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ABSTRACT

Reports on a project in the tri-county metropolitan Portland, Oregon area designed to help educators answer the questions: "What is to be learned?" "How is it to be learned?" and "Has it actually been learned?" Educational goals were produced for use in management and planning, and coded for retrieval from a computer storage system. The goal collections were designed for the following uses: (1) participation of students, parents, teachers, school boards, and local citizens in decisions about what the school should teach, (2) individualization of instruction, (3) cross-disciplinary education, (4) accountability, (5) long-range planning and systematic control of educational development, and (6) effective teacher evaluation. Types of goals, codes, and related support systems used in the system are described. Two lines of future development were planned based on the initial work of the project. The first is curriculum improvement, and the second is in measurement and evaluation for which the principal product sought is a criterion referenced set of test items related to each course goal. (Author/RC)

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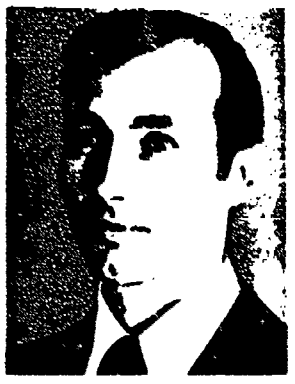
Goals and Objectives in Planning and Evaluation: A Second Generation



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ABOUT THIS REPORT

In recent years there has been a tremendous upsurge of interest in the need for and development of educational goals and objectives. The range of interest has run the gamut from large scale national efforts, to the establishment of objectives banks, to the development of locally designed and tailor made systems. This report tells what has been accomplished at the local level through the cooperative efforts of 40 school districts in the tri-county area of metropolitan Portland, Oregon. The authors of this report have engineered a system for offering alternative answers to the questions, "Where to lead?", "How to lead?", and "Are we getting there?" This report reveals the complexity and the promise of a system designed to help educators communicate to one another the best answers they can find to those questions.

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This is a report of a project in the tri-county metropolitan Portland, Oregon area designed to help educators answer the questions: "What is to be learned?," "How is it to be learned?," and "Has it actually been learned?" This project has as its first task the production of educational goals (learning outcomes) appropriate for use in management and planning at all school system levels, and the coding of these goals to make their curricular uses apparent and to permit their flexible retrieval from a computer storage system. Its long-range goal is to bring consistency to the way school districts develop goal structures for instructional planning and evaluation at all levels. Thus, while the project is initially occupied with producing and coding goals (over 12,000 have been produced and coded to date), it is also concerned in the long run with alternative ways they may be attained and measured. An overview of the project's goals and progress is provided in Figure 1.

	Define and Code Program and Course Level Goals in Eight Major Subject Areas	Define and Produce Related Measurement Criteria	Define and Produce Related Aids to Goal Attainment
Plan	C	C	P
Develop	C	P	U
Disseminate	P	U	U

C Completed P - In progress U - Uninitiated

Figure 1 -- Status of Project Goals

These goals and the ways they are being met will be discussed in detail after a brief review of the project rationale.

NEEDS TO WHICH THE PROJECT IS RESPONDING

The goal collections are being designed for the following uses:

1. Participation of students, parents, teachers, school boards, and local community citizens in decisions about what the schools should teach.
2. Individualization of instruction.
3. Cross-disciplinary education.
4. Accountability.
5. Long-range planning and systematic control of educational development.
6. Effective teacher evaluation.

PARTICIPATION OF STUDENTS, PARENTS, TEACHERS SCHOOL BOARDS, AND LOCAL COMMUNITY CITIZENS IN DECISIONS ABOUT WHAT THE SCHOOLS SHOULD TEACH

By providing a broad based set of alternatives for generating goal statements appropriate and useful at various levels of management and participation, the Project provides an important resource for improving the quality and extent of participation of students, parents, teachers, school boards, and other citizens in deciding the mission of the schools. An intensive look at the roles of each participating group in generating, reviewing, contributing to, and approving goals will be a future part of the effort.

INDIVIDUALIZATION OF INSTRUCTION

Diagnosing and meeting individual learning needs is a long-standing interest of educators, but one that has been frustrated by the apparent organizational and economic constraints under which schools operate. With the advent of the computer and the development of teaching systems and programs based on behavioral principles, new hope has risen for individualization of instruction. An unfortunate aspect of these developments has been the questionable motivational qualities of mechanistic teaching systems and the student/machine relationship on which they depend. A more fortunate by-product of the movement has been the attention given to defining instructional outcomes.

The Tri-county Project is producing a type of goal that is suitable for instructional planning, but not constrained by the behavioral objectives format, in order to provide teachers and students explicit statements of possible learnings for which they can accept accountability. The teacher and student are free to select methods of achieving those outcomes that within the constraints of their resources and capabilities seem most promising. This provides a more flexible approach to teaching and learning than teaching machines and other teaching systems permit. It places greater demands on the ingenuity and professionalism of teachers but has far greater potential because of its consistency with motivational principles.

CROSS-DISCIPLINARY EDUCATION

Probably no concept is currently more abused than "interdisciplinary education." While the goals of subject matter learning are at least implicit in the textbooks and other materials used by teachers, the goals of interdisciplinary education do not have even that questionable point of tangible reference. The Tri-county Project, by developing extensive coding and retrieval systems, permits selection of goals in terms of various combinations of subject matter, educational level, types of knowledge and process, career education program goals, concepts and values, and index words. This system provides important cues to interdisciplinary planning. The goals being produced, although they are printed in subject-oriented collections such as science, social science, mathematics, music, etc., may be related and grouped in and across subjects through computer retrieval by requesting those goals bearing one or more of the seven code parameters. Thus, for example, a teacher interested in a unit on marine biology is able to request goals from these files dealing with related concepts in science, social science, language, mathematics, or any other subject field. A detailed discussion of the seven coding systems is provided in the section on codes.

ACCOUNTABILITY

Perhaps the greatest need addressed by the Project is for a sound basis for accountability in education. Accountability has been much misrepresented as a simple, linear relationship between the worker and his supervisor. Educational accountability is especially complex because it is impinged upon by so many levels of organization and support. It has horizontal elements of management, support, and instruction, and vertical elements of federal, state, intermediate, local, and school organization. The aspects of accountability that are the concern of this Project are exclusively the horizontal element of instruction and the vertical elements of local school systems and schools. It is the assumption of the Project that these elements of accountability, though they may operate within state and occasionally federal guidelines, must find their first explicit expression at the school system level and must undergo definition at the program (science, social science, etc.), course (biology, bookkeeping, or a mini-course), and classroom or teacher level. The system of definitions and examples that illustrate this are presented later.

LONG-RANGE PLANNING AND SYSTEMATIC CONTROL OF EDUCATIONAL DEVELOPMENT

The past few years in education have demonstrated that few results of experimentation and development are transportable. The inability of educators to define clear, unambiguous statements of desired learning outcomes is an important underlying cause. The Tri-county Project is establishing sets of goals that may be used consistently for instructional planning and evaluation. The sets are open and are added to each time teachers or curriculum planners specify appropriate learnings not represented in the original collections. However, any statement admitted to the collections undergoes a rigorous process of statement, definition, and coding to insure that its utility to teachers is equal to goals already in the collection.

The project in its philosophy distinguishes between policy and the resources for the execution of policy. Classroom and curriculum planning has gone on, is going on, and will go on. Decisions are made at various levels which affect how this planning occurs and the directions it takes. The course goal collections are a passive, nonprescriptive resource available for planners who wish to execute their policies more efficiently and effectively. Accordingly, methodological and

procedural biases have been eliminated where possible in favor of a broad range of alternatives from among which any planner should be able to select in carrying out his responsibilities.

These collections will support all curriculum development activities in the Portland School System within a year or two, and in many other school districts in the tri-county area as well. The stability this will provide educational experimentation and development is apparent. The power of the goal collections themselves in promoting good educational planning and the ease and convenience it affords teachers in that planning is equally evident.

EFFECTIVE TEACHER EVALUATION

Absence of well-stated instructional goals has been a chief deterrent to valid teacher evaluation. The goal collections of the Tri-county Project offer teachers extensive sets of well-stated outcomes upon which to draw in negotiating the parameters of their courses with those to whom they are responsible. Instruments for process and product evaluation of teaching are being related to these course goals to aid in assessing their attainment. Furthermore, if goals are not met because of lack of support in the form of supervision, instructional materials, facilities, or any other reason, a basis exists for the teacher in turn to evaluate support services.

DESIGN OF THE PROJECT AND PRODUCTS TO DATE

In the following section are reviewed the types of goals, codes, and related support systems being produced by the Tri-county Project to meet the needs identified in the previous section.

THE COURSE GOALS AS THEY LOOK NOW

Goals produced in the eight subject areas (art, music, social science, mathematics, science, health, physical education, and language arts) are printed or in the process of being printed in volumes that contain an introduction, a set of subject area program goals, a taxonomy of the subject field, and a set of detailed "course level" goals organized according to the subject matter taxonomy.

Examples are presented below for three of the eight subject areas to illustrate the nature of the course goals. The knowledge (K) and process (P) categories illustrated below are the designations used to distinguish the two basic types of goals in the collections, but 12 knowledge and 79 process sub-categories are actually used to code the goals in the collections (see Tables A & B). Each of the 12,000 goals is retrievable by these sub-categories as well as by the other forms of coding previously mentioned and further described later.

SCIENCE

K. The student knows the functions of the cell wall, cell membrane, cytoplasm, and nucleus of a cell.

P. The student is able to make wet mount slides of thin sections of living matter.

K. The student knows the two major classifications of trees defined as deciduous and coniferous and the principal characteristics by which they are distinguished.

P. The student is able to distinguish between deciduous and coniferous trees.

LANGUAGE

K. The student knows that an exclamation point makes an emphatic interjection and a comma a mild interjection.

P. The student is able to use interjections appropriately in sentences.

K. The student knows the purpose served by words in language – the need for conventions that have the same meaning for those expressing as for those receiving thoughts.

P. The student is able to determine a writer's qualifications, sources of information, and use of signaling phrases ("I believe...," "In my opinion...") in distinguishing fact from opinion.

MUSIC

K. The student knows that the meter signature designates the organization of meter within the bar lines.

P. The student is able to read and interpret any meter signature.

K. The student knows the conventional ways music is rythmically represented in notations (e.g., accents, main beats, bar lines, sub-divisions of beats, time signature, notes and rests, ties).

P. The student is able to image a rythmic pattern and encode it in notation.

CONTENT AND FORM OF THE GOALS

Levels of Generality Chosen for Development. Types of educational goals have been arbitrarily designated as system, program, course, and instructional. Figure 2 illustrates all four levels and adds behavioral and performance objectives to show how they differ from the goals as defined in the Project.

System Goal

The student is able to communicate with others, both orally and in writing, in a manner that satisfies his need for expression and the requirements of those under whom he may become employed or receive further education.

Program Goal

P. The student is able correctly to apply the conventions of English grammar and usage in speaking and writing.

Course Goal

K. The student knows that special verb forms exist for use with singular and plural subjects.

P. The student is able to use appropriate singular and plural verbs with singular and plural subjects.

Instructional Goal

K. The student knows the singular and plural forms of the verb "to be" for present and past tenses:

S	P	S	P
I am	We are	I was	We were
You are	You are	You were	You were
He, she is	They are	He, she was	They were

P. The student is able to use appropriate singular and plural forms (present and past tense) of the verb "to be" with singular and plural subjects in writing sentences.

Behavioral Objective (Specification of Method of Measurement)	Given 20 sentences, ten with plural subjects and ten with singular subjects, the student will identify the correct number form of the verb (is, are).
Performance Objective (Specification of Prerequisites and/or Proficiency Level)	Given 20 sentences, ten with plural subjects and ten with singular subjects, the student will identify the correct number form of the verb (is, are) with at least 90% accuracy

Figure 2

In producing comprehensive sets of programs and course goals in eight basic K-12 subject matter areas, the Tri-county Project is extending and refining a course already charted by the work of Tyler, Goodlad, Bloom, Walbesser, Mager, and others. In the next section the coding systems developed to make these collections of maximum use to clients with widely divergent curricular orientations are examined. In this still incompletely charted area lie the chief innovative contributions of the Project.

THE CODING OF THE GOALS

As mentioned earlier, seven coding systems have been developed and applied to each of the course goals. The names of these codes are given in Figure 3.

The codes serve two purposes. First, they make it possible to retrieve subsets of goals to user specification. For instance, a subset can be retrieved containing the primary (or any other level) level reading (or any other subject matter subdivision) goals which deal with the process of decoding (or any other process or knowledge category). Or, a subset can be generated containing all the goals in all eight collections (or only some of them) which deal with the concept of "adaptation" (or any other concept or value coded) at a level appropriate for high school students (or any other instructional level).

Secondly, the codes help the user understand the curricular dimensions of a goal he retrieves – the concepts and values it reinforces, the type of knowledge or process it represents, and the larger goals (including career education goals) to which it relates.

Within Discipline Codes	1. Subject matter 2. Instructional level 3. Program goals
Across Discipline Codes	4. Knowledge-process goal types 5. Career education goals 6. Values-concepts 7. Index (key words)

Figure 3 – Course Goal Coded Relationships

CODES FOR WITHIN-DISCIPLINE RELATIONSHIPS

Three types of coding were designed for retrieval of goals within subject areas in ways that are useful for instructional planning. These are subject-matter taxonomy codes, instructional level codes, and codes for the broad program goals of the subject disciplines in question.

Subject matter taxonomies. The taxonomies of the eight subject areas were first written by curriculum experts as a framework for guiding teachers in writing goals, and were revised by the teachers as they produced the goals. By looking through the taxonomy at the front of one of the eight printed goal collections, a user can find what topics are covered and turn to the topic in which he is interested. Also, the taxonomy headings may be used along with one or more of the other codes to retrieve subsets of goals from the computerized system.

Instructional level. The levels chosen for coding were primary (P), intermediate (I), upper (U), and higher (H). The level code provides the teacher or curriculum planner the best estimate of the writers as to the level or levels at which the learning is appropriate. Many times the nature of the goal suggests continued learning over several levels, in which case all those levels are coded. These level indications are suggestive only, as it is evident that the appropriate time for learning varies with the interests and abilities of students.

Program level goal. A final code aimed at within-disciplinary relationships is the subject matter program goal. Recall that this more general type of goal has been written in each of the subject areas along with the more specific and numerous course goals. The code numbers of any related program goal are written beside each course goal to show the broader implications of the goal and to permit the retrieval of any or all course goals that contribute to a given program goal.

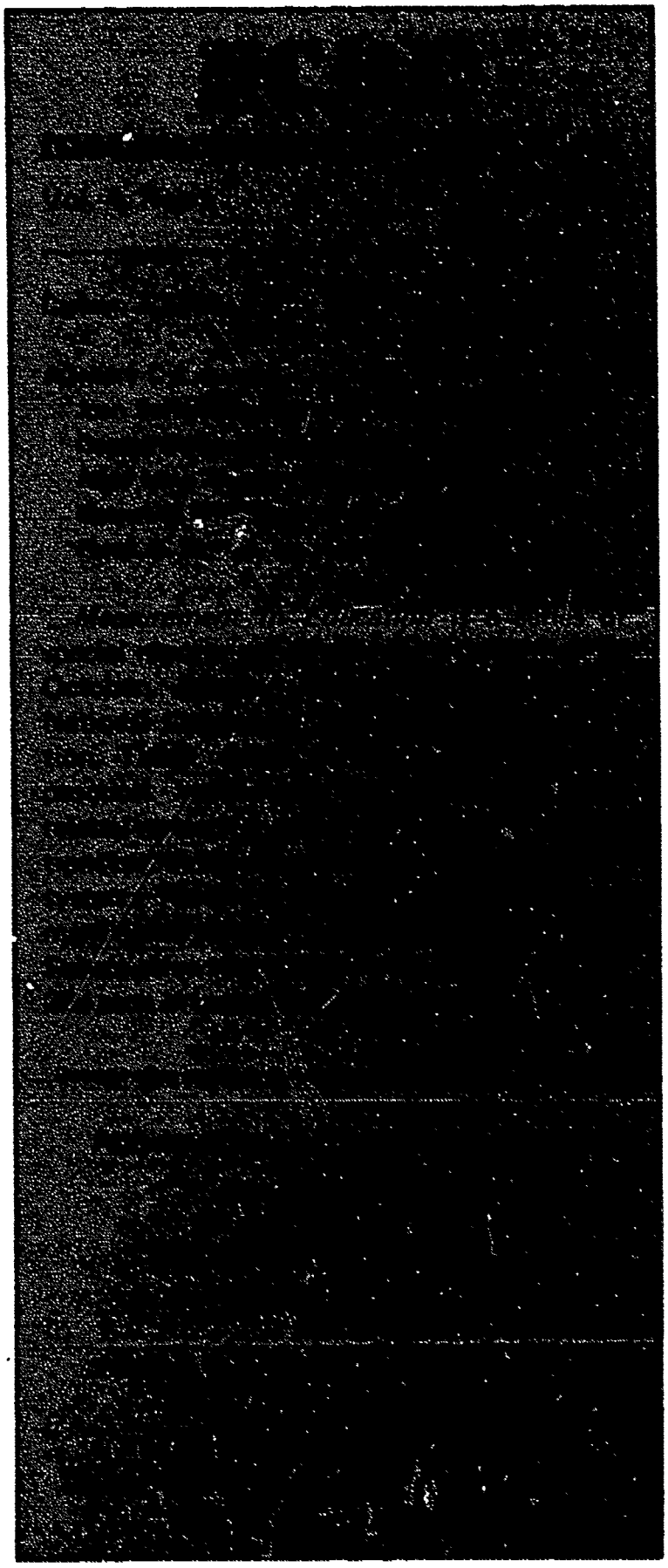
CODES FOR ACROSS-DISCIPLINE RELATIONSHIPS

Five additional codes were designed for retrieval of goals for interdisciplinary planning. They are: knowledge-process goal codes; other related taxonomy codes; career education goal codes; value-concept codes; and index word codes.

Goal types – knowledge and process. All goals were roughly classified as knowledge or process depending upon whether they deal with something that is to be known or something the student is able to do. All goals, therefore, begin with the words, "The student knows..." or "The student is able to..."

The familiar knowledge/process distinction is subdivided into twelve knowledge and five basic process categories: communication processes, inquiry-problem solving processes, production processes, service processes, and human relations processes. To date the only process category that has undergone substantial elaboration is the inquiry-problem solving category in which over seventy sub-elements have been identified.

The knowledge and inquiry-problem solving process categories are represented in Tables A and B following. It will be noted that these classifications owe a partial debt to earlier researchers; notably, Benjamin Bloom, David Krathwohl, Robert Glaser, Henry Walbesser, and Ralph Tyler in Education; Robert Gagne and Robert Miller in Psychology; Jean Piaget and Jerome Brunner in Child Development; and others. Major differences appear, however, in the manner in which the categories are organized and in their content. This is in large part due to validation and revisions from applying our original a priori categories to 12,000 goals from a variety of areas. Notice, for example, that the knowledge categories do not deal with knowledge of generalizations as a basic category, but rather assume that any goal representing a generalization must also deal with one or more of the basic categorizations. Generalizations as a class of knowledge are therefore given superordinate status and divided into two classes: principles and laws, and simple generalizations. Also notice there is no category of knowledge of specific facts as found in Bloom for we have been able to subsume all such goals under the basic ten categories. New categories not found in Bloom include knowledge of properties, parts, characteristics, features, elements, dimensions; knowledge of contexts, locations, orientations; knowledge of operations, methods



functions; knowledge of causes and effects including costs and benefits, advantages and disadvantages; and knowledge of relationships that are not cause-effect.

Perhaps the most significant departures from Bloom concern the process categories under problem solving and inquiry. First, the entire taxonomy is intended to represent standardized or conventional processes of problem solving and inquiry that can be taught and learned rather than psychological processes as is the case in Bloom's handbook on the cognitive domain. This difference is of utmost importance to teachers who have found it difficult to deal with learning goals within the context of Bloom's taxonomy, because it was not clear how these descriptors of psychological processes could be treated instructionally.

Table A – Knowledge Categories

G1	Principles and Laws
G2	Simple Generalizations
K1	Conventions: Names and Nomenclature
K2	Conventions: Symbols, Rules, Standardized Processes, Definitions
K3	Properties, Parts, Characteristics, Features, Elements, Dimensions
K4	Trends and Sequences
K5	Similarities and Differences, Discriminations, Classifications
K6	Contexts, Locations and Orientations
K7	Operations, Methods of Dealing with, Functions
K8	Cause and Effect Relationships (Costs and Benefits)
K9	Criteria or Standards
K10	Non Cause-Effect Relationships

Table B – Inquiry-Problem Solving Processes

P1	Input	Acquiring Information
		P11 Viewing
		P12 Hearing
		P13 Feeling (tactile)
		P14 Smelling
		P15 Tasting
		P16 Using sense extenders
P2	Input Verification	Insuring Validity and Adequacy
		P21 Evaluating authoritativeness of sources
		P22 Evaluating logical consistency and accuracy
		P23 Evaluating relevance to desired learning purposes
		P24 Evaluating adequacy for acting or deciding (comprehensiveness and depth)
P3	Preprocessing	Organizing Information
		P31 Labeling, naming, numbering, coding
		P32 Recording, listing
		P33 Classifying, categorizing, grouping, selecting according to criteria
		P34 Ordering, sequencing
		P35 Manipulating, arranging, transforming, computing
		P36 Estimating
		P37 Summarizing, abstracting

P4	Processing I	Interpreting Information (drawing meaning from data) P41 Decoding verbal and non-verbal symbols (reading and literal translating) P42 Inferring, interpolating, extrapolating P43 Analyzing P44 Associating, relating, equating P45 Comparing, contrasting, discriminating P46 Synthesizing P47 Testing against standards or criteria P48 Generalizing
P5	Processing II	Using Information to Produce New Information P51 Theorizing, predicting P52 Formulating hypotheses P53 Testing hypotheses P54 Revising hypotheses
P6	Output I	Acting on the Basis of Information P61 Reacting P62 Making decisions P63 Solving problems P64 Restructuring values (adapting, modifying) P65 Restructuring behavior (adapting, modifying) P66 Encoding verbal and non-verbal symbols prior to communication P67 Creating on the basis of knowledge and process
P7	Output II	Communicating Information P71 Vocalizing (non-verbal) P72 Gesturing, moving P73 Touching P74 Speaking P75 Writing P76 Using art media (painting, drawing, sculpting, constructing, etc.) P77 Dramatizing P78 Singing, playing instruments P79 Dancing

At this point the reader may question the reason for the rather detailed and elaborate system of classifying educational outcomes that has evolved during the Project. We have found that providing teachers with these classification systems has resulted in a more critical approach to the writing of educational outcomes. Having written a goal, a teacher in attempting to place it in its appropriate category may find that its intent is clearly related to one of the categories but its form of expression does not immediately identify it with that category. By rewording the goal, the teacher brings the true intent of the goal into sharper focus, and in almost every instance improves its meaning and clarity.

Also, the value of detailed classifying of knowledge and process goals provides insight into teaching, measurement, and evaluation requirements. Work has already begun in analyzing types of measurement appropriate for each type of knowledge goal, as described later in this article This work will be extended to process learning as rapidly as resources permit.

Other related content taxonomy headings. This coding is provided to show that goals are often rightly classified under more than one category of subject matter. For example, a course goal coded under economics may be relevant to some aspect of history. This information is provided by coding the economics goal with the relevant taxonomy number in history. For purposes of computer retrieval, it is possible to request all goals which deal with a particular content taxonomy heading, and to extract not only the goals placed under that heading, but also all other goals cross-referenced to it wherever they are located in the collection. While this capability presently exists only within a subject field, it later will be provided among subject fields.

Career education program goals. Course goals in all eight subject areas were coded to a set of career education program goals. Career education, as envisioned by the coders, concerns the total life of an individual, including day-to-day living, vocation, avocation, and leisure.

It was realized by the coders that not all goals have had a direct relationship to career education. However, any goal that contributes to the personal and social qualities believed important to any individual in a career were coded to career education goals that define these qualities. All skills having direct vocational values were, of course, coded to their related career education goals. This coding is the first operational resource for the realization of the goal of "integrating career education and the rest of the curriculum."

Concepts and values. Another index highly useful for those seeking teaching strategies which cut across subject matter lines is the coding to concepts and values. Words chosen to characterize values and concepts represent residuals of experience that influence the way individuals perceive and behave. Thus, the word freedom connotes certain behaviors associated with the ideal state. Likewise, a word like honesty characterizes a set of behaviors which viewed from a societal perspective characterize an individual as "honest". From an educator's point of view, the only resources available to help students acquire the desired concepts and behavioral tendencies are the knowledge and process learning of the experiences planned for and with students.

Especially important in considering the nature of values is the distinction between the process of forming values and values as end products. The curricular and methodological implications of teaching toward values as end products

(inculcation of values) are entirely different from those concerned with decision making and value formation. Where the concern is with teaching how to make value judgments, the learnings sought are pure process and have nothing to do with the nature of values being acquired.

In helping students acquire values, the pedagogue must rely upon teaching knowledge and skills that have a logical bearing upon these values. Where he is concerned with the teaching of valuing processes, he must teach such conventional skills as verifying information, relating information to criteria, and methods of clarifying personal and social values by which the interpretation and internalization of information can be accomplished. These processes can be taught within a wide range of subject matter.

The distinction between these two ways of viewing and dealing with values is extremely important from a curricular and instructional point of view. It seems preferable to some to deal with value formation as process learning rather than value learning, leaving free and clear the issue of whether or not values should be taught in the public schools and what these values should be. The value coding system used in these goal collections makes possible both ways of dealing with values.

The definitions and distinctions regarding concepts and values just presented are important to an understanding of the way these matters have been approached in defining, classifying, and coding goals in the Tri-county Project. For storage and retrieval purposes, concept words have been treated in the same way as end-product value words. They have both been listed and each of the 12,000 goals has been coded to indicate which, if any, are contributed to by the learning in question.

Index words. Other useful tools in interdisiplinary planning are the index words. Although they do not appear on the printed page, they are keyed to each goal for retrieval in much the way documents are retrieved from the familiar ERIC retrieval system. Users will have available lists of index words by discipline and across disciplines.

Logical sub-units of goals. Finally, in the printed edition of the course goals, sets of goals which are logically related have this indicated by being included inside a bracket at the left margin. This alerts the user to possible sets and sequences of goals which it may be desirable to use as a unit.

PARTICIPATION IN THE PROJECT

More than 40 local school districts in the tri-county area of metropolitan Portland are active in the Project. This has been achieved through the leadership of the intermediate education districts of the three counties.

The base of participation strengthens the Project in a number of ways. First, it provides greater financial and personnel support than the Portland District alone could provide. In organizing goal development committees it is possible to draw upon the considerable pool of teacher talent in the three county area.

School districts contribute services of teachers to goal development workshops, using local curriculum development funds. Other sources of support are the State Board of Education, the Small Grants Program of the Regional Office of the U.S. Office of Education, and curriculum and evaluation funds of the Multnomah, Clackamas, and Washington County Intermediate Education Districts and the Portland Public Schools.

The contributions of the State Department of Education and USOE are small in terms of the total budget of the Project, but the involvement is significant. Because the Project's goals are consistent with the State's interests in better educational management practices and instructional improvement, it may eventually be taken over by the State for continuous management. The involvement of the State has already proved important in the dissemination of products, and the Project has had an influence on state developments in PPBS and educational goals at the legislative and state board level.

USOE involvement, although not yielding immediate benefits, provides future potentials for dissemination and involvement in the northwest region.

The second major value of the tri-county coalition is the testing ground it provides for the theories and products of the Project. In less than two years there have already been substantial payoffs.

Reports from the tri-county area indicate that the collections have been used extensively in curriculum development the past year and summer. The power and versatility of these collections are just beginning to be tapped.

FUTURE DEVELOPMENTS

Two lines of future development are planned based on the initial work of the Project. The first of these is in curriculum improvement and the second in measurement and evaluation.

The Tri-county Course Goal Project is looking beyond its immediate job of producing goals to the curricular uses of these goals. It is for this reason that the goals have been classified and coded so that the relationships referred to earlier can be seen more clearly by teachers and curriculum developers.

CURRICULUM IMPROVEMENT

The goal development work being done, coupled with the completion of a multi-faceted and versatile retrieval system will make it possible to move rapidly ahead into forms of curriculum planning that have heretofore been virtually unmanageable, particularly interdisciplinary planning.

The Project at this point has provided a first cut at defining process, knowledge, and value goals which can be flexibly retrieved to serve the needs of this type of planning. The project staff now intends to (1) continue refinement and development of the conceptual elements of the coding and classification systems described above, (2) define and produce a more extensive set of process goals to strengthen the options for process teaching available to teachers, and (3) develop guides and inservice strategies that will lead to the fullest possible use of this new curriculum planning resource.

MEASUREMENT

This report will conclude with a final note on the measurement work in progress and planned for the future. The principal product sought is a criterion referenced set of test items related to each course goal. This set is to be so comprehensive that any teacher who selects a course goal and translates it into one or more instructional goals will be able to retrieve items, or at least examples of items, appropriate to assess the attainment of his instructional goals.

The Project is defining evaluation models appropriate for assessment of goals in each of the classes of knowledge and process. These models will be used to guide both psychometricians and teachers in the development of criterion referenced test items appropriate for measuring each type of knowledge and process. Teachers using the course goals during the period the items are being developed will be asked to supply copies of their periodic and final examinations to provide raw material for a comprehensive set of test items. Teacher aids for test item development based on the different goal types are being prepared to insure the quality of the item bank. As soon as theoretical formulations relating to values, generalizations, and concepts are refined and consistent, similar work will begin in developing evaluation models and items for those classes of learning. This work should take two to five years to complete, depending on resources.

Upon completion of the work described in this article, a complete, dynamic, open system will have been created for goal-based learning and evaluation. Such a system will be a useful resource to all those seeking to improve their understanding of what should be learned, how it should be learned, and how evaluated.

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