

FOCUS ON EXCEPTIONAL CHILDREN

The Science of Curriculum Development Applied to Special Education and the IEP

Mary Simpson Poplin

Every year literally thousands of special educators enter their assigned classrooms to face a clean chalkboard, a bare bulletin board, and a list of previously "not so successful" students. Almost every evening throughout the school year, these educators dutifully prepare special materials and aids, spirit masters and individualized programs in an attempt to stay one step ahead of threatening chaos. Still, each day new questions haunt the special education teacher: "What can I do tomorrow?" "What else is there to math besides the basic facts?" "What makes reading the science text so difficult for the children?" "Exactly what are the social skills that would help these students' integration into the regular classroom environment?"

Often, the only answers to these and countless other questions regarding the education of handicapped youngsters are proposed in the form of objectives inherent in pre-packaged materials, workbooks, and teachers' guides or criterion-referenced skills lists. But rarely are any of these teacher aids or guides adequate to fully answer the questions that concern special education teachers daily.

With the advent of Individualized Education Programs, teachers increasingly have come to look for the answers to their questions in the goals and objectives contained in the student's individual program. While, ideally, IEPs should contain the answers, many times the selected goals and objectives are vague and propose no real continuum for instruction. Often, school psychologists, special education support or administrative staffs, and other non-instructional personnel have composed the educational program with insufficient knowledge of the child. The objectives now mandated and recorded in the student's IEP have, however, served to make us painfully aware of a very real but not so new crisis in special education: *We do not know what we are teaching.*

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This author proposes that the single most critical skill a special educator can develop is the ability to define appropriate goals and objectives for the various areas involved in the special education curriculum. A model for achieving this task is presented here, with an emphasis on defining instructional objectives to mastery, and supported by a discussion of purposes, specific procedures, and application of the goals and objectives to development of the IEP.

MAJOR PURPOSES IN SPECIAL EDUCATORS' DEFINING GOALS AND OBJECTIVES

There are two major purposes to be met through active involvement of special educators in defining the goals and objectives encompassing various educational curricular areas: (1) an increase in teacher competence and confidence, and (2) facilitation of appropriate educational programming.

Increased Teacher Competence and Confidence

Every special or regular educator who has been involved in direct instruction of handicapped children has experienced feelings of incompetence at one time or another. These feelings (real or imagined) emanate largely from unanswered questions and doubts concerning the goals and objectives attempted during in-

struction. Questions and doubts arise in regard to things such as needed prerequisite abilities, appropriate sequences of objectives, the progression of objectives that will reflect true mastery, and the pure knowledge of collective abilities necessary in each of the major educational areas dealt with in special education classrooms. For instance, when Tom cannot count five objects correctly, what prerequisite skills does he need to meet this objective? What is an appropriate sequence of objectives under the goal of mathematical numeration? How would one define mastery of counting five objects? What are *all* of the abilities encompassed under the educational area of mathematics?

Educators in the regular classroom often are plagued by questions similar to those of special educators. In the traditional school program, however, regular classroom teachers have a distinct advantage. For better or worse, traditional school programs are provided with broad-based materials containing a predetermined sequence of curriculum objectives. These materials offer specific guidelines, adding a structure and continuum to classroom experiences that is not characteristic of special education programs. Classroom materials including basal texts in virtually every subject area, teacher manuals, spirit masters, workbooks, and other aids give a sense of security to the classroom environment. Also, basal materials, though certainly not perfect, do approximate what are most often considered appropriate objectives for the normal achieving student. Special education does not, and by its very nature could not, have such standard, reliable guidelines in the preparation of daily objectives.

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For many years, special educators have been trained almost exclusively in pedantic features pertaining to the characteristics, etiology, and formal diagnosis of specific handicapping conditions. Regretfully, little of this information is useful when faced with the task of actually teaching handicapped youngsters. For instance, administration and interpretation of formal tests including intelligence tests, electroencephalogram readings, and tests of perceptual and psycholinguistic abilities tell educators little regarding the educational goals and objectives a student needs to develop. Much of this kind of information has been derived from the sciences of medicine and psychology, and it assists educators primarily in determining specific handicapping conditions — largely an administrative function. This determination is, at best, equivocal and rarely guides a teacher in selecting appropriate goals and objectives for handicapped learners. Herein may lie one of the major tasks of the science of education: the definition and study of educational objectives that will lead to mastery of given educational goals.

The science of special education, of which every teacher is a scientist, must involve formal hypotheses and investigations regarding:

- (1) delineation of all objectives leading to mastery of an educational goal in the four special education areas of self-help/basic living, pre-academic/academic, career/vocational, and socio-behavioral abilities,
- (2) systematic exclusion of objectives not found directly related to given educational goals,
- (3) delineation of any possible sequences of objectives that will facilitate goal achievement, and
- (4) relationships that exist between specific educational objectives and levels of maturation and cognitive development.

Obviously, before any of these investigations can be started, teachers must have an intuitive grasp of all possible curriculum goals and objectives involved in the instruction of handicapped students. Each teacher must know, in the sense of understanding and application, goals and objectives appropriate for the education of handicapped youngsters.

Teachers can obtain knowledge of curriculum objectives in two primary ways. First and most simply, they can select (or be given) a predetermined scope and sequence or list of objectives to follow. These curriculum aids have become increasingly more available with the advent of Individualized Education Program

mandates. Such lists of objectives can be obtained through commercial producers of regular or special education materials, school district curriculum guides, or criterion-referenced test objectives. Special educators who study and use these instruments often find the same sense of security that is afforded their regular education counterparts through basal materials and curriculum guides. Rarely, however, will one find a truly dedicated teacher who remains content and confident with ready-made objectives for long.

Second, educators can become knowledgeable in curriculum by generating their own curriculum goals and objectives. This approach represents more than the mere study and adoption of ready-made curricula. Original construction of curriculum involves an *active process* of careful examination, analysis, synthesis, and evaluation of previously developed curricula that culminates in the re-creation of goals and objectives for the education of handicapped students. Needless to say, creation or re-creation of special education curricula initially requires a great deal more time, study, labor, persistence, and competence on the part of a teacher than does the mere utilization of ready-made objectives. In the long run, though, the advantages of developing original curriculum objectives far outweigh the disadvantages in that the end result for the teacher is less time and labor and an increase in confidence.

The advantages of this approach to a teacher's gaining knowledge in special education curriculum become more apparent upon examination of the goals and uses of such knowledge. One might translate thorough curriculum knowledge into the following special education teacher competencies:

- (1) the ability to plan daily instructional activities for individual students or groups of students that reflect a wide range of goals and objectives needed by handicapped youths — i.e., self-help, vocational, academic, and social goals and objectives,
- (2) the ability to solve problems on the spot when students fail to meet certain objectives or once specific objectives are accomplished — i.e., immediate creation or recall of new objectives or the matching of objectives with developmental levels,
- (3) the ability to evaluate and select materials available that will assist the teacher in facilitating specific objectives, and
- (4) the ability to continuously evaluate student progress and recognize mastery of a given objective.

Each of these abilities requires that the competent teacher have an intuitive understanding of the development and continuum of educational objectives. To solve daily problems, the teacher must be able to immediately recall principles of educational objectives and their sequences. The continuous evaluation of progress can come only from an understanding of how a given objective is or can be objectively defined to represent the principle of mastery. None of the competencies can truly be met by teachers who have not experienced the frustrations and triumphs of actually creating and organizing educational objectives. Well documented studies on the recall, application, and transfer of various scientific principles have established that experience and discovering principles and concepts for oneself produce much better results than merely memorizing or studying given concepts (Bruner, 1963; Piaget, 1970). This holds true for special education curriculum development, in which the intuitive understanding and immediate recall necessary for maximum utilization of educational objectives can come only from teachers who have experienced and discovered the principles of educational objectives for themselves.

An added benefit that can be expected to occur from teacher participation in curriculum development is an increase in teacher confidence. This confidence is derived from the self-knowledge that daily classroom problems can be solved without undue reliance upon administrative and support staffs, and from the rewards inherent in finding solutions to professional problems. This proposition does not necessarily suggest that every special education teacher or group of teachers should always develop a curriculum that is as complete or as well written as that developed by other professionals. Nevertheless, the assumption inherent within this proposal is that teachers can implement a self-designed curriculum better and with more vigor and confidence than they can a curriculum in which they have not been involved.

Additionally, teacher confidence is derived from the accompanying freedom to choose instructional materials according to the objectives they have developed and selected. In many instances, educators operate according to the reverse principle; that is, the material that has been selected or purchased determines the educational objectives presented. This, like undue dependency on support and administrative staffs, gives teachers little leeway in determining which objectives are to be taught. The powerlessness that inevitably results can do little but make teachers the pawns of materials developers and lead to feelings of incompetence.

In contrast, the emergence of more competent and confident special education teachers and their active involvement in special education curriculum development go hand in hand with better educational programming for individual handicapped students. Intuitive knowledge of curriculum along with experience in writing educational objectives simplify the teacher's task of preparing and initiating individualized student programs.

Improved Educational Programming

In addition to an increase in teacher competence and confidence, the special education curriculum development activities proposed here will produce a continuum of educational objectives that will ultimately improve individual educational programming. Delineation of a large number of goals and objectives possible for use in the instruction of handicapped students improves their educational programs by:

- (1) providing a sequenced continuum of goals and objectives over the students' school careers,
- (2) offering a wide selection of objectives so that the most appropriate ones may be selected for instruction, and
- (3) changing the focus in special education programming and services from specific handicapping conditions to educational goals and objectives.

Historically, the special education student's individual program has relied for the most part on the classroom placement for each year. For example, if Don, an educably retarded child, were placed with a teacher who was trained and most comfortable with a unit type of instruction, Don's instruction that year might largely involve units on use of the telephone, time, money, the newspaper, and so forth. The following year, however, Don might be assigned to an academically oriented classroom with an emphasis on reading, writing, spelling, and mathematical skills. Further along in his education, Don could be subjected to arts and crafts oriented programs, therapeutic milieu programs emphasizing social curricula, and pre-vocational programs. Each of these placement changes could alter or repeat educational objectives. After 12 or more years of special education, Don's educational status could very well reveal that the objectives attempted during this instructional period did not represent the continuity necessary for achieving educational goals.

The ideal special education curriculum yields an all encompassing structure of goals and objectives applicable to various special education services and arrangements. Such a structure can improve educational programming for handicapped youngsters by offering a well sequenced continuum of educational objectives across time and classroom settings.

Second, the mere delineation of various objectives believed to be encompassed in academic/pre-academic, self help/basic living, career/vocational, and socio-behavioral education allows for a more comprehensive and simplified selection of appropriate goals and objectives. The very nature of handicapping conditions calls for a rather extensive number of goals and objectives possible for selection in educating individual students. The availability and knowledge of complete curriculum objectives in each of the four areas of special education instruction stated above allow educators to readily select objectives for individual students, at the same time assuring that important objectives are not overlooked. The annual updates and revisions are also simplified by the provision of continuous objectives leading directly to goal achievement.

This focus on specific objectives that will ultimately lead to goal achievement has the side benefit of down-playing specific handicapping conditions. Regardless of the primary handicap, many students share the same or similar goals or objectives at any given time. The traditional emphasis on placement and programming according to handicapping condition can be resisted only by providing a viable alternative. The creation and study of a special education curriculum as proposed here provides an alternative to grouping by categories of exceptionality. It encourages educators to look beyond the potentially stigmatizing variables and to examine and program the student's education according to appropriate goals and objectives.

Only a few of the many purposes to be accomplished by emphasizing the art and science of special education curriculum development have been discussed thus far, namely:

- (1) increasing teacher competence,
- (2) improving teacher confidence,
- (3) providing a continuum of educational goals and objectives,
- (4) simplifying the selection of goals and objectives, and
- (5) reducing the emphasis on handicapping condition.

The following section delineates certain procedures that

have been used successfully in accomplishing each of the above purposes. Other procedures are possible, of course, but this discussion, at least, will give an indication of the enormous potential in curriculum development activities.

GENERAL PROCEDURES FOR DEVELOPING CURRICULUM

Several procedural strategies must be determined prior to initiating special education curriculum development activities. General procedures involve determining:

- (1) who will actually develop the curriculum goals and objectives,
- (2) when these goals and objectives will be developed,
- (3) in what setting the development will occur, and
- (4) in what areas curriculum must be established.

Regarding who will develop the curriculum, the answer is fairly clear when considering one of the major purposes to be accomplished: Special education teachers involved in the direct instruction of handicapped students must be the primary developers of special education curriculum since they are the primary implementors. Ideally, special educators should never be forced to use a set of curriculum objectives that they have not had an active part in developing. Other persons that may contribute to curriculum development include parents, regular classroom teachers, support personnel, and persons from the community at large.

The proper time to develop curriculum goals and objectives necessarily varies from institution to institution. Experience has shown, however, that development of a comprehensive curriculum generally appears best accomplished within highly concentrated blocks of time during which educators' major task can be the examination and creation of curriculum — as opposed to periodic meetings or meetings held at a time when instructional activities in the classroom are occupying most of the teacher's time. For example, the quantity and quality of curriculum material produced sometime during the summer months or in two-week daily workshops has been encouraging. Of course, teachers should be reimbursed in some manner for their time spent in curriculum development of this nature.

The settings reserved for curriculum development can vary widely from pre-service teacher training programs to concentrated in-service programs. Although there are no guidelines to suggest the best setting for special

education curriculum development, many school districts have found that participation in this activity as a group is highly appropriate and productive. This format allows development of a satisfying continuum of goals and objectives across school programs within a given district or cooperative entity.

Most special education programs include goals and objectives in four basic areas of education — self-help/basic living, career/vocational, pre-academic/academic, and socio-behavioral education. These are the areas, then, that eventually must be addressed by special educators when developing curriculum. Goals and objectives must be delineated for each of the four areas, to allow for the more thorough selection of objectives for individual pupils. For instance, while some people consider only severely handicapped students as needing objectives that involve self-help/basic living education, many mildly disabled youngsters also have trouble dressing or performing simple consumer skills. Therefore, special educators of all types need some knowledge of and guidelines for developing objectives in each of the four areas.

To take these broad areas of special education and delineate goals and objectives in each, a structure or model is needed around which to arrange these goals and objectives. The more consistent this model is within a local education agency or across agencies, the more readily transferable are the ideas contained in the special education curricula.

A MODEL FOR SPECIAL EDUCATION CURRICULUM

The model to be adopted in developing special education curriculum should be one that can be directly applicable to the Individualized Education Program mandated for all handicapped students. Thus, the model must relate to both annual goals and short-term instructional objectives. Larsen & Poplin (in press) have suggested a curriculum model designed for use in developing Individualized Education Programs for handicapped students. The model consists of three levels of curriculum development — educational goals or constructs, general objectives, and short-term instructional objectives.

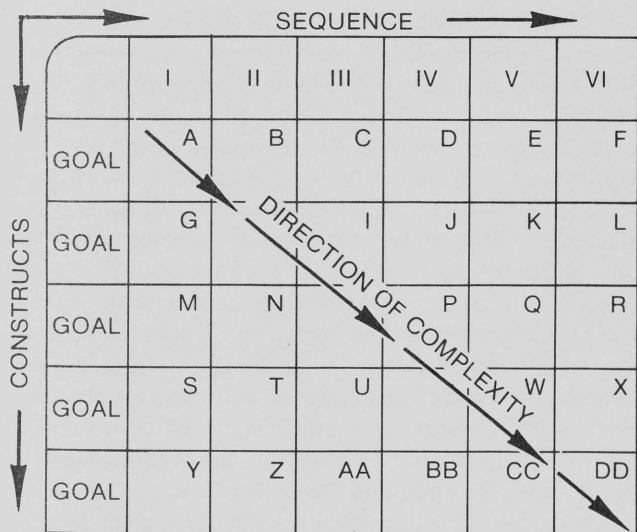
The first level or step in curriculum development involves delineating goals or constructs of a given special education area (e.g., academics or self-help). For example, the constructs or goals of the self-help curriculum might include *motor and mobility, hygiene, dressing, feeding, and grooming*. The second level of

the curriculum represents general objectives — defined as the necessary link between goals and short-term instructional objectives. The primary purpose of this level, as stated by Larsen and Poplin, is to provide content to annual goals and meaning to short-term objectives. For example, general objectives for the construct of feeding might include: drinking from a bottle, eating with a spoon, drinking from a cup, . . . eating in a restaurant. The third level of special education curriculum development involves the breakdown of each general objective into a series of short-term instructional objectives that lead to mastery of a given general objective. Completion of levels one and two (goals and general objectives) results in development of a curricular “map” (discussed next). Completion of level three (described later) results in a specific curriculum guide that can be used directly in the development of IEPs.

Curricular Maps

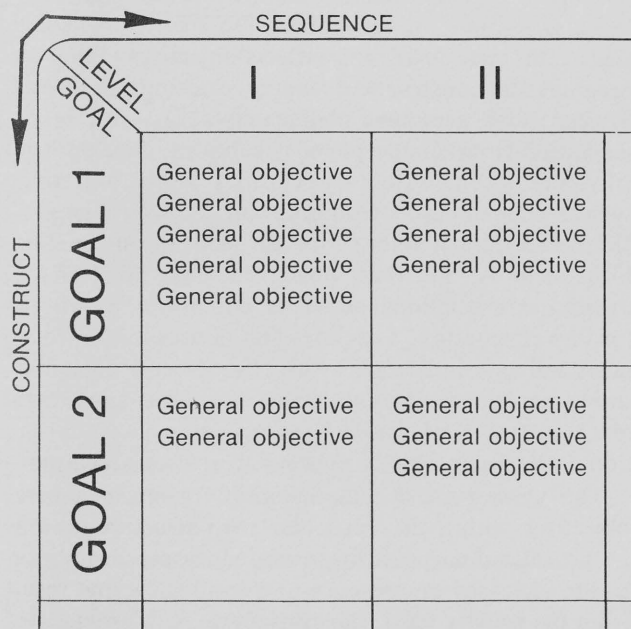
Curricular maps provide teachers an overview of all major concepts to be covered in a given area of special education. This broad picture of curriculum content lends a sense of continuity to classroom activities and allows for the selection of all goals and general objectives appropriate for a given student's educational program. The structure of a curricular map takes a form similar to that of Figures 1 and 2. This basic structure represents a two-dimensional array of general objectives, organized by construct and by level. Therefore, special educators attempting to develop curriculum maps in each of the areas of special education must first delineate (a) the curriculum maps necessary to adequately cover a given area, (b) the constructs inherent in each curricular map, and (c) the levels along which general objectives will be ordered.

For each area of special education there may be several different curriculum maps. For example, the area of pre-academics/academics might include curriculum in oral language, reading, written expression, and math. Self-help/basic living curriculum may contain maps of motor and mobility objectives, personal skills, and independent living curriculum. Career/vocational maps might include career awareness, career exploration, and occupational maintenance curriculum. Curriculum maps for socio-behavioral education might include the delineation of personal interaction objectives and self awareness objectives, as well as a map of behavior disorders (organized from most to least severe). The above, of course, are examples only; the most appropriate con-



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Figure 1
Graph of Curricular Map



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Figure 2
Distribution of General Objectives within the Curricular Map

ceptualization of the various curriculum maps for each area of special education is that devised by the group of teachers developing and utilizing the curriculum itself.

The constructs or goals must be specified as the first dimension of the curricular map. These constructs represent the subcomponents or parts of a curriculum map that, when synthesized, reflect the totality of the curriculum itself. For example, the curriculum of written expression would involve the constructs of spelling, penmanship, capitalization, punctuation, vocabulary, grammar, sentence construction, paragraph construction, and theme development. A personal skills curriculum might contain feeding, dressing, grooming, and hygiene constructs. Career awareness constructs might be organized to reflect various occupational clusters. Curriculum maps of self awareness objectives may be organized around the constructs of body awareness, feelings awareness, response alternatives, and values. The constructs set forth in this first dimension of curricular maps are also appropriate as goals for individual student programs. Thus, the construct dimension not only adds organizational structure to curriculum but is directly applicable to the IEP.

The second dimension of curricular maps also adds to the organizational structure of the special education curriculum. This dimension allows for organization of general objectives along levels of goals or constructs. These levels represent a somewhat subjective organization of general objectives arranged either (a) from simplest to most complex, (b) from high to low priority, or (c) along developmental age levels. Some examples will illustrate these concepts: Mathematical objectives, under the construct of addition, are easily sequenced from simplest to most complex. For example, the objective of "one digit addition" is simpler than, and is often considered a necessary prerequisite to, the objective of "two digit addition without renaming." Language development objectives, under the construct of phonology or articulation, are usually sequenced according to knowledge of the developmental acquisition of speech phonemes in young children. Objectives under the area of career/vocational education generally have no inherent sequence developmentally or by complexity; thus, they are often organized in curriculum on the basis of perceived priorities.

General Objectives

The general objectives delineated for each construct or goal within the curriculum map provide the essential

link between special education goals and short-term instructional objectives. These objectives are most adventitiously generated through the process of brainstorming. In this process, educators developing a given curriculum map brainstorm and record all the possible objectives under each construct of the curriculum. After the session, they examine each brainstormed objective and discard duplicate and inappropriate objectives. The remaining general objectives are then (a) written into the proper form conforming with the characteristics of general objectives, and (b) sequenced into levels within each construct.

These general objectives have seven characteristics that one should keep in mind during development of the curriculum map. These characteristics ensure that curricular maps are comprehensive, yet concise enough to provide educators an efficient overview of the curriculum at a glance. The differences between general objectives and goals and short-term instructional objectives become more apparent upon examining the following characteristics delineated by Larsen and Poplin (in press):

1. General objectives can generally be written in three to four words and do not constitute a complete statement.
2. General objectives do not specify a particular behavior that the student is expected to perform.
3. General objectives do not specify conditions under which an objective is to be accomplished.
4. General objectives do not specify criteria necessary to judge success.
5. General objectives are not time specific — that is, mastering one general objective may involve a week or a year's instruction.
6. General objectives do not state desires for improvement.
7. There is a set of general objectives that can be developed and sequenced under each special education goal.

Examination of general objectives delineated and sequenced under several special education constructs serves to illustrate these characteristics.

A curriculum map developed in the academic area of written expression can be used to demonstrate several of the characteristics of general objectives. A curriculum map in written expression, as mentioned earlier, may contain such constructs as penmanship, spelling, capitalization, punctuation, vocabulary, grammar, sentence and paragraph construction. Figure 3 depicts only the constructs of capitalization and punctuation taken from a curriculum map carried across three levels of general objectives. General objectives delineated here, such as "The first word of a sentence" or "Commas in a list" refer to instances in writing in which capitalization or

punctuation is needed. The objectives need not be written as complete sentences, and they contain no reference to any behavior that the student is to perform. In looking at this portion of the map of objectives, one receives an overview of the early skills involved in capitalization and punctuation, but with no indication of the instructional activities used in developing these skills. For instance, the objectives do not specify whether students are to locate and correct errors in a given or original selection or incorporate these skills automatically within their original writing. The objectives do not mention any special conditions under which the skills are to be performed, nor do they give the criteria for success. Accomplishing the objective of capitalizing "the first word of a sentence" may require a week or a year or more depending on both the child and the instruction.

Improving the skills listed on the curriculum map is obviously a goal of instruction, but the general objectives themselves do not state a desire to improve or increase these abilities. Although Figure 3 shows only two constructs across three levels, a more comprehensive set of objectives is possible under each of the constructs of written expression.

To further illustrate the characteristics of general objectives, Figure 4 depicts the area of self-help/basic living education on the curriculum map of personal skills. This particular map reflects objectives under the personal skill constructs of feeding, dressing, health and hygiene, and grooming delineated across five levels sequenced from simple to most complex, developmentally, and to some extent by priorities. Again, objectives such as "Use of cup," "Combing hair," "Medical needs," "Make-up" clearly refer to specific skills or information to be acquired, but these objectives make no reference to specific instructional activities, conditions, or criteria for implementation. Timelines and desires for improvement are not indicated within the general objectives shown here. Once again, the curriculum map provides a quick picture of the general content of a given educational area frequently of concern to special educators.

The process of developing and organizing general objectives within the curricular map structure accomplishes several purposes for special educators. In addition to the increased competence and confidence that result from the activity itself, the curriculum map provides an efficient structure for inventorying a large number of objectives often necessary for individual student programs. Also, general objectives contained in the curricular map aid educators in making the critical transition between goals and short-term instructional objectives.

	I	II	III
Capitalization	The first word of a sentence The child's first and last names The name of the teacher, school, town, street The word "I"	The date First and important words of titles of books the children read Proper names used in children's writings Titles of compositions Names of titles: Mr., Mrs., Miss	Proper names: month, day, common holidays First word in a line of verse First and important words in titles of books, stories, poems First word of salutation of informal note, as "Dear" First word of closing of informal note, as "Yours"
Punctuation	Period at the end of a sentence which tells something Period after numbers in any kind of list	Question mark at the close of a question Comma after salutation of a friendly note or letter Comma after closing of a friendly note or letter Comma between the day of the month and the year Comma between name of city and state	Period after an abbreviation Period after an initial Use of an apostrophe in a common contraction such as isn't, aren't Commas in a list

From "Problems in Writing" by D. D. Hammill and M. S. Poplin, in *Teaching Children with Learning and Behavior Problems* (second edition) by D. D. Hammill and N. R. Bartel. Copyright 1978 by Allyn and Bacon, Boston. Reprinted by permission.

Figure 3
Partial Curriculum Map of Written Expression

	I	II	III	IV	V
Feeding	Being fed - liquids Being fed - solids Self feeding - bottle Self feeding - hands	Use of cup Use of spoon Use of fork and spoon	Use of knife, fork, spoon Use of bottle drinks Use of can drinks	Table manners Food selection School lunch	Restaurant dining
Dressing	Shoes Socks Coat Shirt	Pants Skirts Gloves Undergarments	Appropriate colors Hose Appropriate sizes Jewelry	Appropriate for season Appropriate for physical characteristics	Appropriate styles Purchasing own wardrobe Accessories
Health and Hygiene	Toilet training Hand washing Face washing	Regular bathing Deodorant Nose care	Medical needs Dental needs Menstruation Other puberty related needs	Medical and dental care - regular Use of over-counter drugs	Regular hygiene Use of prescription drugs Medical and dental emergencies
Grooming	Combing hair Brushing teeth	Washing & drying hair Washing clothes Drying clothes	Shaving Curling hair Ironing Fingernails	Toenails Special skin care Simple repair of clothing	Make-up Styling hair Cologne

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Figure 4
Example of a Curricular Map of Personal Skills in Self-Help/Basic Living Education

Tangential advantages of curricular maps include the possibilities of using these maps and objectives to (a) improve communication with parents regarding selection of appropriate goals and objectives for their handicapped youngsters, (b) simplify the organization of curriculum guides containing short-term instructional objectives, and (c) create informal systems for monitoring individual students' progress. All of these advantages stemming from curricular mapping activities are contingent, of course, upon appropriate use of the curriculum objectives generated.

Two major criticisms of many educational curricula must be considered in order to avoid common pitfalls when developing and utilizing curriculum maps. The first criticism is that often, as in regular education curricula, the objectives themselves determine the students' programs. In other words, many teachers utilize the general objectives on the curricular map by automatically assigning each objective to every student. In such cases, the idea of individualized programs is fallacious. This criticism of predetermined curriculum is less valid for many special education programs in which variances in handicapped students' abilities are so great as to preclude automatic assignment of identical objectives to every child. Unlike traditional scope and sequence charts that delineate the objectives contained in specific materials, curricular maps should exhibit a much broader perspective. General objectives within curricular maps are designed to represent *all* of the objectives possible in a given special education area. Specific objectives are then selected from that array for individual students. Finally, specific materials are located or designed to assist in instructing the student in the selected objectives.

A second frequent criticism of predetermined curriculum objectives is that they tend to provide only a cursory picture of true abilities in each of the areas of education. For example, a mathematics curriculum usually places much emphasis upon algorithms, calculations, and memorization of number facts, with little attention afforded to development of mathematical concepts. In other words, it is said that the skills oriented educator accepts a "school-house attitude" about educational achievement, often reflected in an overuse of worksheet type activities and objectives that ignores concept learning and thought development. Although this criticism is highly valid, in many instances it can be overcome by giving careful definition of mastery to each general objective on the curriculum map. The concept of mastering curriculum objectives is best applied by perfecting the development of criteria, conditions, and behaviors in the delineation of short-term instructional objectives.

SHORT-TERM INSTRUCTIONAL OBJECTIVES LEADING TO MASTERY

Two important concepts must be understood and utilized during development of short-term instructional objectives — i.e., the components of these objectives, and the various ways in which mastery can be defined. Once components of instructional objectives and definitions of mastery have been incorporated for each general objective, the results of these activities will produce comprehensive curriculum and instructional guides.

Components of Instructional Objectives

Any short-term instructional objective has three primary components:

- (1) the student activity or observable behavior,
- (2) any special conditions under which the activity will take place, and
- (3) the criteria by which success will be determined.

These components, when spelled out for each general objective, assist special education teachers both in the determination of actual instructional activities for the classroom and in evaluation or assessment strategies for monitoring pupil progress.

Observable Behavior

The student activity denotes a particular student behavior necessary to perform the given instructional objective. For example, will the student be asked to *write* or *say* the answer to a given problem; *drink* from a cup; *correct* an error in capitalization; verbally *name* a common object; or *identify* a cup, sentence, addition sign, or common object? All of these verbs specify an observable behavior that is to occur during instructional and/or evaluative activities. General objectives, on the other hand, do not provide teachers with a student activity that can be observed.

Special Conditions

Any special conditions necessary for performing a given behavior must also be included in short-term instructional objectives. Conditions are sometimes obvious from either the behavior or criteria defined, but in some instances it becomes a most pertinent consideration. For example, if "drinking from a cup" is an objec-

tive, transferring this skill from the classroom to home or from one cup to many different cups may be important considerations. The conditions under which a child is expected to function upon returning to a regular classroom may be another consideration. For instance, correctly answering addition problems may be transferable only if the student can record 25 answers in 15 minutes on a single worksheet. Special conditions including rate, quantity, and setting, then, are often important considerations in defining instructional objectives.

Criteria

The third essential component to be delineated in short-term instructional objectives relates to the criteria that must be achieved in order for an instructional objective to be considered mastered. Criteria are generally stated in terms of percentage of accuracy or number of times consecutively performed over a given period of time. Generally, percentage of accuracy or number alone is insufficient to indicate that an instructional objective has been met. For example, achieving "90% to 100% accuracy" on a given list of spelling words rarely assures the successful spelling of those same words tomorrow or next week. Therefore, "90% accuracy measured once every 3-4 weeks" would be a much more appropriate criterion. "Using a spoon during mealtime at home"

once would not automatically be considered as an objective achieved; however, if the behavior were to occur over a period of "two weeks," one could be more certain of mastery. Likewise, no one would consider that a student who made one successful bus trip unassisted had mastered the "ability to utilize bus transportation." The delineation of criteria for success, along with the behavior to be performed by the student, and any special conditions, then, are all necessary parts or components of short-term instructional objectives.

Defining Mastery

In developing instructional objectives, initially defining the single short-term instructional objective that will represent mastery of the given general objective is helpful. After that, a series of instructional objectives leading to the mastery objective can be specified. Mastery as a concept is frequently applied to educational or general objectives in three ways: cue reduction, task analysis, and taxonomy of educational objectives (Larsen & Poplin, in press). These approaches to definition of mastery are most often used in combination rather than as single entities. Each will be discussed below utilizing the lists of short-term instructional objectives contained in Figures 5, 6, 7, and 8 as points of reference.

Self-help/Basic Living — Personal Skills Map — Feeding

General Objective: Drinking from a cup

Short-Term Instructional Objectives:

Criteria: Ten consecutive trials

Special Conditions: At home and school with three different cups

Behavior	With Physical Prime	With Physical Prompt and Verbal Cue	With Verbal Cue	Independently
1. Reaches for cup				
2. Grasps cup				
3. Brings cup to mouth				
4. Tilts cup				
5. Swallows liquid				
6. Replaces cup				
7. Steps 1-6 sequentially	<i>M.S. 3-79</i>	<i>M.S. 4-79</i>	<i>"drink" M.S. 5-79</i>	*

*Indicates mastery

Figure 5
Short-Term Instructional Objectives for "Use of a Cup"

Academics — Math Curriculum — Addition

General Objective: Sums to 18

Short-Term Instructional Objectives:

Criteria: 90% accuracy over 3 weeks (6 recordings)

Mechanical Behaviors			
	5 per page	10 per page	25 per page in 10 min.
1. Records answers to vertically arranged problems, sums to 9, excluding 0's	✓		
2. Records answers to vertically arranged problems, sums to 18, including 0's	✓		
3. Records answers to horizontally arranged problems, sums to 18	✓		*
4. Records answers to vertically and horizontally arranged problems, sums to 18	✓	Md 5-79	
	1 per 5 sec.	1 per 5 sec.	1 per sec.
5. Names answers to vertically arranged problems, sums to 9, excluding 0's			Md 5-79
6. Names answers to vertically arranged problems, sums to 18		Md 5-79	
7. Names answers to horizontally arranged problems, sums to 18	Md 5-79		*
Conceptual Behaviors			
	With prompt or prime	With cue	Independently
1. Records algorithms vertically when verbally given			Md 4-79
2. Arranges concrete objects to denote a given algorithm representing sums to 18	Md 5-79		
3. States, records, and solves algorithms when given concrete objects demonstrating sums to 18	Md 5-79		
4. Solves own problems involving addition sums to 18	Md 5-79		*

*Indicates mastery

Figure 6
Short-Term Instructional Objectives for "Sums to 18"

Cue Reduction

When mastery of an objective depends largely upon the performance of a behavior being accomplished *independently* or *automatically*, it is often best to utilize cue reduction instructional objectives. Cue reduction is merely the specification of instructional objectives whereby teacher assistance is gradually withdrawn from a student activity or behavior. In the several levels of

cues that reflect a continuum from most to least teacher assistance:

- (1) *priming* represents an activity that is completed with total teacher assistance. An example of a *physical prime* is the formation of letters in handwriting, with the teacher guiding the student's hand through the entire movement. An example of a *verbal prime* would be when a teacher reads aloud each word of a selection with the student.

Academics — Written Expression Curriculum — Capitalization

General Objective: Capitalizing first word in a sentence

Short-Term Instructional Objectives:

Criteria: 90% over 6-week period (measured 6 times)

Behavior	With Verbal Cues	Independently
1. Identifies capital letters	AC 10-77	MS 3-78
2. Recognizes first word of sentences	AC 11-77	MS 3-78
3. Identifies errors in capitalizing first word of sentences	AC 12-77	MS 4-78
4. Corrects errors in capitalizing first word of sentences	AC 12-77 MS in original comp. 5-78	YC 9-79
5. In original composition, capitalizes first word in sentence	YC 10-79	*

*Indicates mastery

Figure 7
Short-Term Instructional Objectives for "Capitalizing First Word in a Sentence"

Pre-academic — Oral Language Curriculum — One-Word Utterances

General Objectives: Naming common food items

Short-Term Instructional Objectives:

Criteria: 7 consecutive correct responses

Condition: School and home

Behavior	With Prime	With Prompt	With Model or Cue	Automatically
1. Points to object when given the name	MP 1-79 to 5-79	MP 5-79		
2. Points to picture when given the name	MP 1-79 to 5-79			
3. Repeats word				
4. Names when shown object				
5. Names when shown picture of object				
6. Uses noun when requesting or referring to food item				*

*Indicates mastery

Figure 8
Short-Term Instructional Objectives for "Naming Common Food Items"

(2) *prompts* are activities in which the teacher begins or completes some part of the behavior with the child. *Physical prompts* are often used to get children started on manual activities or to assist them at difficult points during the activity. Teach-

ers voice *verbal prompts* to assist students when indicated at varying intervals during a course of instruction (e.g., providing words for students reading aloud when difficulty becomes apparent or is likely).

- (3) *cues* are merely signals given to students for a certain behavior to occur. *Physical cues* can be hand, facial, or object cues. Modeling is one kind of physical cue. *Verbal cues* include almost any teacher direction — e.g., “An ‘o’ starts at the top and goes around until it meets again,” “Tilt the cup,” and “Line up your numbers one under the other.”

Most often, verbal or physical cues are begun at the prime and prompt stages so that as these kinds of behaviors are accomplished and withdrawn, the verbal cue remains associated with the activity itself. Verbal mediation skills whereby the child verbally directs him/herself through an activity are predicated upon this assumption.

Examples of cue reduction applied to definition of short-term instructional objectives to mastery are represented in each of Figures 5-8. In each instance, cue reduction techniques are listed to reinforce the behaviors to be acquired. For example, in Figure 5 the teacher might physically help children reach for the cup, physically prompt them, or verbally say, “Reach for the cup,” or “Cup?” until they independently reach for the cup. Obviously, with some students application of each of these techniques for every behavior listed would not be necessary. In the event that a student cannot perform a given task independently, however, teachers do have these instructional devices to fall back on in attempting to teach various concepts and/or behaviors. Readers interested in further explanation of cue reduction techniques are referred to Becker, Englemann and Thomas (1975) and Larsen and Poplin (in press).

Task Analysis

A second means of conceptualizing mastery of general objectives is the process of task analysis. This method is most appropriate for objectives in which mastery requires a series of tasks that must be completed simultaneously or sequentially in order to accomplish the given general objective, such as the steps involved in washing one's hair. Task analysis involves taking a given general objective and dividing it into a series of related sub-tasks. Many self-help/basic living and some vocational tasks are highly appropriate for task analysis activities.

Figure 5 depicts the objective of “Drinking from a cup” broken into sub-tasks like grasping the cup, tilting the cup, and swallowing the liquid. Mastery occurs

in Step 7 — the point at which the individual sub-tasks are combined into one activity. To a lesser extent, Figures 6-8 represent some task analysis related activities. For instance, in Figure 6, the “Sums to 18” objective is essentially divided into two tasks — “Sums to 9, excluding zeros,” and “Sums to 18, including zeros.”

In task analysis activities, it is not uncommon to find many students for whom the teaching of each individual sub-task is unnecessary. Instead, the objectives that denote mastery can be instructed directly from the outset. Readers interested in more thorough explanations of this topic are referred to Lovitt (1975a, b) and Larsen and Poplin (in press).

Taxonomies of Educational Objectives

For general objectives in which development of concepts, ideas, or principles is most important, teachers may want to become more familiar with the various taxonomies of educational objectives (Bloom, 1956; Krathwohl, Bloom & Masia, 1964) and utilize those concepts in developing instructional objectives. The taxonomy of objectives involved in the cognitive domain represents a hierarchy whereby students are required to perform behaviors as simple as rote recall or behaviors that demand application or the complex manipulation of information in order to solve problems and create and evaluate products. The five levels of the cognitive domain, in ascending order, are:

- (1) *knowledge objectives*, requiring retention of previously presented information (i.e., memory and recall),
- (2) *comprehension objectives*, demanding that the student perform behaviors that indicate his or her understanding of the meaning of acquired information,
- (3) *application objectives*, requiring behaviors in which learned material is applied to new situations,
- (4) *synthesis objectives*, calling for students to put previously learned information together in new ways to form a new whole, and
- (5) *evaluation objectives*, necessitating behaviors whereby materials or information is judged.

Special education teachers are frequently most concerned in helping students reach the level in goals and objectives at which they can apply concepts and facts to their own lives. This view of mastery to application is highly important in special education. For example, knowledge of addition facts offers students only limited

assistance until they understand and can apply the concept of addition to their own needs. Nevertheless, preparing students for participation and success within the regular classroom environment commonly requires the achievement of objectives that represent either more or less than that necessary for application. Referring to the general objective of capitalizing the first word in a sentence, this skill is often taught and evaluated on the basis of locating or correcting an error or by re-writing a given unpunctuated sentence. The ability to perform this task falls far short of mastery to application, whereby students automatically capitalize beginning words of their own original sentences. On the other hand, applying addition skills to story problems in which students are given simulated problems to *read* and *solve* requires skills that go beyond the ability to apply addition facts and understanding to their own uses.

When developing short-term instructional objectives, teachers are encouraged to keep both the concepts of mastery to understanding and to application in mind along with mastery as it relates to regular classroom activities. In some instances, when a discrepancy exists between classroom objectives and application, teachers may choose to disregard regular classroom kinds of objectives in favor of more practical application oriented objectives. Application oriented objectives are especially preferred in cases in which the student's abilities in a given special education curriculum area are so deficit as to preclude regular classroom participation for a period of time. Also, in the case of older students, teachers often opt for the more functional objectives, and performance within the regular classroom receives a low priority for the student's education.

In summary, short-term instructional objectives can be defined to mastery by careful use and combination of the concepts of cue reduction, task analysis, and taxonomies of the various educational domains. When defining a series of short-term instructional objectives, it is most efficient to begin by defining the last of the series — i.e., the instructional objective that will represent mastery of the given general objective. Following delineation of the mastery objective, the various techniques outlined here may be incorporated to construct a series of short-term objectives that will hopefully lead to the mastery objective.

Unfortunately, little research information is available to indicate what kinds of instructional activities or objectives actually do contribute to mastery of various educational goals and general objectives. Very likely, differences exist from child to child to the extent that conclusive statements may not be possible to reach.

Teachers in situations in which the lack of empirical research on instructional objectives continually manifests itself should be careful to instruct children according to instructional objectives that are as close as possible to the definition of mastery.

After instructional objectives to mastery have been developed for all the general objectives contained in a given curriculum map, the accumulation of listings like those of Figures 6-8 will result in a comprehensive, valuable curriculum and instructional guide for instruction. In addition to the new understanding that involved teachers will have gained through these curriculum related activities, well-defined objectives will assist them in appropriate instruction and materials selection.

APPLICATION OF CURRICULUM TO THE IEP

In addition to providing special educators an almost daily guide for instruction (as well as other purposes previously discussed), curricular maps and guides can be used to simplify development of Individualized Education Programs. Application of a well planned, carefully designed curriculum in developing IEPs involves using curriculum maps and guides as

- (1) a source for selecting goals and objectives for individual students, and
- (2) a structure for continuous monitoring of pupil progress throughout one or several years of education.

These uses of curriculum maps and guides greatly simplify the development of individual programs and provide students and teachers with a true continuum of educational objectives.

Maps and guides outlining various goals, general objectives, and instructional objectives constitute excellent resources for the special education teacher when selecting goals and objectives for individual programs. A comprehensive curriculum, along with the teacher's knowledge gained in developing the array of goals and objectives, helps ensure that important goals and objectives are not overlooked. A special educator involved in developing numerous educational programs could otherwise have a tendency to repeat the same objectives from program to program and/or to avoid or overlook goals and objectives that are needed but difficult to define. The experience derived from developing a good curriculum does offer an alternative preferable to the likely duplication or omission of goals and objectives.

The concept of Individualized Education Programs does not mean that a new curriculum must be created for each student. It does mean, though, that the range of possibilities for goals and objectives is wide and may be different for each student. During preparation of goals for the student's IEP, teachers are advised to review curriculum maps in the various areas of special education and record the appropriate special education areas, goals, and general objectives directly on the student's IEP form.

Realistically, special education teachers are aware of the virtual impossibility of recording every short-term instructional objective on the IEP form itself. Usually, IEP forms allow approximately one-half page at most for the delineation and evaluation of short-term instructional objectives. Curriculum guides containing short-term instructional objectives offer several alternatives to the tedious recording of instructional objectives on every student's IEP. Following delineation of goals and general objectives, teachers may want to merely refer to the pages and/or numbers in the curriculum guide containing the appropriate instructional objectives or, better yet, to duplicate and attach these pages to the student's individual program. One school district provides the entire guide for each student's program once the appropriate special education curriculum areas have been identified. This guide then follows the student from year to year, program to program, and serves as a continuous monitoring device. The method of delineating short-term instructional objectives as represented in Figures 5-8 provides an inherent evaluation form. Progress toward short-term instructional objectives can be marked directly on the form. Criteria, conditions, and behaviors are all contained within the guide.

Referring again to Figures 5-8, one sees how these example forms can be used to record progress over time. For example, Figure 5 tells next year's teacher that of the steps, only Step 7 was attempted, and before the end of the school year, the child was drinking from a cup on the verbal cue "drink"; he had not reached mastery, however. The student whose progress was recorded on Figure 6 had not mastered all the mechanical or conceptual skills listed. As another informative aid, teachers had recorded checkmarks during pretesting to indicate skills the student was already able to perform. Figure 7 demonstrates the utility of guides following students through various years of schooling. At a glance, teachers, parents, and administrators can determine past instructional efforts for a given child in the application of capitalization skills. Figure 8 charts the progress of a student having obvious difficulty with one-word utter-

ances. Both initiation and completion dates have been recorded, along with the special education teacher's initials. Progress recorded on Figure 7 for Objective 4 indicates a difference in teaching methods between teachers A.C. and M.S. While A.C. may have given the student ready-made sentences in which to locate and correct errors, M.S. utilized this proofreading objective with the student's own composition. Teaching methods, approaches, and the selection of short-term instructional objectives may differ from teacher to teacher and from child to child, but with a comprehensive monitoring system no essential information goes unrecorded.

The direct application of curriculum goals and objectives to development of Individualized Education Programs prevents useless duplication of efforts and frees teachers for valuable instructional time. Curriculum maps can serve as a source for transferring goals and general objectives directly to the IEP. Curriculum guides containing short-term instructional objectives are most useful as (a) a reference from which teachers can plan instructional activities, (b) a reference that can be duplicated and attached to individual programs, and (c) a continuous monitoring device. Handicapped students' programs then can truly reflect a continuum of goals and objectives that can be easily revised and updated.

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