Developing an Objective Based Curriculum for a Family Practice Residency

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Although there is a preponderance of articles on behavioral objectives in education, few address the *process* by which objectives are developed and agreed upon in a residency training program. The process by which objectives are developed is critical to their eventual implementation. The development and implementation of objectives are particular concerns in family practice residencies which, because of their broad based content, are uniquely dependent on other departments for portions of the residency training program. This paper describes an approach for developing curriculum objectives in a Family Practice Residency Program which emphasized the personal involvement of individuals who would be instrumental in implementing the curriculum, such as program directors, coordinators of "other" specialty rotations, and resident representatives. This approach, although time-consuming, resulted in well-formulated objectives that could be implemented. Further, this approach allowed for intensive interaction among various faculty members representing many fields, resulting in increased mutual understanding and appreciation.

Many books and articles have been written on behavioral objectives in education.[1-5] The *Educational Index* alone references over 600 such publications for the last five years. However, only a small percentage of these publications address the role of behavioral objectives in medical education, and even fewer relate directly to residency training. The articles that do concentrate on objectives for medical education usually cover only an isolated area of undergraduate medical education,[6-19] and those which consider residency training relate largely to broad goals rather than defined objectives and ignore the process by which these goals were derived.[1,20-28]

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Thus, when beginning to write objectives for a residency training curriculum, the literature on objective writing provides little help in understanding the *process* of developing effective, agreed-upon objectives. The purpose of this paper is to describe such a process as it occurred in a newly developing department of a well-established medical school. Some of the problems which arose may be unique to family practice because of its broad based content, its dependence on other departments, and its recent origin. The methods used in solving these problems, however, are likely to benefit many types of residency programs.

Setting

The Department of Family Practice and Community Health with an Affiliated Residency Training Program was established at the University of Minnesota in 1970. The Affiliated Residency Training Program has become the largest family practice residency in the country with 199 residents in nine programs. The rapid development of the department and its residency program, with wide responsibilities within an established University, contributed to the early recognition of the need for objectives. These same factors, however, presented some difficulties. How could objectives be established and implemented that would blend with the interests and resources of the University's other residency training programs and its medical school, while still meeting the specific needs of the residency programs in Family Practice and Community Health?

Why Write Objectives?

There are a number of generally recognized reasons why educational objectives are of value. Such reasons include better communication with colleagues and increased efficiency and effectiveness for both student and teacher as a result of understanding what is expected in the learning process. Many other reasons are discussed in the literature.[1-5]

The specific impetus for writing objectives in this situation came from persistent concerns within the department. The concerns fell into three categories: (1) program evaluation, (2) program delineation, and (3) faculty utilization. The need for evaluation was recognized early in the program's development. A norm-referenced, subjective evaluation system was instituted to provide continuous feedback to the program directors and department chairman about resident performance, teacher performance, and service or course effectiveness.[29] In addition to this subjective informa-

tion, the faculty felt a need for defined criteria and for a more objective way to evaluate residents and learning experiences. It was the need for a clearer program delineation and faculty utilization, however, that finally crystallized the faculty's effort into a vigorous attempt to establish a set of minimum educational objectives. As the second and third years of the residency program developed and the number of residents increased, more learning experiences and more teachers were needed in family medicine and in the conventional specialties. Heavy reliance was placed upon the private practitioners of the community, the medical staff of the affiliated hospitals, and on the full-time academic faculty at the University Hospitals.

Subsequently, the family practice teachers felt the pressure of overextension and the chairmen of several other departments in the medical school voiced their concern over the extent of their departments' involvement in the family practice educational program. A clearer description of the program's curriculum was needed to make more efficient use of all faculty and to identify the role of conventional specialties in family practice resident training.

Who Writes the Objectives?

As a result, several departments of the medical school were asked to participate in the development of core curriculum objectives and in the planning of educational strategies for family practice residents. Representatives from these departments became involved and they, along with the family practice program directors and other persons from the affiliated hospitals, constituted core curriculum committees whose responsibility it was to outline the curriculum and establish or maintain learning experiences to meet curriculum goals. Each core curriculum committee was responsible for the delineation of a major subdivision, such as surgery, of the residency training program.

The educational psychologists in the Department of Family Practice and Community Health joined with the members of the core curriculum committees in the spring of 1974 to write educational objectives for the residency program. By the fall of 1974 a set of objectives had been written covering the minimum competencies expected of family practice residents in the area of surgery. Even though a draft of the surgical objectives had been completed by working with the entire surgery core curriculum committee, it was decided to implement a program of objective writing which did not require the involvement of all the core curriculum committee members. This was done to make more efficient use of faculty time and to establish a smaller group which was more able, among other things, to schedule meetings and hold discussions.

Volunteers from the core curriculum committees as well as other interested family practice faculty became a working task group and began to develop skills of curriculum design and objective writing. The task group included the family practice program directors, educational psychologists, representatives from each conventional specialty and behavioral science, and other family practice faculty who were particularly interested in curriculum development. The original core curriculum committees were maintained to handle immediate curriculum needs and to screen the behavioral objectives written by the task group. Although the task group was to do the majority of the actual objective writing, it was important to maintain the input of the core curriculum committees as they were an invaluable resource representing the specialties touched by family practice. Perhaps even more important, they needed to share in the development of the objectives since they and their departments would be asked to help accomplish the stated objectives and their contributions would be evaluated in terms of the objectives. This effort, to share the responsibility for developing the objectives, was a cornerstone throughout the objective writing process, a process which involved family practice faculty, other specialty faculty, and residents. It was thought that only through such personal involvement and commitment in the development of the objectives would they become a useful statement of the curriculum instead of a dusty book on a shelf.

Stages Involved in Writing the Objectives

The process of writing the objectives was broken down into four stages as follows: Stage 1: Training in objective writing, Stage 2: Writing objectives for specific areas, Stage 3: Organizing the objectives, and Stage 4: Review, revision, and approval of objectives.

Stage 1: Training in Objective Writing

Two workshops were held for the task group during this stage. The first workshop presented the potential uses of the curriculum objectives (Table 1), the role of objectives as an integral part of the curriculum, and a short course on the mechanics of writing objectives.[30]

The second workshop was concerned with establishing a framework or organization for the objectives and with increasing the objective writing skills of the task-group members. There are many ways to outline the curriculum of family practice. The core curriculum outline from the Society of Teachers of Family Medicine[31] and the Educational Objectives from the Family Medicine Residency Training Program at Regina, Saskatchewan,[26] are examples of the different organizations that were considered in developing an outline. It was decided, however, that in this residency program it would be most practical to organize the objectives around the traditional specialty areas such as pediatrics and internal medicine.

During the second workshop, a video tape was presented to demonstrate a strategy for objective writing and the process of give and take involved in writing with others. In addition to outlining a step-by-step procedure for objective writing, the video tape served as a modeling device. It illustrated a method of questioning, working, and writing with others which was unfamiliar to many family physicians who commonly work alone. Since a family practice residency consists of

many disciplines besides medicine, the tape showed a physician and an educational psychologist working together, capitalizing on their complementary assets as they developed objectives. The actual steps for objective writing as they were outlined in the tape are presented in Table 2.

The model presented in Table 2 illustrates the steps in the objective writing process, which begins with the selection of a content area about which one wishes to write behavioral objectives. The content areas which were identified as core areas in the curriculum were Ob/Gyn, Pediatrics, Internal Medicine, Surgery, Family Medicine, Behavioral Science, Community Health, and Health-Care Coordination.

Stage 2: Writing Objectives for Specific Areas

Stage 2 began with a meeting at which the various core areas were assigned to members, who became subgroups of the task group. Each of these subgroups sketched a breakdown of the area, and took as a "homework" task the job of individually brainstorming a part of the core area (step 2 in the model). The brainstorming process meant simply outlining very loosely and in any format the core area chosen. This brainstorming usually took the form of a dictated collection of somewhat disconnected sentences and thoughts.

During a second set of meetings in stage 2, each subgroup considered various methods of organizing the core area which had been brainstormed (for example, a patient age sequence or a sequence of patient organ systems involved). The next step was to take the brainstormed comments and write actual objectives within the system or organization. Both general and specific objectives were created. The general objectives consisted of phrases like, "the resident will understand. . . ." The specific objectives were the measurable behaviors that characterize a resident who "understands." The specific objectives were usually only a representative sample of information, skills, and attitudes to be learned, and were not an exhaustive list. The specific objectives used words like, "the resident will discuss. . ." or "the resident will perform. . .," or "the resident will identify. . ."* (steps 3 and 4 in the model).

As the subgroups wrote the general and specific objectives, the original organization (for example, chronological or by organ systems) at times seemed cumbersome, and it was occasionally necessary to reorganize and begin again. However, once the system was working, objective writing continued until the core area was complete and defined. Frequently it was easier to write the general objectives, with only a few specific objectives added, leaving "holes" to be filled later by additional specific objectives. Stage 2 proceeded with each subgroup writing and revising their objectives with the assistance of the Department's educational psychologists (steps 5 to 8 in the model).

Stage 3: Organizing the Objectives

During this stage the educational psychologists, with the assistance of various faculty members, began the process of organizing the objectives from all the core areas into a usable package. This consisted of filling in "holes," editing, and organizing the objectives into several more practically useful packages depending on the audience, such as residents, program directors, core coordinators, or preceptors. It was thought that each of these groups had different purposes for the objectives and that different packaging and introductory material would, therefore, help in their understanding and use of the objectives.

Stage 4: Review, Revision, and Approval of Objectives

During this stage each of the nine affiliated program directors, the faculty of the Department of Family Practice, and the members of the core curriculum committees reviewed the objectives. This stage is still being implemented. Final review and approval rests with the faculty of the Department of Family Practice and Community Health, but it was thought important that each department and hospital which would be asked to implement these objectives continue to have a role in their development and final form.

*This format of general and specific objectives is adapted from "Stating Behavioral Objectives for Classroom Instruction," by Norman E. Gronland. London, Macmillan Company, Collier-Macmillan Limited, 1970.

What Do the Objectives Look Like?

The core curriculum objectives that have resulted from this process define the competencies a family physician should possess when he/she has completed the University of Minnesota Affiliated Residency Training Program in Family Practice and Community Health. One way of conceptualizing the family physician is to view him/her as an information processor for problem solving and health maintenance. The role of the information processor can be viewed as: (A) collecting information, (B) organizing and recording information, (C) assessing information, and (D) using information to solve problems or direct health maintenance. The core curriculum objectives were organized around this concept of the family physician as an information processor – a "cold" but functional definition for a hopefully very "warm" process.

Thus, the core curriculum objectives are the skills, attitudes, and knowledge a family physician needs in each of the four general areas of information processing. These physician abilities and information processes are woven into an organizational grid with delineated competency areas as shown in Figure 1. The reader may wish to refer to Figure 1 and Figure 2 while reading the following description of the core curriculum objectives.

The core curriculum objectives found in the Family Practice Master Grid (Figure 2) outline the domain of the family physician. In each of the 12 competency areas of this Family Practice Master Grid are found three types of objectives: (1) common objectives, (2) integrative objectives, and (3) generic objectives.

Common objectives describe basic competencies that are common to all medical specialties and include such things as basic history-taking, basic physical examination techniques, basic investigatory testing, basic recording systems, or basic attitudes towards patients.

Table 1. Proposed Uses of Curriculum Objectives

A. Instructional purposes
   1. To provide a guide for resident expectations
   2. To define expected residency competencies for:
      a. Residents
      b. Teachers
      c. Evaluators
   3. To provide guidelines for developing learning strategies
   4. To provide a delineation of generally stated goals
   5. To provide guidelines for developing teacher competence

B. Evaluation purposes
   1. To provide a basis for developing instruments which will evaluate:
      a. Resident competencies
      b. Teaching effectiveness
      c. Effectiveness of learning experiences
      d. The program as a whole
      e. Program units
      f. The appropriateness of the objectives

C. Communication purposes
   1. To provide a description of the family physician for interested persons, such as,
      a. Patients
      b. Medical students
      c. Other specialties
   2. To illustrate the interrelation of the family physician to other medical specialties and disciplines

D. General purposes*
   1. To provide guidelines for other residency programs
   2. To provide guidelines for residency review committees or other groups establishing standards
   3. To provide guidelines for continuing education programs
   4. To provide guidelines for practicing physicians in self-education and self-assessments

*The general purposes are adapted from the 1974 draft of the "Foundations for Evaluating the Competency of Pediatricians," from the American Board of Pediatrics, Chicago.

The *integrative objectives* describe the unique combination of competencies the family physician possesses that enable him/her to merge or bridge different specialty disciplines when addressing patient situations. These competencies may include such things as attitudes which facilitate use of several disciplines together, knowledge of the domain of many disciplines, or recording systems which easily incorporate a variety of information from various disciplines. Other specialties may possess parts of the integrative objectives. However, the family physician who possesses all the integrative objectives has a unique combination of abilities that allows him/her to effectively interact, merge, and bridge medical specialties as well as other disciplines when problem solving.

The *generic objectives* refer to competencies the family physician uses from other specialty disciplines and applies to specific problems or situations within his/her patient population. For example, the family physician uses specific pediatric abilities in intubating a newborn or specific behavioral science abilities in interpretation of certain psychological test results.

These three types of objectives in the Family Practice Master Grid enjoy different levels of specificity. Common and integrative objectives are stated very specifically, whereas generic objectives are only broadly stated. It is the common and integrative objectives that are primarily addressed by the Family Practice Center or its associated programs, conferences, and seminars. The generic objectives are most likely *first* accomplished on the resident's specialty rotations.

To further delineate the competencies needed within other specialty areas, eight additional grids were derived. Each additional grid has its own specialty designation. Within each of these specialty grids are the specifically stated objectives which further define the broadly stated generic objectives of the Family Practice Master Grid. This spells out for the family practice resident and specialty preceptor(s) the specific competencies the resident should master while on that specialty rotation. The preceptor is thus better able to tailor the experience and teaching strategies.

The above discussion has described

the organization and components of the core curriculum objectives. In order to better understand the three types of objectives and how they exist in the various grids, the following examples are given.

Example 1 (See Figure 2.) – The following is an example of a common objective from the Family Practice Master Grid competency area of skill(s) in information collection.

The resident is able to identify and to demonstrate skills designed to establish rapport, such as,
- *Open-ended questions*
- *Silence*
- *Reflection of feeling*
- *Genuineness*
- *Specificity of expression*

Example 2 (See Figure 2.) – The following is an example of an integrative objective from the Family Practice Master Grid competency area of attitude(s) in information collection.

The resident shows concern for the effect of information collected and the manner or means of its collection on the patient and others by, for example,
- *Getting family's opinions regarding client's health situation;*
- *Sensitively avoiding making statements which elicit fear, hostility, withdrawal, inaction or overstatement from the client;*
- *Providing a gown and appropriate dressing area for teenage patient;*
- *Examining frightened toddler on mother's lap;*
- *Taking the danger and cost of an arteriogram into account before ordering the study;*
- *Using person-to-person, rather than mass media methods for collecting information about an epidemic to avoid causing panic in the community;*
- *Understanding possible effects that a teenage pregnancy could have on the spectrum of family dynamics; and*
- *Taking into account the factors of danger, effectiveness, cost and information gain on patient's entire life of any investigatory work-up or procedure.*

Example 3 (See Figure 2.) – The following is an example of a generic objective from the Family Practice Master Grid competency area of skill(s) in information utilization/application.

Table 2. Model for Objective Writing Process

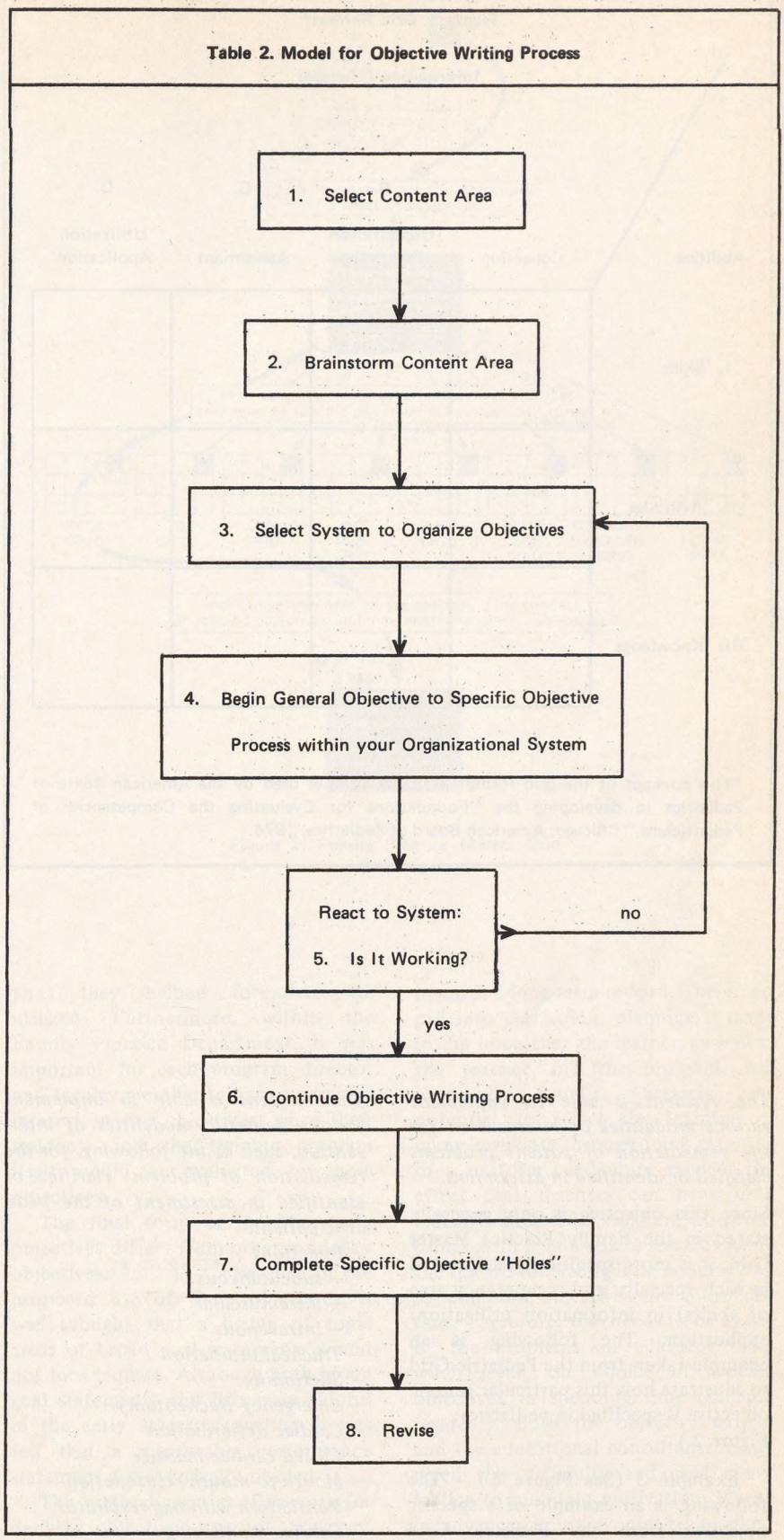
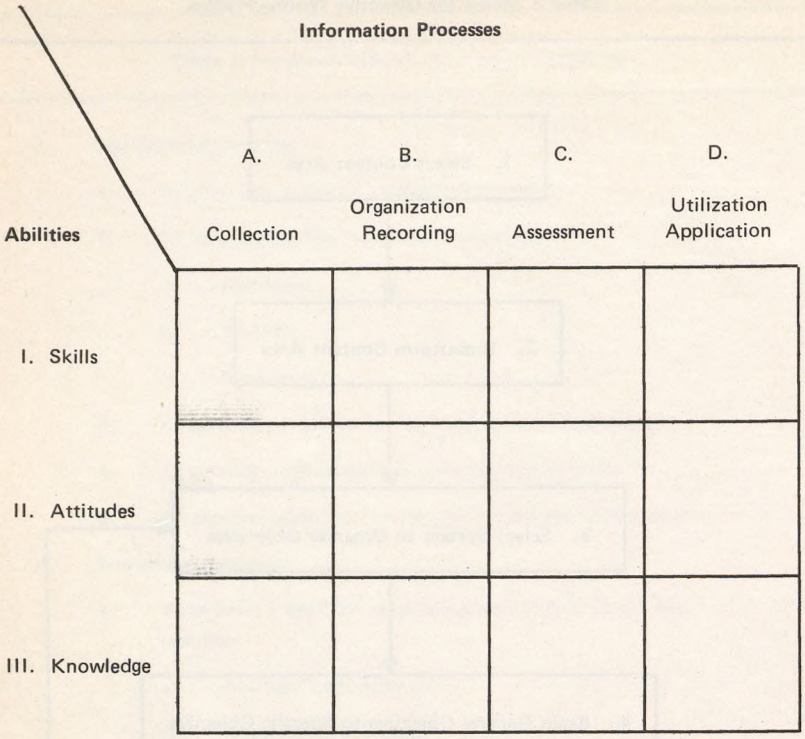


Figure 1. Grid Format*



*This concept of the grid format is similar to that used by the American Board of Pediatrics in developing the "Foundations for Evaluating the Competencies of Pediatricians," Chicago, American Board of Pediatrics, 1974.

The resident is able to implement various modalities of intervention for the remediation of patient problems clarified or identified in assessment.

Since this objective is only generally stated in the Family Practice Master Grid, it is more specifically delineated in each specialty grid competency area of skill(s) in information utilization/application. The following is an example taken from the Pediatric Grid to illustrate how this particular generic objective is specified in pediatrics: Figure 2.)

Example 3 (See Figure 2.) – The following is an example of a specific objective from the Pediatric Grid competency area of skill(s) in information utilization/application.

The resident is able to implement various pediatric modalities of intervention, such as the following, for the remediation of problems clarified or identified in assessment of the pediatric patient.

- *Injections*
  - *subcutaneous*
  - *intramuscular*
  - *intravenous*
- *Tracheal intubation*
- *Suctioning*
- *Emergency tracheotomy*
- *Cardiac defibrillation*
- *Closed cardiac massage*
- *Mouth-to-mouth resuscitation*
- *Ventilation with bag respirator*
- *Cardiac monitoring*
- *Intravenous line*
  - *scalp vein on scalp*
  - *peripheral vein*
  - *transcutaneous catheter placement (subclavian vein)*
  - *cutdown*
- *Umbilical catheter placement (both vein and artery)*
- *Set up and administration of blood*
- *Regulation of incubator*
- *Proper breast suckling technique*
- *Administration of any oral medicine*
- *Thoracentesis*
- *Abdominal paracentesis*
- *Unique office procedures*
  eg, remove gum in hair
  remove foreign body from any orifice
- *Nasal packing*
- *Clip frenulum on tongue*
- *Remove labial adhesions*
- *Remove skin tags*
- *Remove umbilical granuloma*
- *Myringotomy*
- *Immobilization procedures of joints or extremities*
- *Preparation of newborn for transport*

In the OB Grid, there would be a similar objective to Example 3 generated from the same generic objective in the Family Practice Master Grid; however, it would address itself to interventions for remediation of obstetric problems. The other specialty grids also fit into this same flow.

The merging of competencies drawn from each of these specialty areas along with the common and integrative competencies, into a family physician can be visualized by examining the Family Physician Daisy (Figure 3). The area within the dotted inner circle represents the Master Grid objectives. The family physician portion of the petals represents the specialty specific objectives.

This organization of the core curriculum objectives is particularly useful as it clearly shows the unique perspective of the family physician working within a variety of disciplines while also expressing his/her dependence upon other disciplines. In addition, this organization of the core curriculum objectives is useful in that the specialty objectives can stand alone as those competencies a resident is expected to acquire in a particular specialty that are unique to that specialty. Thus, specialty preceptors may wish only to read their respective set of specialty objectives.

Discussion

The University of Minnesota Affiliated Residency Training Program in Family Practice is not the first medical area or residency to attempt to define its program in behavioral objectives. However, the method for writing objectives and the resultant objectives at Minnesota differ from other residency programs.[21-24, 26,28]

The Minnesota program chose to derive its objectives through the group involvement approach described in this paper because, in developing specific program objectives, it has advantages over the commonly used survey approach. The survey approach employs a small, self-selected group which writes the objectives and mails them to staff physicians, practicing physicians, or students to change, add, delete, or rate.[10,13,32] Schwab, in his article on problems in curriculum development, addresses the advantages of the group involvement approach when he points out that there are "meanings" impossible to encompass in a written statement of objectives that are understood only when one is privy to the initial deliberations.[33] For this reason it is important to include the people who will be involved in the implementation of the curriculum in the initial writing of the objectives. By their inclusion, they gain a full understanding of the final objectives and have a vested interest in seeing them implemented in the full spirit intended.[34] The establishment of the core curriculum committees which linked the Family Practice Residency Program to the many departments and hospitals it touches and the direct involvement of at least one member of each of these committees in the writing of the family practice objectives allowed the program to benefit from the vast resources of a complex university/community system. Just as important, it allowed other departments to assess their role in the Family Practice Residency and to have a direct input into that program.

The involvement of so many people does make the objective writing process slow. However, it results in well-formulated objectives that are likely to be fully implemented, since many people in the various departments who are involved in the family practice training program have an interest in seeing that the objectives that they helped formulate are utilized. Furthermore, within the Family Practice Department, it was important for each program director and faculty member to have a personal interest in the objectives, since their residents and the training program itself would be evaluated by these objectives.

The final form of the Minnesota objectives differs from other residency objectives.[21,24,26-28] Because of the proposed use of these objectives, it was thought that a listing of topic areas or broad goal statements would not be adequate. Although both broad goal statements and lists were helpful in the early stages of writing, it was felt that a measurable performance statement was eventually needed.

The method used at Minnesota for deriving objectives was not, however, without its disadvantages and difficulties. Curriculum planning always involves a long-term reward. The effort put into curriculum planning is made in the hope that the learner, as well as the teacher and the program, will eventually benefit. Certainly, the potential to affect the learning of many residents through joint planning of a uniform curriculum exceeds the effect that teachers can have individually. Individual teaching, however, brings with it immediate rewards while the reward for sitting long hours trying to compose objectives are more distant. Therefore, one needs to be aware of the problems an educator faces when given the choice of writing objectives or spending time teaching residents. Both the objective writers and the educational consultants recognized this difficulty and used many tactics to maintain motivation. Weeks in advance, hours would be blocked off on appointment calendars for sitting and writing. Meetings were

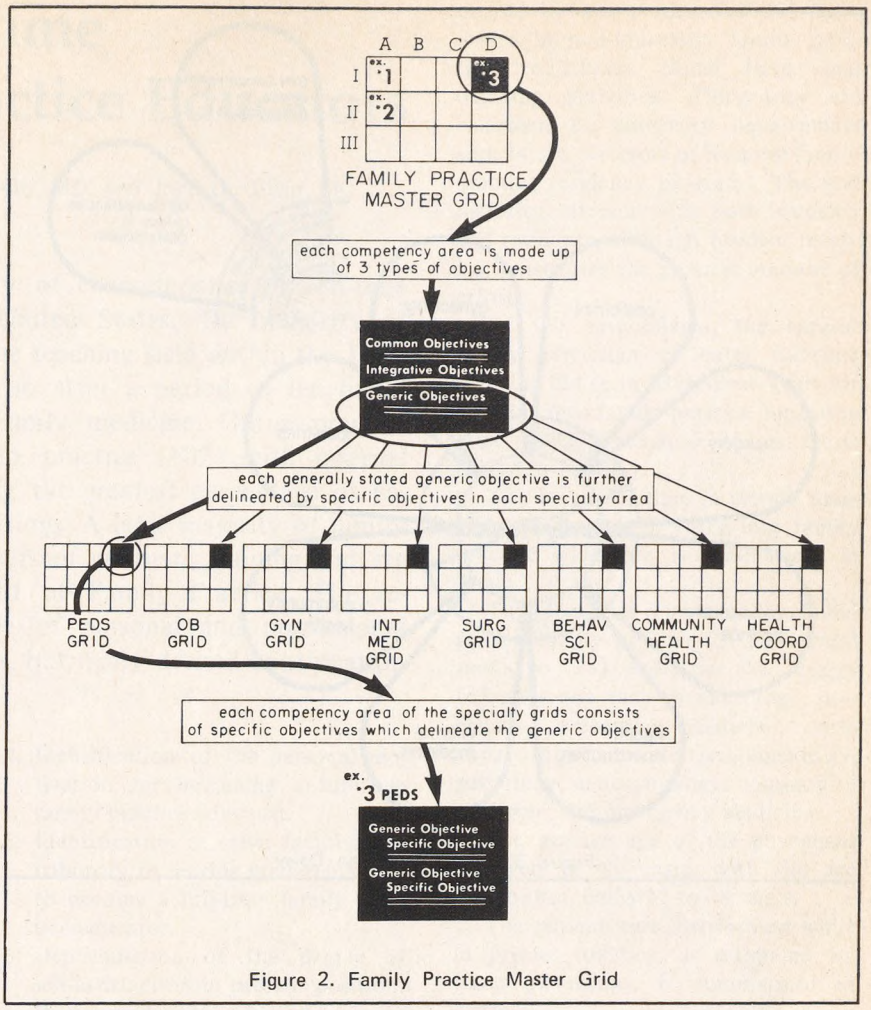


Figure 2. Family Practice Master Grid

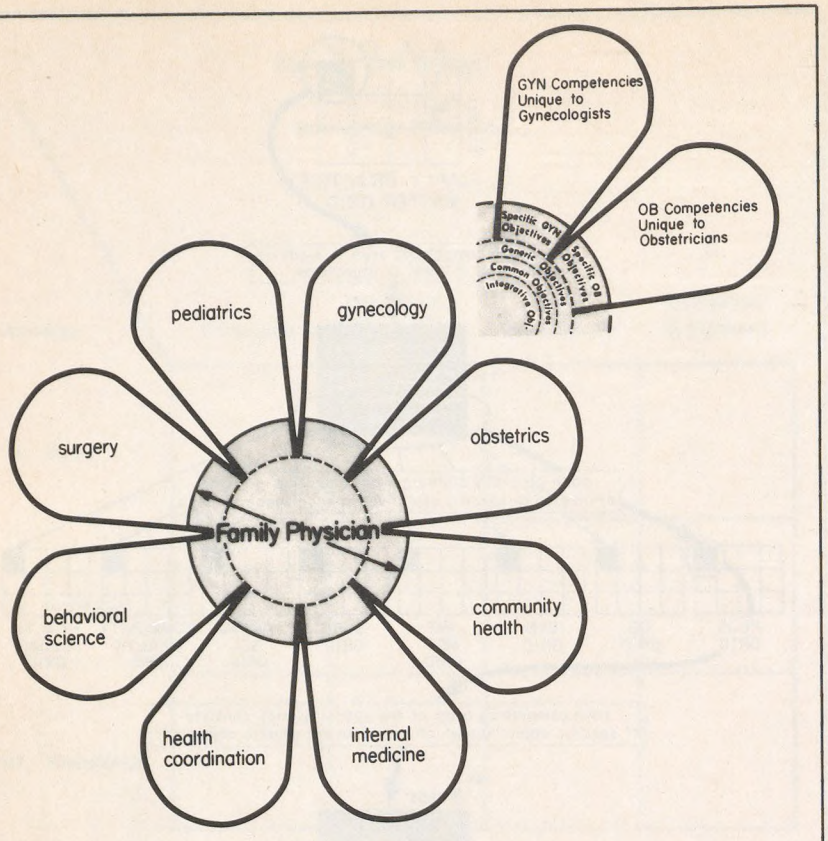


Figure 3. Family Physician Daisy

arranged where writers were given food and drink and simply went to opposite corners and worked.

This objective writing process not only allowed for the completion of a curriculum defined by objectives, but also resulted in some unexpected byproducts. As a result of learning and writing about objectives, many of the faculty have increased their understanding of the curriculum, instruction, and evaluation. They now feel more comfortable as teachers and managers of an educational program. Perhaps more important, this total program effort, which included much give and take, served to bring the members of the affiliated programs together. They grew to know each other and to understand each other better as they shared in developing and defining the objective based curriculum which defines the Affiliated Family Practice Training Programs at the University of Minnesota.

Acknowledgement

The process and product described in this paper are the result of the combined efforts of the unit directors of the affiliated program, core curriculum committee members, and other interested faculty. Thus, this paper represents the efforts of many more people than the authors listed.

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