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A Model for a Performance Analysis of an Ongoing Educational/Habilitative Interdisciplinary Team

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A MODEL FOR A PERFORMANCE ANALYSIS OF AN ONGOING EDUCATIONAL/HABILITATIVE INTERDISCIPLINARY TEAM

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INTRODUCTION

Legal, funding, and accreditation sources often recommend or mandate the use of an "interdisciplinary team approach" to providing services to persons with handicaps (Kahn, 1976). The concept of planning and providing needed human services via a team process is not a new one. The team process was cited as a desired means of providing health care as early as 1922 (Barker, 1922). During the 1940's the Montefiore Hospital in the Bronx made significant contributions toward developing team models for providing primary health care. (Kindig, 1975). The work at Montefiore in the area of health care continued into the 60's as part of the efforts of the Office of Economic Opportunity to develop neighborhood health centers. The Institute for Health Team Development is currently located at Montefiore (Tichy, 1974). The team approach to providing services has been recommended and applied in several different human service areas: from corrections...to mental health...to dentistry...to rehabilitation (Ducanis and Golin, 1979).

A team approach has been described as "a distinctive style of working aimed at harnessing the collective talent and energy of people. A team consists of individuals who relate together to get things done. A team is, however, more than a collection of individuals" (Francis and Young, 1979, p. 6).

Morgan and Moreland (1978) identified three phases of team development. They defined them as: 1) affiliation phase; 2) consolidation phase; and 3) synthesis phase. They believe a "group" evolves into a "team" by passing through each of these developmental phases (p. 1).

The team approach to providing human services evolved from the generally accepted assumption that teams of persons representing a variety of professions could "bring together diverse skills and expertise to provide more effective, better coordinated, better quality services for clients" (Ducanis and Golin, 1979, p. 1).

Using teams of persons to plan and provide services for persons with handicaps is a widely accepted concept (Haring and Brown, 1976; Sontag, 1977; Allen, Holm, Schiefelbusch, 1978; Elder & Magrab, 1980). It is generally agreed that a handicapping condition affects multiple aspects of a person's life and that no one person can possibly have all of the skills necessary to identify, plan and provide for the resulting service needs.

It is generally agreed that: 1) the more severe the handicapping condition(s), the more important it is to use a team approach (Reynolds, 1978); and 2) because each person's needs are unique, programs should be designed to match the individual needs of each person seeking services (Kahn, 1976).

The terminology most often used to refer to these teams is "multidisciplinary" or "interdisciplinary" (Gjerde, 1978; McCormack, 1977; Bayrd, 1977; Project L.E.A.R.N., 1978; Schachter, 1978; Tracy, Gibbons, Kladder, 1976; Haring and Brown, 1976; Johnston and Magrab, 1976; Sontag, 1977; Flack, 1978; Gardner, 1980; Sirvis, 1978; Elder and Magrab, 1980; Allen, Holm and Schiefelbusch, 1978). "Transdisciplinary" (Lyon and Lyon, 1980) and "intradisciplinary" (Pronovost, 1976) are also two common team labels.

Public Law 94-142, a federal law which affects education service systems, reflects the generally accepted notions of providing

individualized services through a team approach. The federal law mandates that persons referred to special education services be evaluated by a "multidisciplinary team." It further requires that: 1) a team of persons determine service eligibility; 2) formulate placement recommendations; and 3) develop an Individual Education Plan (I.E.P.) for each person who qualifies for special education services.

Kahn (1976) reviewed P.L. 94-142's rules and regulations and reported the following required components or provisions in the development, implementation and review of an individualized plan:

A. Comprehensive assessment conducted by an interdisciplinary team.

B. Technical and procedural provisions:

1. Plan is in writing for each individual under twenty-two years of age.
2. Plan provides for the establishment or revision of the educational plan at the time of placement, and at least annually.

C. Individualized planning for an individual which means that the plan:

1. States the present level of educational performance.
2. Identifies the specific educational services to be provided.
3. Specifies the extent to which the individual will be able to participlate in regular educational programs.
4. States the projected dates for initiation of services and the anticipated duration of such services.
5. States annual goals, and includes a statement of short-term instructional objectives.

D. Individualized plan review and coordination which requires a plan that:

1. States for the purposes of periodic review of the plan: objective criteria for evaluating

attainment of objectives.
2. Is reviewed regularly and at least annually, for evaluation of the program, modification of objectives and/or programs and appropriateness of placement, in light of the progress evaluation, by the agency or facility or educational program primarily responsible for the coordination of delivery of services to the individual.
3. Provides that the individual and that person's parents or other representative, shall be given the opportunity to review the plan and participate in its revision. (pp. 24-31)

Although the rules and regulations related to P.L. 94-142 establish a general criteria for who should be on the teams, what kinds of meetings should be held, and how often a plan must be reviewed, the law does not describe exactly how these teams must function (Witkomsky, Cronin, 1979).

> ". . . according to P.L. 94-142 and related federal and state rules and regulations, a multidisciplinary team approach to the I.E.P. process is mandated . . . Because each district or cooperative must work within its own constraints, each will undoubtedly adjust the team approach to a committee model which best fits its own needs and available staff, while still addressing the individual needs of the student" (p. 45).

Several additional federal and state laws, as well as accreditation sources directly related to services for handicapped individuals, specify that a team of appropriate and relevant persons must assess, plan, and provide necessary individualized service programs (Kahn, 1976). However, like most legal mandates, these sources tend to set minimum standards for performance rather than exemplary standards. They define some required outcomes and establish some general parameters for service systems, but it becomes the responsibility of the service systems to define performance standards for

truly quality service delivery.

In the past, special education service systems primarily provided services to mildly and moderately handicapped persons. Education programs sometimes attempted to plan services through an interdisciplinary process; however, "interdisciplinary planning for individual students was frequently incomplete with regard to the range of disciplines involved and the depth of effort" (McCormack, 1977, p. 1).

P.L. 94-142 mandates that educational services be provided to all persons requiring special education programs, regardless of the severity of their disability. This fact, combined with the law's insistence that services be individualized and planned through a team process, "presents a provocative and much needed opportunity to progress . . . to a new level of detailed interdisciplinary planning for all handicapped children" (McCormack, 1977, p. 1). It is also creating teams within educational systems who have little or no experience or training in interdisciplinary team skills.

It seems obvious that before any system can prepare persons to function as effective members of interdisciplinary teams, or effectively function through an interdisciplinary team approach, the competencies of effective interdisciplinary team performance must first be identified and defined. A clearer definition of what constitutes exemplary interdisciplinary team performance would provide agencies and consumers with a better means of evaluating team performance and could guide the efforts of persons interested in training persons to function on interdisciplinary teams.

Review of Literature

Team Labels

The terminology most often used to refer to human service teams involved in providing services for persons with handicaps is "multi-disciplinary" or "interdisciplinary." (Gjerde, 1978; McCormack, 1977; Bayrd, 1977; Project L.E.A.R.N., 1978; Schachter, 1978; Tracy, Gibbons, Kladder, 1976; Haring & Brown, 1976; Johnston & Magrab, 1976; Sontag, 1977; Flack, 1978; Gardner, 1980; Sirvis, 1978; Elder and Magrab, 1980; Allen, Holm, and Schiefelbusch, 1978) "Multidisciplinary" and "interdisciplinary" are intended to refer to the process used by a particular team. "Interprofessional," and "transdisciplinary," are also terms used to label teams according to apparent team process. Additionally, there are several terms in the literature which label teams according to the team's function i.e., case management team; staff conference team; I.E.P. team; I.P.P. team, staffing team, etc.

Clearly defined and universally accepted criteria for using these current team labels does not appear to exist. One cannot with any reliability assume that when one author describes a team using any one of the current terms that he or she is describing a team which functions like another team that a different author describes using the same terminology.

Ducanis and Golin believe that it may be somewhat premature to even attempt to distinguish between different kinds of teams. They are of the opinion that "the study of teams may best be facilitated by the use of a commonly agreed upon term to describe those teams composed of members of different professions" (1979, p.3). Even though a team approach to planning and providing human services has been

advocated and, in one form or another, applied in almost all areas of human service, Ducanis and Golin believe that "to date the concept has generated more rhetoric than research and an adequate theory of teams has yet to be formulated . . . A clearer understanding of the concept could only improve the effectiveness of the team delivery approach" (1979, p. 1).

Because "interdisciplinary" is the term most frequently used in current literature, Ducanis and Golin (1979) advocate its use whenever one is referring to "a functioning unit composed of individuals with varied and specialized training, who coordinate their activities to provide services to a client or group of clients" (p. 3).

At this time, Ducanis and Golin's recommendation for adopting the term "interdisciplinary" seems a worthy one. Even though arguments can be made for the use of any one of the current team labels, it seems to be a fact that "attempts to draw fine distinctions between them has at times led not to clarification but to even greater confusion" (Ducanis and Golin, 1979, p. 2). Since "interdisciplinary" is the term most widely used, it seems reasonable to adopt its use while working toward a clearer definition of exemplary interdisciplinary educational/habilitative team performance.

Additional Definitional Characteristics

Most authors agree that varied membership composition is a necessary but not sufficient condition for labeling a team "interdisciplinary." They believe a variety of representatives can function "akin to parallel play" . . . "On the other hand, the end product of 'interdisciplinary' work is greater than the sum of its parts--the interactive learning and give-and-take among the professionals

yields something new and different that reflects more than one particular approach to problems" (Haring and Brown, 1976, p. 9).

Many sources would include the "active involvement" of parents or client advocates (Haring, Brown, 1976; Hawkins-Shepard, 1978; Sirvis, 1978; Gjerde, 1978) as a criterion for an exemplary educational/habilitative interdisciplinary team. P.L. 94-142 also mandates that attempts be made to actively involve parents in the planning of the child's educational programs.

Regardless of who is writing about the team approach; regardless of which team label the author uses; and regardless of which area of human services the author is addressing, the element most consistently described as characterizing a team approach is "collaboration or coordination of services" (Ducanis and Golin, 1979, p. 2). Leading authors who addressed interdisciplinary teams within the context of providing services to persons with handicaps consistently used the terms "collaboration" and "coordinated and integrated services." They also often include some form of "consensus" or "group" decision making as a necessary condition for effective interdisciplinary team function. A singly comprehensive service plan which is truly "coordinated and integrated" in both form and function is usually described as the desired outcome of this group decision-making model and coordinated, cooperative effort (Haring and Brown, 1976; Johnston and Magrab, 1976; Sontag, 1977; Gardner, 1980; Elder and Magrab, 1980; Allen, Holm and Schiefelbusch, 1978).

Pearson (1972) has cited interdisciplinary collaboration and coordination as a principle of effective on-going case management for persons with chronic disabilities. He also believes it is "probably

the most difficult principle to put into practice and the least understood." He says that without it "the handicapped child and his [or her] family can become confused wanderers adrift between 'circumscribed islands of service.'" (pp. 11-12).

The term "interdisciplinary" is not only used to describe a particular service team, it is also used in a broader context to describe a total service process. The term "interdisciplinary process" is often used interchangably with the term "interdisciplinary team" and has been defined as the "integration and coordination of all services that are provided for the individual within his or her environment" (Falck, 1978, p. 74). The "emotional climate of the team, the dynamics of the team, and the style of leadership" have also been described as important "factors . . . that comprise the interdisciplinary process " (Johnston and Magrab, 1976, p. 9).

University Affiliated Programs (UAP's) are one of the primary bodies charged with providing interdisciplinary training for personnel concerned with developmental disabilities. UAP's have become "the major federal program designed to provide interdisciplinary trained personnel for work with mentally retarded and developmentally disabled individuals" (AAUAP, 1978, p. 2).

Several of the criteria for belonging to the Association of University Affiliated Programs relate very specifically to the concept of using "interdisciplinary teams" to provide services. For example, the following represents AAUAP membership criteria (AAUAP, 1978):

1. "A University Affiliated Facility or Program is an interdisciplinary program which is an integral component of, or formally affiliated with, a University or other institution of higher

learning " (p. 6).

2. Exemplary interdisciplinary training programs and exemplary interdisciplinary service programs are criterion missions of UAP's. (p. 2)

3. Training must be "planned, coordinated, and implemented by an interdisciplinary body, with multiple disciplines represented in group decision making " (p. 16).

4. Trainees must be "provided with interdisciplinary experiences in a team setting with other disciplines " (p. 16).

5. Interdisciplinary client services must "involve a team process in: planning, intervention, parent interpretation, and teaching " (p. 16).

The interdisciplinary process is obviously fundamental to all UAP's. Staff are expected to function in an "interdisciplinary" manner, trainees are expected to learn "interdisciplinary" behaviors, and clients are expected to be served through an "interdisciplinary team process." The number of UAP's has increased from 20, in 1962, to 45 in 1980. (AAUAP, 1980)

All UAP's have made efforts toward functioning through and teaching skills in the "interdisciplinary process." UAP's and some individual researchers have made attempts at defining specific desired interdisciplinary behaviors. The results of these efforts are lists of interdisciplinary "competencies." UAP's sometimes incorporate these "competencies" into their training program's instructional objectives. For example, some of the instructional objectives described by Georgetown University, UAP, under the heading of "Interdisciplinary Process and Attitudes Toward the Developmentally

Disabled" (1978, p. 34) are:

The student will:

1. Demonstrate the ability to exercise leadership competence in an interdisciplinary setting.

2. Discuss his/her own role in the decision-making process.

3. Demonstrate a balance between disciplinary role identity and interdisciplinary group membership.

A doctoral dissertation by Mary E. Hielman (1977) identified 51 "competencies" associated with "teaming." Of these 51 "competencies," five of the highest ranking were:

1. Understand that although leadership is important to team success, the leadership role may change with the task to be done.

2. Deal positively with conflict by using it to encourage individual participation and group growth.

3. Possess self-confidence in one's own professional expertise and contribution.

4. Be able to be flexible and adaptable in the common effort.

5. Demonstrate effective problem-solving techniques.

Despite the fact that both Heilman's and Georgetown's "competencies" are either not stated in behavioral terms and/or do not provide measurable performance criteria, they do serve as typical examples of the efforts that have gone into defining exemplary interdisciplinary performance.

Our efforts at defining exemplary "interdisciplinary" team performance have focused on behavior and process. This approach may, in part, explain our continued frustration at reaching agreement and clarity about desired "interdisciplinary" team performance. Thomas Gilbert (1978) proposes that "it is often hard to specify exactly what behavior is required for exemplary performance, because two

exemplars may behave in considerably different ways " (p. 36).

Team Roles

Interdisciplinary educational/habilitative teams have at times concentrated on one stage of service delivery while seriously neglecting other equally important stages. Services for persons with handicaps are commonly divided into at least four major categories: 1) evaluation and assessment; 2) planning; 3) implementation; and 4) program review. Evaluation and assessment are important components of a service delivery model for handicapped persons. However, there has been a tendency to sometimes arbitrarily divide evaluation services from the continued planning and provision of services. Some teams have defined their role as strictly "diagnostic," and their goal has been to assess problems and recommend treatment elsewhere (Allen, Holm, Schiefelbusch, 1978, p. 113). However, "most [teams serving persons with disabilities] today realize the futility of pure diagnostic assessment, and most therefore have some commitment to treatment and management" (Allen, Holm, Schiefelbusch, 1978, p. 114).

Wolfensburger (1965) contends that: "Diagnostic services are often overdeveloped in comparison to other available resources," and that "we really have no strong empirical basis for claiming even a fraction of the benefits attributed to the team evaluation in mental retardation" (p. 30).

Although upon initial diagnosis the management plan for a person with a disability may focus on the person's medical needs, there is usually a "need for a shifting of authority and emphasis at different

times and at different life stages depending on both the kind and degree of handicap present and the availability of services to meet these needs...In the case of a child, the medical problems may have become relatively stable so that the child's prime needs, and therefore the program emphasis, become educational" (Pearson, 1972, p. 12).

Conclusion

There seems to be agreement that services can best be provided through an appropriate "team" of individuals; that the resulting services should be "coordinated"; and, that the team, in one form or another, should be involved in all stages of service delivery. However, there does not seem to be agreement as to what constitutes exemplary performance of an interdisciplinary educational/habilitative team.

Statement of the Problem:

Although legal, funding, and accreditation sources aften mandate the use of an "interdisciplinary team approach" to providing services to persons with handicaps, there is no clear, concise definition of what constitutes exemplary team performance. Without a definition of what constitutes exemplary team performance, it is impossible to know how to prepare persons to function on interdisciplinary teams or how to evaluate the performance of existing teams.

Related Questions

The following questions will be addressed in an attempt to define exemplary performance standards for an ongoing "interdisciplinary" educational/habilitative team:

1. What are the valued outcomes (accomplishments i.e., valued consequences of behavior) of an exemplary interdisciplinary educational/habilitative team?

2. What are the measurement requirements of these accomplishments and what are their relevant units of measurement?

3. What are exemplary standards for each of these units?

Definitions and Assumptions

Team: A team will be defined as "a number of persons associated together in work or activity and functioning as a collaborative unit" (Webster, 1976).

Interdisciplinary team: An interdisciplinary team will be defined as "a functioning unit, composed of individuals with varied and specialized training and/or experiences who coordinate their activities to provide services to a client or group of clients" (Ducanis and Golin, 1979, p. 3).

Accomplishment: a valued consequence of behavior. To be an accomplishment, it must be stated in "other than behavioral terms and must be able to be observed and measured when the performer has gone away"(Gilbert, 1978, pp. 22-25).

Performance: "a transaction involving both behavior (B) and its consequence (C) or in shorthand: P = B C. In performance, behavior is a means, and its consequence is an end" (Gilbert, 1978, p. 16).

Worthy Performance: performance which is achieved when "the value of the accomplishment exceeds the cost of the behavior" (Gilbert, 1978, p. 17).

Exemplary Performance: "the most sustained worthy performance

that we can reasonably expect to attain" (Gilbert, 1978, p. 40).

Engineering human performance: the process of using available knowledge to create a new or better level or from of human performance (Gilbert, 1979, pp. 1-7).

Measurement Requirements: characteristics of an accomplishment that are required for exemplary performance (Gilbert, 1979, p. 45).

On-going educational and habilitative team: a functioning interdisciplinary unit, composed of individuals with varied and specialized training, who coordinate their activities to plan and provide educational and/or habilitative services to a client or group of clients.

University Affiliated Program: an interdisciplinary program which is an integral component of, or formally affiliated with, a university or other instutution of higher learning and whose major goals include: providing exemplary interdisciplinary training programs to prepare persons who work with handicapped individuals; exemplary service programs which can be used as part of the training programs; and exemplary research related to handicapping conditions. (AAUAP, 1978, p. 2)

METHOD

Theoretical framework

Thomas F. Gilbert's performance engineering model, (PEM), (Gilbert, 1978), was used as the theoretical framework for defining exemplary performance standards for an "interdisciplinary" educational/habilitative team.

Basic to Gilbert's performance engineering model are the premises that:

1. "We must first discover for sure what we are trying to accomplish. And until we know that, no one is going to be able to tell us how to accomplish it" (p. 164).

2. "Only when we have made a proper analysis of accomplishments (i.e., valued consequences of behavior) and their measures will we have any sensible reason to concern ourselves with behavior" (p. 73).

When trying to define, or "engineer" a performance system, Gilbert directs us to:

1. First, define the accomplishments (valued consequences of behavior) that are desired of that system (i.e., the performer or performers).

2. Second, define the valued characteristics (requirements) of each accomplishment.

3. Third, define the units of measurement for each characteristic. In other words, describe how one might measure each defined characteristic.

4. Fourth, establish exemplary standards for each requirement. These standards may be established from actual exemplary performance

examples or formulated from ideals. (Gilbert, 1978, p. 40 and 179).

Gilbert defines quality, quantity and cost as the three most general requirement categories (See Appendix C). "When we measure an accomplishment, any one or more of these requirements may be relevant, and one of our principal tasks is to identify them" (p. 45).

Instead of focusing on behavior, the performance engineering model views behavior as only one aspect of competence. It establishes exemplary performance as the standard for measuring competence and it requires us to define and measure competencies within their environmental context.

Gilbert's model establishes the ratio of exemplary performance to typical performance (any given instance) as a measure of competence. He views this ratio as our "potential for improved performance (PIP)" (p.30). He defines exemplary performance as our standard for competence because anything less than that tends to produce mediocrity. Once we've defined our desired performance model, this approach helps us identify those performance areas which deviate the most from our exemplary standards. The areas which deviate the most are viewed as having the most "potential for improved performance (the highest PIP's)" and are considered to be the performance areas which, if improved, will produce the most change for the least cost. We are directed to use performance information as a means of improving necessary aspects of performance rather than as a means of criticizing it.

Subjects

The "interdisciplinary" team approach to providing exemplary services to persons with disabilities is a primary mission of

University Affiliated Programs (UAP's). UAP's are also designated to provide "interdisciplinary" training to persons interested in working with persons with disabilities. Therefore, the Meyer Children's Rehabilitation Institute, a UAP, at the University of Nebraska Medical Center, was used as the site for using the performance engineering model to define exemplary performance of an ideal ongoing interdisciplinary educational/habilitative team.

A staff person from eight of the disciplines represented at Meyer's was asked to participate in this study. The discipline representatives who participated were chosen based on having: 1) experience functioning on interdisciplinary educational/habilitative teams; and/or 2) experience training persons to function on teams. They were required to have an expressed committment to the "interdisciplinary" team approach to providing services, and they had to be willing to participate in the study. The disciplines represented were: 1) occupational therapy; 2) physical therapy; 3) special education; 4) psychology; 5) medicine; 6) social work; 7) speech; 8) nursing; and 9) one parent.

PROCEDURE

The nine participants were individually briefed as to what they would be expected to do. They were each given a written description of the proposed project and told that they would be asked to: 1) meet as a group to generate a list of desired "accomplishments" of an ideal ongoing interdisciplinary educational/habilitative team; 2) define the valued characteristics (requirements) of each accomplishment; 3) define the units of measurement for each requirement; and 4) establish

exemplary standards for each requirement. (Appendix A)

They were told that they would be required to participa e in several group meetings, as well as complete individual reviews of the products of the small group meetings.

The first group meeting was scheduled for three hours and was facilitated by an experienced group leader who used the nominal group technique (Delbecq, Van De Ven, and Gustafson, 1975). Accordingly, participants were instructed to silently and individually take ten minutes to:

"Briefly list what you think should be the desired results (accomplishments) of an exemplary interdisciplinary ongoing educational/habilitative team."

They were told that in order for a statement to qualify as an "accomplishment" it must meet all of the following criteria:

1) must describe a valued consequence of the team
2) must be stated in other than behavioral terms
3) must be able to be observed when the team has gone away and
4) must relate to an exemplary team.

After ten minutes, the participants were asked to share their list, one item at a time, taking turns, using a "round-robin" process. Each item was written on large paper and posted in full view of all group members. No disucssion or evaluation of items was permitted.

Once all items were listed, anyone could request clarification of any item, but debate and prolonged discussion were not permitted.

When the group members were satisfied with the clarity and meaning of the statements, they were asked to silently and individually select

what they considered to be the five most "essential and important" accomplishments from the total list. They were then told to rank order their five selected items and assign corresponding points to each item (5 points=1st; 4 points=2nd; 3 points=3rd; 2 points=4th; and 1 point=5th).

Subsequently, the researcher reviewed and analyzed all statements generated by the group. If an item did not clearly state an accomplishment, according to the established criteria, it was: 1) considered as a possible valued characteristic (requirement) of an accomplishment; 2) considered as a possible subaccomplishment; 3) reworded; 4) deleted. These proposed changes, including some items originated by the researcher, were all documented and submitted to the group members along with a written report of: 1) the total list of statements as originally generated by the group; 2) the list of statements rank-ordered by the group; and 3) the list of statements not included in rank-ordering (See Appendix B). The proposed list and reorganization of accomplishments were sequenced chronologically according to four stages of service delivery: evaluation, planning, implementation, and review.

Participants were asked to review the written materials item by item. They were asked to:

1) Add any accomplishments you think are missing. It might help this process if you try to answer the following questions:

"Are there any accomplishments missing related to:
evaluation
interpretation
planning
ongoing management
review?"

2. Add any valued characteristics you think missing for a particular accomplishment. (Are there any characteristics of an accomplishment missing that you think are requirements of exemplary performance?)

3) Change any item or part of an item that you think is unclear, inaccurate, incomplete, etc. If possible, briefly describe why you would change it.

4) Delete any item, or part of an item you think inappropriate and explain why.

5) If possible, list the units of measurement you think appropriate for a given characteristic. In other words, explain where and how to measure a particular characteristic.

Participants were asked to return their written review to the researcher by a given date. The researcher reviewed their comments and changes, asked for clarification, when necessary, and continued to revise the materials.

A group meeting was scheduled at which the researcher presented to the group, item by item, all further proposed changes and additions. The participants were given an opportunity to comment on the proposed draft and the researcher recorded their comments.

The larger group was then divided into two smaller groups. The two groups were given 30 minutes and were asked to concentrate on defining units of measurement and corresponding exemplary standards. At the end of 30 minutes, they were asked to share their work with the larger group. This information was recorded by the researcher.

The researcher then further revised the list of accomplishments, requirements, units of measurement, and exemplary standards.

These revisions were submitted to each group member for one final review. They were again asked to review the materials item by item. They were asked to indicate next to each item either: 1) acceptance; 2) acceptance with following modifications; 3) don't accept; and/or 4) why.

The researcher reviewed the participants final comments and made final revisions.

RESULTS

All nine participants were present for the first group meeting. The group generated a total of 31 "accomplishment" statements. Although, at the first group meeting, the group was directed to rank-order the "most important and essential" five of the 31 statements, it was decided that the rank-ordering process was too limiting. The group agreed that it seemed premature to limit the study to an arbitrary number. Therefore all 31 statements were carefully considered by the researcher.

Only parts of twelve of the 31 original statements qualified as "accomplishments," based on the stated criteria. Eight of the twelve "accomplishments" were redundant: three of the twelve cited a "plan" as an accomplishment; and four of the remaining nine cited "recommendations" as an accomplishment.

Those parts of the original statements which clearly did not meet the criteria of an "accomplishment" were either deleted or recategorized as "characteristics of an accomplishment" or as a sub-accomplishment (See Appendix B). The researcher suggested deleting eight of the original statements and provided the participants with a written rationale. The remaining 23 statements (including individual parts of statements) were then reorganized into accomplishments, sub-accomplishments and characteristics. Thirteen accomplishments, 38 requirements, and one sub-accomplishment were derived from the group's 31 original statements (See Appendix B).

The participants individually reviewed the researcher's first draft of proposed accomplishments and requirements. Seven of the nine participants returned a written review to the researcher (the

person representing medicine and the parent were the two participants who did not provide a written review). Included in this review were each participant's suggested additions, changes, and deletions, as well as suggested units of measurement and exemplary standards.

The researcher analyzed the returned reviews and revised the proposed listing. The second proposed listing included nine accomplishments, 71 requirements, and two sub-accomplishments. It also included a first draft of proposed units of measurement.

This second proposed listing was distributed to the group at a second group meeting. Six of the nine original participants were present at the second meeting. Three of the original participants (occupational therapy representative, psychology representative, and the parent) were not present: one because of illness and two because of scheduling conflicts. The six participants present reviewed and discussed the second proposed listing and possible criteria for establishing exemplary standards. The researcher recorded their comments and later revised the materials based on their input.

A third draft of the listing was prepared by the researcher. The third draft included nine accomplishments, 17 sub-accomplishments, (See Table 1), and 88 requirements. It also included a proposed unit of measurement and corresponding exemplary standards for each requirement. The third draft was then submitted to each participant for a final review.

Table 1

List of Final Accomplishments and Sub-Accomplishments

1. WRITTEN STATEMENT OF TEAM'S ORGANIZATIONAL STRUCTURE AND OPERATIONAL RULES

   Sub-accomplishments:
   -Definition of each team member's role(s)
   -Definition of decision-making process to be used by team
   -Definition of team's general goals
   -Definition of process for communicating information
   -Definition(s) of major times when, and issues around which, clients with specific disabilities need to be seen
   -Definition of membership composition
   -Statement of philosophy

2. INDIVIDUALIZED EVALUATION PLAN

   Sub-accomplishments:
   -Questions to be addressed during evaluation

3. ASSESSMENT RESULTS AND CONCLUSION

   Sub-accomplishments:
   -Summary statement
   -Programmatic Recommendations

4. WRITTEN PROGRAM PLAN

   Sub-accomplishments:
   -Goal statements
   -Strategies for achieving goals
   -Programmatic objectives
   -Plan for monitoring program
      sub-accomplishment:
      -Data collection procedures

5. DOCUMENTATION OF NEW INFORMATION

6. DOCUMENTATION OF INTERVENTION RESULTS

7. PROGRAM REVIEW AND EVALUATION

   Sub-accomplishments:
   -Analysis and summary of intervention results
   -Recommended modifications

8. APPROPRIATE SERVICES

9. SATISFIED TEAM MEMBERS

All nine participants accepted the third draft with only minor suggested word revisions. The final draft, as accepted by the small group begins on page 26.

NOTE: The exemplary performance standards were established based on "ideal" team performance. It was agreed that at this stage of developing a model for exemplary performance of an ongoing inter-disciplinary educational/habilitative team, it was best to think in terms of "ideal" and not "actual."

For those identified requirements that are to be measured by their "presence," the standards were set at 100%. For those identified requirements that are to be measured through an opinion rating of specified persons, the standards were set at 90%. It was agreed that one could never expect 100% of persons surveyed to be in total agreement. It was felt, however, that a very high degree of agreement was desirable, and required, for exemplary performance.

Anytime the term "team" or "team members" is used, it should be assumed that a parent(s) is a part of the group referred to. It was decided that, ideally, parents are treated, and function, as full members of the total team. Therefore, they were treated as such, and it is assumed they are to receive the same rights, privileges, and appropriate responsibilities, as other team members.

ACCOMPLISHMENTS	REQUIREMENTS	MEASUREMENTS	EXEMPLARY STANDARDS
1.0 Written statement of team's organizational structure and operational rules	QUALITY	% of following items present in statement: -definition of roles of each team member -definition of decision-making process to be used by team -definition of general goals of team -definition of process to be used for communicating information among and between team members -definition of major times when, and issues around which, clients with specific disabilities need to be seen -description of membership composition -statement of team's philosophy	100%
sub-accomplishments:			
1.1 definition of each team member's role(s)	QUALITY -clarity	degree of consistency between written statement(s) and each team member's reported definition of each team member's role	In the judgement of independent evaluators there is agreement between the written statements of each team member's role and each team member's reported definition

ACCOMPLISHMENTS	REQUIREMENTS	MEASUREMENTS	EXEMPLARY STANDARDS
Sub-accomplishments (continued)			
1.2 definition of decision-making process to be used by team	QUALITY -clarity	degree of consistency between written definition and the definition of the decision-making process to be used as reported by team members	In the judgement of independent evaluators there is agreement between the written statements and the definition as reported by each team member
	-agreed to among team members	% of team members who report agreeing to the decision-making process defined in written statement	100% of team members report agreeing to the decision-making process as defined in writing
1.3 definition of team's general goals	QUALITY -clarity	degree of consistency between written definition and the definiof the team's goals as reported by the team	In the judgement of independent evaluators there is agreement between the written statements and the definition as reported by team members
1.4 definition of process for communicating information	-clarity	degree of consistency between written definition and the definition of the team's communication process as reported by team members	In the judgement of independent evaluators there is agreement between the written statements and the definition as reported by team members

ACCOMPLISHMENTS	REQUIREMENTS	MEASUREMENTS	EXEMPLARY STANDARDS
sub-accomplishments: (continued)			
1.5 definition(s) of major time when and issues around which, clients with specific disabilities need to be seen	-scientifically defensible	comparison of defition(s) with an appropriate criteria for scientific defensibility	In the judgement of independent evaluators the protocal defined for each issue and disability is scientifically defensible
1.6 description of membership composition	QUALITY -determined by client's needs	comparison of client's needs with team members competencies	1:1
1.7 statement of philosophy	QUALITY -consistent with principle of normalization; developmental assumption; human and legal rights; and principles of client advocacy	comparison of statement of team's philosophy with a criteria for philosophical consistency	In the judgement of independent evaluator(s) the philosophy statement meets the criteria

ACCOMPLISHMENTS	REQUIREMENTS	MEASUREMENTS	EXEMPLARY STANDARDS
2.0 Individualized Evaluation Plan	QUALITY		
	-specifies questions to be addressed during evaluation	% of plans which specify questions to be addressed during evaluation process	100%
	-specifies process(es) to use for gathering data related to each question	% of plans which specify process(es) to use for gathering data related to each question	100%
	-includes statement that outlines possible modifications in evaluation plan (instruments, time, setting, strategies, personnel)	% of plans that include modification statement	100%
sub-accomplishment: 2.1 questions to be addressed during evaluation	QUALITY		
	-includes all questions raised by referring agency	consistency between questions in evaluation plan and those the referring agency reports to have raised	1:1
	-includes all questions raised by parents (if any)	consistency between questions in evaluation plan and those the parents report to have raised	1:1

ACCOMPLISHMENTS	REQUIREMENTS	MEASUREMENTS	EXEMPLARY STANDARDS
Questions to be addressed during evaluation (continued)	-includes all questions raised by client (if any)	consistency between questions in evaluation plan and those the client reports to have raised	1:1
3.0 Assessment results and conclusions	QUALITY validity		
	-specifies time limitations for applicability of data	% of assessment results and conclusions that specify time limitations for applicability of data	100%
	-specifies conditions and settings within which information is applicable	% of assessment results and conclusions that specify conditions and settings within which information is applicable	100%
	-based on scientifically defensible practices	comparison of assessment results and conclusions with a criteria for scientifically defensible practices. Team members and outside evaluators must agree that criteria used is appropriate for particular situation	In the judgement of of independent evaluators, the assessment results and conclusions meet the criteria

ACCOMPLISHMENTS	REQUIREMENTS	MEASUREMENTS	EXEMPLARY STANDARDS
Assessment Results and Conclusions (continued)	-reflects use of process and tools appropriate for person a. age appropriate b. disability appropriate c. adjustments made for any unique situational factors (client's health on day(s) of assessment, fatigue, fear, etc.)	a. and b. comparison of client's age and disability with tools and processes used c. opinion of parents and other team members	In the judgement of independent evaluators, tools and process(es) used were age and disability appropriate 90% of parents and other team members agree that adjustments were made for situational factors
	<u>completeness/comprehensiveness</u> -addresses all problems and questions raised by referring party; client; parents; and other team members	comparison of: 1) problems and questions listed in assessment plan and 2) additional problems and questions which referring agency, client, parents, and other team members report that they raised with questions and problems addressed in assessment results and conclusions	1:1

ACCOMPLISHMENTS	REQUIREMENTS	MEASUREMENTS	EXEMPLARY STANDARDS
Assessment Results and Conclusions (continued)	-includes data and/or input from all persons who are relevant to assessing client's needs	consistency between number and names of persons who are relevant to assessing client's needs--as determined by interviewing parents, client, other team members, referring agency--and persons who provided data or input into assessment results and conclusions	100% consistency
	-includes data related to all suspected need areas	comparison of suspected need areas as stated in evaluation plan and as reported by team members with data provided in assessment results and conclusions	1:1
	-includes summary statement	% of assessment results and conclusions that include a summary statement	100%
	clarity/usefulness -presented in terms that are functional and understandable to people receiving information	% of people receiving information who report it is presented in terms that are functional and understandable	90%

ACCOMPLISHMENTS	REQUIREMENTS	MEASUREMENTS	EXEMPLARY STANDARDS
Assessment Results and Conclusions (continued)	-organized and described in a way that can be used to plan client's programs	% of persons who must use information to plan client's programs who rate the assessment results and conclusions very useful for making programmatic decisions	90% of persons involved in planning programs give the assessment results and conclusions an above average rating on a rating scale designed to measure opinion regarding usefulness for making programmatic decisions
	-consistency between oral report and written report	opinion of persons who received information in both oral and written formats	90% of persons who received information in both formats give the assessment results and conclusions an above average rating on a rating scale designed to measure opinion regarding consistency between oral and written formats
	-contradictory findings are resolved	opinion of independent evaluators and team members	in opinion of evaluators and team members, 100% of contradictory findings were resolved

ACCOMPLISHMENTS	REQUIREMENTS	MEASUREMENTS	EXEMPLARY STANDARDS
Assessment Results and Conclusions (continued)	TIMELINESS		
	-must be provided in time for making appropriate programmatic decisions	opinion of persons requiring assessment information	90% of persons requiring information report information provided in time to be useful for making programmatic decisions
		difference between dates assessment performed and dates information provided to persons requiring information	1) independent evaluators judge time difference acceptable based on immediacy of problem(s) to be addressed
			2) no more than one week difference between dates assessments performed and dates information presented orally
			3) no more than two weeks difference between dates assessments performed and dates when information presented in writing

ACCOMPLISHMENTS	REQUIREMENTS	MEASUREMENTS	EXEMPLARY STANDARDS
Assessment Results and Conclusions (continued)	COST		
	# and type of staff involved	-ratio of number of staff involved to number of staff required	1:1
		-ratio of type of staff required to type of staff involved	1:1
	# and type of assessments performed	-ratio of number of assessments performed to number of assessments required	1:1
		-ratio of type(s) of assessments performed to type(s) of assessments required	1:1
sub-accomplishments:			
3.1 Summary statement	QUALITY		
	-defines client's problems	% of summary statements that define client's problems	100%
	-defines client's strengths	% of summary statements that define client's strengths	100%
	-prioritizes client's programmatic recommendations	% of summary statements that include programmatic recommendations	100%

ACCOMPLISHMENTS	REQUIREMENTS	MEASUREMENTS	EXEMPLARY STANDARDS
3.2 Programmatic recommendations	QUALITY		
	-integrates client's separate developmental needs into single intervention strategies	opinion of independent evaluators	in the opinion of independent evaluators, recommended intervention strategies integrate separate developmental needs into single strategies to the maximum degree possible
	-addresses all identified needs	% of identified needs that are addressed in recommendations	100%
	-based on/or supported by sound scientific data or scientifically defensible practices	comparison of programmatic recommendations with a criteria for scientifically defensible practices. Team members and outside evaluators must agree that criteria used is appropriate for particular situation	In the judgement of independent evaluators, the recommendations meet the criteria
	-consistent with principle of normalization, developmental assumption, human and legal rights, and principles of client advocacy	comparison of programmatic recommendations with a criteria for philosophical consistency	In the judgement of independent evaluators, recommendations meet the criteria

ACCOMPLISHMENTS	REQUIREMENTS	MEASUREMENTS	EXEMPLARY STANDARDS
Programmatic Recommendations (continued)	-includes BOTH recommendations based on person's needs and independent of currently available resources AND recommendations based on currently available resources and services	% of assessment results and conclusions that include both	100%
4.0 Written program plan	QUALITY		
	-includes goal statements	% of program plans which include goal statements	100%
	-includes strategies for achieving goals	% of program plans which include strategies	100%
	-includes specific programmatic objectives for achieving goals	% of program plans which include programmatic objectives	100%
	-defines plan for monitoring program	% of program plans which define a plan for monitoring program	100%
	-specifically responds to all of client's identified needs	comparison of needs stated in assessment results and conclusions and those responded to in written plan	1:1

ACCOMPLISHMENTS	REQUIREMENTS	MEASUREMENTS	EXEMPLARY STANDARDS
Written program plan (continued)	-defines who's responsible for carrying out each aspect of program plan	% of plans that specify who's responsible for carrying out each aspect of program	100%
		and	
		ratio of aspects of program plan to persons designated as responsible	1:1
	-consistent with legal requirements	comparison of program plan with a valid criteria for legal consistency	In the judgement of independent evaluators, 100% of the plans must be consistent with legal requirements
	-written in terms that are functional and understandable to all who receive and use plan	% of people receiving plan who report it to be understandable and functional	90%
sub-accomplishments:			
4.1 gcal statements	QUALITY		
	-address all need areas	comparison of need areas with goal statements	1:1

ACCOMPLISHMENTS	REQUIREMENTS	MEASUREMENTS	EXEMPLARY STANDARDS
goal statements (continued)	-consistent with principle of normalization, developmental assumption, human and legal rights, and principles of client advocacy	comparison of goal statements with criteria for philosophical consistency	In the judgement of independent evaluators the goal statements meet the criteria
4.2 strategies for for achieving goals	QUALITY		
	-simultaneously respond to two or more need areas	opinion of independent evaluators	in the opinion of independent evaluators, recommended strategies simultaneously respond to two or more need areas to the maximum degree possible
	-address all goals	comparison of strategies with goals	1:1
	-defensible as means for accomplishing goals	opinion of independent evaluators	in the opinion of independent evaluators, the strategies are appropriate and efficient for accomplishing goals
	-consistent with: -principle of normalization -developmental assumption -legal and human rights -client advocacy principles	comparison of strategies with a criteria for philosophical consistency	In the judgement of independent evaluators, strategies meet criteria

ACCOMPLISHMENTS	REQUIREMENTS	MEASUREMENTS	EXEMPLARY STANDARDS
4.3 programmatic objectives	QUALITY	opinion of independent evaluators	in the opinion of independent evaluators, programmatic objectives simultaneously respond to two or more need areas to the maximum degree possible
	-simultaneously respond to two or more need areas		
	-directly relate to a specified strategy and goal	comparison of objectives with strategies and goals	In the judgement of independent evaluators the objectives directly relate to a stated strategy and goal
	-include specific description of desired outcomes, conditions, and assessment criteria	comparison of objectives with criteria for technically sound objectives	In the judgement of independent evaluators the objectives meet the criteria
	-consistent with principle of normalization, developmental assumption, human and legal rights, principles of client advocacy	comparison of objectives with a criteria for philosophical consistency	In the judgement of independent evaluators objectives meet criteria
4.4 plan for monitoring program	QUALITY		
	-specifies criteria for follow-up evaluation	% of program plans that specify criteria for follow-up evaluation	100%

ACCOMPLISHMENTS	REQUIREMENTS	MEASUREMENTS	EXEMPLARY STANDARDS
plan for monitoring program (continued)	-specifies conditions under which program needs to be changed	% of program plans that specify conditions under which program needs to be changed	100%
	-defines decision-making process for making programmatic changes	% of program plans that define decision-making process for making programmatic changes	100%
	-specifies data collection procedures for monitoring implementation of program	% of program plans that specify data collection procedures for monitoring implementation of program	100%
sub-accomplishment of plan for monitoring program: 4.4.1 data collection procedures	-based on how data is ultimately to be used	comparison of recommended data collection procedures with how data is ultimately to be used	In the judgement of independent evaluators the recommended procedures are appropriate based on the ultimate use of data
5.0 Documentation of new information	TIMELINESS		
	-occurs each time there is new information available which is related to client's goals and objectives	comparison of each team member's reported description of new information (new since last time the team met) with documented information	1:1 correspondence between information occurring and it being recorded

ACCOMPLISHMENTS	REQUIREMENTS	MEASUREMENTS	EXEMPLARY STANDARDS
Documentation of new information (continued)			in opinion of independent evaluators, difference between date of occurrence and date of documentation is acceptable and appropriate
	-occurs each time there is an important change in the client's personal life	comparison of each team member's reported description of new important changes in client's personal life with documented changes (new since last time team met)	1:1 correspondence between changes occurring and changes being documented comparison between date team member became informed of change and date change was documented differ by no more than 3 days
	QUALITY		
	-is shared with all appropriate people	comparison of criteria for who to share what information with, with written record of with whom information was shared	1:1
	-includes date; content; who information was shared with	% of documented new information that includes date; content; with whom information was shared	100% include all three

ACCOMPLISHMENTS	REQUIREMENTS	MEASUREMENTS	EXEMPLARY STANDARDS
6.0 Documentation of intervention results	QUALITY		
	-includes documentation related to all essential aspects of program	# of essential program aspects compared to # with intervention documentation	1:1
	-based on ultimate required use(s) of documentation	comparison of ultimate uses of documentation and actual documentation	1:1
	-appropriate and adequate for ultimate use(s) of data	comparison of documentation of intervention results with ultimate use(s) of data	in opinion of independent evaluator, the documentation is appropriate and adequate for the ultimate use(s) of data
7.0 Program review and evaluation	QUALITY		
	-written	% of program reviews and evaluations that are in writing	100%
	-includes analysis and summary of intervention results	% of program reviews and evaluations that include an analysis and summary of intervention results	100%
	-functional and understandable to those who receive and use information	% of people who receive and use information who report it to be functional and understandable	90%

ACCOMPLISHMENTS	REQUIREMENTS	MEASUREMENTS	EXEMPLARY STANDARDS
Program review and evaluation (continued)	-includes recommended modification(s) of goals, strategies and objectives	% of program reviews and evaluations that include recommended modification(s) of goals, strategies and objectives	100%
	TIMELINESS		
	-Consistent with legal requirements	# of times and frequency of program review and evaluation required by law compared to # of times and frequency of occurrence	1:1
	-determined by a combination of indicators; including passage of time, changes in client behavior, changes in staff, changes in family, etc.	comparison of dates of indicators with dates of review(s) and evaluation(s)	in the judgement of independent evaluators program review and evaluation occurs at times appropriate based on the combination of indicators
sub-accomplishments:			
7.1 analysis and summary of intervention results	QUALITY		
	-based on scientifically defensible practices	comparison of analysis of intervention results with criteria for scientifically defensible practices	in the judgement of independent evaluators, there is agreement between the two

ACCOMPLISHMENTS	REQUIREMENTS	MEASUREMENTS	EXEMPLARY STANDARDS
analysis and summary of intervention results (continued)	-includes analysis of all aspects of program	ratio of # of program aspects with # analyzed	1:1
7.2 recommended modifications	-based on analysis of intervention results and other relevant data	comparison of recommended modifications with intervention results and other relevant data	1:1
	-consistent with principle of normalization, developmental assumption, human and legal rights and principles of client advocacy	comparison of recommended modifications with criteria	in the judgement of independent evaluators recommended modifications meet criteria
8.0 Appropriate Services	QUALITY		
	-consistent with client's needs	ratio of number of client's needs to needs being directly addressed in programming	1:1
		ratio of type of client's needs to type of program	in opinion of independent evaluators the type of program(s) client is participating in is appropriate for type of need(s)

ACCOMPLISHMENTS	REQUIREMENTS	MEASUREMENTS	EXEMPLARY STANDARDS
Appropriate services (continued)	-consistent with principle of normalization developmental assumption, human and legal rights, and principles of client advocacy	comparison of programmatic settings and procedures with a criteria for philosophical consistency	in judgement of independent evaluators settings and procedures meet criteria
	-coordinated: compatability of separate aspects of program	comparison of the goals, strategies and objectives of separate aspects of total program	in the judgement of independent evaluators the goals, strategies and objectives of separate aspects of the clients total program are compatible
	-service strategies of separate aspects of total program are integrated	comparison of the strategies of separate aspects of total program	in the judgement of independent evaluators, the strategies of separate aspects of the client's total program are integrated to the maximum degree possible
	TIMELINESS		
	-modified at times specified in program review and evaluation	comparison of recommended modification dates in program review and evaluation and actual modification date	in the judgement of independent evaluators the difference (if any) between the recommended modification date and the date the program was

ACCOMPLISHMENTS	REQUIREMENTS	MEASUREMENTS	EXEMPLARY STANDARDS
Appropriate services (continued)			modified is acceptable based on immediacy of need(s)
	TIMELINESS (continued)		
	-dates of programmatic implementation are appropriate based on particular characteristic of identified need(s)	comparison of date of implementation with particular characteristics of identified need(s)	in judgement of independent evaluators dates of implementation were appropriate based on characteristics of identified need(s)
9.0 Satisfied team members	QUALITY		
	-degree of satisfaction with decision-making process used by team	% of team members reporting above average satisfaction with decision-making process used by team	90%
	-degree of satisfaction with respect expressed by other team members	% of team members reporting above average satisfaction with respect shown to them by other team members	90%
	-degree of satisfaction with implementation of program(s)	% of team members reporting above average satisfaction with implementation of program	90%

ACCOMPLISHMENTS	REQUIREMENTS	MEASUREMENTS	EXEMPLARY STANDARDS
Satisfied team members (continued)			
	-degree of satisfaction with results of program(s)	% of team members reporting above average satisfaction with results of program(s)	90%

Seventy-nine of the 88 identified requirements (characteristics of accomplishments for exemplary performance) related to dimensions of quality. Only nine of the 88 requirements identified through the study related to dimensions of quantity or cost. Those nine requirements and the accomplishments to which they are related are listed in Table 2.

Table 2

Requirements Related to Quantity and Cost Dimensions and Their Corresponding Accomplishments

ACCOMPLISHMENT	REQUIREMENT
Assessment Results and Conclusions	QUANTITY (Timeliness) -must be provided in time for making appropriate programmatic decisions COST -# and type of staff involved -# and type of assessments performed
Documentation of New Information	QUANTITY (Timeliness) -occurs each time there is new information available which is related to client's goals and objectives -occurs each time there is an important change in the client's personal life
Program Review and Evaluation	QUANTITY (Timeliness) -timing is consistent with legal requirements -timing is determined by a combination of indicators: including passage of time, changes in client behavior, changes in staff, changes in family, etc.

Table 2 (continued)

ACCOMPLISHMENT	REQUIREMENT
Appropriate Services	QUANTITY -modified at times specified in program review and evaluation -dates of programmatic implementation are appropriate based on particular characteristic of identified need(s)

Four of the nine accomplishments identified by the group are already explicitly mandated by P.L. 94-142. They are: written assessment results and conclusions; written program plan; documentation of intervention results; and program review and evaluation. Three of the other five (individualized evaluation plan; documentation of new information; and, appropriate services) are at least implied within the law. The remaining two (written statement of team's organizational structure and operational rules; and, satisfied team members) are not explicitly or implicitly mandated by law, but they are cited as desirable by researchers interested in team and small group process.

Only three of the 17 identified sub-accomplishments are explicitly mandated by P.L. 94-142; i.e., goal statements; programmatic objectives and a plan for monitoring the program.

To actual educational-habilitative teams and to persons interested in forming them, the requirements, measurements, and exemplary standards defined by the group should prove to be useful information.

We have known for some time that it was important for interdisciplinary teams to produce assessment results and conclusions, written program plans, and program reviews and evaluations. However, we have never specifically defined what it was we valued about each of those "accomplishments," how to measure the requirements, or exemplary performance standards.

DISCUSSION AND CONCLUSIONS

In the process of developing this performance model for an ongoing interdisciplinary educational/habilitative team it became clear that it was difficult for the small group members to: 1) think in terms of outcome rather than process; 2) focus on an "ongoing" educational/habilitative team rather than strictly an evaluation team; and 3) differentiate between accomplishments, sub-accomplishments, and requirements.

Initially, the small group participants, when asked to describe accomplishments of an interdisciplinary team, almost invariably would describe a behavior (i.e., a process issue) of the team rather than a non-behavioral outcome. In every instance, they also included some requirements with their accomplishment statements. It seemed evident that, although all of the group members went through graduate training programs, and had worked on teams and in settings that trained persons to function on interdisciplinary teams, none of them had ever formally defined what it was these teams were expected to accomplish. They admitted, however, that they had spent a fair amount of time discussing how team members ought to behave at team meetings.

Interactive behaviors of team members during meetings seems to be what many people equate with team performance. Training centers and service programs interested in, and mandated to use, interdisciplinary teams have often focused on defining the interdisciplinary "process." They have viewed "behavior" as synonymous with "performance." This approach has led to endless discussion and argument.

By using Gilbert's performance engineering model, we are able to focus on team performance in a fundamentally different way. Each accomplishment and sub-accomplishment when combined with its corresponding requirements, measurements, and exemplary standards forms a measurable performance objective. It's only when we identify a performance objective that is not being met that we need concern ourselves with the behavior for meeting it. We cannot begin to define and reach agreement on "how" until we know "what."

> "...no matter how often or how exhaustively we measure ...behavior, we cannot tell what kind of performance it is. ...Is it legal, ethical, effective, valuable?
>
> To answer these questions, we must first look away from the behavior, to see what effect it has upon the world. Did the hunter shoot a rabbit; hit a target; or fail to hit anything at all? When we observe the whole transaction, including both the hunter's behavior and what he accomplished by it, we are observing performance. And the performance of hitting the bullseye of a target is quite different from the performance of killing a person, even if the behaviors in both cases were identical. In contrast, the identical performance of killing a person can be produced by enormous varieties of behavior" (Gilbert, 1978, p. 16).

Most articles and discussions related to the team approach to providing educational/habilitative services focus on the difference between "interdisciplinary," "multidisciplinary," and "transdisciplinary" teams. They discuss the merits of one "process" over another. They

are essentially arguing "tactics," with little, if any, discussion given to outcomes. It seems clear that, short of legal and humanistic considerations, the client has little concern about what a team calls itself or how a team functions. The client is concerned with what the team accomplishes and the quality of the service outcomes.

The accomplishments, sub-accomplishments and requirements identified through this project provide teams with an opportunity to stop arguing process and start concentrating on valued outcomes. It also provides the beginnings of a working definition of valued and exemplary interdisciplinary educational/habilitative team performance.

In addition to having problems describing desired accomplishments, some participants found it difficult to think in terms of an "ongoing" educational/habilitative team. Those participants who had experience working on teams which functioned as strictly evaluation teams, initially tended to limit their statements to those related to the evaluation stage of service delivery. They agreed, however, that an ideal team would never be involved in only one stage of service delivery. Once they concentrated on designing a performance model for an ideal team, they were able to address all stages of service delivery.

The group's difficulties discriminating between accomplishments, sub-accomplishments and requirements were cited by Gilbert as a common problem. It is, however, an important consideration because: "A subtle cause of measurement redundancy may occur...when we fail to separate accomplishments properly by levels of generality" (Gilbert, 1978, p. 51). Therefore, the researcher continuously asked the

questions: 1) Is this a subaccomplishment of something else?; 2) Is this requirement measured somewhere else? The continuous questioning and reorganizing changed the group's product several times and appears a necessary part of applying Gilbert's performance engineering model.

This project's resulting model for interdisciplinary educational/habilitative team performance defines only a limited number of requirements related to quantity and cost. The small group addressed the quantity issue of timeliness most often, but defined no rate or volume requirements. They also defined only two cost requirements (cost requirement categories are: labor, material and management). Although cost and quantity requirements will vary from team to team more than quality requirements will vary, they should be carefully addressed by any group interested in defining performance objectives for a particular team.

It seems fairly probable that no one individual could independently achieve all of the performance objectives defined in the model designed by the small group. It also seems clear, however, that for cost requirements, it is desirable to use only those team members who are necessary for achieving any given performance objective. Therefore, exemplary team performance may involve carefully limiting the number of team members when forming a team and that the number of team members required to achieve an accomplishment may vary from one accomplishment to another. The accomplishments and their requirements should determine who is involved from the team and not vice versa.

It should be noted that two of the major accomplishments identified by the team do not have a particularly direct impact on the lives of clients, i.e., written statement of team's organizational structure and operational rules; and satisfied team members. It is safe to assume that most team members would view both items as desirable; however, it is probably also safe to assume that if all other identified performance criteria were achieved, most clients would not care whether or not the other team members were satisfied or if the team had a written statement of its operational rules and organizational structure. However, it is also safe to assume that most team members would be more likely to achieve the other seven accomplishments to criterion if they also achieved the two less client-related objectives.

There seem to be four major ways this team performance analysis model could be used: 1) as a model, or guide, for forming new teams; 2) as a self-evaluation tool for existing teams; 3) as an external evaluation tool for existing teams; and 4) as a tool for structuring the preservice and inservice training of persons who must serve on or organize interdisciplinary educational/habilitative teams.

As an evaluation tool, the model allows for determing how much any given educational/habilitative team deviates from the exemplary standards on any single or all of the requirements listed. This comparison should allow teams and/or outside evaluators to identify those performance areas which most need improvement and to concentrate on improving performance areas that will provide the most improvement for the least cost.

Persons and groups interested and involved in interdisciplinary educational/habilitative team performance will need to determine if the accomplishments, requirements, measurements and standards listed by this project can be applied to their particular setting and/or team. In some cases, groups may want to add or delete items in order to make the model more specific to their particular functions and needs.

Persons interested in applying this project's method and theoretical framework to design their own team performance analysis model will probably find it helpful to present their group participants with written examples of performance objectives that are consistent with Gilbert's performance engineering model. Examples from this project could be used for that purpose, regardless of the team's actual function. Existing educational/habilitative teams could use this project's model as the actual foundation for designing a performance analysis model specific to their setting and function.

The model could provide trainers with a tool for focusing on relevant areas of team performance. It provides trainees with measurable performance objectives and sets exemplary standards for which they should strive.

The model created whrough this project defines several performance requirements for which there are no readily available measurement scales or tools, e.g., a criteria for scientifically defensible practices; and, criteria for philosophical consistency. A valuable extension of this project would be to develop measurement scales for those requirements that were identified as being important but for which appropriate measurement scales and/or tools do not exist.

It would be interesting to use the tool to evaluate existing teams who are considered to be "examplars." The performance of "exemplary" teams with different process labels, i.e., multidisciplinary, interdisciplinary, transdisciplinary could be compared to determine if one purported process tends to produce higher performance than any other.

If exemplary individual clinicians could be identified, it would also be interesting to determine if any of the accomplishments defined in this model could be achieved by only one "master" clinician.

The work of Thomas F. Gilbert in performance engineering and performance analysis provided this project with an extremely helpful technology for defining and evaluating desired human performance. It seems that human service agencies could benefit from considering his model as a means for defining desired job performance and evaluating the performance of agencies, programs, and individuals.

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APPENDIX A: Description of Group's Tasks

TASK #I: The group will formulate a list of written statements which describe "accomplishments" of an "exemplary" interdisciplinary team responsible for the ongoing educational and/or habilitative program of a child with a chronic disability.

The group will be attempting to define what they consider to be valuable contributions or valuable outcomes of an interdisciplinary team. In other words, the group will first concentrate on defining the desired results of an exemplary interdisciplinary team.

In order to be accepted as a statement of an "accomplishment," an example must meet all four of the following criteria:

1. describe a valued consequence of the team's (or team member's) behavior;
2. be stated in other than behavioral terms (In other words, it must describe outcomes not process.);
3. be able to be observed or measured when the team (or team member) has gone away; and,
4. be an outcome of an "exemplary" team - not simply an "average" or typical team.

You will be asked to think in terms of:

1. accomplishments of the "team"
2. accomplishments specific to your discipline (if any) but related to using a team approach to planning and providing services.

The list of team accomplishments will be formulated within the structure of the following five principles of medical case management and the following four stages of service delivery.

Principle 1: Accomplishments related to "beginning a program as early as possible after diagnosis:"

a. before, during or after initial evaluation

b. before, during or after interpretation

c. before, during or after ongoing planning and management

d. before, during or after program review.

Principle 2: Accomplishments related to "utilizing the family in a meaningful way:"

a. before, during or after initial evaluation

b. before, during or after interpretation

c. before, during or after ongoing planning and management

d. before, during or after program review

Principle 3: Accomplishments related to "basing long-term and continuous planning on strong principles of child development:"

a. before, during or after initial evaluation

b. before, during or after interpretation

c. before, during or after ongoing planning and management

d. before, during or after program review

Principle 4: Accomplishments related to "providing services through coordinated interdisciplinary cooperation."

a. before, during or after initial evaluation

b. before, during or after interpretation

c. before, during or after ongoing planning and management

d. before, during or after program review.

Task #2: The group will list and describe the important dimensions (characteristics) of each accomplishment and their units of measurement.

This phase will focus on: 1) determining the characteristics of each accomplishment that are most important and valued; i.e., defining the requirements for performance; 2) defining appropriate units for measuring the performance related to each requirement.

One way of identifying the valued characteristics of accomplishments is to think in terms of defining the "major requirements of worthy performance" as related specifically to each accomplishment.

We will use Gilbert's classes of major requirements of worthy performance as a structure for this analysis. These classes are:

1. Quality
    a) accuracy
    b) class
    c) novelty
2. Quantity (or Productivity)
    a) rate
    b) timeliness
    c) volume
3. Cost
    a) labor (behavior repertories)
    b) material (environmental support)
    c) management

Any one or more of these requirements may be relevant to a particular accomplishment.

Guidelines for defining relevant dimensions (valued characteristics) of each accomplishment

1. Establish relevant requirements of an accomplish and useful units of measurement.

2. Determine if we have units to measure everything we want to measure - check each accomplishment against each of the nine possible performance requirements.

3. Determine who has control over variations in the measure. If the team (or a team member) does not have control over variance it will not be considered an appropriate performance requirement. (Gilbert: "We must never apply a measure to a performer who cannot be held accountable for that performance.")

4. Determine whether we have defined a requirement that might result in our measuring the same thing twice.

   - if a redundance appears, we will check to be sure we have not confused an accomplishment with a sub-accomplishment.

TASK #3

Once we have established the relevant requirements of an accomplishment and useful units of measurement, we will define exemplary standards of performance for each requirement.

APPENDIX B: Results of First Group Meeting

Enclosed are the following attachments:

A. List of original statements generated by small group in response to directions to: "Briefly list what you think should be the desired results of an exemplary inter-disciplinary ongoing educational team."

B. List of original statements as rank ordered by small group.

C. List of original statements not included in rank-ordering.

D. List of proposed changes in statements.

E. Proposed reorganization of results of small group session.

The original statements were analyzed in an effort to identify those statements which met the four-part criteria for an accomplishment: (1) describes a valued consequence of the team (or team member's behavior, and (2) is stated in other than behavioral terms, i.e., an outcome not process; and (3) is able to be observed (measured) when the team (or team member) has gone away; and (4) relates to an exemplary team. Those portions of the statements which described an accomplishment were separated from those parts which described valued characteristics of an accomplishment.

All statements were analyzed in this manner; including those statements which were not included in the rank ordering.

If an item did not clearly state an accomplishment (according to the 4-part criteria) it was: (1) considered as a possible characteristic of an accomplishment; (2) considered as a possible sub-accomplishment; (3) reworded; or (4) deleted. (These changes are described on List of Proposed Changes in Statements, Attachment D).

As a result of this analysis, an attempt was made to chronologically sequence the resulting list of accomplishments according to the four stages of service delivery: (1) evaluation; (2) interpretation; (3) planning and management; (4) review.

Attachment E reflects the results of reorganizing the original statements into accomplishments and their valued characteristics. Some statements were added to the final list by the researcher.

Please carefully review the attached material. As part of your review you may:

(1) Add any accomplishments you think are missing. It might help this process if you try to answer the following questions:

"Are there any accomplishments missing related to -

evaluation
interpretation
planning
on-going management
review?"

(2) Add any valued characteristics you think missing for a particular accomplishment. (Are there any characteristics of an accomplishment missing that are requirements of exemplary performance?)

(3) Change any part of an item that you think is unclear, inaccurate, incomplete, etc. If possible, briefly describe why you would change it.

(4) If possible, list the units of measurement you think appropriate for a given characteristic. In other words, explain where and how to measure a particular characteristic.

Please review and complete this stage of the project by Friday, May 1. I will organize all submitted changes and additions and as soon after May 1 as possible, we will have another group meeting to discuss the results.

I certainly appreciate your efforts and cooperation and, if all goes well, this second meeting may be enough to meet the requirements of the project.

I will be calling you in the next couple of days to arrange a convenient group meeting time. A 90-minute - 2 hour session should be adequate. Would you check your calendars and see if we could agree on a date sometime between May 4 and May 8?

Thank you.

ORIGINAL STATEMENTS GENERATED THROUGH NOMINAL GROUP PROCESS

1. All team members aware of total child.
2. Educational/treatment plan which specifies child's needs/problems that are a function of the child's disability.
3. Have at hand complete assessment information and be prepared to present it in a fashion that will be understood by other team members.
4. Productive/trusting relationship with family/client system.
5. Precise problem/identification/definition including data from reports and from perceptions.
6. Good understanding among team members of the roles, functions, and contributions of each team member.
7. Produce a report which is directly responsive to questions which have been generated by the child.
8. Design a screening form that structures the required information for the team.
9. A plan for the evaluation process that meets needs of referring agency, parents and child.
10. Parents well educated of importance of their role.
11. Plan that specifies child's and family's strengths as they contribute to treatment.
12. Good knowledge of resources and special services prior to I.E.P. meeting so that program is not delayed by pursing unrealistic recommendations.
13. Increased independent functioning of family/parents.
14. Valid record of observed important behavior relative to problem.
15. A feeling on the part of team member that they are a part of the team.
16. Produce recommendations that are accurate in a qualitative sense.
17. Use language that is understood by all who will be participating or receiving information.

18. Programmatic suggestions which define goals, strategies, methods and monitoring.

19. Ongoing exchange and review of all pertinent information.

20. Complete documentation of essential aspects of intervention results, data based changes in program.

21. Team serves as advocate of child implementing P.L. 94-142. ex. least restrictive environment.

22. Recommendations about intervention must be based or supported by sound scientific data or scientifically defensible practices.

23. Each team member should gain knowledge from one another because of being part of team.

24. The recommendations of team should be self-correcting...consideration of possible options...according to incoming data.

25. Recognize trainee as equal member of team.

26. Definition of needed action and responsibility for those actions.

27. Attitude of genuine caring by all team members.

28. Evaluation of outcome of intervention.

29. Needs of child take precedent of any needs of team members.

30. Recommendations that take a position, offer an opinion, provide directions,...arrived at by consensus.

31. Team outcomes are cognizant of legislation, rules and regulations.

ORIGINAL STATEMENTS AS RANK ORDERED BY GROUP

Rank Order #	Item #	Total points	Accomplishment
1	5	18	Precise problem/identification/definition including data from reports and from perceptions.
2	2	17	Educational/treatment plan which specifies child's needs/problems that are a function of the child's disability.
3	22	12	Recommendations about intervention must be based or supported by sound scientific data or scientifically defensible practices.
4	20	9	Complete documentation of essential aspects of intervention results, data based changes in program.
5	9	8	A plan for the evaluation process that meets needs of referring agency, parents and child.
5	18	8	Programmatic suggestions which define goals, strategies, methods and monitoring.
6	7	7	Produce a report which is directly responsive to questions which have been generated by the child.
7	26	6	Definition of needed action and responsibility for those actions.
7	28	6	Evaluation of outcome of intervention.
8	1	5	All team members aware of total child.
8	6	5	Good understanding among team members of the roles, functions, and contributions of each team member.
8	12	5	Good knowledge of resources and special services prior to I.E.P. meeting so that program is not delayed by pursuing unrealistic recommendations.

ORIGINAL STATEMENTS AS RANK ORDERED BY GROUP (continued)

Rank Order #	Item #	Total points	Accomplishment
8	13	5	Increased independent functioning of family/parents.
8	17	5	Use language that is understood by all who will be participating or receiving information.
9	4	4	Productive/trusting relationship with family/client system.
9	15	4	A feeling on the part of team member that they are a part of the team.
10	14	3	Valid record of observed important behavior relative to problem.
11	11	1	Plan that specifies child's and family's strengths as they contribute to treatment.

ITEMS NOT INCLUDED IN RANK ORDERING

3. Have at hand complete assessment information and be prepared to present it in a fashion that will be understood by all other team members.

8. Design a screening form that structures the required information for the team.

10. Parents well educated of importance of their role.

16. Produce recommendations that are accurate in a qualitative sense.

19. Ongoing exchange and review of all pertinent information.

21. Team serves as advocate of child in implementing P.L. 94-142. ex. least restrictive environment.

23. Each team member should gain knowledge from one another because of being part of team.

24. The recommendations of team should be self-correcting...consideration of possible options...according to incoming data.

25. Recognize trainee as equal member of team.

27. Attitude of genuine caring by all team members.

29. Needs of child take precedent of any needs of team members.

30. Recommendations that take a position, offer an opinion, provide direction,...arrived at by consensus.

31. Team outcomes are cognizant of legislation, rules and regulations.

LIST OF PROPOSED CHANGES IN STATEMENTS

1. All team members aware of total child.

   Rather than listing it as an accomplishment, it was treated as an underlying premise of a team approach. A basic rationale for using a team approach is to assure treatment of a child's total individual needs.

2. Educational/treatment plan which specifies child's needs/problems that are a function of the child's disability.

   Accomplishment: Educational treatment plan
   Characteristic: specifies child's needs/problems that are a function of child's disability.

3. Have at hand complete assessment information and be prepared to present it in a fashion that will be understood by other team members.

   Accomplishment: complete assessment information.
   Characteristic: presented in a manner that is understood by all other team members.
   Delete: "Have at hand" and "be prepared". It can be assumed that if information is complete and presented, it was "at hand" and the person was "prepared".

4. Productive/trusting relationship with family/client system.

   Accomplishment: a) relationship with family
   b) relationship with child
   c) relationship with others in client system.
   Delete: productive/trusting. Attempt to more specifically describe what is required to be true of the relationship as a result of an exemplary interdisciplinary team performance.

5. Precise problem/identification/definition including data from reports and from perceptions.

   Accomplishment: Problem identification/definition.
   Characteristics: a) precise
   b) change "including data from reports and perceptions" to "based on scientifically based data and reported perceptions".

6. Good understanding among team members of the roles, functions, and contributions of each team member.

   Change to
   Accomplishment: Clear statement of team's organizational structure and operational rules.
   Characteristics: a) clear definition of roles of each team member
   b) clear definition of decision-making process to be used
   c) clear definition of general goals of the team

7. Produce a report which is directly responsive to questions which have been generated by the child.

   Accomplishment: report (same as educational/treatment plan with sub-accomplishment being recommendations).
   Characteristic: change to read: "directly responsive to child's identified problems".

8. Design a screening form that structures the required information for the team.

   Delete: "Design a screening form" and change "structures the required information for the team."
   Reword to: "organized in a way that facilitates programmatic planning and decision-making" and use it as a characteristic of Assessment information.

9. A plan for the evaluation process that meets needs of referring agency, parents and child.

   Accomplishment: A plan for the evaluation process.
   Characteristics: a) meets needs of referring agency
   b) meets needs of parents
   c) meets needs of child

10. Parents well educated of importance of their role.

    Delete: treated as a possible means for an end but not as an accomplishment of an interdisciplinary team or a particular characteristic of an identified accomplishment. If parents are, in fact, members of the team, their understanding of their role would be measured as a part of evaluating the team's Statement of Organizational Structure and Operational Rules.

11. Plan that specifies child's and family's strengths as they contribute to treatment.

    Accomplishment: plan (same as educational/treatment plan)
    Characteristic: specifies child's and family's strengths as they contribute to treatment.

12. Good knowledge of resources and special services prior to I.E.P. meeting so that program is not delayed by pursuing unrealistic recommendations.

    Change to a characteristic of an educational/treatment plan.
    Change to read: describes BOTH
    a) recommendations based on child's needs and independent of currently available resources and services
    AND
    b) recommendations based on currently available resources and services

13. Increased independent functioning of family/parents.

    Unsure of how to handle this statement. If you have suggestions, please note.

14. Valid record of observed important behavior relative to problem.

    Characteristic: of 1. Problem Identification/Definition
    2. Documentation of Essential Intervention Results.

15. A feeling on the part of team members that they are a part of the team.

    Characteristic: of all satisfied team members.
    Change to read: satisfied with decision-making process used by team.

16. Produce recommendations that are accurate in a qualitative sense.

    Sub-accomplishment: Recommendations of Educational/Treatment plan
    Characteristic: (qualitative sense) change to "based on scientifically-based data or scientifically defensible practice".

17. Use language that is understood by all who will be participating or receiving information.

    Characteristic: uses language that is understood by all who will

be participating. (characteristic of assessment information and educational/treatment plan).

18. Programmatic suggestions which define goals, strategies, methods and monitoring.

    Accomplishment: Programmatic suggestions (same as "recommendations")
    Characteristic: defines goals
    defines strategies
    defines methods
    defines monitoring

19. Ongoing exchange and review of all pertinent information.

    Accomplishments: 1) ongoing exchange of pertinent information
    2) ongoing review of pertinent information

20. Complete documentation of essential aspects of intervention results, data based changes in program.

    Accomplishment: Documentation of essential intervention results
    Characteristic: - complete (includes all essential aspects of programs)
    - data-based

21. Team serves as advocate of child in implementing P.L. 94-142. ex. least restrictive environment.

    Delete as an accomplishment and treat as a principle basic to the professional/client relationship.

22. Recommendations about intervention must be based or supported by sound scientific data or scientifically defensible practices.

    Accomplishment: Recommendations about intervention (same as "programmatic recommendations")
    Characteristic: Based on sound scientific data or supported by scientifically defensible practices.

23. Each team member should gain knowledge from one another because of being part of the team.

    Treated as a possible consequence of a team but not an accomplishment or goal directly tied to meeting the educational management needs of a child.

24. The recommendations of team should be self-correcting...consideration of possible options...according to incoming data.

    Interpreted to mean that recommendations of the team should be designed to include options. The options should be designed so if specified behavior or conditions occur, an alternative programmatic option can be selected based on incoming and changing data and without a team meeting. Therefore, #24 is treated as a characteristic of recommendations.

25. Recognize trainee as equal member of team.

    Deleted - small group agreed to delete as a characteristic of an exemplary team outside of a training situation. An exemplary educational team would not necessarily be a part of a training situation.

26. Definition of needed action and responsibility for those actions.

    Characteristic: of an educational/treatment plan.

27. Attitude of genuine caring by all team members.

    Treated as an underlying assumption of an exemplary team - not an accomplishment of one.

28. Evaluation of outcome of intervention.

    Accomplishment: Evaluation of outcome of intervention.

29. Needs of child take precedent of any needs of team members.

    Treated as an underlying assumption of an exemplary team - not an accomplishment of one.

30. Recommendations that take a position, offer an opinion, provide direction,...arrived at by consensus.

    Accomplishment: Recommendations. Changed "arrived at by consensus" to "arrived at according to decision-making process as defined by the team".

31. Team outcomes are cognizant of legislation, rules and regulations.

    Change to read: meets legal requirements and use as a characteristic of educational/treatment plan; assessment information; and evaluation of outcomes.

Respect for child's legal and human rights also treated as a basic philosophical premise of an exemplary team's operation.

APPENDIX C: Gilbert's Measurement Classes (Requirements)

1. Quality

(a) Accuracy. The degree to which an accomplishment matches a model without errors of omission or commission.

(b) Class. Comparative superiority of an accomplishment, beyond mere accuracy. For example, two short stories may both be technically accurate; but one is more effective, appealing, or sells better. Several kinds of units may be used to measure class:

1. Market value, or simply what something sells for: High-quality (class) furniture is likely to bring a higher price.

2. Judgement points: show dogs are judged and given points--so many for erect ears, and so on. Olympic acrobats and skaters are similarly judged. It is a system widely used, both formally and informally.

3. Physical measures: Chemists and engineers often rate accomplishments by simply measuring some quality. A batch of rubber that is too soft is assigned to lower-quality lots to be used in an application that does not require high quality.

4. Opinion ratings: In these, people are polled and can respond as they like. A film wins as Oscar, or a ballplayer's performance is judged "most valuable" by people who are not given a point system or market criteria to follow.

Each of these measures of class can have its usefulness, but the definition of class is inherent in the method of measurement adopted.

(c) Novelty. Inventors, artists, and designers often strive to achieve this. For inventors, the measure that might be applied is useful variance along some important dimension--such as gas mileage in an auto engine. If an inventor develops a system for getting 100 miles per gallon without sacrificing other qualities, the accomplishment is truly novel. For artists, we probably have to resort to a judgmental point system or an opinion rating.

(d) Quality combinations. Sometimes quality is clearly the product of more than one quality requirement. The great gasoline engine inventor must preserve accuracy and produce novelty; if either is missing, the quality is zero. The dimension we assign to these accomplishments would be expressed as requirement products, such as $Q = f(a \cdot n)$.

2. Quantity (or Productivity)

(a) Rate. This is the most common measure of productivity, and it applies when "bulk" is time-sensitive: "pieces produced per hour" or "time to completion."

(b) Timeliness. It applies when time, not bulk, is the key consideration: "getting Cinderella home before midnight;" "a letter mailed before sundown;" "a manufacturing line running by the time the night shift arrives."

(c) Volume. This applies when bulk is important but is not time-sensitive. "How many fish did you catch?" or "How many sales did you make?"

3. Cost

(a) Labor. The amount expended on purchasing all the necessary labor to make an accomplishment, including direct overhead, benefits, wages, insurance, and taxes.

(b) Material. All material costs required to make an accomplishment, including supplies, tools, space, energy.

(c) Management. By this I mean supervision, its supports, public taxes, and internal allocations of general and administrative costs associated with an accomplishment.