

DOCUMENT RESUME

ED 035 907

CG 004 880

AUTHOR DUNN, JAMES A.
TITLE PROJECT PLAN: GUIDANCE THROUGH THE INSTRUCTIONAL
PROCESS. THE ACCOMMODATION OF INDIVIDUAL DIFFERENCES
IN THE DEVELOPMENT OF PERSONAL PROGRAMS OF STUDY.
INSTITUTION AMERICAN INSTITUTES FOR RESEARCH, WASHINGTON, D.C.;
AMERICAN PERSONNEL AND GUIDANCE ASSOCIATION,
WASHINGTON, D.C.; AMERICAN PSYCHOLOGICAL
ASSOCIATION, WASHINGTON, D.C.
PUB DATE AUG 69
NOTE 18P.; PAPER PRESENTED AT AMERICAN PSYCHOLOGICAL
ASSOCIATION CONVENTION, WASHINGTON, D.C., AUGUST
31-SEPTEMBER 4, 1969; AND AT THE AMERICAN PERSONNEL
AND GUIDANCE ASSOCIATION CONVENTION, LAS VEGAS,
NEVADA, MARCH 30-APRIL 3, 1969
EDRS PRICE MF-\$0.25 HC-\$1.00
DESCRIPTORS COUNSELING, *DEVELOPMENTAL GUIDANCE, EDUCATIONAL
GUIDANCE, GUIDANCE OBJECTIVES, GUIDANCE SERVICES,
HIGH SCHOOL CURRICULUM, INDIVIDUALIZED CURRICULUM,
*INDIVIDUALIZED INSTRUCTION, *INDIVIDUAL NEEDS,
INSTRUCTION, INSTRUCTIONAL DESIGN, *INSTRUCTIONAL
INNOVATION, INSTRUCTIONAL PROGRAMS, OBJECTIVES,
PROGRAMED INSTRUCTION, PROGRAMING, *PROJECTS,
STUDENT DEVELOPMENT, VOCATIONAL DEVELOPMENT

ABSTRACT

PROJECT PLAN IS DESIGNED TO MAKE EDUCATIONAL PROGRAMS FIT THE NEEDS OF INDIVIDUAL LEARNERS, AND THE PROBLEM OF HOW SUCH A CURRICULUM CAN BE IMPLEMENTED IS DISCUSSED. IN ADDITION TO INDIVIDUALIZATION OF WHAT IS TO BE LEARNED AND AMOUNT OF EXPOSURE TO LEARNING MATTER, INDIVIDUALIZATION MUST ALSO BE BASED ON THE STUDENT'S LEARNING STYLE; FOR EXAMPLE, ON THE VARIOUS WAYS IN WHICH THE CONTENT TO BE LEARNED MAY BE STUDIED. THIS IMPOSES A MASSIVE MONITORING TASK WHICH MUST BE COMPUTERIZED. THE PARADIGM FOR THE DEVELOPMENT OF A PLAN PROGRAM OF STUDIES FOR SECONDARY SCHOOL IS SUMMARIZED. PLAN EDUCATION, HOWEVER, IS DESIGNED TO BE MORE THAN A PROGRAM OF ACADEMIC INSTRUCTION, AND GUIDANCE IS AN INTEGRAL PART OF THE PROJECT. THE GUIDANCE PROGRAM WILL BE DEVELOPED OVER THE NEXT FEW YEARS AND PROTOTYPE I WILL IMPLEMENT THE EDUCATIONAL AND VOCATIONAL COUNSELING EFFORT BY ATTEMPTING TO MAKE THE EDUCATIONAL SYSTEM VOCATIONALLY AND LEARNER RELEVANT. IT CALLS FOR EXPERIENCES WHICH WILL INCREASE THE CHILD'S KNOWLEDGE AND SKILL IN THE AREAS OF: (1) INDEPENDENT LEARNING, (2) RATIONAL DECISION MAKING, (3) THE ASSESSMENT AND IMPLICATION OF INDIVIDUAL DIFFERENCES FOR VOCATIONAL, AVOCATIONAL AND SOCIAL CHOICE, (4) VOCATIONAL INFORMATION, AND (5) LEISURE AND CITIZENSHIP OPPORTUNITIES. (RSM)

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE
PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS
STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION
POSITION OR POLICY.

PROJECT PLAN: GUIDANCE THROUGH

THE INSTRUCTIONAL PROCESS

James A. Dunn

Guidance & Individual Planning Division

Project PLAN

American Institutes for Research

Presented at the American Personnel and Guidance Association 1969
Convention, Las Vegas, Nevada--April 2, 1969.

ED035907

CG004880

The topic for this symposium today, and for several other symposia at this convention, is "Guidance Through the Instructional Process." In general guidance has been defined as the assistance and/or direction given to a person concerning his choice of courses, his preparation for a vocation or for further education, or his coping with personal problems (Webster's Third New International). In this symposium Dr. Jones and I would like to describe one effort at the development of a comprehensive guidance program which is currently being designed as an integral part of the regular instructional program. I am referring to the guidance program for Project PLAN.

DESCRIPTION OF PROJECT PLAN

Project PLAN is a new approach to education being developed conjointly by the American Institutes for Research, the Westinghouse Learning Corporation and a number of cooperating public school systems.

I shall not go to great length to describe all of the details of Project PLAN. Those interested in further information might consult either Flanagan's "Individualizing Education" (1968) or his "Functional Education for the Seventies" (1967).

In brief, PLAN stands for Program of Learning in Accordance with Needs. PLAN is an ungraded, computer-supported, individualized program of education. The intent of Project PLAN is to provide an educational system so rich in potential educational experiences for the child that specific tailor-made programs of study can be developed to meet the needs, wishes, interests,

and abilities of each and every child. To accomplish the task of completely individualizing children's programs of study the services of a large scale computer are required to relieve the teacher of the record keeping burden associated with individualized assignments, program coordination, student progress monitoring, test scoring and other clerical chores.

A PLAN education is designed to be more than just a program of academic instruction. We want to offer the individual a view of distant horizons as well. We want the student to be able to plan wisely for the future, appreciate what the realistic probabilities of actually achieving his goals are, and be able to pursue his goals with directness, skill and perserverance. And we want the student to eventually be able to arrive at a satisfying balance between work, leisure and citizenship involvements. The relevance of guidance to these goals should, I think, be obvious.

It is the basic precept of PLAN guidance that the guidance effort be an integral part of the educational program and not a set of techniques and services appended to, or superimposed on, the regular educational process.

THE FUNCTIONS OF GUIDANCE

Regarding the functions of guidance, Koos and Kefauver (1925) almost half a century ago described guidance as having an adjustive (i.e., problem oriented) function and a distributive (i.e., informational) function.

Some years later, McDaniel (1956) argued that guidance involved still a third function, namely an adaptive function whereby guidance assumed responsibility for assisting schools to continually adapt courses, procedures, activities, etc. to the needs of students.

A slightly different view of guidance functions has been used by the Interprofessional Research Commission on Pupil Personnel Services (Eckerson and Smith, 1966) and the persons working with them (Dunn, 1965, 1967; Liddle, 1967; Pierce-Jones, 1965; and Shaw, 1966, 1967). They have held that guidance emphases, and hence its functions to accommodate those emphases, can be classified as those which: (1) facilitate normal growth and development of the individual; (2) prevent abnormal or atypical problem development in children (i.e., problem prevention); and (3) assuming problems have developed, make differential diagnoses and develop programs to ameliorate those problems. Thus it would seem that guidance can be classified as to: type of counseling (personal, social, educational, and vocational); its developmental as contrasted to its problem orientation (and if the latter, it can be further classified as to a prevention orientation or its remediation orientation); and finally, its informational, consultative, and decision making focus. All of these would be necessary in a comprehensive guidance system.

THE INCOMPATIBILITY OF COMPREHENSIVE GUIDANCE PROGRAMS AND CURRENT EDUCATIONAL STRUCTURES

There is little doubt that much of the variance in the guidance enterprise today is due to individual differences in the interests, skills, and competencies of the practitioners working in the field. It is also possible that a good part of that variance may also have been due to the extreme difficulty of instituting a truly comprehensive program of guidance in a school system.

A comprehensive program of guidance is by definition extremely ambitious, and, given the resources of public education mobilized in their current

format, beyond the financial capability of all but the wealthiest school systems. As a consequence, priorities had to be assigned and, because of local community differences in those priority assignments, considerable variability has ensued.

In Project PLAN however, we are not encumbered with many of the structures of traditional education. We are not limited to the professional expertise of local staff members; to formal course structures; to the grade level concept; to a limited number of "curricula" such as college preparatory, vocational, business, and general; to the hand posted cumulative record file; to a minimal number of discrete and highly arbitrary choice points for the individual; and the like.

THE TWO COMPONENTS OF PLAN GUIDANCE

The guidance program in Project PLAN is divided into two components, the first deals with the normal development of the student. Services are provided for all children. The purpose is to develop the student's awareness of himself and his own personal capabilities, knowledge of the world around him, (especially insofar as citizenship, leisure, and the world of work are involved); and to develop in the child a sense of his own agency. Included in this first section of the guidance program is the acquisition of skills dealing with learning how to learn, realistic goal setting, evaluation of personal alternatives, and the management of one's own behavior. And it is this aspect of the guidance program to which I will address myself this morning.

The second section of the guidance program is concerned with problem detection and remediation. In this latter section attention is focused on differential diagnosis and problem amelioration via prescribed learning

experiences and special remedial treatment. Dr. Jones will discuss this aspect of PLAN Guidance.

THE PURPOSE, ASSUMPTIONS, AND
RESPONSIBILITIES OF PLAN GUIDANCE

It is the purpose of PLAN Guidance to help students develop a sense of agency, to formulate their goals, to determine what they need in order to achieve those goals, and finally, to take responsibility for, to plan, and to manage their own learning experiences in order to accomplish those goals.

The efforts of PLAN Guidance rest on the philosophical assumptions that

- (1) a child's program of learning should be constructed in accordance with his needs;
- (2) the child should be assisted in identifying his needs on the basis of his understanding of his developed abilities, and the relationship of those abilities to the goals he has been helped to formulate;
- (3) the child should become increasingly responsible for the development of his own individual plans and for the execution of those plans;
- (4) planning should be rational and based on adequate relevant information regarding both the individual and goals he has set for himself;
- (5) it is one of the primary purposes of education to assist the child in the development of skills in planning and self-management.

It is the responsibility of the Guidance and Individual Planning division to:

- (a) ORIENT the child to the over-all philosophy of PLAN, and its style of operation;
- (b) INFORM the child regarding:
 1. educational opportunities and requirements;
 2. the social implications of individual behavior;
 3. the world of work, leisure, and citizenship; and
 4. the nature of one's own interests, abilities, attitudes, and values;
- (c) INSURE that the student takes continually increasing responsibility for formulating his own goals, making his own plans for attaining those goals, and managing his own progress in the pursuit of those goals; and

(d) ASSIST the student in the development of skills in rational decision making, planning, and self-management;

(e) MONITOR the student's progress in order to be able to advise him of his progress toward his goals, so that he may reevaluate his plans and act accordingly.

It is axiomatic in Project PLAN that an individual's goals are a personal matter. The individual himself is seen as the one most appropriate for the final establishment of goals. And it is held to be the school's responsibility to merely assist the child in the processes of goal formulation and pursuit. It is, however, the responsibility of schools to assist the child in formulating his goals so that his choices are realistic, reasonable and compatible with the democratic principles on which this country is based.

A BRIEF DESCRIPTION OF THE DEVELOPMENTAL GUIDANCE PROGRAM

The PLAN Guidance Program, both the developmental and problem oriented components, will be developed in sequential fashion over the next few years. Prototype I is expected to be operational in limited fashion this fall. This first version has as its goal the implementation of an educational and vocational counseling effort. These efforts will be refined on the basis of empirical evidence, obtained in the 1969-70 school year. Concurrent with this refinement process materials dealing with personal and social development will be gradually phased in so that by the fall of 1970 a fairly comprehensive developmental guidance program embracing personal, social, educational, and vocational counseling, will be available.

One of the major efforts of PLAN Guidance over the past several months has been on vocational guidance. Vocational guidance as we know it today is due directly to the pioneer work of Frank Parsons (1909). In

addition to coining the term vocational guidance, and introducing vocational guidance into the public schools, Parsons was also the first to formulate a systematic theory of vocational counseling.

In essence, Parsons' theory held that a counselee had to have: (1) a clear understanding of the requirements and conditions for success in different lines work; (2) knowledge of one's own abilities, skills, interests, and values; and (3) to be able to engage in what he termed "true reasoning" about the relationships between these two sets of facts. This conceptualization still has considerable validity today.

There is implicit in the Parsonian model, however, the assumption of a critical vocational choice point; a moment of vocational truth when, after assessments are made, the data weighed, and alternatives considered, a single deliberate choice is made. Many argue that a critical choice theory of vocational decision, while it has conceptual elegance, actually applies to only a small fraction of cases in real life. The opponents of critical choice theory argue that vocational decision is in fact a developmental process; it was Ginzberg (1951) who brought this issue into central focus.

Ginzberg and associates argued that individuals arrive at vocational decisions "not at any single moment in time, but through a series of decisions over a period of many years." They held that "occupational choice is a process; that the process is largely irreversible; and that compromise is an essential aspect of every choice." They also felt that occupational decision making can be described in terms of a number of periods. They felt, and the work of O'Hara (1962) and others offers at least partial support of this, that a person's choices (or expectations) tend to be based first on fantasy, later on interests, somewhat later on capacity, and still later on values. Finally, during what they term the realistic period of job choice, choice is characterized as a working out of compromises between

interests, capacities, values, and the opportunities and limitations offered by the world of work and by the environment in general.

If the Ginzberg hypothesis regarding the developmental nature of vocational choice is correct, and there seem few who disagree, then vocational decision making clearly takes time. This is precisely what is least offered children and youth today. Vocational decision making is forced upon them in a very brief span of time, often with little warning, and they are forced to make decisions, usually in an extreme state of ignorance regarding the nature of the world of work.

In Project PLAN we are directing one portion of our effort toward: the development of vocational information units to be used at all grade levels, including the early primary grades; the development of ability, interest, value, and preference tests; the development of materials whereby the results of one's tests may be made available to him in a meaningful way; the development of job requirement profiles, based on TALENT data; and the development of vocationally relevant programs of study for students given specified areas of vocational interest and intent.

In addition to this effort, which may best be described as an attempt to make the PLAN educational system vocationally relevant, PLAN Guidance is also concerned with making the system learner relevant. This former emphasis stems from the applied psychometric tradition, the latter from the developmental-operant tradition. This second focus of our program is concerned with: the development of instructional materials dealing with such basic psychology considerations as; individual differences, human development, learning how to learn, principles of behavior management, decision making and goal formulation ; the identification of student learning styles; and the development of procedures to permit direct

matching or learner and materials to maximize learner gain, or to selectively mismatch in order to expand the learner's capability to cope with a variety of methods and materials, i.e., expand his style repertoire.

We are currently planning on a developmental guidance program of approximately 1200 hours to be distributed more or less equally over the child's 1-12 experience.

To summarize from the student's point of view, Prototype I of PLAN developmental guidance calls for guidance experiences which will increase the child's knowledge and skills in the areas of (1) independent learning and the self-management of one's own learning experiences; (2) rational decision making; (3) individual differences, their assessment, and their implications for vocational and avocational and social choice; (4) vocational information; and (5) leisure and citizenship opportunities.

As I have indicated two of the unique aspects of Project PLAN are that it is (a) intended to be an ungraded program and (b) the guidance effort is intended to be integral to the entire educational program 1-12. This means that all the guidance efforts just mentioned will be represented at all levels of the instructional program.

The teacher-counselor concept and decision making paradigm of Parsons, the developmental notions of vocational choice highlighted by Ginzberg, Super, and others, the differential functions of McDaniel and the distinction between problem oriented guidance for exceptional students and developmental guidance for all students, can, I hope, be seen from this brief description of PLAN Guidance.

BIBLIOGRAPHY

- Dunn, J. A. Professional characteristics and functions of selected mid-western pupil personnel workers. Midwest Research Center, IRCOPPS Monograph #1, The University of Michigan, with collaborators.
- Dunn, J. A. Research and service activities: Summary status report. Midwest Research Center for Pupil Personnel Services, University of Michigan, 1965.
- Eckerson, L. O. and Smith, H. M. (Coord.). Scope of pupil personnel services. Washington, D.C.: U. S. Government Printing Office, 1966.
- Flanagan, J. C. Functional education for the seventies. Phi Delta Kappan, 1967, September, 27-32.
- Flanagan, J. C. Individualizing education. American Psychological Association, Division 15 Meeting, 1968 (American Institutes for Research reprint).
- Ginzberg, E., Ginsberg, S. W., Axelrad, S., and Herma, J. L. Occupational choice: An approach to a general theory. New York: Columbia University Press, 1951.
- Koos, L. V. and Kefauver, G. N. Guidance in the secondary school. McGraw Hill Book Company, 1925.
- Liddle, G. P. Contemporary policies and practices in pupil personnel services programs. Guidance In American Education IV, edited by Landy, E. and Kroll, A. Harvard University Press, 1967.
- McDaniel, H. B. Guidance in the modern school. New York: The Dryden Press, 1957.
- O'Hara, R. P. The roots of careers. Elementary School Journal, 1962, 62, 277-280.
- Parsons, F. Choosing a vocation. Boston: Houghton Mifflin, 1909.
- Pierce-Jones, J., Iscoe, I., Friedman, S. T., and Hogge, J. Preliminary findings from child behavior consultation. IRCOPPS mimeo, 1965, March.
- Shaw, M. C. Role delineation among the guidance professions. Psychology In The Schools, 1967, January.
- Shaw, M. C. and Tuel, J. K. A focus for public school guidance programs: A model and proposal. Personnel and Guidance Journal, 1966, April.
- Super, D. E. The psychology of careers. New York: Harper, 1957.
- Super, D. E. A theory of vocational development. American Psychologist, 1953, 8, 185-190.

THE ACCOMMODATION OF INDIVIDUAL DIFFERENCES IN THE DEVELOPMENT OF PERSONAL PROGRAMS OF STUDY¹

James A. Dunn

American Institutes for Research

It has long been the goal of education to make educational programs more fully fit the needs of individual learners. It is in this area that the next major step forward in the improvement of education must take place. And it is toward this goal that Project PLAN is working. It is hoped that PLAN will be able to mobilize the resources of contemporary education toward the satisfaction of the specific needs of individual children. My task this afternoon is to describe one aspect of the PLAN enterprise; namely, the process by which individualized programs of study are generated for PLAN students.

There are two distinct, but interconnected, curriculum problems to be considered in dealing with the question of individualized programs of study. They are: 1) how the curriculum should be defined; and 2) how the curriculum should be implemented. Both are essential. And both have been treated, although often only implicitly, in most major theoretical treatments of curriculum in the past. The former is directly connected to the latter in that it defines what, and how much, content should comprise the curriculum and that, in turn, creates implications for implementation. While the present paper is concerned primarily with the latter, it would be well to put both issues in perspective.

HOW THE CURRICULUM SHOULD BE DEFINED

Our society has traditionally been, and is, a pragmatic one. Interest in education in our society has always been on its practical implication. Even though there has often been disagreement as to what was most practical, it is reasonably accurate to state that the curriculum effort of the late nineteenth and early twentieth centuries was based fundamentally on the acceptance of Herbert Spencer's 1859 argument that what a child most needed to learn was that which would be most useful to him as an adult. (Kearney and Cook, 1960).

On the one hand were those theorists who emphasized the importance of mastery of formal disciplines. They did so not so much because of the intrinsic value of the material per se, but rather because they considered sound disciplinary training the best preparation for the demands of adulthood. On the other hand were those who challenged the theory of formal discipline and who argued that one should base curriculum considerations on more explicit, empirically demonstrable, considerations.

The underlying differences between the disciplinists and empiricists came to the fore in 1895 with the recommendations of the Committee of Fifteen. The Committee of Fifteen had been concerned with establishing a set of guidelines which would be to elementary education what the recommendations of the Committee of Ten (1893) were for secondary education; i.e., the standardization of the format of elementary education. Instead of achieving their goal they succeeded only in polarizing the views of the educational community and in precipitating what Drost (1967) has described as the "Great Curriculum Debate." At the heart of the debate was the issue of how the curriculum should be defined, that is, whether content should be selected for its direct utilitarian

¹1969 APA Symposium Presentation, Washington, D.C.

value, or its contribution to the maintenance and/or enhancement of the integrity of a given subject field. The debate continues almost unabated today. On one side Bruner (1960) concerned with society's exponential explosion of information, has suggested reorganization of the educational curriculum even to the point of eliminating such fields as history. On the other the trend of the various curriculum projects such as Harvard Project Physics, the School Mathematics Study Group (SMSG), the Biological Sciences Curriculum Study (BSCS), and the like, has been to create more and more intensive, and elegant, disciplinary programs; with apparently little regard to how much of the field is necessary for practical living, or even what proportion of public school students will want or even be able to complete their various programs. (Bellack, 1969; McNeil, 1969.)

HOW SHOULD THE CURRICULUM BE IMPLEMENTED

The Committee of Ten had earlier (1893) wrestled with the problem of how best to implement a more individualized secondary school program. Their solution was very simple; and, with only slight modification in 1918, it set the mode of secondary education for almost half a century (Sizer, 1964). In essence, the recommendations called for the establishment, and standardization, of a set of core courses which would comprise the educational base of all students. Collateral with these basic requirements would be an array of "elective" courses which could then be selected by the student on the basis of his interest. This paradigm still has clear contemporary relevance and remains the standard educational pattern.

Elaborations on this paradigm have included tracking, homogeneous grouping, platoon systems, and tutorial programs. Counter variations were heterogeneous groupings, unified studies, self-contained classrooms and the like.

The Committee of Ten individualized programs by permitting differential content exposure. The unit of content exposure, however, was the "course". Later elaborations of the paradigm involved the identification of various sub-programs such as vocational, business, general, and college preparatory, while still preserving the student elective option. Responsibility for "tracking" students into these various programs was, for the most part, retained by the schools.

More recently, programmed instruction and various forms of modern instructional technology, have skirted the issue of what is to be studied. And since they generally require content mastery, these procedures individualize instruction by allowing variability in the amount of scheduling of exposure the content gets. It is in this way that individual differences in learning rate are allowed to operate.

If one is to be serious about individualization of education, in addition to individualization based on what is to be learned, and individualization based on amount of exposure to that which is to be learned, individualization must also be based on how one will learn, i.e. on learning style, on the various ways in which the content to be learned may be studied. A contemporary individualized educational program must begin to accept some responsibility vis-a-vis the differential selection of the material from which the student is to learn.

In particular, individualization of educational programs must consider among other things:

- 1) what the student needs to know
- 2) what the student would like to know
- 3) what the student already knows
- 4) the rate at which the selected content should be presented
- 5) the sequence in which that content should be presented

- 6) the size of the steps in the sequence of that content
- 7) the mode of presentation of that content
- 8) the amount, type, and schedule of feedback associated with the presentation of content
- 9) the difficulty level of the learning materials used to teach the content
- 10) the meaningfulness of the content to the individual learner
- 11) the nature of the physical and social context in which the teaching-learning takes place
- 12) the contemporary affect state, including the motivational state, of the learner at the time of learning
- 13) the amount of teacher supervision--media richness--technology involved
- 14) the amount of variation provided for in the learning program
- 15) the amount of overlearning, and/or, periodic review built into the program, and so forth.

To do this the necessity for moving toward an ungraded program, toward individualized rather than group testing, and toward criterion normed rather than group normed tests should be obvious. This of course imposes problems on administration. And the evaluation of the program cannot rest on such simple, and traditional, criteria as significant differences in the mean achievement scores of experimental and control groups because standardized testing is based on the assumption of fixed exposure to a common content.

In addition, if one insists that the curriculum should be relevant, one must know relevant for what. That is, one must know what goals the child has set for himself so that one may decide whether or not the content to be assigned is in fact relevant.

A system such as this, then, obviously imposes a massive monitoring task; a task that cannot be done without the aid of computer support services. These services are available in PLAN and with those services we are attempting to accomplish as much of the preceding as possible.

PLAN PROCEDURES FOR 1969

Tomorrow, approximately 9000 PLAN students in 61 different school buildings in 17 different school systems will be entering school. Waiting for them will be 9000 individualized Programs of Study. We do not offer these programs as ideal, but they are at least real, the largest such effort at purposeful individualization that we know of.

I would like to summarize briefly for you the paradigm for the development of a PLAN Program of Studies. I shall describe the paradigm in its most complex form--that used at the secondary school level. The procedure is scaled down for use at the lower grades where some of the more complex variables such as long range vocational goals, educational aspirations, and the like, lose relevance.

Instructional Resources. First, we have in PLAN over 1000 lessons (or modules) divided across our nine operating grades and four subject matter areas. At the secondary level we have approximately 85 modules per subject area. This would yield, on the average, approximately 170 weeks of instruction distributed across grades 9, 10, 11. The typical student in the typical secondary school, which operates an average of 38 weeks in the school year, would have, excluding final examination periods, special vacations and the like, an average of 110 weeks available for formal instruction. So, for the hypothetical student we can offer a Program of Studies derived from a lesson bank containing over half again as much work as he could reasonably be expected to accomplish. In addition each of these modules is offered, on the average, in two different forms (teaching-learning units).

It is not enough to simply have an extremely rich lesson bank, however. For individ-

ualized education, the lesson bank must be coded so that specific lessons can be retrieved for specific needs of specific students. Each of the more than 1000 modules and 1700 TLU's were coded along a variety of dimensions.

Each module was coded as to whether or not it was a part of a state or local requirement, essential for a given occupational area, highly desirable for that area, essential for minimal functioning as a citizen, highly desirable for all citizens to know, or would make the individual a particularly well-informed citizen (and perhaps thereby make his citizenship involvement a little more meaningful).

Each teaching-learning-unit was coded as to its reading difficulty, the degree to which it required teacher supervision, its media richness characteristic, the degree to which it required social involvement and/or group learning activities, the amount of reading involved, and the variety of activities inherent in the unit.

The Individual Data Base. In order to use this cross-referenced lesson bank for the development of individualized Programs of Study, it is also necessary to have information about the needs, interests, abilities and aspirations of the individual for whom the Program of Study is to be generated. To this end, data on the following variables were collected:

- 1) parent and student educational goal;
- 2) parent and student vocational aspiration;
- 3) student's vocational interests;
- 4) student's level of achievement;
- 5) student's level of developed abilities (on such dimensions as reading comprehension, arithmetic reasoning, and the like);
- 6) the student's recall of past studies;
- 7) and the student's learning style.

Learning style, for the time being, was defined as: a) need for teacher supervision; b) need for social involvement; c) need for media richness; d) need for variety of learning activities; and e) preference for reading.

Data on parent-student vocational and educational aspirations, were collected via parent-student questionnaires. This information was used to identify parent-student long range goals. Student interests, achievement levels, and developed abilities are obtained from the Expressed Interests Inventory, the PLAN Achievement and the Developed Abilities Performance Tests. Information regarding the student's optimum learning style was obtained from a series of student ratings made by his teacher.

From information about the student's developed abilities a second long range vocational goal was generated for the student, using TALENT based regression equations. This "data suggested" LRG was used to supplement the parent-student planning so as to have as many reality based options open for the student as possible. The student's two long range goal (LRG) categories plus his expressed interests carry a major role in determining what content will be recommended for him. His level of tested achievement, plus his record of past studies in Project PLAN determine his placement and quota.

Module Assignment. The computer process in generating what lessons are to be recommended for a student is as follows: given information about a student's long range goals, his expressed interests, citizenship requirements, and state and local school requirements, the computer generates a three year list of recommended modules arranged in the following order: 1) state requirements; 2) local requirements; 3) essential citizenship requirements; 4) parent-student long range goal requirements; 5) parent-student long range goal highly desirable modules; 6) computer recommended LRG requirements; and 7) computer recommended LRG highly desired experiences. This

list is then followed by modules selected alternately on the basis of first, probable interest and then second, citizenship. This alternating selection process is continued until the student's quota is filled. His quota is based on the measured level of the student's developed abilities plus data on the number of modules he completed in PLAN the proceeding year.

This process gives a three year list which is then broken into annual increments. Each increment is composed of one-third of the requirements identified above plus one-third of the highly desirable modules identified above plus one-third of the iterative process modules described above. Now placement becomes an issue. On the basis of the individual's tested achievement plus his record of past studies in PLAN, the child is given credit for that material he already knows. If there is material for which he cannot demonstrate mastery and which is considered prerequisite to modules to which he is assigned, the prerequisite material is also assigned.

TLU Selection. At this point, specific TLU assignment takes place. Up to now the consideration has only been of identification of the content to be studied, i.e., which lessons, how many lessons, and in what sequence the lessons should be taken. Now we are faced with the question of learning style, i.e., what particular TLU's the student should take to study the assigned lessons so as to maximize the likelihood of his mastering the content as quickly as possible. It is at this point that the computer, from a complex set of decision rules, matches the student with specific TLU's.

The results of these computer-generated decisions are then printed as a formal Program of Study for the student. It is printed in two copies, one for school record keeping, and the other for teacher-student classroom use. Figure 1 shows a sample of the POS format. (See page 6.)

The POS module assignment and TLU matching rules are not best fit rules however, since one wants a student's program to stretch the student a little, to broaden his interests and strain his intellectual ability a little, and lead him a little further down the educational road than he might ordinarily go. Best fit is called for in only an arbitrary percentage of the time, e.g. ninety percent. One of the big unanswered questions is what this value should be. Clearly from need-achievement/fear of failure research, and other motivation research this should be a variable. And in time, given experience with POS operation, I am sure this will be individualized as well as any of the other factors.

Conclusion. In conclusion let me say that a student's recommended POS is not an inviolate entity. The teacher can add or delete modules to the POS with considerable ease; and if she chooses, even totally revise the recommended Program of Studies. A formal change in the POS can be made by simply indicating the number of the module she would like to delete or add. Barring this, the teacher can even affect a change in the POS by simply having the student study a module or TLU not on his POS. Then, when the student's Status Card is filed with the computer terminal, the computer notes that the module or TLU is different from any on the student's recommended POS and asks the teacher to verify that a coding mistake on the Status Card has not been made, i.e., that the new selection is in fact a deliberate selection. Upon confirmation, the computer adds the new selection to the student's Program of Studies file automatically and from that point forward it is carried in his record.

As one might expect, with programs of the complexity we are describing, and given the current state of sophistication with regard to the requisite data necessary for sophisticated individualization, a large number of arbitrary, interim, decisions have had to be made. As was indicated, the 1969 PLAN POS procedure is not offered as an

ideal model. It is not the best of all possible models; it is, rather, our first operating prototype. As we acquire additional sophistication in the identification of specific student needs, the identification of those aspects of currently available instructional materials that are relevant to the needs of youth, and ways to further accommodate individual differences in learning style, our POS procedures will be modified accordingly.

Let me say, however, that a computerized procedure such as this, offers research capability of uncommon proportions. Some of the specific questions we are asking of this year's POS data are: 1) how similar are student-parent long range goals to computer recommended LRG's; 2) what proportion of a typical school curriculum is in fact relevant to the long range vocational goals of youth; 3) to what long range educational and vocational goals do youth currently aspire, and the like. Next year we should be in a position to report on the effectiveness and operating characteristics of this model and on the revisions to be made for our 1970 procedure.

Figure 1 -- POS FORMAT

COMPLETION CODE	MODULE NUMBER	MODULE NAME	DATE FINISHED
<p>Take <u>all</u> of the following modules.</p>			
	40-775	Introduction to Historical Inquiry	
	40-759	Introduction to Economics	
	40-772	The Research Paper	
<p>Choose <u>five</u> of the following modules. The modules are grouped into clusters. It is suggested that once a student chooses a module from a particular cluster, he choose the remaining modules in that cluster.</p>			
	40-754	Economic Problems I	
	40-755	Economic Problems II	
	40-756	Conflict-Wars	
	40-763	Conflict-Minorities	
	40-757	Compromise and Adjustment-Foreign Affairs	
	40-769	Compromise and Adjustment-Legislative-Executive I	
	40-778	Compromise and Adjustment-Legislative-Executive II	
	40-758	Social Change-Women	
	40-761	Social Change-Role of Blacks	
	40-777	Social Change-The Progressive Movement	
<p>Choose <u>twelve</u> of the following modules. These modules may be sequenced in a number of ways. You may want to consult the Teacher Supplement for suggestions to aid in sequencing.</p>			
	43-643	European Monarchism	
	43-644	Development of Democracy in England	

REFERENCES

- Bellack, A. A. History of curriculum thought and practice. *Review of Educational Research*. 1969, 39 (3), 283-291.
- Bruner, J. S. *The process of education*. Cambridge, Mass.: Harvard Univ. Press, 1960.
- Drost, W. H. The immortal day in Cleveland -- the report of the Committee of Fifteen. *Educational Theory*. 1967, 17, 178-91.
- Kearney, N. C., & Cook, W. W. Curriculum. *Encyclopedia of Educational Research*. (3rd ed.) New York: Macmillan, 1960.
- McNeil, J. D. Forces influencing curriculum. *Review of Educational Research*. 1969, 39 (3), 293-318.
- Sizer, T. R. *Secondary schools at the turn of the century*. New Haven: Yale Univ. Press, 1964.