meets with you in your office armed with several books and photocopies of various articles. During your discussion with Jim, you would ask **(CHOOSE AS MANY AS ARE APPROPRIATE IN ANY ORDER)**:

L1 How many books and articles he has reviewed.

L2 If he has encountered any difficulties so far in his review

L3 How he goes about identifying materials to review

L4 What issues and concepts he feels will be useful as background for his work on this research project

**Based on what you have learned, you would now (CHOOSE ONLY ONE):**

L5 Tell Jim you feel he is making insufficient progress and remind him that this assignment is due in one week

L6 Remind Jim of the deadline for the completed annotated bibliography and confirm your schedule to meet in a week

L7 Ask Jim if he feels he will need more time to complete the assignment

L8 Ask Jim if there is any way you can be of assistance during the second week of this assignment

The final task is providing the student with feedback on his work and arranging for whatever follow-up instruction is appropriate. (See Section B, below.) The decision to recommend additional references for Jim to review and to offer to provide additional assistance (B8) is the recommended response. This decision reflects both a recognition that the student is not prepared at this point to begin the research phase, and a willingness to take specific steps in assisting him with additional preparation. Option B10 also provides him with feedback and indicates a willingness to be of assistance, but it does not include any plan for addressing his difficulties. B7 is strictly pejorative and fails to offer any suggestions for further instruction. Options B6 and B9 also

**SECTION B**

Two weeks after your initial meeting Jim comes to your office and presents a five-page annotated bibliography. You would now **(CHOOSE AS MANY AS ARE APPROPRIATE, IN ANY ORDER)**

B1 Review his citations for current and major sources

B2 Ask Jim if he feels prepared to begin the research phase of the preceptorship p

B3 Examine the way he analyzed key controversial issues in his annotations

B4 Ask Jim to summarize what he considers to be the major issues in the literature

B5 Ask Jim if there are any issues he wants to discuss based on his readings

**Based on the information you have collected, you would now (CHOOSE ONLY ONE)**

B6 Comment on the strengths and weaknesses you have noted and encourage Jim to continue his reading on the topic

B7 Tell Jim you are disappointed with his work and that he will have to delay his participation in your project until he has a better grasp of the issues

B8 Recommend some additional references for Jim's review and arrange to meet again to assist him in preparing for his work on this research project

B9 Advise Jim to continue reading in areas where he feels deficient

B10 Tell Jim he has not met your expectations and will have to delay his actual work on this project until you have had a chance to work with him on his deficiencies

fail to meet the objective of follow-up and place the burden for remedial work completely on a student who has already indicated that he is having difficulties.

## CONCLUSIONS

The supervision of an individual student is potentially the most helpful of teacher-student instructional encounters. The actual success of this teaching method, however, depends to a considerable extent on the faculty member's willingness to interact with the student directly and the faculty member's skills in doing so. While #65% of the faculty indicate they engage in such teacher-student relationships, their approach to the supervisory problem presented here suggests that many may not be achieving the full potential of this educational experience.

### A. The Primary Areas of Concern

1. Over half the faculty (#56%) do not engage the student in a discussion of his background and readiness for instruction. They therefore miss the opportunity to develop a relationship with the student and to individualize the instructional experience.

2. Faculty do not make their expectations for the student explicit. Almost half (#47%) either neglect discussing their expectations or do it only after the instruction has begun.

3. Faculty are equally remiss in stating in advance how they will evaluate the student's work. Almost half (#47%) do not discuss this with the student.

### B. Encouraging Findings

1. Faculty do choose to monitor the student's progress. The majority (#91%) include this step in their approach.

2. Faculty express a willingness to be helpful to a student experiencing difficulties. After they review his final work, #61% offer to provide further assistance.

3. Almost one-fourth (#22%) are interested in attending a workshop designed to assist them in improving their supervisory skills.



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TABLE 20

EXPECTATIONS FOR ASSIGNMENT

| TOTAL POPULATION | | SECTIONS | | | | TOTAL |
|---|---|---|---|---|---|---|
| DESCRIPTION OF OPTIONS | | E | H | O | P | |
| 1 Types of sources | A. Include | 6 | 18 | 18 | 37 | 74 |
| | B. Not Include | 1 | 1 | 1 | 2 | 5 |
| 2 Format | A. Include | 3 | 9 | 10 | 23 | 45 |
| | B. Not Include | 3 | 4 | 7 | 16 | 30 |
| 3 Relevance of literature search to research project | A. Include | 7 | 13 | 19 | 38 | 77 |
| | B. Not Include | 0 | 1 | 0 | 2 | 3 |
| 4 Importance of controversial issues | A. Include | 5 | 12 | 17 | 30 | 64 |
| | B. Not Include | 1 | 2 | 2 | 9 | 14 |
| 5 Depth of research | A. Include | 3 | 9 | 11 | 27 | 50 |
| | B. Not Include | 3 | 5 | 7 | 12 | 27 |
| 6 Evaluation standards | A. Include | 5 | 10 | 12 | 26 | 53 |
| | B. Not Include | 1 | 4 | 6 | 13 | 24 |
| 7 Number of citations | A. Include | 1 | 4 | 3 | 8 | 16 |
| | B. Not Include | 5 | 9 | 14 | 20 | 58 |
| 8 Relevance of assignment to role of physician | A. Include | 4 | 11 | 9 | 19 | 43 |
| | B. Not Include | 2 | 2 | 5 | 18 | 31 |

TABLE 21

DISCUSS STUDENT'S RESEARCH BACKGROUND

| TOTAL POPULATION<br>DESCRIPTION OF OPTIONS | SECTIONS C | D | S | U | TOTAL |
|---|---|---|---|---|---|
| 1 Opinion of research | 7 | 12 | 3 | 7 | 29 |
| 2 Prior experience reading scientific articles | 7 | 13 | 5 | 9 | 34 |
| 3 Ability to interpret technical information | 5 | 10 | 2 | 6 | 23 |
| 4 Reasons for selecting topic | 9 | 17 | 4 | 10 | 40 |
| 5 Expectations for this course | 9 | 16 | 4 | 10 | 39 |

TABLE 22

PROGRESS MEETING

| TOTAL POPULATION<br>DESCRIPTION OF OPTIONS | SECTIONS G | L | N | T | TOTAL |
|---|---|---|---|---|---|
| 1 Number of books and articles reviewed | 2 | 11 | 12 | 14 | 39 |
| 2 Difficulties experienced | 3 | 20 | 24 | 28 | 75 |
| 3 Method for identifying what to review | 4 | 18 | 18 | 23 | 63 |
| 4 Issues and concepts relevant to project | 4 | 19 | 19 | 26 | 68 |

TABLE 23

REVIEW STUDENT'S BIBLIOGRAPHY

TOTAL POPULATION

| DESCRIPTION OF OPTIONS | SECTION B* |
|---|---|
| 1 Review quality of citations | 75 |
| 2 Discuss readiness for research phase | 55 |
| 3 Examine analysis of key issues | 68 |
| 4 Request summary of major issues | 88 |
| 5 Ask for questions from student | 69 |

TABLE 24

Standard Errors for "Research Supervision" Simulation

| OPTION | STANDARD ERROR | OPTION | STANDARD ERROR | OPTION | STANDARD ERROR |
|---|---|---|---|---|---|
| A1 | 1 | G6 | 1 | 06A | 1 |
| A2 | 2 | G7 | 0 | 06B | 1 |
| A3 | 2 | G8 | 0 | 07A | 1 |
| A4 | 2 | G9 | 1 | 07B | 2 |
| A5 | 2 | H1A | 2 | 08A | 1 |
| B1 | 2 | H1B | 0 | 08B | 1 |
| B2 | 2 | H2A | 1 | 09 | 2 |
| B3 | 2 | H2B | 1 | 010 | 1 |
| B4 | 1 | H3A | 2 | P1A | 2 |
| B5 | 2 | H3B | 0 | P1B | 1 |
| B6 | 2 | H4A | 1 | P2A | 2 |
| B7 | 1 | H4B | 1 | P2B | 1 |
| B8 | 2 | H5A | 1 | P3A | 2 |
| B9 | 1 | H5B | 1 | P3B | 1 |
| B10 | 2 | H6A | 1 | P4A | 2 |
| C1 | 1 | H6B | 1 | P4B | 1 |
| C2 | 1 | H7A | 1 | P5A | 2 |
| C3 | 1 | H7B | 1 | P5B | 1 |
| C4 | 1 | H8A | 1 | P6A | 2 |
| C5 | 1 | H8B | 1 | P6B | 1 |
| C6 | 0 | H9 | 0 | P7A | 1 |
| C7 | 1 | H10 | 2 | P7B | 2 |
| C8 | 1 | J1 | 1 | P8A | 2 |
| C9 | 1 | J2 | 1 | P8B | 2 |
| D1 | 1 | K1 | 0 | P9 | 1 |
| D2 | 2 | K2 | 0 | P10 | 1 |
| D3 | 1 | L1 | 1 | P11 | 2 |
| D4 | 2 | L2 | 2 | R1 | 1 |
| D5 | 2 | L3 | 2 | R2 | 1 |
| D6 | 0 | L4 | 2 | S1 | 1 |
| D7 | 2 | L5 | 1 | S2 | 1 |
| D8 | 1 | L6 | 1 | S3 | 1 |
| D9 | 1 | L7 | 1 | S4 | 1 |
| D10 | 1 | L8 | 2 | S5 | 1 |
| E1A | 1 | M1 | 1 | S6 | 0 |
| E1B | 0 | M2 | 1 | S7 | 1 |
| E2A | 1 | M3 | 1 | S8 | 0 |
| E2B | 1 | M4 | 1 | S9 | 1 |
| E3A | 1 | N1 | 1 | T1 | 2 |
| E3B | 0 | N2 | 2 | T2 | 2 |
| E4A | 1 | N3 | 2 | T3 | 3 |
| E4B | 0 | N4 | 2 | T4 | 2 |
| E5A | 1 | N5 | 1 | T5 | 1 |
| E5B | 1 | N6 | 2 | T6 | 2 |
| E6A | 1 | N7 | 1 | T7 | 1 |
| E6B | 0 | N8 | 1 | T8 | 1 |
| E7A | 0 | N9 | 2 | T9 | 1 |
| E7B | 1 | O1A | 2 | T10 | 2 |
| E8A | 1 | O1B | 0 | U1 | 1 |
| E8B | 1 | O2A | 1 | U2 | 1 |
| F1 | 0 | O2B | 1 | U3 | 1 |
| F2 | 1 | O3A | 2 | U4 | 1 |
| G1 | 1 | O3B | 0 | U5 | 1 |
| G2 | 1 | O4A | 2 | U6 | 0 |
| G3 | 1 | O4B | 1 | U7 | 1 |
| G4 | 1 | O5A | 1 | U8 | 1 |
| G5 | 1 | O5B | 1 | | |

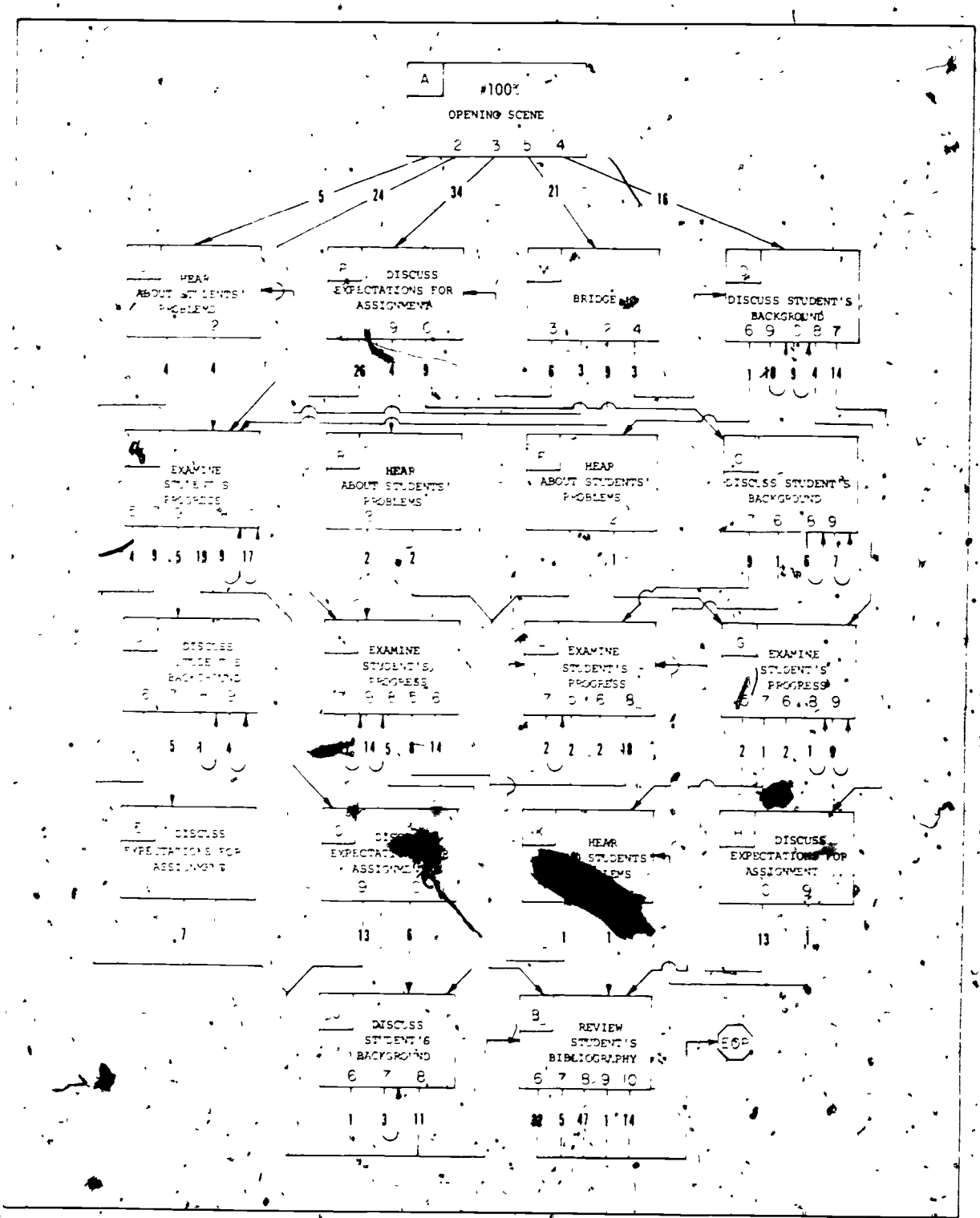


FIGURE 5 TOTAL POPULATION RESULTS FOR "RESEARCH SUPERVISION" SIMULATION (Numbers are estimated percentages of the population selecting the option indicated.)

# V. SMALL GROUP DISCUSSION

## INTRODUCTION

The survey results indicate that #65%[54] of all faculty use the small group discussion method on a frequent basis and that #61% would find themselves, in their teaching, in a situation like the one in the simulation. Only #23% indicate that they have ever attended a workshop or training session on small group teaching. Ninety-one percent ( 91%) of these individuals consider such preparation to have been valuable and helpful in their teaching. Virtually a third of current faculty members (#32%) indicate that they would be interested in attending a workshop directed at improving their small group teaching skills.

Apparently, while faculty members use the small group discussion method frequently, most have not had any specific preparation for use of this technique. The following discussion will analyze how medical faculty manage a particular problem in small group teaching, in an effort to determine what preparation might be needed.

## KEY FEATURES OF THE SIMULATION

This simulation is designed to determine how faculty members:

A. approach a problem in small group instruction (e.g., what information they gather and in what order),

B. view their roles as instructors in the small group setting (e.g., content experts, resources, group facilitators),

C. regard the relationship between group process and learning (e.g., stages of group development, the importance of peer interaction).

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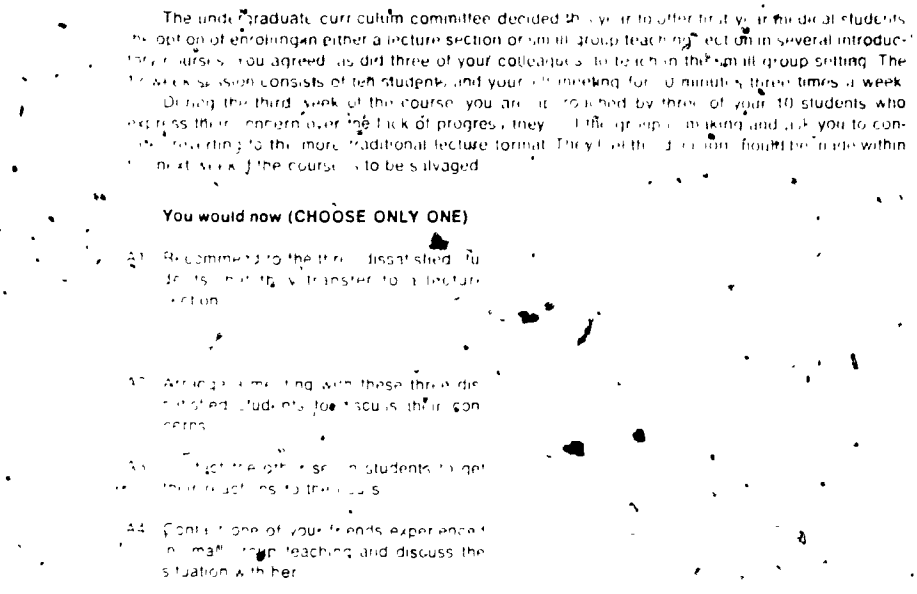
[54] For a discussion of the percentage symbols in this report, see Chapter I, pages 9 - 10.

The opening scene defines the problem situation:



The undergraduate curriculum committee decided this year to offer first year medical students the option of enrolling in either a lecture section or small group teaching section in several introductory courses. You agreed, as did three of your colleagues, to teach in the small group setting. The two-hour session consists of ten students, and your group is meeting for 50 minutes three times a week.

During the third week of the course you are approached by three of your 10 students who express their concern over the lack of progress they feel the group is making and ask you to consider switching to the more traditional lecture format. They feel the transition should be made within the next week of the course if it is to be salvaged.

**You would now (CHOOSE ONLY ONE)**

A1. Recommend to the three dissatisfied students that they transfer to a lecture section.

A2. Arrange a meeting with these three dissatisfied students to discuss their concerns.

A3. Suggest that the other seven students begin expressing their reactions to the process.

A4. Consult one of your friends experienced in small group teaching and discuss the situation with her.

The important elements of this instructional problem are:

1. These students are in their first year. Because of this they are likely to experience some anxiety, regardless of the instructional format. Their high level of motivation and the competitive nature of their premedical experience contribute to their concern about "measuring up" to other students and meeting the expectations of the faculty. Small group teaching tends to magnify this concern; while students can remain anonymous in lectures (and therefore less prone to "exposure"), their participation in small groups makes them vulnerable to evaluative judgments by both faculty members and peers.

2. Only three of the students expressed concern. Regardless of the instructional setting, a faculty member should be careful neither to generalize to the group indiscriminately from individual students' feedback, nor to disregard minority opinion. In small group teaching, these cautions are especially important because each student represents a potentially valuable resource to the group; if anyone is experiencing difficulties with this approach, the entire group can be affected. It is

recommended, therefore, that the experiences of the three dissatisfied students not be viewed as an isolated situation, but that the perceptions of the other seven students also be sought in an effort to work toward a solution to the problem involving the entire group.

3. The class is in the third week of a twelve week course. The perception of the three students is that the class is moving too slowly. This is a common reaction from students who are accustomed to a more structured and passive approach to learning. It must be realized, however, that small group teaching usually requires more time and greater student involvement than the lecture method before students realize a sense of accomplishment. It is important, therefore, that the faculty member encourage the students to be patient while working through these initial problems.

The various sections of the simulation provide the respondent with information from three different sources at various levels of detail. The instructor can speak initially, for instance, with the three students experiencing difficulties to learn what these students consider to be problems with the course. S/he can then pursue the discussion further, in an effort to determine why the three students are experiencing such difficulties. The respondent also has an opportunity to meet with the other seven members of the class, to obtain their reactions to the course and, similarly, to continue that discussion for background on why they are not dissatisfied.

The third available source of information is faculty colleagues. Directly after the problem is presented, respondents have the opportunity to discuss the situation informally with a friend experienced in small group teaching. At several other points in the simulation, faculty colleagues currently teaching in small groups are available for specific advice on various options for addressing the problem.

Regardless of what information sources respondents use, in whatever order, they then choose among five options for solving the problem. These are:

1. Recommend that the three dissatisfied students stick it out and offer to assist them with those areas of the course material in which they feel deficient.

2. Recommend that the three dissatisfied students transfer to a lecture section and offer to assist them with the process.

3. Reassure the three dissatisfied students that they are simply experiencing normal anxieties for first-year medical students and recommend that they stick it out.

4. Devote a class session to discussing the issues with the entire group.[55]

5. Modify the current format to provide more didactic presentations as part of the sessions.[55]

The findings for this simulation are reported in two ways. First, we will look at what information faculty gather, without regard for the order in which it is collected (e.g., what percentage of the faculty ask their colleagues for advice at any point in the simulation?). Second, the order in which faculty collect information is examined to understand better the common approaches used in solving the problem (e.g., which students are approached first, and does this decision affect the way the problem is resolved?).

MOST COMMON ROUTES (See Figure 7)

A. Information Collection

At the outset #86% of faculty have at least an initial meeting with the three dissatisfied students to hear their concerns about the course. While this proportion is undoubtedly large, it should be recognized that the remaining #14% (a sizable number) make a final decision without any knowledge of the particular problems these students are experiencing.

Further, only #68% of the faculty discuss the problem with the other seven students in the class. This means that #32% of the faculty make a final decision without ever knowing whether the other seven students are

[55]These options are available only once during the simulation. The others are repeated, permitting respondents to pursue these decisions in any order they choose.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experiencing difficulties similar to those expressed by the three that complain. Perhaps some respondents assumed that if someone is experiencing difficulties s/he will complain or that the three students were speaking for the entire class.

The next most common source of information involves both the initial discussion with the three students and a continuation of this discussion in pursuit of factors that might help explain the problems. Forty-eight percent (#48%) of the faculty collect at least this much information. In contrast, however, this also implies that #52% of the faculty make their decisions without collecting data on why these students are experiencing difficulties.

The opportunity to speak with colleagues who teach in small groups is available at several points in the simulation. Seventeen percent (#17%) choose to solicit advice from their peers, while #83% do not. This appears inconsistent with the view expressed in a different part of the survey by #42% who indicate that they frequently contact their colleagues for assistance or advice on instructional issues and problems.[56]

Respondents who meet with the other seven students learn they are aware of their classmates' problems but that they themselves are satisfied. Faculty then have several opportunities to search for reasons explaining why this group is satisfied with the course. Only #15% of the faculty make an attempt to gain such explanation. Thus, while #68% of the faculty discover the extent of dissatisfaction in the class, less than a fourth of these faculty pursue the source of the problem. In total, #85% of the faculty make a final decision without collecting information about how and why the seven satisfied students differ from their classmates.

The least frequent approach to collecting information is to pursue all five opportunities (i.e., initial and detailed discussions with both groups of students plus advice from colleagues) for understanding the problem. Only #7% of the faculty collect the maximum amount of information prior to making one of the five decisions.

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[56]See Chapter II, p. 32. This apparent discrepancy is conceivably explained by the possibility that the respondents to the simulation did not regard the situation as a problem.

One possible explanation is that faculty rely heavily on their prior experience as teachers and their own intuition in managing such problems. This interpretation is supported by the finding that #62% of faculty indicate that their own intuition and judgment contributes strongly to the way they teach.[57]

Faculty appear more interested in knowing that the other seven students are not experiencing difficulties than in understanding why. Their approach is thus one of isolating the problem to the three students and making a decision on an issue considered to be relevant only to this sub-group. Additional support for this analysis will be presented when specific routes are discussed below.

B. Sequence of Information Collection

In this simulation there are five final recommendations available for concluding the problem presented in the opening scene. Since a respondent could select only one of these conclusions it is possible to trace the particular sequence of information collection leading to each decision. While the design of this simulation provided the opportunity to make certain decisions at multiple points in the process (e.g., there are fourteen points at which transfer could be recommended), only the most frequent routes, representing at least #5%, will be discussed. Table 25 provides a summary of all routes and the amount of information collected prior to each of the five decisions.

1. Offer Special Assistance

The most common solution is the decision to "recommend that the three dissatisfied students stick it out and offer to assist them with those areas of course material in which they feel deficient." Forty-eight percent (#48%) of the faculty make this choice. The most common routes followed in making this decision are:

41% of the faculty that make this decision (#20%) do so after meeting with both groups for an initial discussion of the problem. Twenty-six percent (#12%) meet first with the seven students to determine whether thay are also experiencing difficulties and then with the three

[57] First Preliminary Report, p. 90.

TABLE 25

Summary of Amount of Information Collected
Relative to Each Decision in Small Group Discussion

| Sources of Information | Decision | | | | |
|---|---|---|---|---|---|
| | Provide Special Assistance (#48%) | Transfer To Lecture (#28%) | Normal Anxieties (#13%) | Devote Class Session (#9%) | Modify Format (#2%) |
| No additional information | | 9 | | | |
| Informal discussion with a friend | | 3 | | | |
| Initial discussion with the three dissatisfied students | | 15 | 46 | | |
| Initial discussion with the other seven students | | 18 | 50 | | |
| Initial discussion with both groups of students | 41 | 21 | | | |
| Initial and detailed discussion with the three students | 31 | 3 | | | |
| Initial and detailed discussion with the seven students | 1 | | | | |
| Initial and detailed discussion with the three students plus a faculty consult | 4 | 3 | 1 | | |
| Initial and detailed discussion with the seven students plus a faculty consult | | | | 1 | |
| Initial and detailed discussion with the three students plus an initial meeting with the other seven students | 10 | 11 | | | |
| Initial and detailed meeting with the seven students plus an initial meeting with the three students | | 1 | | | |
| Initial and detailed discussion with the three students plus an initial meeting with the seven students and a faculty consult | 7 | 13 | 1 | 39 | 41 |
| Initial and detailed discussion with the seven students plus an initial meeting with the three students and a faculty consult | | | 1 | 1 | |
| Initial and detailed discussion with both groups of students | 1 | 1 | | 15 | 25 |
| Initial and detailed discussion with both groups of students plus a faculty consult | 5 | 1 | | 44 | 34 |

students to learn the nature of their problems, while 15% (#7%) reverse this process. Apparently, the sequence does make some difference. Those who speak with the seven students first are more prone to end the problem without exploring further why either group is or is not having difficulty learning in this setting.

31% (#15%) make their decision on the basis of initial and follow-up talks with the three complaining students, but without interactions with the other seven students. These faculty deal with the three students in isolation from their classmates. They apparently rule out the possibility that others might also be having difficulties or might be an important factor in reaching a solution.

10% (#5%) go one step further and include an initial meeting with the other seven students along with an initial and detailed discussion with the three students. These faculty are more thorough than the respondents described above, but even though they know that the course is currently causing problems for only a minority of students, they cannot discern why there is this discrepancy in the students' experiences. They seem to assume that since the seven students are not dissatisfied they need not be involved in a decision regarding this issue.

2. Transfer to Lecture

The second most frequent decision is to "recommend that the three dissatisfied students transfer to a lecture section." Twenty-eight percent (#28%) of the population indicate that this would be their choice.

21% (#6%) make this judgment following an initial meeting with both groups to discuss the problem. As is true with the decision to offer special assistance (described above), faculty who meet first with the seven students and learn that they are not currently dissatisfied (15%) (#4%) are more likely to make a decision at this point than faculty who meet first with the three who express dissatisfaction (6%) (#2%). Once again, faculty who begin solving the problem by determining that the three are a minority appear to have less interest in these students than do those who address the problem directly.

18% (#5%) of the faculty recommend that the three transfer without even talking with them. By simply

talking with the other seven students and learning that they are not dissatisfied these instructors decide that the issue is unresolvable within the group. This is an even more extreme isolation of the problem than previously described.

Compared with the faculty who decide to provide special assistance, faculty recommending transfer collect less information bearing on the problem. Sixty-six percent (#18%), for example, make their decision without any information about why either group is or is not benefiting from this educational approach. While it can be argued that not all students will benefit equally from the same approach, it is, nevertheless, important that faculty demonstrate a willingness to work toward achieving a meaningful experience for each student.

3. Normal Anxieties

The next most common decision is to "reassure the three dissatisfied students that they are simply experiencing normal anxieties for first-year medical students and recommend that they stick it out." Thirteen percent (#13%) of the faculty select this approach.

50% (#6%) have only an initial meeting with the seven satisfied students prior to reaching this conclusion. A striking feature of this group is that they make this intuitive judgment without ever discussing the situation with the three dissatisfied students. The issue here is not whether the difficulty is normal anxiety or something else, it is rather a question of how faculty should relate to students who express such a concern. A recognition of and appreciation for the difficulties some students may initially experience in the small group setting is not evident in this response.

46% (#6%) have only an initial discussion with the three dissatisfied students prior to making this decision. While this group at least speaks to the students initially involved, they fail to pursue and verify their speculation that "normal anxiety" is the cause of the problem and that time alone will resolve the issue.

The problem presented in this simulation is common and it can be expected that some students will adjust more slowly and experience more anxieties than others. The criticism of those who select this route is that they rely almost totally on intuition and make

only a modest attempt to understand the problem. This approach is likely to communicate a lack of interest, whether such is the case or not. If, however, the students' problems are more complex, this approach could actually be harmful.

4. Devote Class Session

The next most frequent approach is to "devote a class session to discussing the issues with the entire group." Nine percent (#9%) of the faculty make this decision. This option, and the option of "modifying the current format," is only available at one point in the simulation, after faculty have collected some initial information.

Since there are no routes which represent the choices of at least #5% of the faculty, individual routes will not be presented. It should be noted, however, that fifty-nine percent of the faculty who make this decision (#5%), are the most thorough in collecting information relevant to the problem. They pursue the issue in detail with all ten students. They are able, therefore, to learn not only why the three students are dissatisfied but also why the other seven students are enjoying the initial weeks of the course. And, in making this decision, they are recognizing that a solution to the problem expressed by the three students may best be arrived at by involving all ten students.

5: Modify Current Format

The final option available in this simulation is to "modify the current format to provide more didactic presentations as part of the [small group] sessions." Two percent (#2%) choose this option. This choice, like the preceding one, however, is available only once, late in the simulation, when #74% of the faculty have already made another decision.

Since such a small percent make this decision, individual routes are not presented. This group is similar, however, to those who devote a class session to the problem in that they are quite thorough in their diagnosis. Their decision, though, is quite different. They decide not to involve all ten students in a resolution of the problem, but rather to agree to the request made by the three students for more lecture-type presentations. While this decision may indicate a sincere

desire to work with the students having difficulty, it runs the risk of creating a new set of problems for the other seven students who are enjoying the current format.

The above review has described how faculty members manage this particular educational problem. While such simulations are only an approximation of what might be observed in the actual teaching process, #79% of the faculty indicate that their responses to this simulation do reflect how they manage problems they face as teachers. This congruence between the problem presented in the simulation and the way faculty report they teach makes it possible to suggest some specific implications for the quality of teaching in the small group format. This analysis will compare the optimal, research-supported route with the most common routes followed by faculty as described above.

THE OPTIMAL ROUTE (see Figure 6)

The remainder of this discussion will focus on a presentation of the optimal route through the simulation and provide a rationale in support of this approach. Only #2% follow this precise route. The percentages provided in the analysis below will describe the proportion of the total faculty that begin with the recommended option, but select non-recommended options at various points along the way. (While #55% begin, only #2% complete the optimal route).

The decision to meet first with the three students who have expressed their concerns is the most direct response. It not only communicates a sincere interest in their problem, but recognizes the faculty responsibility for the success of the group. While #55% of the faculty make this decision, #36% of their colleagues meet first with the other seven students in an effort to determine the scope of the problem.

The recommendation that the students transfer is not a constructive response. The #3% of the faculty who make this choice seem to be suggesting that the three students are totally responsible for the existing situation and that there is no way of resolving these problems within the group. There is not enough information at this point to justify that decision.

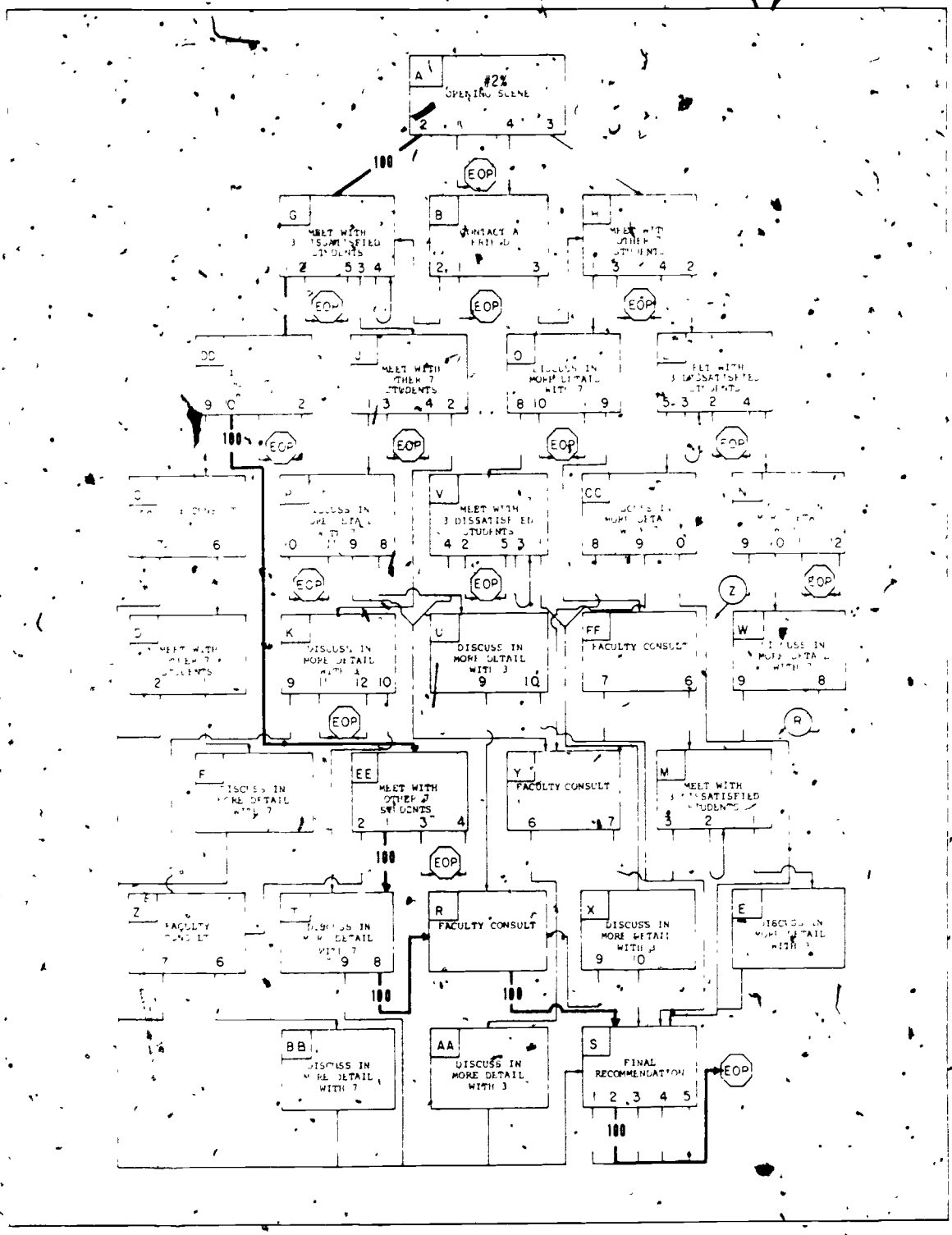


FIGURE 6 "OPTIMAL" ROUTE FOR SMALL GROUP DISCUSSION SIMULATION

The second step in the recommended route is to pursue the conversation with the three students in more detail. While the initial conversation gives an indication of the problems, it fails to provide any insights into why these problems have occurred. By inquiring into the students' backgrounds and their expectations for the course, the faculty member gains some insight into the problem. Thirty-five percent (#35%) of the faculty make this decision, while #14% choose to talk with the other seven students before proceeding. The disadvantages of not continuing the discussion with the three students at this point are that they might view this as an indication that their problems are only legitimate if others share their concerns and, also, it is less efficient to have to schedule another meeting at a later date. This contention is supported by the finding that 64% of the #14% who did not continue the immediate conversation ended the problem without a second meeting.

Now the instructor who is following the recommended route has some basic information about the three students and some clues as to why they may be experiencing difficulties with small group discussion. It is now appropriate that s/he determine whether the other students in the class share this concern, since a different course of action may be necessary if more than the three students are experiencing difficulties.

Ten percent (#10%) of the faculty make this decision to meet with the other seven students at this point. Sixteen percent (#16%), however, end the problem, primarily by agreeing to assist the three students individually with their difficulties. While this decision certainly seems to communicate a sincere interest in the three individuals initially involved, it fails to recognize the possibility that other students might also be experiencing difficulties and require some assistance, and that the involvement of all 10 students may be necessary to resolve the issues described.

The option of seeking advice from peers indicates a willingness to be open about the problem, but the #8% who choose this approach do so prematurely, without first defining the scope of the problem.

The faculty who speak to the other seven students learn that they are not dissatisfied with the course, and that they are aware of the difficulties their classmates are experiencing.

It might be assumed that the problem has been isolated at this point and that future efforts should be directed at only the three complaining students. This approach is not recommended. While in other instructional settings it may be possible to isolate and respond to individual student problems, in small group teaching each student's participation is important and the only lasting resolution must involve the entire group. Even if the response is to provide individual assistance to the three students, it is unlikely that this will improve the students' abilities to function and contribute within the group.

The next step in the recommended approach, therefore, is either to continue this initial conversation with the seven students in an effort to gather some baseline data for comparing and understanding potential differences in student satisfaction with the course (chosen by #3%), or to meet with colleagues for advice on the problem (chosen by #2%). The advantages of continuing the existing discussion with the seven students are that this is more efficient than scheduling another meeting and that comparative data on all ten students would provide a stronger background for assessing the advice provided by the other faculty.

Now that the faculty member has collected information from all ten students, it is recommended that s/he approach other faculty who teach in small groups for their advice. (If this was done as a previous step, the choice would now be to meet with the other students to learn why their experience has been more positive.) Since any decision has the potential for both positive and negative consequences, the opportunity to reflect on the relative strength and weaknesses of several approaches is an important step in the problem-solving process. The decision to discuss this problem with peers also suggests an openness to criticism and a willingness to learn, which are desirable characteristics in teaching. Unfortunately, many faculty view seeking assistance as tantamount to admitting failure and avoid such a step. The finding (from this simulation) that only #17% of faculty seek advice from their colleagues at one of the five points where it is an option tends to confirm that this is not a readily pursued step.

The recommended decision at this point would be for the instructor to confront the entire class with the issues



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and share with them his/her impressions, based on the information gathered. While this approach does not guarantee resolution of the problem, it is suggested because it is not possible to accommodate differences in student backgrounds and expectations without involving the entire group.

The possibility of confronting the entire group early in the process was not an option in this simulation. That approach certainly has merit, but would have to be managed with considerable skill because group confrontation could alienate some of the students, seriously damaging prospects for a group solution. It is recommended, therefore, that time be spent gathering information from the two groups independently, prior to any group discussion of the problem. The recommended solution would be different if the course had been in the sixth or seventh week. In that case, an immediate and direct confrontation with the entire group might be necessary.

The decision to provide more didactic material also has merit. A brief presentation at the start of each group session would both help focus discussion and allay some of the concerns of the unhappy students. If this technique is used, it is best to have the students prepare and make the presentations. This technique should be used sparingly, however, since the primary purpose of small groups is not to present new information but to develop student skills in applying information they already have, and in solving medical problems.

The offer to assist these three students reflects a genuine concern for their situation. In this approach, however, the assistance would address only the cognitive aspects of their education, not the underlying problem of their limited ability to interact in a group learning situation. It also tends to emphasize a teacher-centered approach to education where the instructor is the content expert. A potential value of small groups is that students can alternate between the roles of teacher and student, as discussions relate to their areas of competence, with the result that they become more actively involved and consolidate their own thinking.

The suggestion that these students will simply outgrow their anxieties is unwarranted in view of the background of these students. Further, this approach

denies that the faculty member shares responsibility for the success of the group and should be prepared, particularly in the early stages, to provide necessary leadership and direction. Similarly, the recommendation that the student transfer should be viewed as a last resort. While it is true that not everyone finds the small group format compatible with his/her needs, it should be determined first whether this is the case or whether the group is functioning poorly. Unstructured, unorganized group sessions will degenerate into meaningless "bull" sessions and ultimately frustrate all participants. There must be stated objectives and a plan for managing each session. Students and faculty should not be deceived into thinking that simply to meet around a table as a group responds to student learning needs. If the group is functioning well, and students still cannot relate to this approach, transferring to a more traditional lecture section might be appropriate, although in doing so they may be denied the possibility of developing some skills they will need in the future, such as the capacity to express themselves clearly and think through problems systematically.

## CONCLUSIONS

The previous analysis and discussion suggest that while small group teaching is a commonly used method, there are some fundamental issues that need to be addressed to assure its effective use.

### A. The Primary Areas of Concern

1. Most faculty are not thorough in their management of this educational process. Fifty-two percent (#52%) make no attempt to understand the causes of the students' difficulties, and #85% do not collect information on why the other students are relatively satisfied.

2. There is little evidence of faculty collaborating with their colleagues in resolving educational problems. Eighty-three percent (#83%) do not seek any advice or share their problem with their peers.

3. Many faculty do not seem to understand the difficulties students can have learning in a small group setting. Twenty-eight percent (#28%) treat the problem as unresolvable, while another #13% act as though there is no problem.

B. Encouraging Findings

1. Almost half the faculty (#48%) are at least willing to take the students seriously and offer to work with them on their problems. While this is not the optimal decision, it does indicate that faculty accept their share of responsibility for the students' education.

2. Approximately one-third express an interest in attending a workshop on small group teaching. Apparently, they have some self-identified needs they want to address.

TABLE 26

DISCUSSION WITH THREE DISSATISFIED STUDENTS

TOTAL POPULATION

| DESCRIPTION OF OPTIONS | SECTIONS | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|
| | E | K | N | U | X | AA | DD | |
| 1 Attitude toward group process | 1 | 3 | 6 | 0 | 1 | 0 | 21 | 32 |
| 2 Expectation for faculty role | 1 | 3 | 7 | 0 | 1 | 0 | 27 | 39 |
| 3 Academic background | 1 | 3 | 5 | 0 | 1 | 1 | 19 | 30 |
| 4 Prior experience in small groups | 1 | 4 | 6 | 0 | 1 | 0 | 24 | 36 |
| 5 Progress in other classes | 1 | 3 | 7 | 0 | 0 | 0 | 23 | 34 |
| 6 Opinion of group structure | 1 | 4 | 6 | 0 | 0 | 1 | 29 | 41 |
| 7 Feelings of identity with group | 1 | 2 | 5 | 0 | 0 | 0 | 16 | 24 |
| 8 Responsibility for learning of others | 1 | 3 | 5 | 0 | 1 | 1 | 22 | 33 |

TABLE 27

FACULTY CONSULTATION

| TOTAL POPULATION | SECTIONS | | | | | TOTAL |
|---|---|---|---|---|---|---|
| DESCRIPTION OF OPTIONS | C | R | Y | Z | FF | |
| 1 Recommend transfer | 5 | 2 | 0 | 6 | 0 | 13 |
| 2 Reassure students | 3 | 3 | 1 | 4 | 0 | 11 |
| 3 Offer to assist students | 7 | 3 | 1 | 6 | 0 | 17 |
| 4 Arrange for educational consultant | 4 | 2 | 0 | 4 | 0 | 10 |
| 5 Modify current format | 6 | 2 | 0 | 6 | 1 | 15 |

TABLE 28

DISCUSSION WITH SEVEN SATISFIED STUDENTS

| TOTAL POPULATION | SECTIONS | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|
| DESCRIPTION OF OPTIONS | F | O | P | T | W | BB | CC | |
| 1 Prior experience in small groups | 2 | 1 | 0 | 3 | 1 | 2 | 1 | 10 |
| 2 Academic background | 2 | 1 | 0 | 3 | 1 | 2 | 1 | 10 |
| 3 Attitude toward group process | 2 | 1 | 0 | 3 | 1 | 2 | 1 | 10 |
| 4 Feelings of identity with group | 2 | 1 | 0 | 2 | 1 | 2 | 0 | 8 |
| 5 Progress in other classes | 2 | 1 | 0 | 2 | 1 | 2 | 1 | 9 |
| 6 Expectation for faculty role | 2 | 2 | 0 | 3 | 1 | 2 | 1 | 11 |
| 7 Opinion of group structure | 3 | 2 | 0 | 3 | 2 | 3 | 1 | 14 |

TABLE 29

Standard Errors for the "Small Group Discussion" Simulation

| OPTION | STANDARD ERROR | OPTION | STANDARD ERROR | OPTION | STANDARD ERROR | OPTION | STANDARD ERROR |
|---|---|---|---|---|---|---|---|
| A1 | 1 | K11 | 0 | T1 | 1 | Z5 | 1 |
| A2 | 2 | K12 | 1 | T2 | 1 | Z6 | 1 |
| A3 | 2 | L1 | 1 | T3 | 1 | Z7 | 1 |
| A4 | 1 | L2 | 1 | T4 | 1 | AA1 | 0 |
| B1 | 0 | L3 | 1 | T5 | 1 | AA2 | 0 |
| B2 | 0 | L4 | 1 | T6 | 1 | AA3 | 0 |
| B3 | 1 | L5 | 0 | T7 | 1 | AA4 | 0 |
| C1 | 1 | M1 | 0 | T8 | 1 | AA5 | 0 |
| C2 | 1 | M2 | 0 | T9 | 1 | AA6 | 0 |
| C3 | 1 | M3 | 0 | U1 | 0 | AA7 | 0 |
| C4 | 1 | N1 | 1 | U2 | 0 | AA8 | 0 |
| C5 | 1 | N2 | 1 | U3 | 0 | BB1 | 1 |
| C6 | 1 | N3 | 1 | U4 | 0 | BB2 | 0 |
| C7 | 1 | N4 | 1 | U5 | 0 | BB3 | 1 |
| D1 | 1 | N5 | 1 | U6 | 0 | BB4 | 0 |
| D2 | 1 | N6 | 1 | U7 | 0 | BB5 | 1 |
| E1 | 0 | N7 | 1 | U8 | 0 | BB6 | 1 |
| E2 | 0 | N8 | 1 | U9 | 0 | BB7 | 1 |
| E3 | 0 | N9 | 1 | U10 | 0 | CC1 | 0 |
| E4 | 0 | N10 | 1 | V1 | 0 | CC2 | 0 |
| E5 | 0 | N11 | 0 | V2 | 0 | CC3 | 0 |
| E6 | 0 | N12 | 0 | V3 | 0 | CC4 | 0 |
| E7 | 0 | O1 | 0 | V4 | 0 | CC5 | 0 |
| E8 | 0 | O2 | 0 | V5 | 0 | CC6 | 0 |
| F1 | 1 | O3 | 0 | W1 | 0 | CC7 | 0 |
| F2 | 1 | O4 | 0 | W2 | 0 | CC8 | 0 |
| F3 | 1 | O5 | 0 | W3 | 0 | CC9 | 0 |
| F4 | 1 | O6 | 0 | W4 | 0 | CC10 | 0 |
| F5 | 1 | O7 | 0 | W5 | 0 | DD1 | 2 |
| F6 | 1 | O8 | 0 | W6 | 1 | DD2 | 2 |
| F6 | 1 | O9 | 0 | W7 | 1 | DD3 | 2 |
| G1 | 2 | O10 | 0 | W8 | 0 | DD4 | 2 |
| G2 | 1 | O11 | 0 | W9 | 1 | DD5 | 2 |
| G3 | 1 | P1 | 0 | X1 | 0 | DD6 | 2 |
| G4 | 1 | P2 | 0 | X2 | 0 | DD7 | 2 |
| G5 | 1 | P3 | 0 | X3 | 0 | DD8 | 2 |
| H1 | 1 | P4 | 0 | X4 | 0 | DD9 | 1 |
| H2 | 2 | P5 | 0 | X5 | 0 | DD10 | 1 |
| H3 | 1 | P6 | 0 | X6 | 0 | DD11 | 2 |
| H4 | 1 | P7 | 0 | X7 | 0 | DD12 | 0 |
| J1 | 0 | P8 | 0 | X8 | 0 | EE1 | 1 |
| J2 | 1 | P9 | 0 | X9 | 0 | EE2 | 1 |
| J3 | 1 | P10 | 0 | X10 | 0 | EE3 | 1 |
| J4 | 1 | P11 | 0 | Y1 | 0 | EE4 | 0 |
| K1 | 1 | R1 | 1 | Y2 | 0 | FF1 | 0 |
| K2 | 1 | R2 | 1 | Y3 | 0 | FF2 | 0 |
| K3 | 1 | R3 | 1 | Y4 | 0 | FF3 | 0 |
| K4 | 1 | R4 | 1 | Y5 | 0 | FF4 | 0 |
| K5 | 1 | R5 | 1 | Y6 | 0 | FF5 | 0 |
| K6 | 1 | S1 | 1 | Y7 | 0 | FF6 | 0 |
| K7 | 1 | S2 | 1 | Z1 | 1 | FF7 | 0 |
| K8 | 1 | S3 | 1 | Z2 | 1 | | |
| K9 | 1 | S4 | 0 | Z3 | 1 | | |
| K10 | 0 | S5 | 1 | Z4 | 1 | | |

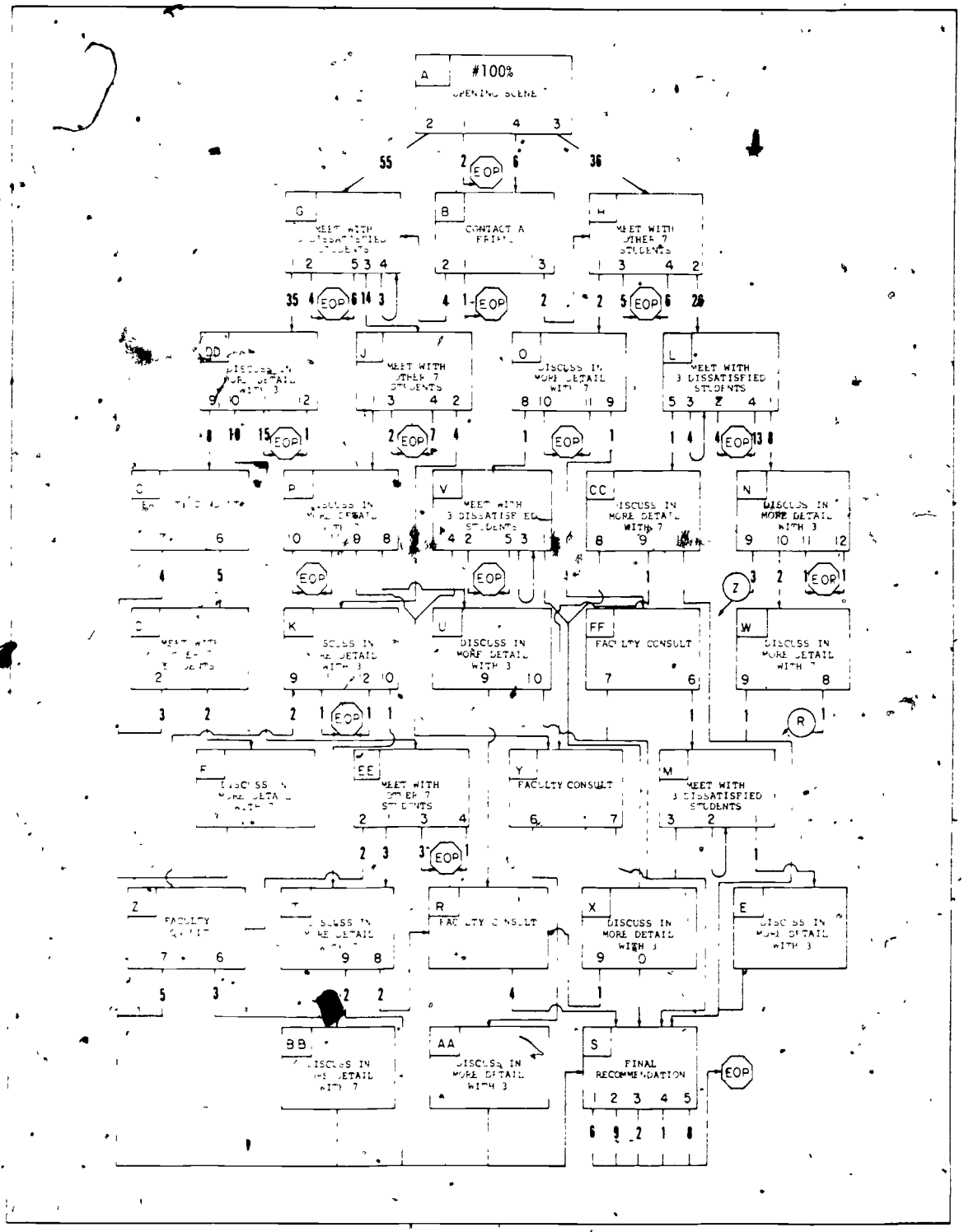


FIGURE 7 : TOTAL POPULATION RESULTS FOR "SMALL GROUP DISCUSSION" SIMULATION (Numbers are estimated percentages of the population selecting the option indicated.)

# VI. LECTURING

## INTRODUCTION

Faculty members in United States medical schools report that lecturing is a commonly used teaching method: #56%[58] use it frequently, and another #33% use it occasionally.[59] Few of them have had training in lecturing techniques. Only #16% have taken courses in teaching methods (which, presumably, would include lecturing), and only #25% have attended workshops in this area.[60] Thirty-seven percent (#37%) reported that they would like to receive printed materials about lecturing and another #31% would like both to receive printed materials and attend a workshop on this topic.[61]

## KEY FEATURES OF THE SIMULATION

The three purposes of the simulation are:

A. to determine which sources of information faculty members use in evaluating lectures,

B: to determine which of a number of serious lecturing problems faculty members can identify in the simulation, and

C. to identify the methods faculty members recommend as ways to improve lecturing.

The simulation also allows the collection of information on how faculty members "consult" with one another, though this was not a goal of the survey.

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[58] For a discussion of the percentage symbols in this report, see Chapter 1, pages 9 - 10.

[59] First Preliminary Report, pp. 116, 60, 67 and 70.

[60] First Preliminary Report, pp: 57, 60, 67, 70.

[61] First Preliminary Report, p. 188.

The simulation begins as follows:

Dr Stuart Brown is a young newly appointed faculty member in your department He is bright well-trained and has knowledge and expertise in an important area and for these reasons, has been asked to give a series of three lectures to medical students as part of the introductory course your department offers You are conversant with the material Dr Brown is presenting

Dr Brown has come to you for help with his lectures He has already given two and a number of the students have approached him complaining that his presentations were extremely difficult to follow You are impressed by his earnestness and his desire to improve his teaching and on this basis you agree to work with him

He tells you that his third talk is coming up shortly and that he doesn't expect your help to be reflected at that point Rather he expects that improvements based on the recommendations and suggestions you make will appear when he is asked to lecture in the future

**You begin by (CHOOSE ONLY ONE)**

A1 Talking with Dr Brown in detail about his lecturing

A2 Asking Dr Brown if he would mind your talking with some students who attended his lectures

A3 Asking Dr Brown if you can sit in on his third lecture

A4 Looking over the notes from which Dr Brown lectures

The opening scene makes it clear that the respondents to this simulation have an unhindered opportunity to discover Brown's problems. First, Brown himself is requesting the help and has no objections to the consultant using all four sources of information available in the simulation: talking with Brown's students, discussing lecturing with Brown, attending the third lecture, and examining Brown's lecture notes. Second, Brown is to give another lecture soon so the consultant has the opportunity to observe a lecture directly. And finally, Brown has a reasonable expectation about how long it might take for him to improve his lecturing, and is willing to let the consultant take as much time as necessary to provide the feedback he needs.

In working through the simulation, respondents have the opportunity to collect information which would allow them to identify Brown's problems, and, at the end, to recommend ways Brown can overcome them.

Brown has six problems with his lecturing method:

1. In deciding what to cover in his lectures, Brown fails to consider what students need to know in order to understand the content of his lectures. In fact, there are three concepts students must have mastered (called W, X and Y in the simulation), and the students feel comfortable with only X. Brown (who determines lecture coverage pretty much on his own) would have known that the students were unprepared for what he planned to teach if he had either talked to the students or with faculty members who were knowledgeable about the curriculum.

2. Brown does not consider how the information he is teaching might be used by the students. While the students expect the lectures to be clinically useful (as are other lectures in the series), Brown does not relate what he says to either clinical applications or non-clinical ways the students might use the material covered (e.g., to understand material in other courses they will be taking). There are two problems here; the material Brown is lecturing on is not integrated into the medical curriculum, and the students have difficulty putting the content in perspective.

3. Brown has major problems with questions, both from him to the students and from the students to him. He does not ask questions as part of his lecture (either rhetorically or addressed to the students) and he asks that his talk not be interrupted by questions from the audience. Thus, he loses opportunities to find out when students are confused, to monitor their progress, and to enhance the students' active engagement in the learning process.

4. Brown has difficulties, during the lecture, in identifying and emphasizing the main points he wishes to communicate. This results both in students missing what Brown wishes to stress as being important, and in making everything seem equally valuable.

5. Feedback from the students is not utilized. Brown misses cues he could use to know that things are amiss and fails to solicit information from the students either through the use of questions or by talking with the students after class.

6. Brown's delivery is flat. Brown could improve his lectures markedly by the use of devices (including questions and clinically relevant problem examples) designed to attract and hold the students' attention. Such techniques serve to maintain students' interest (and thereby facilitate learning) in what otherwise might seem to be dull material.

To collect the information about the flaws in Brown's lecturing, a respondent should tap three sources of information: talk with Brown, attend the third lecture, and talk with the students. Some of the information gained from each of these sources is redundant and will only reconfirm things already determined from other sources, but some of it will be novel. It will either be available only from that source, or it will cause information from other sources to fall into place. The fourth source, looking over Brown's notes, provides little new information and can be safely ignored.[62]

MOST COMMON ROUTES

In this simulation, the particular order in which data are collected is of lesser import than the number and variety of data sources used.[63] Thus, the number of data sources will be considered and each of the sources of information will be described along with the percentages of faculty selecting them.

Figure 8 for example, indicates how many sources of information respondents use before they give Brown an analysis of his teaching and suggestions for how he might improve.

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[62]The same assertion holds true in the "real world;" little can be learned from lecture notes in comparison to direct observation, talking with the lecturer and interviewing students.

[63]Order will be considered, however, under the description of the optimal route.

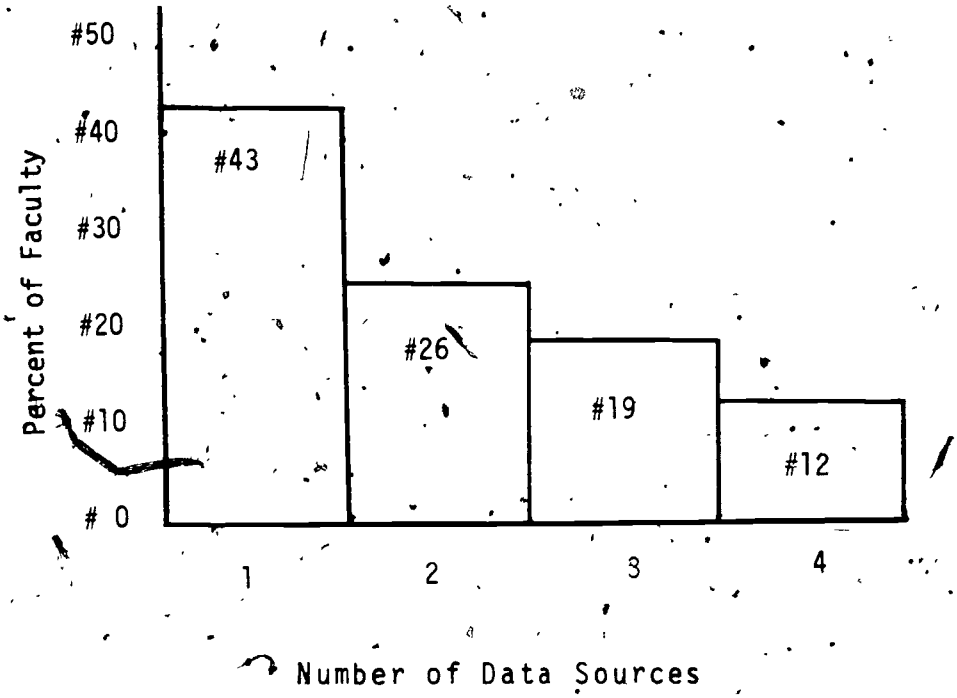


Figure 8: NUMBER OF DATA SOURCES USED BY RESPONDENTS

When only a single source of information is used, it is most often the observation of Brown's lecture; 90% (#38%) of those using only a single data source select this option, with approximately equal portions of respondents picking the other three. (See Table 30).

Better than a quarter of the population (#26%) use two sources of information. Talking to Brown and observing the third lecture are the most popular (#20% and #23% respectively). The other two sources of data are used much less frequently.

Only #19% of the population use three sources of information. The review of Brown's notes is the source used least frequently; with only #3% choosing this option. Finally, #12% use all four sources.

Three sources (talking with Brown, talking with Brown's students, and observing Brown's third lecture) are necessary to discover Brown's problems, although the use of a source or the number of sources used does not assure that a respondent will discover all of Brown's six problems.

TABLE 30

Population Percentages Indicating How Often Each Data Source is Used by Faculty Members

| Number of Information Sources Used | Percent of Population | Percentage of Population Using Each Data Source | | | |
|---|---|---|---|---|---|
| | | Talk with Brown | Talk with Students | Observe Lecture | Review Notes |
| 1 | #43 | # 2 | # 1 | #38 | # 1 |
| 2 | #26 | #20 | # 6 | #23 | # 2 |
| 3 | #19 | #18 | #15 | #17 | # 3 |
| 4 | #12 | #12 | #12 | #12 | #12 |
| Total | #100 | #50 | #34 | #90 | #18 |

A. Observing the Lecture

Of the three main sources of information, observing the lecture is chosen most frequently by faculty (#90%), irrespective of how many other sources they use. All options in the sections on observing Brown offer information which is useful in diagnosing the weaknesses in lectures generally. In this case, though, some of the options are essential for identifying Brown's particular problems. For example, the observation that Brown's delivery is flat could be based on the information presented at the beginning of each section (underlines added):

Your first impressions of Dr. Brown as a lecturer are that he is businesslike and consistent—there is little variation in his manner as he talks through the material he is covering. You have the feeling that he approaches lecturing with the same sincerity, sense of purpose and intensity that he brings to his research.

You also observe that he speaks clearly and varies the pitch and tone of his voice very little. Similarly, he stays behind the podium and moves around very little.

During the balance of the lecture you would take notice of **(CHOOSE AS MANY AS ARE APPROPRIATE IN ANY ORDER)**

1 The way the subject matter of the lecture is organized

2 His definitions of new terms and explanations of concepts (principles)

Cont'd...

## Lecturing Simulation Continued...

3 His response to questions from the students and the way he handles questions from them

4 How he identifies and stresses main points in his talk

5 His use of interim summaries throughout the lecture

6 His use of formal and informal feedback from the students on how the lecture is progressing

7 The students behavior during the lecture

8 His use of examples and problems demonstrating the concepts (principles) presented

9 His use of handouts audiovisual aids the blackboard and demonstrations

Confirming evidence of Brown's monotonous delivery is available to the 90% (#81%) choosing option 3, and the 93% (#84%) selecting option 4. Relatedly, #80% learn that he uses few examples and no problems (option 8).

Eighty percent (#72%) and 89% (#80%), respectively, select options 6 and 7 and learn that Brown is pretty much unaware of his audience, and that increasing numbers in his audience "give up."

On the positive side, 88% (#79%) choosing option 2 learn that Brown's definition of technical terms and explanations of concepts seem precise and technically correct. He bases his definitions, however, on concepts W, X and Y, two of which are unfamiliar to the students.

Thus, after the lecture is over, it is possible to draw several conclusions: Brown's lecturing manner is fairly dull, he makes no use of feedback from the students either by noticing that they are confused and bored or by "probing" them to find out if they understand his presentations, he does not emphasize the major points during the lecture, no questions are asked either by the lecturer or members of his audience, there are few examples, and no problems are presented to the students.

Of the #90% who observe the lecture,[64] 86% (#78%) recognize that lecturers should generate enthusiasm about their subject, and 61% (#55%) see this as one of Brown's problems. He could do much toward overcoming his difficulties through the use of questions, problems and talking with the students. Seventy-nine percent (#71%) recognize that asking questions of students contributes to lecture quality, 89% (#80%) believe that students should be allowed to ask questions, and 88% (#79%) feel it is important for the lecturer to check with the students to verify that they understand complex material. Further, 78% (#70%), 83% (#75%), and 86% (#78%) respectively, recognize that these are aspects of Brown's problem in failing to secure feedback from students.

Nearly all (97%) those who observe the lecture (#88%) report that emphasis of important points contributes to lecture quality, and only slightly fewer (86%, #78%) see this as another of Brown's problems. A smaller percentage (75%, #68%) recognize that interim summeries in the lecture serve the same purpose, and that Brown does not use them (73%, #66%).

Finally, respondents note Brown's lack of use of questions, problems and examples. Eighty-three percent (#75%) feel that presenting problems to students contributes to lecture quality, and 80% (#72%) notice that Brown does not use them. Eighty-nine percent (#80%) assert that examples contribute to lecture quality, and 85% (#77%) report that clinical applications (including clinical examples) should be emphasized. Eighty-four percent (#76%) and 85% (#77%) feel Brown has difficulty with these two aspects of lecturing.

B. Talking with Brown

The second most popular source of information is talking with Brown and #50% of the faculty use it. From that meeting (see below), it is clear that Brown has had no formal training as a teacher, nor any strong teaching role models to emulate. But, more important for the difficulties at hand, it is clear that Brown spends little effort deciding what to include in his lectures. For example, 90% (#45%) learn that he identifies topics by reviewing his own class notes (option 3), while 38% (#19%)

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[64] Regardless of what other data sources they use.

Dr. Brown describes his undergraduate and graduate experience which prepared him well to do research but contained essentially no instruction or experience in teaching. He says he has never lectured before but he has made presentations at recent meetings. You pursue the conversation by asking (CHOOSE AS MANY AS ARE APPROPRIATE IN ANY ORDER)

1. How he feels about teaching (how important and actually it is for him)?
2. Were there any teachers he particularly admired?
3. How he decided on what to cover in this set of lectures?
4. Did he talk with students about what to cover in the lectures?
5. Did he talk with colleagues about what to cover in the lectures?
6. How do the things taught relate to the knowledge and skills needed by practicing physicians?
7. What should students gain from the lecture series (i.e. how will they be changed due to having attended and learned from the lectures)?
8. Were the students told what they should gain from the lectures and which points were important?
9. What facts, principles, skills and experiences do students need in order to understand the lectures?

learn he does this without finding out whether they square with the students' expectations.

Eighty-two percent (#41%) discover that he does not consider whether students will be able to handle the material he is planning to teach, and he does nothing to increase the likelihood that the students will pick up the main points of his talks (option 8, chosen by #42%).

Of the #50% who choose this section,[65] 88% (#44%) recognize that adapting the lecture to the students' backgrounds is important for lecture quality. Seventy percent (#35%) see this as one of Brown's problems.

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[65] Regardless of which other sources of information they use.

Further, 79% (#40%) recognize Brown's failure to consider how his students will use the material he is covering and 87% (#44%) believe this is important to lecture quality.

C. Talking to Students

The third essential source of information is talking with the students and #34% tap this source (see below).

The students say they had no advance information on Dr. Brown but quickly concluded he was terrific. They had expected him to present information they could record in their notes and looked forward to his using handouts (which would make note taking simpler). They also tell you that they hoped the information presented would be useful to them clinically since this had been the case with other lectures in this course. In pursuing the conversation you would ask **(CHOOSE AS MANY AS ARE APPROPRIATE IN ANY ORDER)**

1. How much students already know in area is related to those addressed in Dr. Brown's lectures
2. Whether there is a range of knowledge and experience in the class (i.e. whether students vary markedly in their backgrounds)
3. What Dr. Brown's explanations of concepts/principles are like
4. How Dr. Brown defines technical terms
5. Whether Dr. Brown regularly summarizes important points
6. The way Dr. Brown handles questions
7. How Dr. Brown distinguishes between major and minor points in his talk
8. How Dr. Brown uses examples to illustrate points he is making
9. What Dr. Brown's manner is like
10. His use of handouts, audio-visual aids and the blackboards

Brown has identified three concepts, W, X and Y, as central to understanding his lectures. Respondents choosing option 1, (80%, #28%), or option 2, (76%, #26%), learn that students generally are weak on concepts W and Y. They will not be able to understand the material Brown is presenting.

Those faculty members, (7[illegible]%, #24%), who select option 6 learn that Brown requests that the students not ask questions during the lecture. Those who choose

option 8, (71%, #24%) learn that he seldom asks questions of his own, and that he uses few examples, none related to clinical medicine.

Respondents choosing other options in this section collect information verifying observations made on the basis of attending Brown's lecture or talking with Brown.

While only #34% of the faculty talk with the students, 88% of those who do (#30%) recognize that adapting lecture material to the students' backgrounds is important and 79% (#24%) understand that Brown has not done this. Eighty-nine percent (#30%) feel that Brown should provide students with the opportunity to ask questions and 89% (#30%) believe that giving students a chance to ask questions improves lecture quality.

All three essential sources (meet with Brown, talk with his students, and observe his lecture) were used by #22%, though larger percentages used pairs of sources, as shown in Table 31.

TABLE 31

Percentages of the Population Choosing Each Pair of Data Sources

| Pair Examined | Population Percentage |
|---|---|
| Talk with Brown/Talk with Students | #25 |
| Talk with Brown/Observe Lecture | #42 |
| Talk with Students/Observe Lecture | #29 |

After faculty members finish diagnosing Brown's problems, they are asked to make recommendations on how he might improve his lectures. The percentages choosing each option are shown in Table 32.

TABLE 32

Percent of the Population Recommending
Each Method of Improvement

| Method of Improvement | Percent of the Population |
|---|---|
| R1. Read about lecturing techniques in some public speaking and education texts, and in education journals. | #52 |
| R2. Read about lecturing in medical education journal articles. | #56 |
| R3. Talk with competent lecturers at the medical school about how they lecture. | #75 |
| R4. Talk with students about what they look for in a lecture. | #79 |
| R5. Seek assistance from an educational specialist about how to improve his lecturing. | #53 |
| R6. Observe people recognized as being good lecturers and then try some of their techniques. | #93 |
| R7. Go over the lecture notes more thoroughly in order to be better prepared. | #34 |
| R8. Work with you (you will observe him and give him feedback) on his lecturing. | #74 |
| R9. Arrange to give some additional lectures in order to gain experience. | #71 |
| R10. Arrange to have his lectures videotaped so he can review his own performance. | #88 |

OPTIMAL ROUTE (See Figure 9)

As previously stated, the particular order in which data are collected in this simulation is of less importance than the number and variety of data sources.[66]

To collect enough data to diagnose Brown's problems accurately it is necessary to observe the lecture, talk to Brown, and talk to the students. Twenty-two percent (#22%) used all three sources.

After respondents have finished collecting information, the next step is the identification of Brown's problems (section T). Twenty potential problems are listed in this section, and respondents are asked to indicate whether each is important to lecture quality, and whether each applies to Brown. The options pertaining to Brown are displayed in Table 33.

There is considerable agreement among faculty members concerning the eleven options corresponding to Brown's six problems. The least agreement, 83% (#18%), concerns using interim summaries (option T17) as a necessary attribute of lectures, and letting students know what the lectures will cover (option T3, 76% (#17%). Nevertheless, both of these values are high, and support the conclusions that faculty using the three essential sources are aware of the attributes of good lecturing as they apply to Brown, and are able to identify the problems Brown is having.

The next step, then, is recommending to Brown how to improve his lecture technique. Almost all of these faculty members (97%, #21%) suggest that Brown observe some good lecturers. This suggestion may reflect the way most of the population learned to teach; #90% report that watching other teachers contributed to the way they currently teach.[67] Eighty-seven percent (#87%) suggest that Brown also talk with competent lecturers.

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[66]A consequence of this situation is that the "optimal route" is not a single route and cannot be represented in a separate figure.

[67]First Preliminary Report, p. 99.

TABLE 33

Brown's Lecturing Problems and Percentages of Respondents Who Recognize Them[68]

| Brown's Problem | Section T Options | Percentage Indicating That the Option is Important to Lecturing | Applies to Brown |
|---|---|---|---|
| 1. Failed to consider what students needed to know in order to understand the lectures. | T1. Lecture content should be adapted to student backgrounds. | 93 (#20) | 79 (#17) |
| 2. Failed to consider how the information presented might be used by students. | T18. Whenever feasible, the clinical application of the material should be emphasized. | 93 (#20) | 90 (#20) |
| 3 Failed to use questions. | T7. Lecturer should engage the students through the use of questions. | 86 (#19) | 84 (#18) |
| | T13. Opportunity should be provided during the lecture for student questions. | 90 (#20) | 85 (#19) |
| 4. Inadequate identification and emphasis of main points in the lecture. | T3 Students should be provided with an understanding of what the lecture(s) will cover. | 93 (#20) | 76 (#17) |
| | T5. The lecturer should emphasize the most important points in the lecture. | 99 (#22) | 88 (#19) |
| | T17. Summaries should be interspersed throughout the lecture. | 83 (#18) | 81 (#18) |
| 5 Failure to utilize student feedback. | T16 Lecturer should check with students to assure that complex material is being understood. | 91 (#20) | 89 (#20) |
| | (also see T7 and T13) | | |
| 6. Flat delivery. | T8. Students should be challenged by problems dealing with the subject matter. | 86 (#19) | 81 (#18) |
| | T10. Lecturer should generate enthusiasm about his/her subject. | 91 (#20) | 87 (#19) |
| | T12. General points should be illustrated with specific examples. | 94 (#21) | 90 (#20) |
| | (also see T7 and T13) | | |

[68]These statistics apply only to the #22% who collect data by observing Brown, talking with him, and talking with his students.

Ninety percent (#20%) recommend that Brown talk with students about what they look for in a lecture. This suggestion also probably reflects the experience of the faculty generally; #97% report that students have contributed to the way they currently teach,[69] #83% seek assistance at least occasionally from current students, and #73% from former ones.[70] Finally, 89% (#20%) recommend that Brown have his lectures videotaped so he can review his own performance. This is a rather high percentage, considering that only #42% report having had experience with videotape as a teaching tool.[71]

Some potential sources of improvement are recommended less frequently. Reading about lecturing or public speaking in general and medical education literature is suggested by only 58% (#13%). This is a small percentage considering that #88% report that educational literature has contributed to their teaching, and #73% state that they seek assistance, at least occasionally, in "the literature." Perhaps faculty consider "the literature" to be sources of information on content, such as they would find in the New England Journal of Medicine, which #82% report that they read.[72]

Fifty-eight percent (#13%) suggest that an educational consultant should be contacted to help Brown improve his lecturing. Only #26% of the faculty, however, report that they themselves use such a source.

Most of the faculty members who pursue the optimal route (80%, #18%), volunteer to work with Brown to improve his lectures. This is not a surprising finding, considering that #93% report they turn to other members of their departments, at least occasionally, for help.[73]

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[69] First Preliminary Report, p. 99.

[70] Ibid., p. 137.

[71] Ibid., p. 125.

[72] Ibid., p. 83.

[73] Ibid., p. 136.

Better than two-thirds, 68% (#15%) also suggest that Brown should give some additional lectures to gain experience. Going over the lecture notes was the one suggestion made infrequently; only 33% (#7%) believe Brown's lectures would be markedly improved on the basis of this activity.

As mentioned earlier, the lecture simulation also provides data on how faculty members consult with one another, and analyzing the order in which various information sources are used, the percent of the population using the recommended order can be estimated. In good consultative practice, this order would require the first activity to be talking to the client to become acquainted, to reassure him of the good intentions of the consultant, and to familiarize him with the nature of the information sought. Analysis of data from the simulation shows that few faculty choose the "proper" route: only #1.7% talk to Brown before using other information sources. Their diagnoses and recommendations, however, do not differ markedly from those of other faculty who use these sources in a different order. (See Tables 34 and 35.)

## CONCLUSIONS

Based on the results described in the preceding pages, a number of conclusions can be drawn about the way faculty members view lecturing. Note, though, that these conclusions are based on somewhat indirect evidence, as the respondents were acting as "consultants," not as lecturers, per se.

### A. Primary Areas of Concern

1. Large portions of the faculty miss valuable sources of information bearing on the success of lectures. For example, only about a third consider the audience for the lecture.

2. Potential sources of information on lecturing (e.g., educational literature, educational specialists) are not valued by faculty in this situation.

3. Only about one third of the faculty members include the assembly of student views when trying to understand an instructional problem.

TABLE 34

Brown's Lecturing Problems and Percentages of Respondents (#1.7%) Who Recognize Them[74]

| Brown's Problem | Section T Options | Percentage Indicating that the Option is Important to Lecturing | Applies to Brown |
|---|---|---|---|
| 1. Failed to consider what students needed to know in order to understand the lectures | T1. Lecture content should be adapted to student backgrounds. | 81 | 78 |
| 2 Failed to consider how the information presented might be used by students. | T18. Whenever feasible, the clinical application of the material should be emphasized. | 80 | 67 |
| 3. Failed to use questions | T7. Lecturer should engage the students through the use of questions. | 91 | 91 |
| | T13. Opportunity should be provided during the lecture for student questions. | 100 | 100 |
| 4. Inadequate identification and emphasis of main points in the lecture | T6 The lecturer should emphasize the most important points in the lecture. | 100 | 100 |
| | T17. Summaries should be interspersed throughout the lecture. | | |
| | T3. Students should be provided with an understanding of what the lecture(s) will cover. | 100 | 89 |
| 5 Failure to utilize student feedback. | T16. Lecturer should check with students to assure that complex material is being understood. (also see T7 and T13.) | 91 | 91 |
| 6. Flat delivery. | T10. Lecturer should generate enthusiasm about his/her subject. | 100 | 100 |
| | T8. Students should be challenged by problems dealing with the subject matter. | 92 | 77 |
| | T12. General points should be illustrated with specific examples. (also see T7 and T13.) | 94 | 91 |

[74] These statistics apply only to the #1.7% who selected the three essential sources in the proper order.

TABLE 35

Recommendations for Improvement by the #1.7% Choosing the Three Essential Sources in the Proper Order

| Recommendation | Percentage of Population | Percentage of Those Selecting the Optimal Route |
|---|---|---|
| R1. Read about lecturing techniques in some public speaking and education texts, and in education journals. | # 1 | 62 |
| R2. Read about lecturing in medical education journal articles. | # 1 | 58 |
| R3. Talk with competent lecturers at the medical school about how they lecture. | # 1 | 74 |
| R4. Talk with students about what they look for in a lecture. | # 1 | 73 |
| R5. Seek assistance from an educational specialist about how to improve his lecturing. | # 1 | 46 |
| R6. Observe people recognized as being good lecturers and then try some of their techniques. | # 2 | 100 |
| R7. Go over the lecture notes more thoroughly in order to be better prepared. | # .3 | 19 |
| R8. Work with you (you will observe him and give him feedback) on his lecturing. | # 1 | 79 |
| R9. Arrange to give some additional lectures in order to gain experience. | # 1 | 63 |
| R10. Arrange to have his lectures videotaped so he can review his own performance. | # 2 | 96 |

B. Encouraging Findings

1. Faculty members are generally able to identify major problems in lecturing, at least when the task involves selecting from a prepared list.

2. Faculty members employ direct observation in analyzing lecturing problems.

3. Faculty members believe that talking with students and colleagues recognized as good lecturers is a valuable way to collect information on lecture improvement.

4. Faculty members seem generally willing to assist their colleagues in improving their lectures.

TABLE 36

CONSIDERATIONS WHILE INTERVIEWING BROWN

| TOTAL POPULATION | SECTIONS | | | | TOTAL |
|---|---|---|---|---|---|
| | M | G | B | E | |
| 1 Brown's attitude toward teaching | 8 | 19 | 10 | 3 | 40 |
| 2 Did he admire any teachers | 5 | 14 | 6 | 3 | 28 |
| 3 Procedures for selection of content | 11 | 21 | 10 | 3 | 45 |
| 4 Requesting students input on lecture content | 3 | 9 | 4 | 3 | 19 |
| 5 Requesting colleagues input on lecture content | 9 | 19 | 9 | 3 | 40 |
| 6 Relationship between what he teaches and what is required of physicians | 9 | 18 | 8 | 3 | 38 |
| 7 What students are to gain from the lectures | 10 | 23 | 8 | 3 | 44 |
| 8 Communicating important points to the students | 10 | 21 | 8 | 3 | 42 |
| 9 Determining entry level skills and knowledge | 9 | 20 | 9 | 3 | 41 |

TABLE 37

CONSIDERATIONS WHILE OBSERVING BROWN

| TOTAL POPULATION | SECTIONS | | | | TOTAL |
|---|---|---|---|---|---|
| | Y | N | F | S | |
| 1 How he organizes the subject matter | 69 | 9 | 2 | 2 | 82 |
| 2 How he defines terms and explains concepts | 66 | 9 | 2 | 2 | 79 |
| 3 How he handles questions | 68 | 9 | 2 | 2 | 81 |
| 4 How he stresses main points | 72 | 8 | 2 | 2 | 84 |
| 5 Whether he uses interim summaries | 58 | 7 | 2 | 2 | 69 |
| 6 How he uses students' feedback | 61 | 8 | 2 | 1 | 72 |
| 7 How students behave during the lecture | 67 | 9 | 2 | 2 | 80 |
| 8 How he uses examples and problems | 69 | 8 | 2 | 1 | 80 |
| 9 How he uses handouts and audiovisual aids | 70 | 9 | 2 | 2 | 83 |

TABLE 38

CONSIDERATIONS WHILE INTERVIEWING BROWN'S STUDENTS

| TOTAL POPULATION | SECTIONS | | | | TOTAL |
|---|---|---|---|---|---|
| | J | W | L | C | |
| 1 How much do they know in areas related to the lectures | 4 | 13 | 9 | 2 | 28 |
| 2 Do students vary in the backgrounds they have | 4 | 12 | 8 | 2 | 26 |
| 3 Are Brown's explanations understandable | 6 | 10 | 8 | 2 | 26 |
| 4 Are Brown's definitions of technical terms understandable | 4 | 9 | 7 | 2 | 22 |
| Whether Brown summarizes important points | 6 | 9 | 7 | 2 | 24 |
| How Brown handles questions | 5 | 10 | 7 | 2 | 24 |
| How Brown identifies major points | 5 | 9 | 8 | 2 | 24 |
| How Brown uses examples | 6 | 9 | 7 | 2 | 24 |
| 9 What Brown's manner is like | 4 | 10 | 8 | 2 | 24 |
| 10 How Brown uses audiovisual aids | 5 | 9 | 6 | 2 | 22 |

TABLE 39

CONSIDERATIONS WHEN REVIEWING BROWN'S NOTES

| TOTAL POPULATION | SECTIONS | | | | TOTAL |
|---|---|---|---|---|---|
| | H | U | O | K | |
| 1 the form of the notes | 2 | 3 | 7 | 3 | 15 |
| 2 How important points are identified | 2 | 4 | 7 | 4 | 17 |
| 3 How he plans to use the notes | 2 | 4 | 7 | 3 | 16 |
| 4 How the conclusion of the talk has been prepared | 1 | 3 | 6 | 3 | 13 |
| 5 How technical terms are defined | 2 | 3 | 7 | 4 | 16 |
| 6 Whether questions are included in the notes | 2 | 3 | 7 | 3 | 15 |

**TABLE 40**

ANALYSIS OF BROWN'S STRENGTHS AND WEAKNESSES

| TOTAL POPULATION | SECTION T | | |
|---|---|---|---|
| | A Important to lecture quality | B Applies to Dr. Brown | C Does not apply to Dr. Brown |
| 1 Lecture content should be adapted to student backgrounds | 86 | 61 | 23 |
| 2 Lecture should be paced according to the listening and notetaking skills of students | 75 | 51 | 24 |
| 3 Students should be provided with an understanding of what the lecture(s) will cover | 90 | 64 | 21 |
| 4 The lecturer should clarify that his/her responsibilities are limited to presenting the material | 6 | 3 | 11 |
| 5 The lecturer should emphasize the most important points in the presentation | 96 | 86 | 8 |
| 6 Redundancies should be minimized to permit maximum efficiency in presentation | 32 | 20 | 26 |
| 7 Lecturer should engage the students through the use of questions | 78 | 77 | 3 |
| 8 Students should be challenged by problems dealing with the subject matter | 82 | 77 | 4 |
| 9 Lecture format should be adapted to the instructor's goals | 64 | 42 | 21 |

TOTAL POPULATION TABLE 40 (Cont'd)

| | | | |
|---|---|---|---|
| 10 Lecturer should generate enthusiasm about his/her subject | 90 | 84 | 5 |
| 11 Verbal presentation should be supplemented with appropriate visual aids | 90 | 82 | 5 |
| 12 General points should be illustrated with specific examples | 89 | 83 | 5 |
| 13 Opportunity should be provided during the lecture for student questions | 89 | 82 | 7 |
| 14 Lecture material should be organized for ease of comprehension | 89 | 55 | 30 |
| 15 New terms should be carefully defined | 90 | 40 | 46 |
| 16 Lecturer should check with students to assure that complex material is being understood | 88 | 86 | 3 |
| 17 Summaries should be interspersed throughout the lecture | 73 | 70 | 3 |
| 18 Whenever feasible, the clinical application of the material should be emphasized | 85 | 75 | 9 |
| 19 Complex issues and detailed lists should be distributed as handouts | 82 | 53 | 29 |
| 20 Conflicting data should be avoided to reduce confusion | 39 | 17 | 25 |

TABLE 41
RECOMMENDATIONS

| TOTAL POPULATION | | SECTION R |
|---|---|---|
| 1 Read about lecturing techniques in some public speaking and education texts, and in education journals | A Probably should<br>B Probably should not | 51<br>40 |
| 2 Read about lecturing in medical education journal articles | A Probably should<br>B Probably should not | 53<br>38 |
| 3 Talk with competent lecturers at the medical school about how they lecture | A Probably should<br>B Probably should not | 77<br>17 |
| 4 Talk with students about what they look for in a lecture | A Probably should<br>B Probably should not | 79<br>16 |
| 5 Seek assistance from an educational specialist about how to improve his lecturing | A Probably should<br>B Probably should not | 54<br>36 |
| 6 Observe people recognized as being good lecturers and then try some of their techniques | A Probably should<br>B Probably should not | 93<br>3 |
| 7 Go over the lecture notes more thoroughly in order to be better prepared | A Probably should<br>B Probably should not | 32<br>57 |
| 8 Work with you (you will observe him and give him feedback) on his lecturing | A Probably should<br>B Probably should not | 74<br>19 |
| 9 Arrange to give some additional lectures in order to gain experience | A Probably should<br>B Probably should not | 67<br>24 |
| 10 Arrange to have his lectures videotaped so he can review his own performance | A Probably should<br>B Probably should not | 85<br>11 |

TABLE 42

Standard Errors for the "Lecturing" Simulation

| OPTION | STANDARD ERROR | OPTION | STANDARD ERROR | OPTION | STANDARD ERROR | OPTION | STANDARD ERROR |
|---|---|---|---|---|---|---|---|
| A1 | 1 | H5 | 0 | R2B | 2 | T12C | 1 |
| A2 | 1 | H6 | 1 | R3A | 2 | T13A | 1 |
| A3 | 2 | J1 | 1 | R3B | 2 | T13B | 2 |
| A4 | 1 | J2 | 1 | R4A | 2 | T13C | 1 |
| B1 | 1 | J3 | 1 | R4B | 1 | T14A | 1 |
| B2 | 1 | J4 | 1 | R5A | 2 | T14B | 2 |
| B3 | 1 | J5 | 1 | R5B | 2 | T14C | 2 |
| B4 | 1 | J6 | 1 | R6A | 1 | T15A | 1 |
| B5 | 1 | J7 | 1 | R6B | 1 | T15B | 2 |
| B6 | 1 | J8 | 1 | R7A | 2 | T15C | 2 |
| B7 | 1 | J9 | 1 | R7B | 2 | T16A | 1 |
| B8 | 1 | J10 | 1 | R8A | 2 | T16B | 1 |
| B9 | 1 | K1 | 1 | R8B | 2 | T16C | 1 |
| C1 | 1 | K2 | 1 | R9A | 2 | T17A | 2 |
| C2 | 1 | K3 | 1 | R9B | 2 | T17B | 2 |
| C3 | 1 | K4 | 1 | R10A | 2 | T17C | 1 |
| C4 | 1 | K5 | 1 | R10B | 2 | T18A | 1 |
| C4 | 1 | K6 | 1 | S1 | 1 | T18B | 2 |
| C5 | 1 | L1 | 1 | S2 | 1 | T18C | 1 |
| C6 | 1 | L2 | 1 | S3 | 1 | T19A | 2 |
| C7 | 1 | L3 | 1 | S4 | 1 | T19B | 2 |
| C8 | 1 | L4 | 1 | S5 | 1 | T19C | 2 |
| C9 | 1 | L5 | 1 | S6 | 1 | T20A | 2 |
| C10 | 1 | L6 | 1 | S7 | 1 | T20B | 2 |
| D1 | 1 | L7 | 1 | S8 | 1 | T20C | 2 |
| D2 | 1 | L8 | 1 | S9 | 1 | U1 | 1 |
| D3 | 1 | L9 | 1 | T1A | 1 | U2 | 1 |
| D4 | 1 | L10 | 1 | T1B | 2 | U3 | 1 |
| D5 | 2 | M1 | 1 | T1C | 2 | U4 | 1 |
| E1 | 1 | M2 | 1 | T2A | 2 | U5 | 1 |
| E2 | 1 | M3 | 1 | T2B | 2 | U6 | 1 |
| E3 | 1 | M4 | 1 | T2C | 2 | W1 | 2 |
| E4 | 1 | M5 | 1 | T3A | 1 | W2 | 1 |
| E5 | 1 | M6 | 1 | T3B | 2 | W3 | 1 |
| E6 | 1 | M7 | 1 | T3C | 2 | W4 | 1 |
| E7 | 1 | M8 | 1 | T4A | 1 | W5 | 1 |
| E8 | 1 | M9 | 1 | T4B | 1 | W6 | 1 |
| E9 | 1 | N1 | 1 | T4C | 1 | W7 | 1 |
| F1 | 1 | N2 | 1 | T5A | 1 | W8 | 1 |
| F2 | 1 | N3 | 1 | T5B | 1 | W9 | 1 |
| F3 | 1 | N4 | 1 | T5C | 1 | W10 | 1 |
| F4 | 1 | N5 | 1 | T6A | 2 | X1 | 2 |
| F5 | 1 | N6 | 1 | T6B | 1 | X2 | 2 |
| F6 | 1 | N7 | 1 | T6C | 2 | X3 | 1 |
| F7 | 1 | N8 | 1 | T7A | 2 | X4 | 1 |
| F8 | 1 | N9 | 1 | T7B | 2 | X5 | 2 |
| F9 | 1 | O1 | 1 | T7C | 1 | Y1 | 2 |
| G1 | 2 | O2 | 1 | T8A | 2 | Y2 | 2 |
| G2 | 2 | O3 | 1 | T8B | 2 | Y3 | 2 |
| G3 | 2 | O4 | 1 | T8C | 1 | Y4 | 4 |
| G4 | 1 | O5 | 1 | T9A | 2 | Y5 | 2 |
| G5 | 2 | O6 | 1 | T9B | 2 | Y6 | 2 |
| G6 | 2 | P1 | 1 | T10A | 1 | Y7 | 2 |
| G7 | 2 | P2 | 1 | T10B | 2 | Y8 | 2 |
| G8 | 2 | P3 | 1 | T10C | 1 | Y9 | 2 |
| G9 | 2 | P4 | 1 | T11A | 1 | | |
| H1 | 0 | P5 | 2 | T11B | 1 | | |
| H2 | 1 | R1A | 2 | T11C | 1 | | |
| H3 | 0 | R1B | 2 | T12A | 1 | | |
| H4 | 0 | R2A | 2 | T12B | 2 | | |

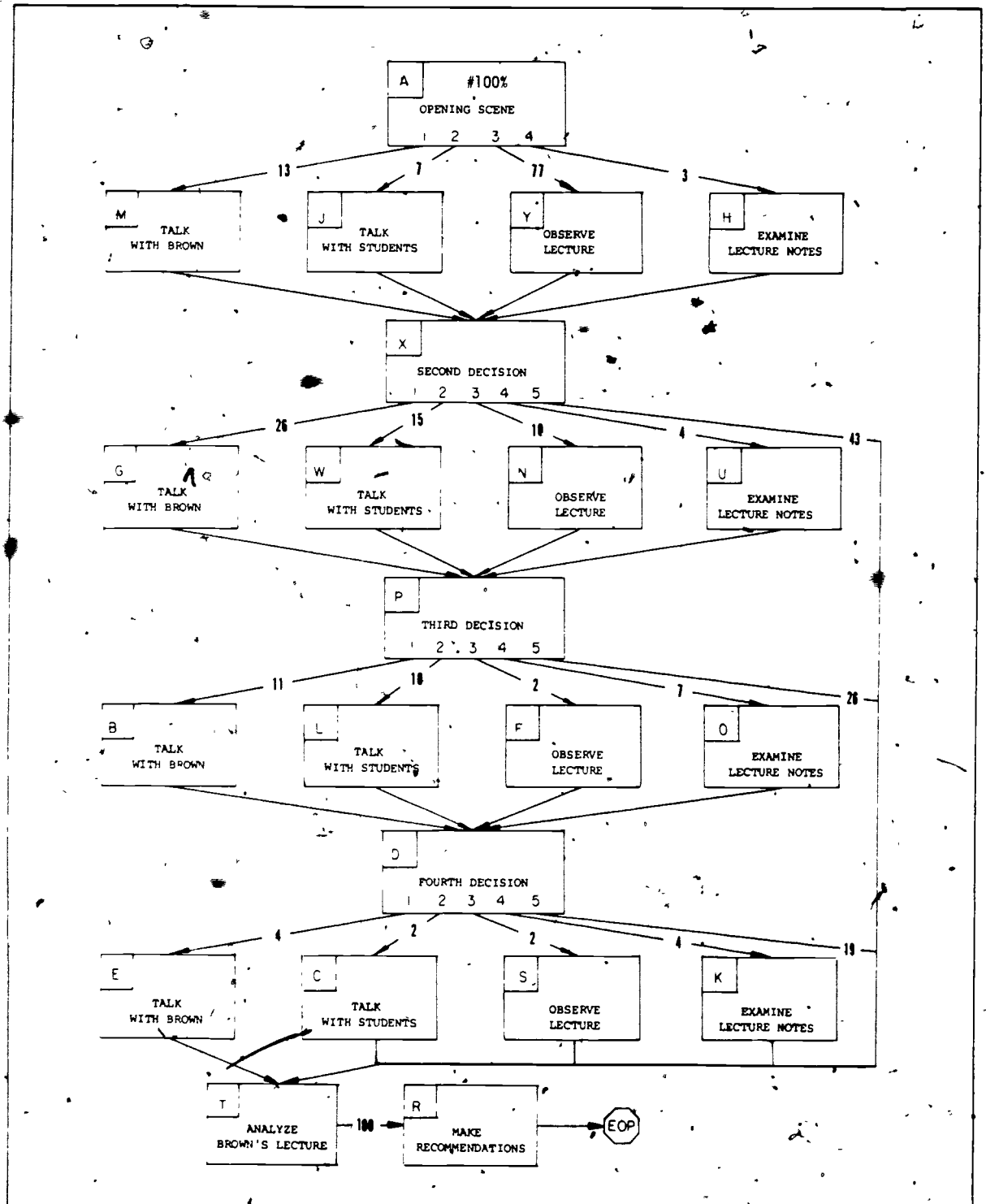


FIGURE TOTAL POPULATION RESULTS FOR "LECTURING" SIMULATION (Numbers are estimated percentages of the population selecting the option indicated.)

# VII. COURSE SEGMENT DESIGN

## INTRODUCTION

The design of a course is an educational responsibility that #92%[75] of medical faculty feel they should be able to manage. Only #12%, however, have ever taken a formal course in instructional design and only #25% have ever attended a workshop on this topic. Of that group 92% consider these experiences valuable. It may be reasonable to expect, therefore, that the approaches used by faculty are more reflective of traditional practices or of their intuitive judgments about instructional design than specific educational principles learned in a formal manner.

In this simulation the respondent is assigned the role of a faculty member responsible for the design of a segment of a larger course. Apparently, this is a common responsibility. Seventy-two percent (#72%) indicate they would find themselves in a situation like the one described, and #87% regard the simulation as realistic. Eighty-two percent (#82%) say that their management of this simulation's problem reflects the way they actually manage problems in their teaching.

## KEY FEATURES OF THE SIMULATION

This simulation was designed to explore:

A. the approaches faculty members use in designing a segment of instruction (how they decide what to teach, the instructional methods they use),

B. the extent to which faculty base the instruction they design on explicitly formulated goals, and

C. the approaches faculty use in evaluating the instruction provided (the evaluation of students, the course, and their own performance).

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[75] For a discussion of the percentage symbols in this report, see Chapter 1, pages 9 - 10.

The simulation begins as follows:

Your department chairman has asked you to assume responsibility for a 9-hour segment of instruction dealing with your speciality as part of the introductory course your department offers. You are to plan the use of this time however you see fit. You begin working by **(CHOOSE ONLY ONE)**.

A1 Identifying what subject matter should be taught

A2 Considering the instructional options available (e.g., lecture discussion)

A3 Determining whether and how to evaluate the students and/or the instruction

A4 Learning how others in the department are handling their segments of the course

A5 Finding out in more detail what your department chairman expects of you

The following is the situation that faces the respondent:

1. This is an introductory course, which suggests that student backgrounds are likely to vary.

2. The 9-hour segment is part of a larger course, so the instructional goals should relate to the broader goals of the full course.

THE MOST COMMON ROUTES (See Figure 11)

The opening scene presents a task which is relatively unspecified. This places a demand on the respondents to consider both the kinds of information they regard as relevant to designing a course and the sequence (route) in which they believe the decisions concerning this information should be made.

A. Sources of Information

The decisions on what to teach relate directly to what the students are expected to learn. The critical issue is deciding whose input will be included. The respondents to this simulation are given the oppourtunity to consult with students, colleagues, and practicing physicians, in addition to using their own expertise as a

basis for deciding what should be taught (Table 43).

Most faculty (#87%) include their own judgements in making the content decision. While this is a natural and appropriate choice, faculty designers of introductory courses need to be careful not to overestimate the readiness of students for detailed information in their own specialty area. One way to help assure a reasonable balance is to secure the views of others, outside one's discipline.

The decision to ask colleagues about what students need to know is made by #62% of the respondents. This is an important decision, since it focuses on the learning objectives and not simply on the teaching techniques. Sixty-seven percent (#69%) also ask their colleagues what they are planning to teach so they can co-ordinate the various presentations. This consideration is critical because it assists the faculty in avoiding undesirable redundancies and omissions.

Forty percent (#40%) include a meeting with practicing physicians. This is an impressive response (especially for an introductory course); it suggests that many faculty realize the value of relating what they teach to what students need to know for medical practice.

The other source of information is students. While #53% ask past students what would be useful, only #26% discuss the course with the present class. Perhaps the reluctance to discuss the course with the latter group reflects the attitude that students come to an instructional experience with no background in the area and have nothing to contribute. This ignores the need to determine the student's entry level skills and knowledge, and their expectations for the course.

Next, faculty are asked to describe what will be taught. Fifty-seven percent (#55%) produce a topic outline, while 36% (#34%) include both a topical outline and a set of behavioral objectives. The remaining 8% (#7%) write either a brief narrative or a set of behavioral objectives. Therefore, over half the faculty prepare a proposal describing what will be taught (topic outlines), but neglect describing how students will show that they have learned the material at a particular level of competency (objectives).

TABLE 43

SOURCES OF INFORMATION ON WHAT COURSE CONTENT SHOULD BE

| TOTAL POPULATION | SECTIONS | | | | TOTAL |
|---|---|---|---|---|---|
| DESCRIPTION OF OPTIONS | E | P | Z | BB | |
| 1 Talk to students enrolled in the course | 0 | 26 | 0 | 1 | 27 |
| 2 Talk to students who took the course | 0 | 53 | 0 | 1 | 54 |
| 3 Talk to colleagues about what they feel needs to be taught | 0 | 62 | 0 | 1 | 63 |
| 4 Talk to colleagues about what they will teach | 0 | 67 | 1 | 2 | 70 |
| 5 Review what you believe should be covered | 0 | 87 | 0 | 1 | 88 |
| 6 Talk to practicing physicians | 0 | 40 | 0 | 1 | 41 |

The ninety-six percent (#96%) who begin this route are next asked to choose among examining the instructional options available (e.g., lecture, discussion), preparing an evaluation plan, or submitting their present work as a final proposal. Seventy-seven percent (#74%) examine the teaching techniques available, 10% (#9%) begin an evaluation plan, and 13% (#12%) end the problem at this point. The choice between the first two options can be debated. The decision to exclude these important issues entirely in the instructional process, however, is unwarranted. Instructional and evaluation plans must be formulated before this task can be considered successfully managed.

B. Instructional Considerations

As stated, 77% (#74%) decide at this point to examine the instructional options available. Eleven percent (#10%) do so after completing their evaluation plan. For the purpose of this analysis, these groups will be combined. Whether instructional methods or evaluation should be decided first will be reviewed with the discussion of the optimal route. The findings presented below reflect which issues faculty consider relevant to the design of instruction (Table 44).

Ninety-one percent (#76%) inquire about the physical facilities available, 77% (#65%) determine the availability of other faculty for assisting in the course, and 58% (#49%) check the possibilities for producing self-instructional materials.

Sixty-seven percent (#56%) talk to their colleagues to determine what teaching format their colleagues prefer, but only 35% (#29%) consider how the students view the various teaching approaches.

The first three issues relate to the resources available in support of the course and the reasons for examining these are clear. The rationale for the last two is more subtle, but they do relate directly to increasing the quality of the instructional process. Again, most faculty do not consider students relevant sources of information regarding aspects of their own education.

TABLE 44

INSTRUCTIONAL CONSIDERATIONS

| TOTAL POPULATION<br>DESCRIPTION OF OPTIONS | SECTIONS | | | | TOTAL |
|---|---|---|---|---|---|
| | G | U | CC | FF | |
| 1. Determine physicial facilities | 7 | 0 | 67 | 3 | 77 |
| 2. Determine how many colleagues will be available to assist you | 6 | 0 | 57 | 3 | 66 |
| 3. Determine students expectations | 4 | 0 | 24 | 1 | 29 |
| 4. Determine teaching style colleagues prefer | 6 | 0 | 47 | 3 | 56 |
| 5. Check facilities for producing instructional materials | 5 | 0 | 43 | 1 | 49 |

C. Instructional Approach

The next step in the instructional design process is to determine what will be emphasized in the course and how the 9 hours of instruction will be used. Seventy-seven percent (#74%) make this decision directly after determining the availability of administrative and faculty resources. Another 8% (#7%), however, address this issue only after developing their evaluation plan and determining the availability of faculty and physical resources. Since all respondents are provided the same options at this point, the findings for these two groups are combined below.

33% (#32%) "Offer 3 hours of lecture to cover facts and concepts and 6 hours of discussion to consider applications of the concepts and provide experience in using them to solve problems. Worksheets will be used as necessary." (W2)

20% (#19%) "Schedule 6 hours of lecture to cover concepts and applications with handouts as necessary. Reserve 3 hours for tutoring students having problems or interested in doing further work." (W3)

20% (#19) "Produce self-instructional materials to present concepts and facts (these will be used outside of class by the students). The 9 instructional hours will be spent in small group discussions of the concepts and their use in solving problems. Worksheets will be used as necessary." (W4)

9% (#8%) "Schedule 3 hours of lecture covering the material to be taught and 6 hours of discussion to answer students' questions and consider their problems. Handouts will be used as appropriate." (W1)

5% (#4%) "Distribute reading lists to the students with citations covering the concepts and facts to be learned. Use the 9 hours of instructional time for small group discussions of difficulties the students have in understanding the readings and for solving problems using the concepts and facts presented." (W5)

It should be noted that faculty differ considerably on the issue of how much time should be spent in didactic presentations rather than in applying the concepts. While there is certainly no formula for an optimal balance, there is some evidence that class time is best

spent solving problems, using information that was learned outside of class.

At this point, the respondent is asked to choose between submitting the final proposal or developing an evaluation plan. Seventeen percent (#16%) decide to terminate the problem. When this #16% is added to the #12% who ended the problem after only determining what will be taught, we have #28% who include no evaluation plan in their instructional design.

D. Evaluation Plan

The task outlined in the opening scene gives the respondent very little direction on how to design his/her segment of the course. There is no specification, for instance, that a plan for evaluating instruction should be included. If the focus is on what the student is to learn, however, it is necessary to determine the extent to which the goals of instruction have been accomplished. Only #72% include an evaluation plan. The findings reported below are for this subgroup.

Forty-six percent of this group (#33%) include a pretest to determine the students' readiness for the instruction. While some may argue that this step is not necessary in an introductory course, it must be noted that the goal of designing a course relevant to what students need to learn can best be accomplished if it is known where the students are when they begin instruction. There is no basis for assuming that beginning medical students all have no background in the subject of the course.

Sixty-two percent (#45%) recommend that questions relevant to their segment be included in a common examination of the total course, 43% (#31%) decide to conduct their own evaluation of the 9-hour segment, and 19% (#14%) include a brief quiz following each day's presentation. Thirty-seven percent (#37%) include no posttest in their plans despite the two available options to do so.

Sixty-eight percent (#49%) ask the students to evaluate the 9-hour segment of teaching, but only 25% (#18%) collect feedback from the students on each day's presentation.

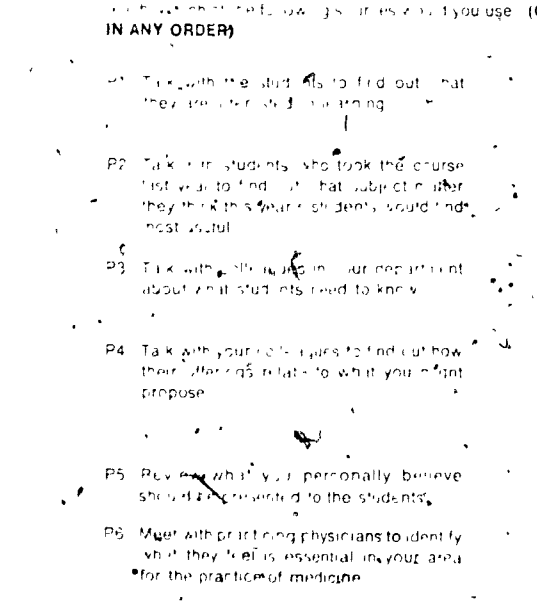
Forty-nine percent (#35%) ask faculty colleagues to critique their teaching, while only 24% (#17%) believe any self-evaluation activities should be included in the

evaluation process. Forty percent (#40%) indicate that they would not include any evaluation of instruction for their 9-hour segment of the course. While a large portion of faculty (#72%) include some evaluation plan as part of their instructional design, many faculty do not: use a pretest in this situation (#67%); include a post-test based on the 9-hour segment (#69%); or arrange for peer review of their teaching (#65%). One possible explanation is that faculty do not view a 9-hour segment of instruction as long enough to warrant such evaluation. Time, however, should not be the issue. Anything worth teaching is worth evaluating.

THE OPTIMAL ROUTE (See Figure 10)

The route discussed below is followed by #17% of the respondents. The rationale for each decision is provided and is based on the primary consideration that any instructional activity must focus on what the students are expected to learn.

The first decision involves the determination of what content the 9-hour segment will include (A1). There are six sources of information available to the instructor. It is recommended that all six be included, since each represents a unique perspective on what students need to know. (The simulation text for this section is below.) The two most debatable sources are practicing


There are a number of sources of information about what knowledge and skills students need to [illegible] you use (CHOOSE AS MANY AS ARE APPROPRIATE IN ANY ORDER)

P1 Talk with the students to find out what they already know

P2 Talk with students who took the course last year to find out what subjects they think this year's students should find most useful

P3 Talk with people in your department about what students need to know

P4 Talk with your colleagues to find out how their offerings relate to what you might propose

P5 Review what you personally believe should be covered in the course

P6 Meet with practicing physicians to identify what they feel is essential in your area for the practice of medicine

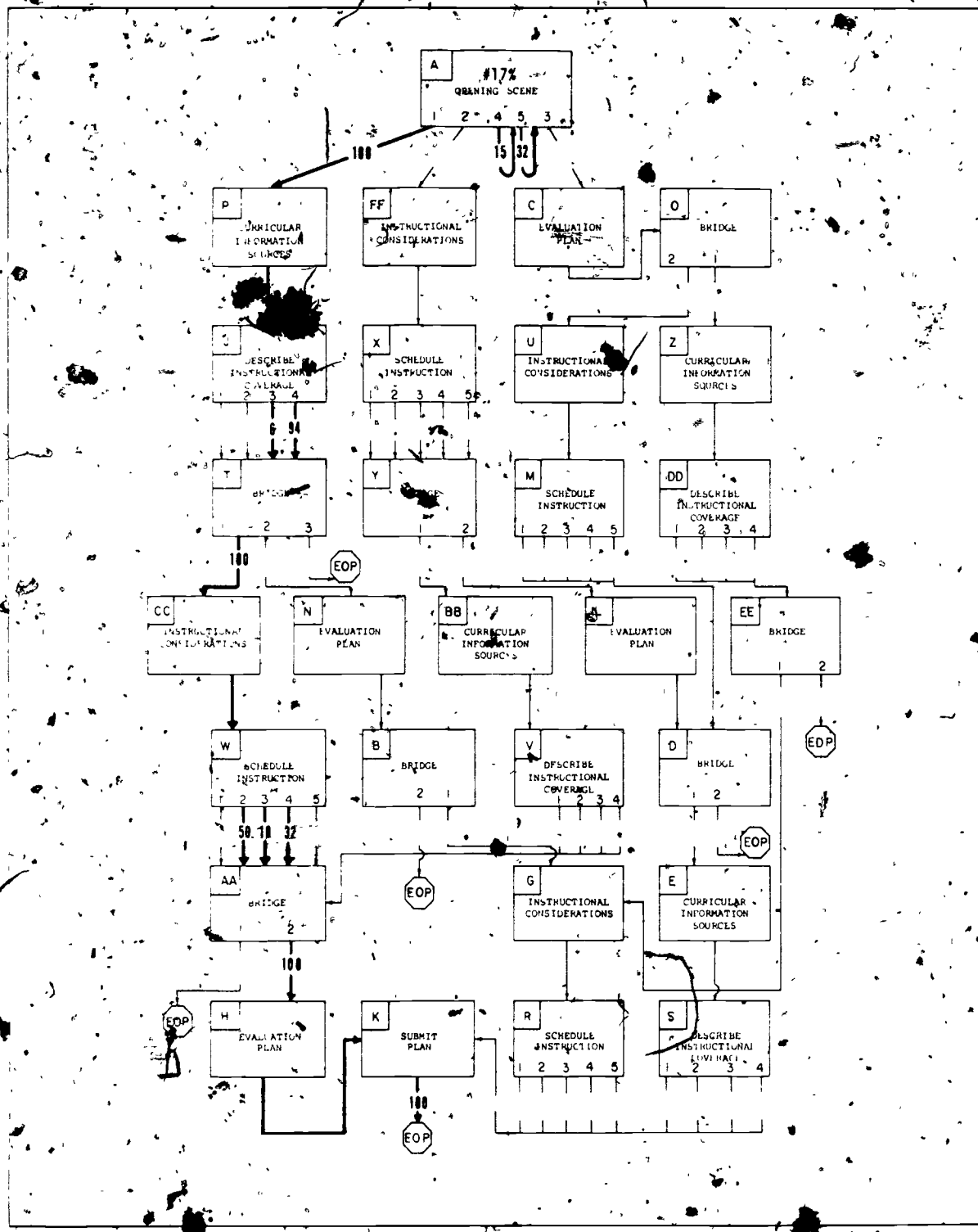



FIGURE 10. "OPTIMAL" ROUTE FOR COURSE SEGMENT DESIGN SIMULATION

physicians and the students enrolled to take the course. With respect to the first group, it could be argued that an introductory course, particularly if it is in the basic sciences, need not be directly related to clinical practice. A faculty member's task is to select from a broad discipline that segment that s/he will teach. What criteria will be used? If the general goal of medical school is the preparation of physicians, then in the design of any course, practicing physicians can provide a perspective deserving consideration.

As noted earlier, most faculty apparently do not view the enrolled students as a valuable source of information on what should be taught. While it is certainly unlikely that the students will be competent in the subject area prior to instruction, it is also improbable that all students will be equally unprepared for the instruction. Asking students what interests them could reveal differences in background and expectations, which are important considerations in the shaping of any new instructional activity.

The next step is to translate the scope of the 9-hour segment into a written proposal. The choices are a topic outline (J1), a brief narrative description (J2), behavioral objectives (J3), or topic outline and objectives (J4). The first two options (J1 and J2) are not recommended since they fail to address what the students are expected to learn. The other two options (J3 and J4), however, are defensible. A set of behavioral objectives expresses not only what will be taught, but also what students must know or be able to do to be competent in this unit of instruction. This step assists the faculty in the evaluation process by specifying what will qualify as a demonstration of content mastery. The additional step of preparing a topical outline is not necessary, but would have the value of organizing individual presentations.

Once learning objectives are specified, it is necessary to decide whether to address the evaluation issues or to determine instructional methods (e.g., lecture, discussion) for presenting the material. It is recommended that the decision on how to present the material be made first. The logic is that the evaluation process should go beyond student evaluation and include an evaluation of the entire instructional activity (i.e., instructor and

instruction). These aspects could easily be neglected if the evaluation design precedes other instructional decisions.[76]

The options related to the instructional approach (Section CC) embrace a broad spectrum of educational and administrative issues (refer to Table 44, p.144). All these issues should be addressed with the possible exception of checking facilities for producing self-instructional materials, (CC5), which can be regarded as optional. The availability of colleagues and their preference for teaching styles as well as the physical facilities will all influence the instructional approach. Small group discussions, for instance, will require additional faculty who are comfortable working with students using this method. Equally important is the consideration of student expectations for various instructional approaches. If students are accustomed to a fairly structured and teacher-centered approach, and small group discussions are desired, the students should be oriented to their role in this new setting.

The next task is to select an approach for teaching the 9-hour segment (refer to p.145). Options W2 or W4 are considered optimal as they both emphasize applying knowledge to the solving of problems. The other three options either ignore this or include it only indirectly. The preferred options also maximize the value of class time by assisting students in learning the didactic information outside the class, thereby allowing the 9 hours to be used for learning the application of this information.

The respondent can now either submit the final proposal or design an evaluation plan for the instruction. Despite the brevity of the instructional activity, the recommendation is that an evaluation plan be included (AA2). Again, if it is worth the effort to teach, it is worth the additional effort to find out whether learning took place.

There are three issues included among the options for the evaluation plan: the consideration of a pretest, the evaluation of student achievement (a posttest), and

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[76]This logic applies to the relatively unsophisticated evaluations implied in this simulation. Ideally, the evaluation should be planned at the same time as the instruction.

the evaluation of the instruction/instructor. The inclusion of the latter two is considered essential, while a pretest is viewed as optional in a course that is this brief. It would be helpful, however, to gain some insights into the students' readiness for this instruction, particularly since this 9-hour segment is part of a larger course. Even an informal discussion with the students would be a contribution.

The evaluation of student learning, however, is not optional. Since the focus is on what students need to learn, some assessment of their competence at the end of instruction is required. A comprehensive examination at the end of the 9-hour segment or the inclusion of a number of questions in the course final are both recommended, though either one alone is satisfactory. A quiz after each day's class is not necessary, especially if application of principles and problem solving skills are being stressed. These skills can be assessed informally in the small group sessions.[77]

The evaluation process should go beyond assessing the students' progress and determine the instructor's effectiveness in facilitating the accomplishment of the objectives. Options H6-H9 address this consideration and it is recommended that at least one of these procedures by included. (The simulation text for this section is below.) Optimally, input from both colleagues and

H6 A questionnaire to be filled out by the students at the end of each day's teaching to provide feedback on how they perceived instruction that day

H7 A questionnaire to be distributed to the students on the last day of instruction to find out how they viewed the week's teaching

H8 Self-report forms to be filled out by each instructor evaluating his or her contribution

H9 Observation and critique of the teaching by other faculty members

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[77]There is evidence, however, that a brief quiz made up of open-ended (e.g., completion or short answer) questions does facilitate long-term retention.

students should be collected, since each has a different perspective on instruction. This feedback would assist the instructor in improving both this series of presentations and his/her teaching in general.

## CONCLUSIONS

The design of any instructional activity requires attention to many issues. The most important considerations are: what will be taught, how it will be taught, each student's readiness for the instruction, and how it will be evaluated.

The findings from this study suggest that faculty do neglect some of these considerations in the design of courses or course segments.

### A. The Primary Areas of Concern

1. Almost three-fourths of faculty members (#74%) overlook student expectations for the course and #71% do not consider student learning styles in making their instructional decisions.

2. A majority of faculty (#56%) focus on the presentation of basic facts without attention to the application of the facts in solving problems.

3. A high percentage of faculty (#60%) do not use objectives to describe what the students are expected to learn.

4. Over one-fourth (#28%) include no evaluation plan.

5. Less than half of the faculty (#49%) ask students to contribute to the evaluation of the instructors.

### B. Encouraging Findings

1. Most faculty consult their colleagues on what students need to know (#61%), and coordinate their segment of the course with other faculty (#69%).

2. Many faculty (#41%) consult with practicing physicians on what should be taught.

3. Over one-third (#35%) ask colleagues to critique their teaching.

4. Sixty-three percent (#63%) include a posttest at the end of instruction to evaluate student performance.

TABLE 45

INFORMATION TO BE INCLUDED IN THE EVALUATION PLAN

| TOTAL POPULATION | SECTIONS | | | | TOTAL |
|---|---|---|---|---|---|
| DESCRIPTION OF OPTIONS | C | H | L | N | |
| 1 Give no test at all | 0 | 2 | 0 | 0 | 2 |
| 2 Give a pretest. | 0 | 27 | 0 | 5 | 32 |
| 3 Give a series of daily quizzes | 0 | 10 | 0 | 2 | 12 |
| 4 Give a comprehensive test at week's end | 1 | 25 | 1 | 4 | 31 |
| 5 Questions covering this instruction would be on the final exam | 1 | 37 | 0 | 5 | 43 |
| 6 Give a daily questionnaire gathering students' views on the day's teaching | 0 | 15 | 0 | 1 | 16 |
| 7 Give a questionnaire at week's end to gather students' views on the instruction they've received | 1 | 42 | 0 | 6 | 49 |
| 8 Ask teachers to complete evaluative self-report forms | 0 | 15 | 0 | 2 | 17 |
| 9 Observation and critique of instruction by other faculty members | 1 | 30 | 0 | 5 | 36 |

TABLE 46

Standard Errors for the "Course Segment Design" Simulation

| OPTION | STANDARD ERROR | OPTION | STANDARD ERROR | OPTION | STANDARD ERROR |
|---|---|---|---|---|---|
| A1 | 1 | L4 | 0 | V2 | 0 |
| A2 | 1 | L5 | 0 | V3 | 0 |
| A3 | 0 | L6 | 0 | V4 | 1 |
| A4 | 1 | L7 | 0 | W1 | 1 |
| A5 | 2 | L8 | 0 | W2 | 2 |
| B1 | 1 | L9 | 0 | W3 | 2 |
| B2 | 1 | M1 | 0 | W4 | 1 |
| C1 | 0 | M2 | 0 | W5 | 1 |
| C2 | 0 | M3 | 0 | X1 | 0 |
| C3 | 0 | M4 | 0 | X2 | 1 |
| C4 | 0 | M5 | 0 | X3 | 0 |
| C5 | 0 | N1 | 0 | X4 | 0 |
| C6 | 0 | N2 | 1 | X5 | 0 |
| C7 | 0 | N3 | 1 | Y1 | 1 |
| C8 | 0 | N4 | 1 | Y2 | 1 |
| C9 | 0 | N5 | 1 | Z1 | 0 |
| D1 | 0 | N6 | 0 | Z2 | 0 |
| D2 | 0 | N7 | 1 | Z3 | 0 |
| E1 | 0 | N8 | 1 | Z4 | 0 |
| E2 | 0 | N9 | 1 | Z5 | 0 |
| E3 | 0 | O1 | 0 | Z6 | 0 |
| E4 | 0 | O2 | 0 | AA1 | 2 |
| E5 | 0 | P1 | 2 | AA2 | 2 |
| E6 | 0 | P2 | 2 | BB1 | 0 |
| G1 | 1 | P3 | 2 | BB2 | 0 |
| G2 | 1 | P4 | 2 | BB3 | 0 |
| G3 | 1 | P5 | 1 | BB4 | 1 |
| G4 | 1 | P6 | 2 | BB5 | 1 |
| G5 | 1 | R1 | 0 | BB6 | 0 |
| H1 | 1 | R2 | 1 | CC1 | 2 |
| H2 | 2 | R3 | 0 | CC2 | 2 |
| H3 | 1 | R4 | 1 | CC3 | 2 |
| H4 | 2 | R5 | 0 | CC4 | 2 |
| H5 | 2 | S1 | 0 | CC5 | 2 |
| H6 | 2 | S2 | 0 | DD1 | 0 |
| H7 | 2 | S3 | 0 | DD2 | 0 |
| H8 | 2 | S4 | 0 | DD3 | 0 |
| H9 | 2 | T1 | 2 | DD4 | 0 |
| J1 | 2 | T2 | 1 | EE1 | 0 |
| J2 | 1 | T3 | 1 | EE2 | 0 |
| J3 | 1 | U1 | 0 | FF1 | 1 |
| J4 | 2 | U2 | 0 | FF2 | 1 |
| K | 2 | U3 | 0 | FF3 | 0 |
| L1 | 0 | U4 | 0 | FF4 | 1 |
| L2 | 0 | U5 | 0 | FF5 | 0 |
| L3 | 0 | V1 | 0 | | |

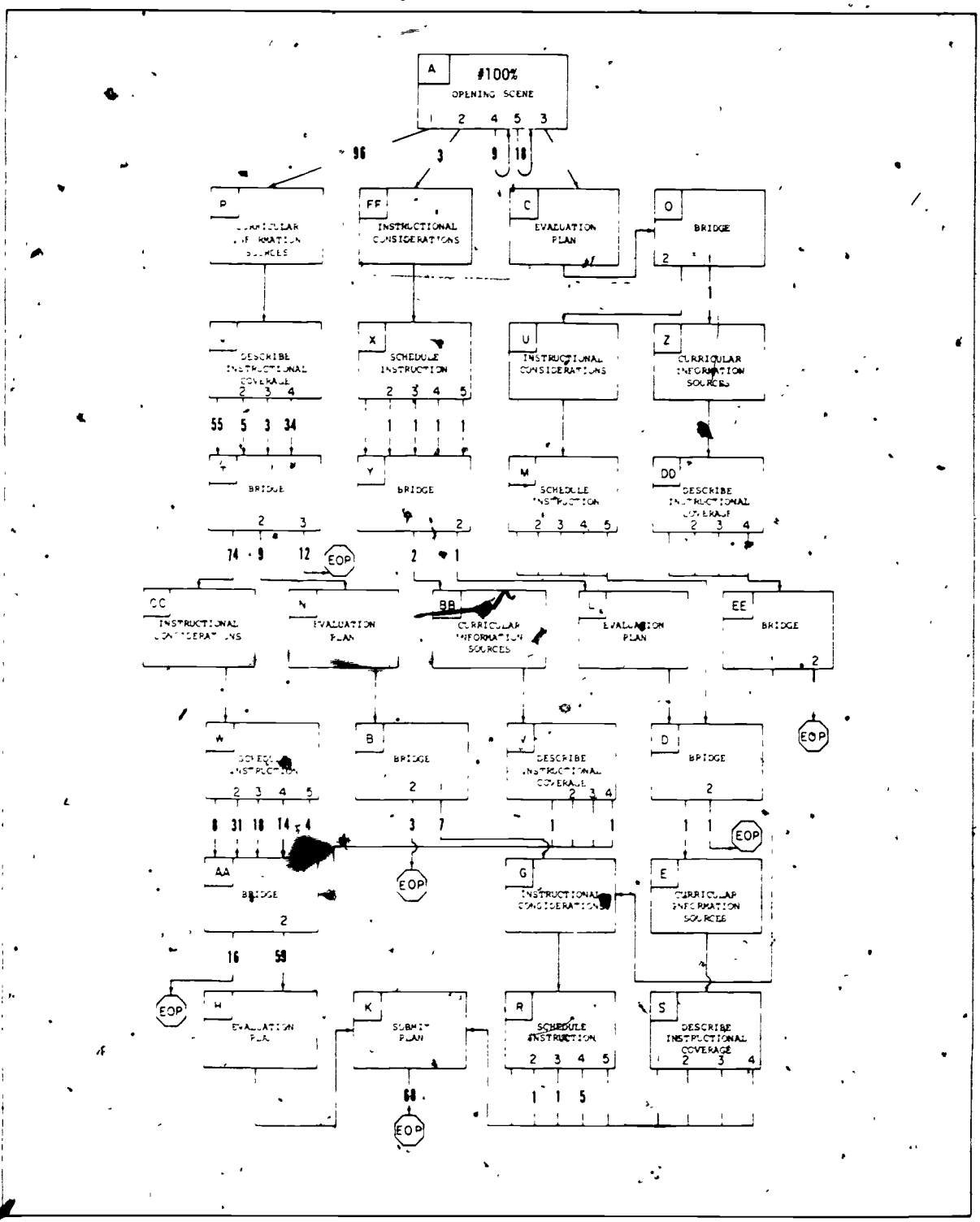


FIGURE 11· TOTAL POPULATION RESULTS FOR "COURSE SEGMENT DESIGN" SIMULATION (Numbers are estimated percentages of the population selecting the option indicated.)

# VIII. TEST CONSTRUCTION

## INTRODUCTION

Test construction is a responsibility #91% of medical faculty members feel they should be able to manage.[78] Only #12%, however, have ever taken a course in evaluation or testing and only #23% have attended a workshop on that topic. There is interest in learning about these matters; #49% of the faculty would like to receive printed material on test construction and an additional #30% express interest in attending a workshop on this topic.

The respondent's role in this simulation, chairperson of a committee constructing a final examination, is familiar to medical faculty members. Fifty-seven percent (#57%) indicated they would expect to find themselves in a similar situation and #87% described the situation in the simulation as "realistic".

## KEY FEATURES OF THE SIMULATION

At least three criteria must be met in constructing a good achievement test.

A. Each student must be graded on the basis of his/her own merit, i.e., on the basis of his/her demonstration of skill or knowledge.

B. Test questions must be straight-forward and clear, without ambiguity or artificial complexity.

C. Instructions to the students must be available and clear so that prior experience with the teacher's tests, or other tests with similar idiosyncrasies, is not a requirement for good performance.

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[78]For a discussion of the percentage symbols in this report, see Chapter 1, pages 9-10.

The simulation begins as follows:

"TEST CONSTRUCTION"

You have been asked to assume the primary responsibility for constructing the final examination for an interdisciplinary course required of all 112 second year medical students. There are two other faculty members who have agreed to assist you. The three of you are members of the 9-person interdisciplinary course committee that designed the course.

The final examination will account for 50% of each student's grade, though no explicit course committee or school policy exists on how to assign grades (e.g. on the curve, pass/fail). To facilitate quick scoring, the test should consist of 100 objective questions.

The course coordinator requested that all faculty members involved in this course write objectives for the material they are responsible for teaching. These written objectives are available to you. An educational specialist and some students who have previously taken the course are also available if you choose to use them.

You begin work by **(CHOOSE ONLY ONE)**

A1 Deciding who will take the responsibility for writing the first draft of the test questions

A2 Deciding how grades will be assigned (e.g. on the curve, pass/fail)

A3 Determining the subject content the test will cover

In the opening scene, three problems confront the respondent in terms of the test construction criteria stated above.

1. No policy exists on how to assign grades. Criterion A requires that grades be awarded on the basis of the way each student performs without regard to the way others have done. Norm-referenced examinations do not meet this criterion because they assign grades on the basis of relative ranking. This is not the information that teachers of medical students need to know; they need to know that every student has attained an acceptable level of knowledge about the subject. In instructional circumstances as described here, therefore, the respondent should choose a criterion-referenced grading system.

2. The choice of persons to write and review the questions in the examination has been left to the respondent. The assurance of straight-forward and unambiguous questions, Criterion B, usually requires review by faculty members other than those who wrote the tests and perhaps a review also by an educational specialist.

3. The respondent has not been told specifically that s/he must develop instructions about how to take the examination, but should do so, in fulfillment of test construction Criterion C.

MOST COMMON ROUTES (See Figure 13)

A. Subject Matter Coverage

Ninety-two percent (#92%) of the respondents choose to begin the simulation by determining the subject content the test will cover (A3). They are presented with five options for accomplishing this task (see Table 47).

Eighty-five percent of the #92% choose to review instructional objectives. They also use other sources, including reviewing instructors' topic outlines, (84%, #77%), discussing topics with colleagues, (79%, #73%), creating their list of topics, (64%, #59%) and examining old tests, (41%, #38%).

B. Writing Examination Questions

The most common decision, after determining test coverage, is to consider who should write the examination questions. Ninety percent (#83%) make this choice, while 9% (#8%) elect to determine how grades should be awarded. Four options are presented for deciding who will write test questions.

Ninety-three percent (#77%) choose to involve both themselves and others, either members of the examination committee (#41%) or the entire course committee (#36%), in the question writing. Six percent (#5%) elect to write the test alone and (1%, #1%) assign the task to other course committee members. The last two groups are so small that they are not followed further.

C. Preparation of Test Questions

The next choice involves deciding between how many questions to write for a 100 question test and how grades are to be awarded. Of the #77% at this choice point, 79% (#61%) tackle the number of test items, and 19% (#15%) decide to determine the grading system.

The larger group is then presented with two options: to collect exactly the 100 questions required or to collect more than are needed. Eight percent (#5%) choose to collect only 100 questions while 92% (#56%) elect to collect more than will be used on the test.

TABLE 47

HOW TEST COVERAGE IS DETERMINED

TOTAL POPULATION

| DESCRIPTION OF OPTIONS | SECTIONS C | H | K | W. | TOTAL |
|---|---|---|---|---|---|
| 1 Examine old tests | 2 | 0 | 38 | 1 | 41 |
| 2 Review instructors' topic outlines | 3 | 0 | 77 | 1 | 81 |
| 3 Review instructional objectives | 4 | 0 | 78 | 2 | 84 |
| 4 Discuss possible topics with course committee members | 3 | 0 | 73 | 2 | 78 |
| 5 Respondent produces own list of topics | 2 | 0 | 59 | 1 | 62 |

TABLE 48

INFORMATION TO BE INCLUDED IN THE INSTRUCTIONS

TOTAL POPULATION

| DESCRIPTION OF OPTIONS | | SECTION X |
|---|---|---|
| 1 Types of answers expected | A. Include | 71 |
| | B. Not Include | 2 |
| 2 Indication of whether there is a penalty for guessing | A. Include | 49 |
| | B. Not Include | 24 |
| 3 Indication of time available to finish the test | A. Include | 73 |
| | B. Not Include | 2 |
| 4 Indication of test's contribution to the final grade | A. Include | 57 |
| | B. Not Include | 15 |
| 5 Indication of how to handle questions about the test | A. Include | 64 |
| | B. Not Include | 10 |
| 6 Comment on the test's importance for marginal students | A. Include | 9 |
| | B. Not Include | 59 |
| 7 Indication of how the test will be graded | A. Include | 45 |
| | B. Not Include | 26 |

When asked how to go about reviewing and selecting items, 79% of the faculty in this group (#44%) have the items reviewed by the test committee and 21% (#11%) by three other members of the course committee. Essentially no one (#1%) did the review and selection on his/her own.

Faculty in the larger group are now presented with the options of having the test reviewed by the educational specialist, writing instructions for students to accompany the test, deciding how grades will be awarded, and submitting the test to the course coordinator. Forty-three percent (#24%) elect to have the educational specialist review the test, and he recommends technical improvements to 32 of the items. Since this option ends with "MAKE ANOTHER CHOICE", these faculty are now free to choose among the remaining options.

Twenty-one percent (#12%) elect to end the problem by submitting the test to the course coordinator even though no decision has been made on grading and no instructions have been written. An additional 10% (#6%) elect to decide on a grading scheme, and the remaining 68% (#38%) move to write instructions to accompany the test. This #38% will be considered further below.

Though not having to decide immediately on how many questions they will need, faculty in the smaller group (#15%) ultimately have to make this decision. Sixteen percent (#2%) feel that exactly 100 questions are needed while the rest (#12%) wish to collect more than the required number. Of these faculty, 4% (#.5%) reviewed the items on their own while 86% (#12%) had the test committee look over the items, and 12% (#1%) by other members of the course committee.

D. Grading System

Only the current group, with #15%, is large enough in size to discuss in terms of how it decided to award grades. Seventy-one percent (#11%) elect a norm-referenced approach to assigning grades while only 29% (#4%) choose the more desirable criterion-referenced one. As implied earlier, this decision was made before the number of items needed was chosen and before the items written were reviewed.

Thus the only decisions remaining for the faculty in this group are whether to have the test reviewed by the educational specialist, an option exercised by 57% (#7%);

to submit the test to the course coordinator, which 19% (#2%) do; or to write instructions, which 81% (#10%) elect.

E. Instructions to Accompany the Test

In writing instructions for the test, 98% (#10%) specify the kind of answer sought (e.g., true/false), 68% (#7%) indicate whether there will be a penalty for guessing, 95% (#10%) indicate the amount of time available to complete the test, 76% (#8%) report the test's contribution to the final grade, 84% (#8%) describe the procedure students are to use in getting answers to questions they have about the test, and 76% (#8%) tell students how the test will be graded (e.g., using a curve). Only 17% (#2%) would include a statement detailing the importance of the test for marginal students.

At this point, it is again possible to have the completed test reviewed, and 31% (#4%) exercise this option. Finally, the test is submitted to the course coordinator by everyone.

Returning to the #30% in the larger group who decide to write instructions, 97% (#37%) tell the students how much time is available to finish the test and 95% (#36%) describe the test format. Smaller percentages, 8[illegible] (#32%), tell the students how to handle questions about the test itself, 63% (#24%) explain whether there will be a penalty for guessing, and 70% (#27%) tell students how much weight the examination carries in determining the final grade. Interestingly, 45% (#17%) elect to tell the students how grades would be awarded even though they had made no decision on that matter. Finally, 8% (#3%) elect to include a warning that the test is most critical for marginal students. This statement has the potential of detracting from student performance by unnecessarily increasing anxiety among some students, and should be specifically excluded, as it is by 92% (#35%) of the respondents at this choice point.

After completing decisions about what to include in the instructions, almost half of these faculty members, 49% (#19%), have the test reviewed by the educational consultant and then join the others in submitting it to the course coordinator. Thus, #38% end the simulation at this point without making a decision about the grading system.

THE OPTIMAL ROUTE (See Figure 12)

The optimal route requires fulfilling all three criteria stated at the beginning: deciding on a grading system which awards each student on the basis of his/her own merit, producing straight-forward questions based on the material taught in the course and devising clear instructions to the student that describe and explain how to take the test. Only #2.6% of the respondent group meet all three requirements for creating an optimal examination.

A. Grading System/Content Coverage

The preferred choice for beginning the simulation is to determine whether the examination will be criterion- or norm-referenced because this decision can shape the way the test's content is identified and presented, and the kinds of questions devised and selected. If a criterion-referenced system is used, items should be written measuring important issues without regard to how well those questions spread out the distribution of students in the class. In contrast, a good spread, reflected in the discrimination index for each question, is particularly important if grades are to be assigned using norm-referenced procedures. To achieve this spread among students, particular kinds of questions are needed. Questions in a norm-referenced test tend to measure specific facts and technical terminology rather than important principles or concepts and may measure general problem-solving or test-taking ability rather than capacity to manage problems that are crucial for the subject area of the course. A student may have performed adequately on a norm-referenced test but receive a low grade because s/he fell at the bottom end of the distribution. This situation can occur even when instruction has been very successful and the students have learned almost all the material covered in the course. As stated earlier, normative information about students is not useful in guiding students or in redesigning instructional programs.

Also acceptable as a sequence in test design is determining subject coverage first and then identifying the grading system. It is central to the construction of a good test that the questions be congruent with the material covered in the course.

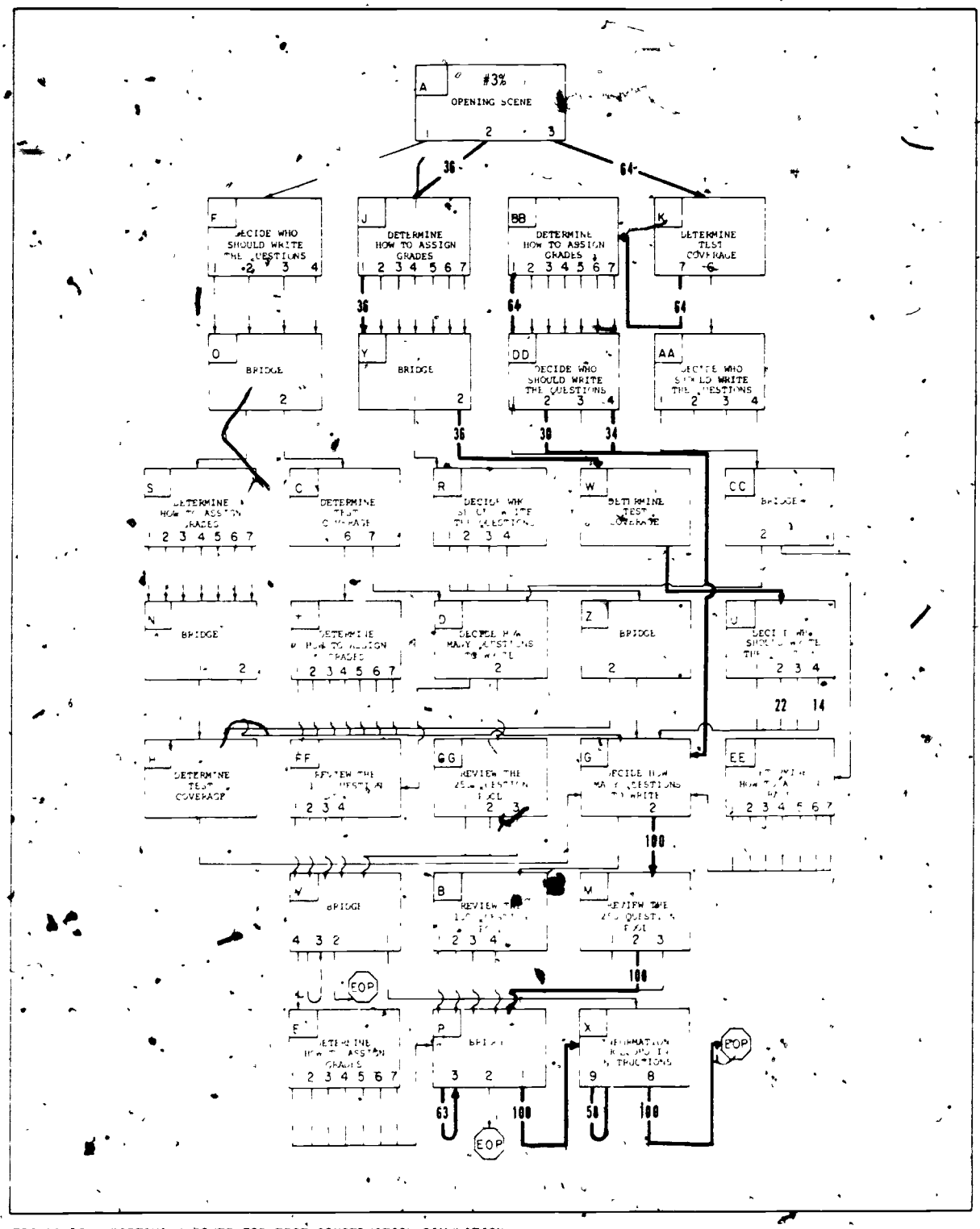


FIGURE 12. "OPTIMAL" ROUTE FOR TEST CONSTRUCTION SIMULATION

Instructional objectives embody both the content to be mastered and the way this mastery is to be demonstrated. They are, therefore, necessary for an optimal definition of subject coverage. They can also be available to the student as a guide to what will be measured. Relying on sources of information provided by all members of the course committee (instructional objectives, topic outlines and discussion) insures excellent subject coverage.

B. Writing and Reviewing Questions

The responsibility for writing and especially reviewing questions must be shared to insure that each test question is critiqued by someone other than the person who produced it. This is the preferred way to identify ambiguities, remove extraneous wordage, delete clues and distractions and produce clear, straightforward questions. Including an educational specialist as part of the review group is recommended, particularly for attention to the technical aspects of question construction.

More than 100 questions should be collected. If only the minimum needed were collected, it is unlikely that they would all be high quality, in terms of content validity and clarity.

C. Instructions to the Student

This is the final step in the creation of an examination that measures a student's performance fairly and without introducing extraneous hazards and distractions. A second opportunity for review by the educational specialist is available here and should be exercised.

CONCLUSION

As stated above, only #2.6% of the respondent group met the criteria of an optimal route, although an additional #15% managed to develop specifications for the examination; that is, test coverage was described and a decision was made on how to award grades. It appears, on the basis of this simulation, that most faculty produce sub-optimal examinations.

A. The Primary Areas of Concern

1. Most faculty members do not award each student a grade on the basis of his/her own merit.

2. Decisions on grading systems, when they are made, often follow the writing of test questions.

B. Encouraging Findings

1. Most faculty members include instructions with their tests.

2. Most arrange to collect more than the required number of items and have them reviewed before they are selected for use on the test.

3. A considerable number of medical faculty are interested in learning more about evaluation.

TABLE 49

Standard Errors for the "Test Construction" Simulation

| OPTION | STANDARD ERROR | OPTION | STANDARD ERROR | OPTION | STANDARD ERROR |
|---|---|---|---|---|---|
| A1 | 1 | M1 | 1 | AA1 | 1 |
| A2 | 1 | M2 | 2 | AA2 | 2 |
| A3 | 1 | M3 | 1 | AA3 | 0 |
| B1 | 0 | N1 | 0 | AA4 | 2 |
| B2 | 1 | N2 | 0 | BB1 | 1 |
| B3 | 0 | O1 | 0 | BB2 | 1 |
| B4 | 0 | O2 | 1 | BB3 | 0 |
| C1 | 1 | P1 | 2 | BB4 | 0 |
| C2 | 1 | P2 | 1 | BB5 | 0 |
| C3 | 1 | P3 | 2 | BB6 | 0 |
| C4 | 1 | R1 | 0 | BB7 | 1 |
| C5 | 1 | R2 | 0 | CC1 | 2 |
| C6 | 0 | R3 | 0 | CC2 | 2 |
| C7 | 1 | R4 | 0 | DD1 | 0 |
| D1 | 1 | S1 | 0 | DD2 | 1 |
| D2 | 2 | S2 | 0 | DD3 | 0 |
| E1 | 1 | S3 | 0 | DD4 | 1 |
| E2 | 0 | S4 | 0 | EE1 | 1 |
| E3 | 0 | S5 | 0 | EE2 | 1 |
| E4 | 0 | S6 | 0 | EE3 | 0 |
| E5 | 1 | S7 | 0 | EE4 | 0 |
| E6 | 0 | T1 | 0 | EE5 | 1 |
| E7 | 1 | T2 | 0 | EE6 | 0 |
| F1 | 0 | T3 | 0 | EE7 | 1 |
| F2 | 1 | T4 | 0 | FF1 | 0 |
| F3 | 0 | T5 | 0 | FF2 | 1 |
| F4 | 1 | T6 | 0 | FF3 | 0 |
| G1 | 1 | T7 | 0 | FF4 | 0 |
| G2 | 2 | U1 | 0 | GG1 | 1 |
| H1 | 0 | U2 | 1 | GG2 | 2 |
| H2 | 0 | U3 | 0 | GG3 | 1 |
| H3 | 0 | U4 | 0 | X1A | 2 |
| H4 | 0 | V1 | 2 | X1B | 1 |
| H5 | 0 | V2 | 1 | X2A | 2 |
| J1 | 0 | V3 | 2 | X2B | 2 |
| J2 | 0 | V4 | 1 | X3A | 2 |
| J3 | 0 | W1 | 0 | X3B | 0 |
| J4 | 0 | W2 | 1 | X4A | 2 |
| J5 | 0 | W3 | 1 | X4B | 2 |
| J6 | 0 | W4 | 1 | X5A | 2 |
| J7 | 1 | W5 | 0 | X5B | 1 |
| K1 | 2 | X8 | 2 | X6A | 1 |
| K2 | 2 | X9 | 2 | X6B | 2 |
| K3 | 2 | Y1 | 0 | X7A | 2 |
| K4 | 2 | Y2 | 1 | X7B | 2 |
| K5 | 2 | Z1 | 0 | | |
| K6 | 2 | Z2 | 0 | | |
| K7 | 1 | | | | |

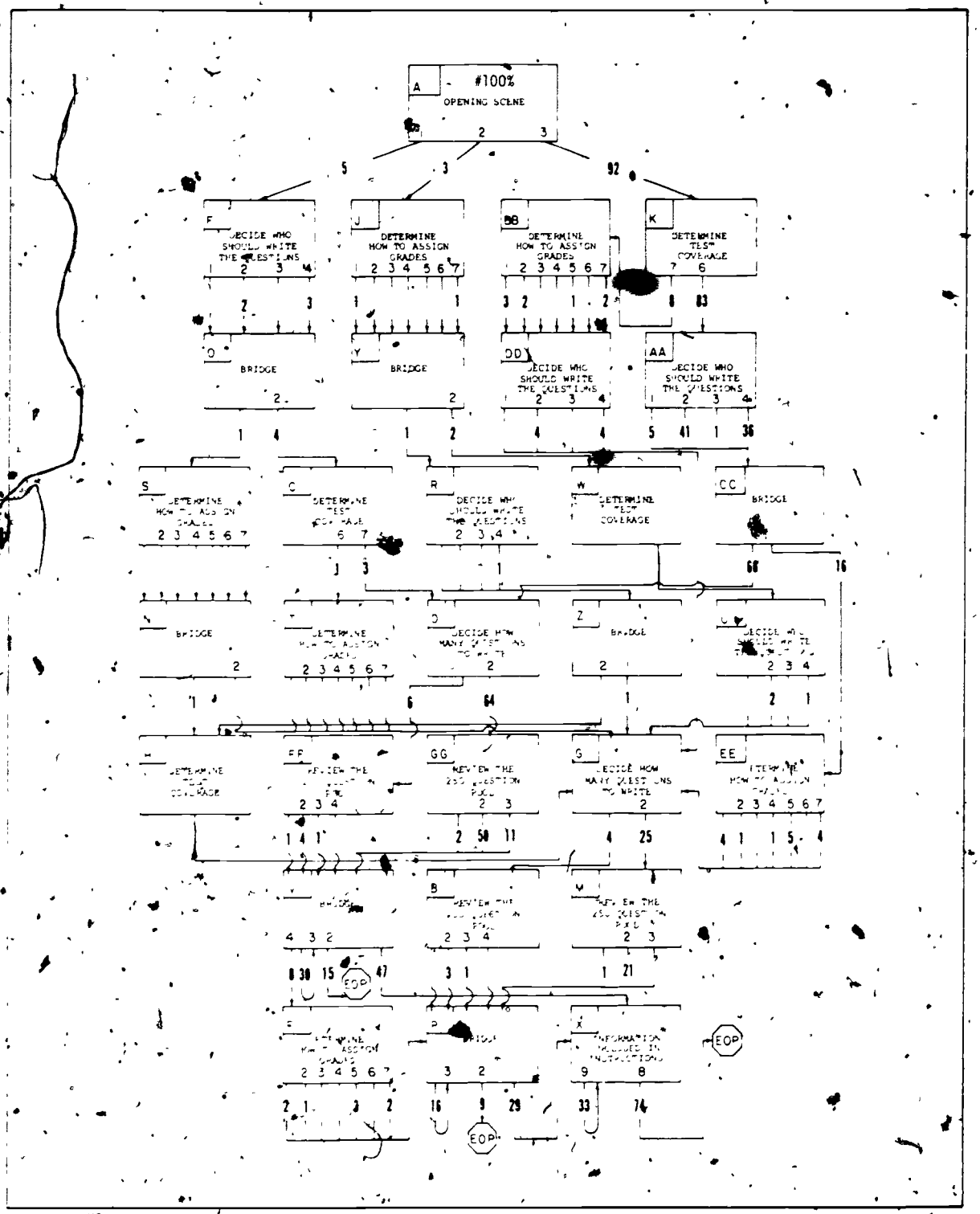


FIGURE 13 TOTAL POPULATION RESULTS FOR "TEST CONSTRUCTION" SIMULATION (Numbers are estimated percentages of the population selecting the option indicated.)

## IX. CONCLUSIONS AND RECOMMENDATIONS

This Chapter focusses on three areas:

A. Findings based on questions asked of all faculty members in the sample regarding faculty members' interests in receiving help with aspects of their instructional responsibilities.

B. Conclusions based on the findings in Chapters II through VIII regarding the areas in which faculty appear to be most in need of help.

C. A set of recommendations for programs of faculty development that appear to be both desirable and feasible at this time, based on the findings on interests and needs.

### INSTRUCTIONAL AREAS WHERE FACULTY MEMBERS WANT/WILL ACCEPT HELP

It is clear from the survey results that a considerable proportion of faculty members at United States medical schools are interested in receiving help in a variety of areas related to their instructional responsibilities. This finding is based on faculty responses to whether or not they would like to receive printed matter and/or attend a workshop in each of the thirteen areas listed in Table 50. The fairly high levels of interest are encouraging, especially considering the range of difficulties identified in the preceeding seven chapters.

When the thirteen topics in Table 50 are examined according to similarities in content and levels of faculty interest in receiving printed materials, three fairly homogeneous clusters emerge. The first cluster, with highest faculty interest, is the area of evaluation of students, courses, and faculty member's instructional effectiveness. Approximately #80% of the faculty members would like to receive printed information on these topics, #13% would not, and #7% are currently undecided. These figures can be related to other survey findings which suggest that virtually all faculty members engage in evaluation activities at one time or another.[79]

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[79] Second Preliminary Report, June, 1977, pp. 94-97.

TABLE 50

Topics In Which Faculty Members Would Like Help

| Topic | Printed Information | | | Workshops | | | Faculty Use[80] | |
|---|---|---|---|---|---|---|---|---|
| | Yes | No | Undec. | Yes | No | Undec. | Occas. | Freq. |
| 1. Formulating Educational Objectives | #68 | #22 | #9 | #22 | #68 | #9 | #22 | #61 |
| 2. Lecturing | #68 | #26 | #6 | #31 | #63 | #6 | #36 | #56 |
| 3. Leading Small Group Discussions | #65 | #27 | #8 | #32 | #60 | #8 | #28 | #65 |
| 4. Interpersonal Skill Development/Sensitivity Training | #41 | #42 | #17 | #22 | #61 | #17 | | |
| 5. Designing Individualized Instruction | #47 | #36 | #17 | #19 | #64 | #17 | | |
| 6. Designing/ Utilizing C.A.I. | #41 | #43 | #16 | #19 | #65 | #16 | #7 | #1 |
| 7 Producing/ Using Self-Instructional Packages | #50 | #36 | #15 | #22 | #63 | #15 | #27 | #6 |
| 8 Producing/ Using Simulations | #45 | #39 | #17 | #18 | #65 | #17 | #10 | #25 |
| 9 Evaluating Students' Performance | #79 | #15 | #7 | #30 | #63 | #7 | | |
| 10 Evaluating Program (Course) Quality | #78 | #14 | #8 | #29 | #63 | #8 | | |
| 11. Evaluating Your Own Instructional Effectiveness | #84 | #10 | #5 | #39 | #56 | #5 | #18 | #80 |
| 12. Making Best Use of Instructional Technology | #74 | #16 | #10 | #32 | #58 | #10 | | |
| 13 Providing Individual Supervision of Students | #58 | #31 | #11 | #22 | #67 | #11 | #47 (Tutorial) #17 (Clinical) #30 (Lab) | #20 #44 #26 |

[80] The data for these two columns are derived from Tables 10 and 12A, E, and F, Chapter II. The 3 from Table 12 (items 1, 8, 11) are measures of familiarity (have "heard of" or "used") rather than frequency of use.

A second cluster encompasses three common medical school teaching techniques: lecturing, leading small group discussions, and providing individual supervision of students. Approximately two-thirds of the faculty (#64%) want printed matter in these areas, #28% do not, and #8% are undecided, which link to the finding that large percentages use these methods: #92% lecture and #93% lead small group discussions, at least occasionally.

The five topics dealing with individualizing instruction (topics 4 through 8 in Table 50) form a third cluster. Faculty interest is somewhat lower here, but it is still substantial: approximately #45% are interested in receiving printed material, #39% are not interested, and #16% are undecided. For the three topics, (nos. 6-8, Table 50) on which we have information current use in medical schools is low.

The two remaining topics in Table 50 (No. 1, formulating instructional objectives, and No. 12, making best use of instructional technology) are not related as content areas but do happen to have similarly high levels of faculty interest in receiving printed materials (#68%, #74%). This finding reflects the high proportions of faculty that have had experience in these areas: more than #80% have used, or at least know about, instructional objectives, and up to #94% of faculty have made some use of instructional technology.[81]

Asking for printed materials (especially if they are free) represents an important but relatively low commitment to improving one's teaching, and the results in the preceding paragraphs should be interpreted accordingly. A stronger commitment is expressed when there is a willingness to attend a workshop, which involves time away from other professional activities and possibly from home. When the thirteen topics are considered from the point of view of interest in workshops, the amount of interest is relatively less, although the rank ordering of topics is similar, and the level of readiness to attend workshops on instruction must still be considered impressively high.

One topic (No. 11) stands out from the others. Thirty-nine percent (#39%) would like to take part in a workshop

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[81] First Preliminary Report, March, 1977, pp. 124-6.

on evaluating one's own instructional effectiveness. This is especially encouraging since a willingness of faculty to be critiqued is a necessary starting point for any serious faculty development activities.

Five topics (lecturing, running small group discussions, evaluating students, evaluating courses, and making the best use of instructional technology) hold interest as possible workshop topics for approximately #31% of the population. While these topics do not form any single conceptual grouping, they are fundamental components of quality instructional programs. This level of faculty interest deserves a response.

Finally, the five topics that relate to individualizing instruction (Nos. 4-8 in Table 50) plus formulating instructional objectives (No. 1) and providing individual supervision of students (No. 13) all received the same response; approximately #21% are interested in attending workshops on these topics.

The above findings indicate a substantial interest in self-improvement among faculty members at U.S. medical schools. While interest in receiving printed matter is higher than readiness to attend workshops, even the lowest figures must be considered impressively high. For example, the potential workshop topic for which there is least interest at this time could still involve more than 5,000 full-time faculty members (18% of 28,393), and the potential audience for workshops could range as high as 11,000 people (39% of the population).

The next section of this Chapter reviews the areas in which the survey findings suggest that faculty may need assistance.

## INSTRUCTIONAL AREAS WHERE FACULTY MEMBERS NEED HELP

The review of the simulations and selected questionnaire findings suggests seven areas where faculty members could profit from specific assistance. These areas are:

A. determining the background and readiness of students for instruction,

B. setting expectations for instruction and student performance,

C. monitoring student progress,

D. evaluating student performance,

E. providing helpful feedback and assistance to students,

F. seeking assistance from colleagues and/or consultants, and

G. using faculty and students effectively as resources.

These areas of need may or may not coincide with faculty interest in receiving help. The relationship between need and interest, and the implications for faculty development will be discussed as the final section of this Chapter.

A. Background of Students

For a faculty member to supervise an individual student or conduct a group instructional activity successfully, s/he must be aware of the skills, knowledge, and attitudes the students bring to the experience. If faculty members are unaware or unresponsive to the students' readiness or their level of competency at course entry, they may have unreasonably high, low, or inflexible expectations for them.

All the simulations emphasize the importance of collecting information on the students' backgrounds in the solution of educational problems. In general, this component of instruction is not managed well. In "Clinical Supervision," for example, only #21% ask the student being supervised about his previous clinical experiences, and only a third of those people (#7%) pursue the conversation far enough to find out if the student has encountered any difficulties with uncooperative patients. Also, almost #80% of the faculty members send the student to his first complete patient workup without knowing anything about his ability to conduct such an activity. In "Research Supervision," #44% ask the student about his background, but #16% ask for this information only after the student has begun working and has encountered difficulties. Thus, #72% (#56% who never ask about the student's background and #16% who ask too late) direct the student to start his project without verifying that he is ready for the assigned task.

The two simulations dealing with the instruction of groups present a slightly different picture. In "Small Group Discussion," #48% talk with the three dissatisfied students in an effort to learn about their backgrounds and readiness for this educational approach. Only #15%, however, talk with the other students, and only #7% talk with both groups to consider these issues.

Although their actions are otherwise, faculty probably know that it is advantageous to learn about the previous experience of their students. In "Lecturing," for example, fully #86% of faculty members report that lectures should be adapted to the backgrounds of the audience. In contrast, though, only #28% take the initiative to inquire into the students' actual backgrounds. These findings from the simulations are reinforced by the information that only #34% of faculty have used course entry evaluation (Table 12G, Chapter II).

In summary, few faculty members consider the backgrounds of their students in planning and managing instructional experiences.

B. Expectations for Students

Formulating and conveying expectations to students of what they are to learn and how they will be evaluated are essential components of effective instruction. Students need to know these things as a guide to their study of subject matter and practice of skills. Faculty need to have formulated their expectations as a guide to their design of appropriate instructional experiences and evaluation procedures. Thus, expectations (goals, objectives) are the foundation for planning and implementing both instruction and evaluation.

In "Clinical Supervision," only #24% convey their expectations for the patient workup that the student is to complete. This means that #76% direct the student to begin the workup without defining the nature of the task. While more faculty (#53%) do discuss their expectations with the student in "Research Supervision," there is still almost half the faculty (#47%) who either do not or who do so only after the student has begun his work.

In the "Lecturing" simulation, #90% indicate that students should be told what a lecture series will cover. It is probable, however, that these faculty are referring

more to course content than to how students are expected to use the information. Support for this contention is the finding that when faculty members talk with the lecturer, only #44% ask him what he expects students to gain from the lectures.

The other finding relevant to the faculty's formulation and use of expectations is their minimal use of instructional objectives. In "Course Segment Design," for instance, only #37% elect to design their 9-hour segment using instructional objectives, (Chapter VII, p. 141) even though a considerable proportion of faculty have had experience with objectives and feel positively about their value (Table 12A, Chapter II).

Thus, most faculty do not provide their students with a clear understanding of what they are expected to learn or how they will be evaluated. It seems likely that most faculty do not explicitly articulate their goals even for themselves.

C. Monitoring Student Progress

Taking mid-course readings on student progress and making necessary adjustments in the instructional offerings are necessary on a regular basis to assure that instructional goals are being fulfilled. Faculty need to verify that students are progressing as intended and that the original expectations for the course are still appropriate.

In "Clinical Supervision," almost everyone (#96%) makes an attempt to observe the student in the process of completing his patient workup. Only #19%, however, observe the entire process, while #45% observe all but ten minutes and #32% are present for only the last twenty minutes.

In "Research Supervision," #91% meet with the student to review his progress. Only #60%, however, have a discussion with the student at the start of instruction and only #47% discuss what will represent satisfactory progress.

In "Course Segment Design" only #13% provide for the use of daily quizzes to monitor student progress. These findings from the simulations, while low, are somewhat more positive than the faculty self-report that only #5% have used "Formative" evaluation (Table 12H, Chapter II).

In short, the Survey data indicate that many faculty do monitor student progress, but a fair proportion of the them are either incomplete in their efforts or unprepared for the task.

D. Evaluation of Students

The extent to which students have mastered material that has been presented is determined by evaluating their performance. In addition, the results of student evaluations can be used to assess the success of a course and effectiveness of the instructor. These important uses of student evaluation make it a central component of the teaching-learning process.

In "Research Supervision" the evaluation of students is addressed indirectly through the setting of expectations. Only #53% of faculty inform the student how he will be evaluated. In "Course Segment Design" faculty are asked to make specific decisions on whether and how they will evaluate students. Seventy-two percent (#72%) include an evaluation plan, but only #63% include a post-test to verify that students have mastered the material, and even fewer (#33%) propose a pretest which is necessary to evaluate student gains. With respect to the use of student evaluations of the course, fewer than half (#49%) have the course content evaluated and only #35% have their own performance as instructor evaluated.

In "Test Construction" the only aspect of evaluation considered is the preparation of an objective test. Only #3% manage this problem in the "optimal" manner. In short, there are a variety of evaluation issues that faculty fail to address.

E. Feedback/Assistance to Students

Monitoring student progress and providing feedback and additional assistance are related issues. Much of the potential value of an instructional experience is lost if an instructor does not provide appropriate feedback. Also ineffective is providing students with feedback at a point when they are unable to modify their work.

In "Clinical Supervision," #86% provide direct and seemingly appropriate feedback to the student, but only #16% had engaged in those prior activities on which fully

helpful feedback can be based.[82] Nevertheless, in selecting the appropriate option, faculty indicate a recognition of what constitutes helpful feedback.

The findings in "Research Supervision" are similar. While #61% are supportive in their feedback and express a willingness to provide further assistance, only #5% reach this point in the recommended manner (e.g., #47% never discuss expectations prior to monitoring the student's progress).

The findings from "Small Group Discussion" present somewhat similar findings. Most faculty do demonstrate a willingness to assist students. A sizable group (#28%), however, recommend that the students transfer out of their group, thus precluding any further assistance. And a third of these faculty (#9%) do so without any attempts to resolve the difficulties the students express.

It appears, therefore, that faculty vary in their interest in providing feedback and assistance to students. Some engage in well-intentioned, but unsupported, efforts which may fail when faculty have no objective basis for providing feedback. For example, complimentary statements to a student can be misleading and even harmful if the faculty member has no evidence on which to base such comments.

F. Assistance from Consultants and Colleagues

Teaching, like medicine, is so vast an area that it is not possible for any one person to have mastered it all. It is likely that most faculty members will run into circumstances where they can profit from outside help. Knowing when and whom to ask for help are important aspects of successful teaching.

"Small Group Discussion" includes opportunities to discuss the problem at hand with other faculty members teaching the same course (undertaken by #17%) and with a friend knowledgeable in small group techniques (done by #3%). There is also an opportunity to express an interest in arranging for a consultation with an educational specialist. Only #10% pursue this option. It is not

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[82] The other #70% may have selected the appropriate option in the feedback section simply because the other options were unattractive.

possible to know why one kind of person is considered rather than another. These findings, however, do relate, proportionally, to those reported in Chapter II concerning people from whom faculty members seek assistance/advice on instructional issues and problems: #93% say they go to colleagues in their own departments, at least occasionally, while #28% turn to an educational specialist.

In making recommendations to the faculty member who has requested help in the "Lecturing" simulation, #54% suggest that he turn to an educational specialist. This is a rate almost twice as large as faculty members report themselves asking for such help. Seventy-four percent (#74%) volunteer to serve as consultants themselves. This latter figure reflects the #93% who report turning to members of their own departments for instructional help.

"Test Construction" again offers faculty members the opportunity to turn to an educational specialist through a request for a technical review of the test that had been constructed. The offer is available twice, #16% pursue it the first time, #33% the second.

Thus, faculty members do turn to others for help, and when they do, it is more likely to be a colleague than an educational specialist. Why this is so cannot be determined from this study. It may be that faculty have had bad experiences with educational specialists, they may not know what educational specialists do, such specialists may be unavailable at their school, or there may be some other reason.

G. Sources of Information

There are circumstances where information is needed rather than advice on solving problems. Under these conditions, it is necessary to turn to colleagues, students, and the educational literature for the information required.

In "Small Group Discussion," for example, #91% of faculty members turn to students for information on the problem presented in the simulation. In this case, the problem directly involves the students. In the "Lecturing" simulation, #90% of faculty members directly witness their colleague's lecture to collect information on his problems. Smaller numbers, #50% and #34%, turn for information to the lecturer himself and to his students. In

making recommendations on how the lecturer can improve, #77% suggest talking with competent lecturers and #79% advise talking to students.

In "Course Segment Design," #61% turn to colleagues for information on what to teach, and #56% to learn what teaching approach is preferred. They also query students, #53% talk to former students, and #26% talk with current students for information on what to teach. Forty-one percent ask this question of practicing physicians.

In "Test Construction," information on what the test should cover comes from old tests (#41%), a review of instructor's topic outlines (#81%) and instructional objectives (#84%).

Thus many faculty do turn to colleagues, students, and other sources for information on instruction and instructionally related activities, at least when the possibility to do so is suggested to them. Even so, the proportion that use these sources, especially students, is low enough to suggest that information sources are not used to full advantage.

## RECOMMENDATIONS FOR FACULTY DEVELOPMENT ACTIVITIES

The preceeding two sections of this Chapter describe the areas in which faculty members at United States medical schools appear to need, and are interested in receiving help in improving their instruction. This section uses these two sets of findings to offer recommendations for future faculty development activities.

Areas where faculty members will accept help and areas where they need help are presented in Table 51 as row and column headings, respectively. The prose in each cell in that Table briefly outlines content that seems appropriate as part of faculty development efforts designed to address problems faculty members need to consider, and provide topics where they want help. Note that while the problems have been determined empirically, the study topics are judgments of what most needs to be done.

For example, faculty members would like to receive printed material and attend workshops relating to a number of topics in evaluation (Table 51, 1st row). Faculty members do not, as a rule, take student backgrounds into

Table 5.1 Recommendations for Faculty Development Activities

| Areas in which faculty members are willing to accept help | Areas where faculty | | |
|---|---|---|---|
| | Student Background | Expectations | Monitoring Progress |
| Evaluation Topics (9, 10, 11) | Provide for assessing student background (e g , pretesting, collecting information on emotional readiness and experiences students have had ) Be aware that background deficiencies can appear as other types of problems | Persons being evaluated should be aware of the purposes/goals for the evaluation (E g , in goal-free evaluation, the logic behind the data collection activities needs to be spelled out ) | Formative and diagnostic testing activities are called for. Care must be taken in the evaluation to assure that information collected can be used to counsel students and faculty. |
| Formulating Objectives (1) | Useful device for describing student background (e g , required entry level skills and knowledge, can be stated as objectives which need to be met before the student can begin instruction) | Expectations for student performances can be stated as objectives to be met. | Monitoring can take the form of noting whether students meet interim and end-of-course objectives |
| Making the best use of instructional Technology (12) | Some approaches (e g , CAI) can be used to collect background information Other approaches need to have mechanisms added for collecting data on student backgrounds | Students need to be aware of expectations for them, either at the time they begin working or at some appropriate point during instruction | Some approaches (e g , CAI) have functions built in Otherwise a mechanism must be created and tested, if the technology is to be in a self-instructional mode (not in conjunction with other activities in which monitoring can be done) |
| Teaching Methods (2, 3, 13) | Generally, methods must be devised for collecting background information here (e g , pretesting, conversations with students ), to verify that students have had experience with certain techniques and appropriate expectations for what instructions will be like | | May be based on formal methods (e g , quizes or informal ones (e g , discussions with students) but must be built into instruction nevertheless Needs to be done frequently |
| Individualized Instruction (4,5,6,7,8) | Aptitude-treatment interactions may be important here Therefore, student background information is essential These data should be collected before decisions are made about assigning students to instructional modalities. | | Some approaches have these functions built into them Otherwise, mechanisms must be created and tested |

members need help

| Feedback/Assistance | Evaluation | Assistance from Consultants/Colleagues | Sources of Information |
|---|---|---|---|
| Though not formally part of the evaluation, provision should be made for using the evaluative data to communicate, regularly, with the people being evaluated in order to improve learning or reinforce acceptable progress | The relationships among the three evaluation topics should be spelled out. Also, information on what constitutes a good evaluation should be presented | Educational consultants: decrease in importance as faculty becomes more experienced. Colleagues serve as sources of information and aid in interpretation of evaluative data. | 1. Colleagues<br>2. Students<br>3. Educational Specialists<br>4. Literature<br>5. Other (e.g., patients, practicing physicians) |
| Can be based on ways to help students meet interim and end-of-course objectives they have not met in the normal course of events. Also, positive reinforcement can be provided to students who need no other assistance | Students evaluated on the basis of objectives they master. Instruction is evaluated on the basis of how each objective is mastered by all the students | Educational consultants teach faculty to write, use, and interpret results from objectives. Colleagues provide information bearing on the objectives and interpret evaluative information on whether the objectives have been realized | |
| | | Educational consultants may be helpful in selection or design and appropriate use. Colleagues helpful in making curricular decisions and interpreting evaluative data | |
| Assistance may include shifting student to an instructional method more suitable to him/her | Evaluation of students, programs, and instructors should be included | | |
| In large groups, feedback/assistance may be based on the way the whole class is performing, with special attention given to individual students as needed. In small groups, each student may receive individual help. Assistance may cover either the process of instruction or the content | Informal techniques (e.g., questioning) should be built in. Evaluation of students, programs, and instructors should be included | Educational consultants can offer assistance in matching teaching method to student needs, providing information on how to use the method chosen, and offer evaluative comments on the success of the actual teaching and ways to improve. Colleagues offer advice on curricular interest and interpretation of evaluative data. | |
| Assistance may include shifing student to instructional method more suitable to him/her | Evaluation of students, programs, and instructors should be included | | |

account in dealing with educational issues (Table 51, 1st column). In offering a resolution to that problem, it is proposed that faculty development activities dealing with evaluation include an emphasis on the importance of collecting information on student backgrounds, as they relate to the evaluation of students, programs, and instructors (Table 51, upper left-hand cell).

The content recommendations in each cell in the table are not proposals for specific faculty development procedures or activities; nor do they imply that all recommendations will apply equally at all medical schools in the country. Local needs and institutional characteristics as well as variations in faculty development personnel must dictate decisions on content and implementation procedures. The suggestions, however, are felt to have general pertinence for medical education nationally, and can provide a framework for local decisions.

Three areas in Table 51 seem to deserve special attention because they represent major problems and are addressable through faculty development activities. The first involves the areas of faculty interest (rows) called "Teaching Methods" and "Individualized Instruction," and the area of need (column) labelled "Student Background." Faculty members may encounter problems in their teaching which are due to an inappropriate match of student background with teacher's expectation but which are prone to being attributed to other causes. For example, a student's failure at a course may be attributed to lack of competence or motivation when, in fact, the student did not have adequate help in understanding what was expected. Faculty development intervention can be effective here because between #35 and #50 percent of the faculty indicate an interest in these areas, and the instructional issue is one of improving existing instructional skills rather than developing new ones or replacing old ones.

In considering this area, emphasis should be placed both on identifying salient features of student backgrounds and matching them to the appropriate instructional modality. This kind of "Aptitude-Treatment-Interaction" approach has been well documented in the literature,[83] which means that relatively little advance

[83] L. J. Cronbach and R. E. Snow, Aptitudes and Instructional Methods, Wiley, New York, 1977.

work needs to be done before appropriate faculty development activities can be begun. Further, because interest already exists within a sizable segment of the population, little work is likely to be needed to engage the faculty in whatever helpful activities are offered.

The second area recommended for attention at this time includes the same areas of interest (Teaching Methods and Individualized Instruction) but involves two other areas of need: monitoring student progress and feedback/assistance. As described in the preceeding paragraph, large percentages of the population are interested in these areas. As a result, there should be little difficulty in securing faculty participation in workshops or other activities on this topic. Again, these faculty development issues primarily involve instruction, not the development of totally new skills. In short, activities along the lines recommended should be well received and should result in meaningful, positive changes in instructional programs.

Finally, there is a concordence between interests and needs in the area of evaluation. Faculty development activities could point out and emphasize the interrelationships among various evaluational activities. Further, since evaluation brings the important aspects of the teaching/learning process under scrutiny, it can provide an excellent vehicle for introducing faculty members to the rational description and analysis of effective instruction, and the relationship of such instruction to improvements in student learning. This area of faculty development should also consider the criteria for high quality evaluation. A systematic effort in this topic area should help faculty members to conduct and interpret evaluations of students, courses, and instructors. All of these are necessary components of the process of continuous improvement of instruction.

## FINAL REMARKS

This study is believed to be the first comprehensive look at teachers and teaching in United States medical schools. Thus, it provides the first available baseline against which future studies can make comparisons. Intentionally, no findings are available from the present study on individual teachers or separate schools.

The present report offers a summary of highlights and major implications based on the survey findings. There are many further analyses and potentially important findings that have yet to be pursued. It is intended that these will be undertaken and reported in subsequent publications.

The true potential value of this study is in the activities that are developed and guided as a consequence of the findings. It is hoped that the sponsoring agencies of this study, the medical schools, and other agencies will see fit to allocate resources in support of programs suggested by the outcomes of this investigation.

The Division of Faculty Development is linking this study to a larger set of faculty development strategies. The two major companion activities being pursued at this time are:

1. the development of a program of self-assessment on instruction for faculty members, and

2. the offering of "Workshops on Faculty Development" for people with responsibilities in this area in the medical schools.

The self-assessment program is being built on the written simulations used in the present study. The workshops include a focus on helping prepare participants to serve as consultants to their medical school colleagues in interpreting and profiting from the findings from their use of self-assessment materials.

Finally, it is emphasized that the purposes of this survey required an emphasis on the instructional problems of medical faculty. Only through a search for problems can appropriately helpful programs be designed. Yet, for those who care about the quality of American medical education there are many causes for encouragement. It is likely that in the 1950's anyone knowledgeable about medical education would have considered as too optimistic a prediction that in the 1970's large numbers of medical teachers would be trying a variety of major instructional innovations and would be as open to evaluating themselves and improving their instruction as this study has found them to be.

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[84] This bibliography is only a summary of the references cited in this report. An annotated bibliography, Faculty Development and Evaluation, was prepared in support of the entire project and is available upon written request from the AAMC's Division of Faculty Development.

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