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ABSTRACT

On completion of this unit, one should be capable of performing each of the following unit objectives: describe individual differences among students; define individualized instruction, list modes of individualization, and present a general instructional model of individualization; justify student self-direction as a learning goal and as a requirement for individualized instruction; describe three modes of student self-direction and show how each contributes to individualizing instruction; review your own experiences with self-directed learning within and outside of school; define mastery-referenced instruction and state the advantages of employing a mastery criterion for students and teaching staff; state the requirements for employing a mastery criterion in individualized instruction; describe and evaluate varieties of homogeneous grouping as approaches to individualizing instruction; describe and evaluate nongrading, cooperative teaching, and the open classroom as approaches to individualization; compare individually prescribed instruction, Program for Learning in Accordance with Needs, and the open classroom in terms of their provisions for student self-direction and mastery; identify or describe an individualized program you would recommend to a school district and justify your choice; and state your view on the values for the student's intellectual and personal development of individualization, self-direction, and mastery learning. (Author/IRT)

TRAINING FOR LEADERSHIP IN LOCAL EDUCATIONAL IMPROVEMENT PROGRAMS

UNIT 4. INDIVIDUALIZATION, MASTERY, AND STUDENT SELF-DIRECTION AS THEMES OF EDUCATIONAL REFORM, WITH RELATED INNOVATIONS

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PREFACE

This is one of 10 units in a program of Training for Leadership in Local Educational Improvement Programs. Development of the program was begun at the Learning Research and Development Center at the University of Pittsburgh and has been carried forward at Research for Better Schools in Philadelphia.

If you have in hand the Instructor's Guide to the program, or Unit 1 entitled Training Program Introduction and General Study Plan Guide, you will have sufficient introduction to the nature and purposes of the training program. If you do not have access to one or both of these items, the following paragraphs will introduce you to this unit of the program.

This unit is designed for use by anyone holding a position calling for leadership in planning and conducting local educational change programs. This means school district leaders - central office administrators, building principals, curriculum specialists, or teachers involved in change project teams. Also it means graduate students in curriculum, administration, or supervision. In addition, curriculum specialists or field personnel of state education departments or other educational agencies may find the unit of value in their work with school districts - as in the conduct of workshops involving local school personnel.

The unit can be studied on a wholly self-instructional basis, or with an instructor's direction. It requires about 6 to 10 hours of study-time. You will recognize the themes of the unit - individualization, mastery, and student self-direction - as major purposes underlying a great many innovations in instruction developed and introduced into school programs during recent years.

CONTENTS

Page		
1	Introduction	
3	Unit Study Plan	
11	Objective 1:	Describe Individual Differences Among Students of the Same Age in Achievement, Learning Rate, Learning "Style", and Interests
20	Objective 2:	Define Individualized Instruction, List Modes of Individualization, and Present a General Instructional Model for Individualization
37	Objective 3:	Justify Student Self-direction as a Learning Goal and as a Requirement for Individualized Instruction
42	Objective 4:	Describe Three Modes of Student Self-direction and Show How Each Contributes to Individualizing Instruction
54	Objective 5:	Review Your Own Experiences With Self-directed Learning, Within and Outside of School
57	Objective 6:	Define Mastery-referenced Instruction and State the Advantages of Employing a Mastery Criterion for Students and Teaching Staff
62	Objective 7:	State the Requirements for Employing a Mastery Criterion in Individualized Instruction
69	Objective 8:	Describe and Evaluate Varieties of Homogeneous Grouping as Approaches to Individualizing Instruction
77	Objective 9:	Describe and Evaluate Nongrading, Cooperative Teaching, and the Open Classroom as Approaches to Individualization
104	Objective 10:	Describe and Evaluate IPI and PLAN as Approaches to Individualizing Instruction
120	Objective 11:	Compare IPI, PLAN, IGE, and the Open Classroom in Terms of Their Provisions for Student Self-direction and Mastery
131	Objective 12:	Identify or Describe an Individualized Program You Would Recommend to a School District and Justify Your Choice
133	Objective 13:	State Your View on the Values for the Student's Intellectual and Personal Development of Individualization, Self-Direction, and Mastery
137	Post-Assessment Exercise	
141	Pre- and Post-Assessment Exercise Answer Key	
144	Unit Evaluation Form	

UNIT 4. INDIVIDUALIZATION, MASTERY, AND STUDENT SELF-DIRECTION AS THEMES OF EDUCATIONAL REFORM, WITH RELATED INNOVATIONS

Introduction

Three related educational themes that are central purposes of many innovative products, procedures, and programs are individualization, mastery, and student self-direction (or self-managed learning). Particularly since 1965, various approaches to individualization -- matching instruction to the individual learner -- have been invented and introduced in many schools throughout the country. Most of these approaches place reliance on the student to perform learning tasks with a high degree of independence or self-direction. Also numerous individualized programs have set out to enable every student to master the learning tasks he undertakes rather than accepting that many students will fail their studies.

Because these three themes are prominent in current innovations in learning materials, instructional procedures, and instructional systems, it is essential that leaders of local educational change understand their nature and importance, and are capable of assessing traditional and innovative instructional products, procedures and programs in terms of them.

Since the three themes are strongly inter-dependent, as will be shown, they are treated together in this unit.

Upon completing study of this unit, you should be capable of performing what is called for in each of the following unit objectives. (Of course, it is likely that you already are prepared to exhibit mastery of some of these objectives.)

Objective 1. Describe individual differences among students of the same age in achievement, learning rate, learning "style" and interests.

Objective 2. Define individualized instruction, list modes of individualization, and present a general instructional model for individualization.

Objective 3. Justify student self-direction as a learning goal and as a requirement for individualized instruction.

Objective 4. Describe three modes of student self-direction and show how each contributes to individualizing instruction.

Objective 5. Review your own experiences with self-directed learning within and outside of school.

Objective 6. Define mastery-referenced instruction and state the advantages of employing a mastery criterion for students and teaching staff.

Objective 7. State the requirements for employing a mastery criterion in individualized instruction.

Objective 8. Describe and evaluate varieties of homogeneous grouping as approaches to individualizing instruction.

Objective 9. Describe and evaluate nongrading, cooperative teaching, and the open classroom as approaches to individualjzation.

Objective 10. Describe and evaluate IPI and PLAN as approaches to individualizing instruction.

Objective 11. Compare IPI, PLAN, IGE, and the Open Classroom in terms of their provisions for student self-direction and mastery.

Objective 12. Identify or describe an individualized program you would recommend to a school district and justify your choice.

Objective 13. State your view on the values for the student's intellectual and personal development of individualization, self-direction, and mastery.

Unit Study Plan

Before beginning study of this unit, you should determine how intensively you want or need to study each objective. After a careful diagnosis of your needs and present attainments, if you judge that study of some of the unit objectives is unnecessary, you are free to omit them from your study plan.

Below is a guide for arriving at your study plan, either with help from your instructor (if you have one) or on your own. The guide calls for a four-step procedure: assess your needs to study the unit objective, decide how to study them, assess your mastery of the unit objectives after study of the unit, and evaluate the unit.

1. Personal assessment of needs to study the unit. First, turn the pages of the unit quickly to acquaint yourself with the objectives and their contents. Twenty minutes should be sufficient for skimming the unit for this purpose.

Next, perform the Pre-Assessment Exercise that follows to obtain a basis for estimating your present level of mastery of the unit objectives. The exercise contains questions giving you the opportunity to review your knowledge as related to most of the objectives. For Objectives 9-11 that deal with major approaches to individualization, you are asked merely to indicate how familiar you are with each approach rather than to write details about them. In doing the Pre-Assessment Exercise, use it simply as a way of determining what parts of the unit you need to study. It is not expected that you will pass the Pre-Assessment, though you may find that you can answer some of the questions adequately before studying the unit.

When you have completed the Pre-Assessment Exercise, check your answers with the Pre-Assessment Answer Key at the end of the unit. Keep in mind that this exercise is for your use in determining which parts of this unit will require the greatest amounts of your time and concentration.

PRE-ASSESSMENT EXERCISE - UNIT 4

Directions: This pre-assessment serves two purposes - it gives you the opportunity to demonstrate mastery of some unit objectives before studying the unit, and it orients you to the unit as preparation for studying it.

Feel no obligation to answer a question. It is not expected that you will necessarily be able to answer any of the questions. However, if you can give a fully adequate answer to a question on this pre-assessment, you have no need to study that part of the unit to which the question refers.

Probably you will need no more than one-half hour to complete this exercise. When you complete it, turn to the Pre-Assessment Answer Key at the end of the unit to check your answers, then turn to the page following this Pre-Assessment Exercise to continue with your unit study plan.

Objective 1. Describe individual differences among students of the same age in achievement, learning rate, learning "style," and interests.

Achievement differences

Differences in learning rate

Differences in learning style

Differences in interests

Objective 2a. Give a one-sentence definition of individualization.

Objective 2b. What are several ways ("modes") in which instruction can be conducted to take account of individual differences?

Objective 2c. What steps should a teacher follow in planning and conducting instruction offered an individual student?

Objective 3. Justify student self-direction as a learning goal and as a requirement for individualization.

Objective 4. Describe three ways of having student self-direction in an instructional program.

Objective 5. This objective deals with your personal experiences. It is not appropriate for this Pre-Assessment.

Objective 6a. Define mastery-referenced instruction.

Objective 6b. State the advantages for students of instruction based on having all students master their learning tasks.

Objective 6c. State the advantages for teachers of instruction where all students master their learning tasks.

Objective 7. State the requirements an instructional program must meet if all students are to achieve mastery of their learning tasks.

Objective 8. Evaluate homogeneous or "ability" grouping as a way of meeting individual differences among students.

Objective 9. Indicate by checking below how well acquainted you are with each of these approaches to individualization. H = highly familiar; M = moderately familiar; L = low familiarity; O = unfamiliar.

	H	M	L	O
Nongrading (non-grade-level-advancement)	___	___	___	___
Cooperative teaching in Individually Guided Education (IGE)	___	___	___	___
Open classroom plans for organizing instruction	___	___	___	___

Objective 10. Indicate by checking how familiar you are with these two programs for individualizing instruction. Use the same code.

	H	M	L	O
Individually Prescribed Instruction (IPI)	___	___	___	___
Program for Learning in Accordance with Needs (PLAN)	___	___	___	___

Objective 11. This objective, calling for a specific comparison of four approaches to individualization, is not appropriate for this Pre-Assessment.

Objective 12. This objective calls for a statement of your conception of individualization and is not appropriate for this Pre-Assessment.

Objective 13. This objective also asks for your personal judgments and is not appropriate for Pre-Assessment.

Having completed the Pre-Assessment Exercise, you (with your instructor, if you have one) should check your answers with those given in the Pre-Assessment Answer Key at the end of the unit. Compare the quality and detail of your answers with those offered in the Answer Key. There is no one right answer to any of the questions but rather key points that are required for an adequate answer, with those points stated in your own words. The Answer Key probably contains fuller answers to most of the questions in the exercise than you can give before studying the unit.

In the following table, you are asked to check the estimates you (and your instructor) make of your level of mastery of each objective or part-objective. Check HIGH if you judge your answer to be right on target and in adequate detail. Check MODERATE if you believe your answer to be good but lacking some points needed for a fully adequate answer. Check LOW if you find your answer to be inappropriate or incomplete, or if you did not answer the question.

After checking your level of mastery of each objective, check at the right whether the objective, or part-objective, requires merely review, or careful study. It is not a sound procedure for you to study the Answer Key as a way of learning answers to items on the Pre-Assessment Exercise. Instead, you should study the unit materials since they are meant to prepare you to give an adequate answer based on an understanding derived from reading and practice exercises.

Note, for the objectives not included in the Pre-Assessment Exercise (5, 11-13), that there are no spaces for checking level of mastery. Also note that these objectives have been checked for you in the NEED TO STUDY column.

OBJECTIVE	TOPIC	PRESENT MASTERY H	M	L	REVIEW ONLY	NEED TO STUDY
1.	Individual differences among students					
2a.	Definition of individualization					
2b.	Modes of individualization					
2c.	Teacher's steps in individualization					
3.	Justifying self-direction as a goal					
4.	3 ways to get student self-direction					
5.	Not included in Pre-Assessment Exercise					✓
6a.	Define mastery-referenced instruction					
6b.	Advantages of mastery for the student					
6c.	Advantages of mastery for the teacher					
7.	Requirements for mastery instruction					
8.	Ability grouping and individualization					
9a.	Familiarity with nongrading					
9b.	Familiarity with cooperative teaching					
9c.	Familiarity with open classroom plans					
10a.	Familiarity with IPI program					
10b.	Familiarity with PLAN program					
11.	Not included in Pre-Assessment Exercise					✓
12.	Not included in Pre-Assessment Exercise					✓
13.	Not included in Pre-Assessment Exercise					✓

2. Study procedure. In studying the unit, you will gain by doing the objectives in the order in which they appear since each part of the unit assumes a level of understanding based on the previous parts. It is a good idea to at least skim each part of the unit even though you judge that you already have mastery of some parts of it.

You may wish to study all or part of the unit with one or more fellow students. Also, your instructor may elect to conduct group sessions either to introduce or review parts of the unit. And, of course, you could study the unit entirely independently.

You will note that, under each objective, explanatory material is given that is usually supported by illustrations and most often is involved in exercises you perform. The exercises are either followed immediately by explanatory materials to help you check and round out your answers, or they are provided with an Answer Key.

You probably will take one or two days to study this unit, depending on how intensively you need or want to study any or all of its objectives. It is best to go through the unit in its entirety first, then make plans for later and more intensive study of any areas of particular interest to you.

When you complete study of the unit, you will find directions for the Post-Assessment Exercise. Also included with the unit is an evaluation form. It will be helpful if you complete and return this form to the address given as an aid in making any revisions of the unit.

Objective 1. Describe individual differences among students of the same age in achievement, learning rate, learning "style", and interests.

The term individualizing instruction, whenever it appears, has to do with ways of adapting instruction to differences among learners. Usually the term is used in connection with differences among students of the same age or grade level. It is such differences, rather than those found in comparing age groups, that are the focus of Objective 1.

What sorts of differences will be found among students of the same or grade placement, and how large are they apt to be? To understand the needs for differentiated instruction given age or grade mates, you need to have a good understanding of the types and magnitudes of such learning-related differences.

Exercise 1

It is likely that you already have at least a general grasp of individual differences among children of an age group. Exercise 1 asks you to review your knowledge of this topic in terms of four types. Following the exercise, you will find a discussion of the topic that will help you check, and round out, your basic knowledge of these sorts of differences.

Turn now to the Exercise 1 - Worksheet, do the exercise, then check your answers with the discussion following.

EXERCISE 1 - WORKSHEET

Learning-Related Differences Among Students of the Same Age or Grade Level

Directions: Under each heading below, write a summary of your knowledge or opinions on differences to be found among age or grade mates. Where appropriate, comment on both the nature and magnitude of differences to be found.

ACHIEVEMENT IN SCHOOL SUBJECTS

LEARNING RATE

EXERCISE 1 - WORKSHEET (Cont'd.)

LEARNING "STYLE"

INTERESTS IN SCHOOL SUBJECTS

Review of Learner Differences

Differences in achievement in school subjects

There is ample evidence that children of the same grade or age differ greatly from one another in achievement levels reached in any school subject. In almost every school, one can find standardized test data that reveal such differences. A representative finding is that children in the same grade in an elementary school differ as much as four or five grade levels in achievement scores in such subjects as reading and mathematics. For example, one third-grade class representing lower-class and middle-class families, tested in March, showed a range of grade-level test scores as follows: Word meaning - 1.7 - 6.0; paragraph meaning - 1.7 - 6.0; arithmetic computation - 2.7 - 4.2; and arithmetic reasoning - 2.1 - 4.8. The class ranged in chronological age from 8 years and 2 months to 9 years and 11 months. The oldest child in the class had the lowest average achievement scores.

Another important fact is that the same child shows different levels of achievement in different subjects. Thus, in the third-grade class referred to above, one child had an achievement level of 1.7 in word meaning, 4.1 in arithmetic computation. Another child in the same class had an achievement level of 6.0 in word meaning, 3.9 in arithmetic computation. Such differences within a child's performance profile should be taken into account in individualized instruction as well as taking account of child-to-child differences.

As children proceed from elementary through secondary school, the range of differences between most and least advanced students of a grade level increases. In one junior high school, seventh-graders given the Stanford Achievement Tests had grade equivalent scores ranging from grade 1 to grade 11 in word meaning, grade 2 to grade 11 in paragraph meaning, and grade 2 to 10 in arithmetic reasoning.

In senior high school there may be found some students reading at a college level while others are reading at a level as low as third-grade. One study found that 10 percent of college seniors when tested on a comprehensive general-culture exam scored below 75 percent of college sophomores. The top 10 percent of high school seniors scored better than 50 percent of college seniors.

Differences in learning rate

Differences in achievement among students of the same age or grade level reflect differences in learning rate, assuming that the students being compared have had about the same exposure to learning tasks. Another way of considering learning rate is to observe that, for any learning tasks they undertake, different students will require very different lengths of time to accomplish the task. Thus Bloom has noted in analyzing achievement test scores in the primary grades that a level of achievement reached by the top 20 percent of students in a given year will probably be attained by an additional 60 percent of students two years later. The time required to learn is apt to be at least five times as great for the slowest as compared with the most rapid learners in a class made up of a random selection of age mates drawn from the general population. (Bloom, Benjamin S. "Time and Learning." American Psychologist 1974, 29, 682 - 688.)

Differences in learning rate are no longer accounted for simply by attributing them to differences in native aptitudes or "intelligence." Instead, such differences are seen as resulting in large part, if not mainly, from differences in experience that produce differences in background knowledge, learning skills, and interests or motivation to learn. Bloom has shown that, when students are taught to master learning tasks and in the process develop improved study skills and motivation to learn, differences in learning rate

become sharply reduced.

Differences in learning "style"

Educators long have recognized that learners differ greatly in their most effective or preferred ways of learning. Many teachers have taken such differences into account by varying learning materials, instructional settings, and teaching methods to match what they considered to be the characteristics of different learners. Different provisions for learning have been offered "concrete" and abstract learners, as well as independent and social learners.

Recently the concept of learning "style" has received much more attention than previously. A good deal of reasarch has been done on the subject, especially with children in the preschool and elementary-school years. "Reflective" and "impulsive" students have been differentiated. It has been claimed that some students learn better through their ears, others through their eyes. Some like to learn by memorizing, while others like to think and experiment. Numerous other dimensions of learning "style" have been claimed including differences related to socio-economic and ethnic backgrounds.

A limitation is that research on learner characteristics such as those listed is quite new and the results of such research are not well established. Further, in most cases, there are no dependable and convenient ways of measuring a student's learner characteristics. Also, equally serious, the relationships between learning-style characteristics and effective instruction have not been adequately worked out.

Because the domain of learning style is just now being charted, educators need to continue doing the best they can to recognize and take account of individual differences in this domain. Any improvements in arrangements for individualizing instruction should make it easier to take account of such learner characteristics in planning and conducting instruction.

One approach to suiting learning style to instructional method is outlined in a recent article by Rita and Kenneth Dunn, entitled "Learning Style as a Criterion for Placement in Alternative Programs." (Phi Delta Kappan, December, 1974, pp. 275-278. See also, by the same authors, Practical Approaches to Individualizing Instruction: Contracts and Other Effective Teaching Strategies. Englewood Cliffs, N.J.: Parker Publishing Co., 1972.)

The Dunns point out that in order to match students' learning styles with a particular instructional program, one must first identify and understand the learning style, identify the learning style requirements of selected programs, and compare the student's learning profile with the demands of the program. Emotional, social and physical characteristics, and responses to environmental conditions, are involved in learning style. Examples of these include motivation, attention span, and needs to interact with others; needs for interaction with an "authority figure"; differences in sensory reception to learning materials, and most effective time of day for learning; and illumination, room temperature, and furniture design.

To adapt instructional programs to these variables in learning style, the Dunns suggest four types of program-style relationships. These are:

1. Open classroom - (Students select their own curriculum and pacing; they may study alone, or with one or more students in small groups; the environment is rich in multimedia resources and encourages student involvement with materials; evaluations are made, not in terms of grades, but by the child's demonstrated growth.) - Adaptable to students who are motivated, responsible, peer-oriented, and able to function without an imposed structure.

2. Alternative programs (such as open campus, use of community resources, mini-course electives, etc.) - These are seen as more appropriate for secondary school students who are motivated, responsible, self-oriented, and do not

require imposed structure.

3. Traditional classroom (where the teacher is responsible to help students achieve minimal grade-level standards, and students are expected to achieve through teacher-selected methods) - For students who do not require mobility, can concentrate for structured time periods, and are not disturbed by having to ask the teacher to fulfill their needs.

4. Individualized classroom (in which the teacher recognizes differences in learning style and allows students to work independently as much as possible, at the same time programming for individual differences) - Suited to groups of students with varied levels of responsibility, perceptual strengths, motivational levels, and degrees of self- or authority-orientation.

The above summary of the Dunns' article presents one way of suiting learning styles to instructional methods. However, it appears to be a more demanding approach than most school districts would be able to accommodate, since it implies that a given district can supply four types of instructional approaches and match these appropriately with each student throughout the system. A simpler approach to matching instruction with learning style would be an individualized system providing diverse learning settings and instructional materials, and offering different degrees and types of structure.

Another criticism that can be directed against the Dunns' proposal is that it focuses entirely on accommodating instruction to whatever learning styles students currently reveal. However, it may be important to modify a student's learning style, as in the case of one who prefers to learn in a highly structured, authoritarian setting that does not call on him to show initiative, planning ability, or any degree of self-direction. Teaching the student to learn effectively in an individualized, open classroom or an independent study program may be what he most needs.

Differences in motivation to learn (interests)

Motivation to learn, or interest, is at least as important as any other factor in determining learning outcomes. Differences in school-related motivation to learn are very large, ranging from general boredom or apathy toward school learning to enthusiasm for all school subjects. Some students are eager to learn with some teachers but not with others. Some like co-curricular and extra-curricular activities but not regular school subjects. Some are motivated to study selected subjects but not others. Most students have special interests related to certain topics. At the secondary level, career or college interests guide and motivate school learning--except for the tune-out or drop-out whose motivation is directed toward escaping school and toward other interests.

Implications of learner differences for instruction

Each of the four types of student differences described above has important implications for organizing and conducting instruction. Differences in achievement level and learning style clearly call for assigning students within a grade different learning tasks and providing for their taking different lengths of time to complete these tasks. Differences in learning style, interests, and motivation to learn call for creating a match between each student's characteristics and instructional arrangements.

The succeeding sections of this unit will examine problems of adapting instruction to take account of these sorts of student differences with the various solutions that have been worked out.

Objective 2. Define individualized instruction, list modes of individualization, and present a general instructional model for individualization.

Defining individualized instruction

Several volumes have been written bearing the title "Individualized Instruction," yet none offers a general definition of the term. One of these volumes, the 1964 Yearbook of the Association for Supervision and Curriculum Development, makes an approach to a definition by claiming "the chief object of individualization to be release of potential in the individual learner..." (p. 13). But note that this merely offers a purpose for individualization without saying what it is.

A first step toward arriving at a definition is to note that instruction refers to any purposeful, planned efforts to teach people. Individualized instruction refers to purposeful, planned efforts to teach individuals. One way of arriving at a satisfactory definition of individualization requires considering various approaches to adapting instruction to individual differences, then making a statement that covers their commonality.

Exercise 2

On the Exercise 2 - Worksheet that follows, try your hand at writing down a brief definition of individualization that, in your judgment, says what it is--not what it is for. Make your definition general enough to cover any sort of provision that can be made in an instructional program with the purpose of taking individual differences into account.

When you complete your try at a definition, check it against the list in the middle of the Worksheet giving types of approaches to adapting instruction to individual differences. If you decide that your definition is not general enough to include all of these approaches, try rewriting it at the bottom of the Worksheet.

After completing the Worksheet, turn to the discussion on defining individualized instruction that follows the Worksheet.

EXERCISE 2 - WORKSHEET

Directions: Below, in the space provided, write your first try at a definition of individualized instruction before examining the list of approaches to individualization given at the middle of this sheet. After writing your try at a definition, test it against the list to see whether it covers all items on the list. If not, try revising it at the bottom of this worksheet.

YOUR DEFINITION OF INDIVIDUALIZATION:

Individualized instruction is (refers to) _____

_____

_____

_____

Check your definition against this list of approaches to individualization. Does it cover all of them? If not, your definition is not general enough.

Approaches to individualization (there are many more):

Tutoring	Special education
Remedial programs	Honors program
Independent study	Enrichment
Ability grouping	Individual or group projects
Nongrading or continuous progress	Correspondence schools
Computer-aided instruction	Open classroom

Do you judge your definition to be general enough to cover all of these? If not, try revising it in the space below.

YOUR REVISED DEFINITION OF INDIVIDUALIZATION;

Individualized instruction is (refers to) _____

_____

_____

_____

Now that you have given your definition of individualization, compare it with the one used in this unit. Here is our definition and our discussion of it.

Individualized education refers to any procedures used to ensure that the individual student learns in ways that are specifically appropriate for him. A general definition is this: Individualized education occurs when the student pursues general programs of study and day-to-day lessons that match his learning needs and his characteristics as a learner. Note that this definition focuses on the individual, not the group, in the decisions made about what is to be learned.

The general definition of individualized education just given is not limited to situations involving formal instruction. It covers also situations in which an individual learns entirely independently. However, this unit focuses on individualized instruction occurring within school programs.

Obviously instruction in today's schools only occasionally satisfies the requirements of our definition. Most instruction is planned for groups. Schools ordinarily individualize with some students some of the time, particularly by drawing them out of the total group for special, remedial, honors, or enrichment instruction.

The definition of individualization offered above is meant to apply to achieving any type of learning goal in any curriculum area and within any type of individualized program. It can cover education directed toward acquiring knowledge, toward developing learner competencies, or toward developing attitudes, interests, values, or interpersonal behaviors. It can be used in designing, or in analyzing and assessing, diverse types of individualized programs as illustrated by Individually Prescribed Instruction (IPI), Program of Learning According to Needs (PLAN), the Montessori approach, the British

Infant School approach, the project method, alternative schools, or programs of independent study.

It is a mistake to identify individualization merely with tutoring or independent study. Tutoring is just one way to achieve individualization. Independent study, such as that made possible by programed instruction or that occurring when students conduct individual projects, also is just one form of individualization.

Group teaching is not ruled out by individualization. Whenever, at the same time, different students are ready to study the same tasks in a similar way through group presentation and discussion, it is desirable to assemble and teach them as a group. Such groupings should be temporary and only for teaching learning tasks on which the students in the group are well-matched in terms of specific learning objectives, appropriate study methods, and the timing of learning.

Administrative grouping differs from instructional grouping. It is proper and necessary to assign a group of students to a teacher (or to a team of teachers). The teacher assumes certain administrative responsibilities for the group as well as responsibilities for teaching members of the group. Individualization requires differentiating instruction offered members of the assigned group by planning with and for each member separately, then carrying out the requirements of the plans made. Those plans should determine what sorts of individual or group learning provisions are to be employed.

To summarize what we have said in offering our definition of individualization, these are key points:

--Individualization requires planning for individuals, not groups

--Long-term and short-term plans for individual students should take into account the student's learning needs and characteristics as a learner

--Individualized instruction can occur in different sorts of settings: independent study, a tutorial relationship, or in groups

--Individualization in group settings requires that the different members of the group are ready to study the same things at the same time and in the same way

Modes of Individualization

In planning and conducting individualized instruction, it is essential to take into account those aspects of instruction that can be adapted to the individual student. When you think of any instance of instruction/learning, these aspects (variables) should come to mind: learning goals, learning materials and equipment, the learning setting, the instructor, instructional methods, and the pacing of instruction. Each of these aspects can be varied from student to student; this gives rise to the following six "modes" of individualization.

1. Different students of the same age or grade can work toward different goals.

   In this mode, some students study things that others do not. The required curriculum of a school covers learning goals (tasks) that all students undertake at some time or other. This first mode of individualization refers to elective or selective goals suited to individual learners. Examples are instances when students work on independent projects, when they take special programs of study (as in high school specializations), or when they elect certain courses.

2. Different students can study the same task using different materials or equipment.

   It is easy to think of many instances of this mode of individualization. Students may use different texts in studying the same topics. They may or may not use certain supplementary materials. Instead of studying texts, they may turn to other sources. Many varieties of equipment could be used: audiotapes, videotapes, films, film loops, overhead projectors, microscopes, typewriters, even computer hook-ups or electronic calculators.

3. Different students can study the same task in different learning settings.

The location of learning settings can vary; they can be at school, at home, anywhere in the community, or elsewhere. At school, a student might study in a classroom, in a laboratory, in the library, in a hallway, or elsewhere. A student may study alone, in a tutorial conference with a teacher, in an informal group of his peers, in a seminar group under the teacher's direction, or in different-sized formal classes.

4. Different students can be assigned to different teachers to produce effective teacher/student match-ups.

It is a fairly common practice in elementary schools for students to be assigned to work with certain teachers, perhaps as a result of student preferences, perhaps as the result of teacher judgments or preferences in the interest of better learning or better interpersonal relationships. In secondary school, students sometimes can choose the teacher they prefer to work with in a given curriculum area. One educator, Herbert Thelen of the University of Chicago, has developed a system of matching students and teachers that he describes in his book titled Classroom Grouping for Teachability (New York: Wiley, 1967).

5. Different students can study the same task with different instruction/learning methods.

There is a great variety of instruction/learning methods, many of them overlapping with different learning materials or equipment, or different learning settings. The methods include independent study, tutoring, seminar discussions, whole-class discussions, small group discussions or lectures. Drill with memorization is one method. The project method is another, including both individual and group projects.

6. Different students can advance in a curriculum sequence at different rates. This mode involves departing from the traditional grade-level advancement on a "nongraded" or "ungraded" basis, permitting "continuous progress" by each student. The learning task a student undertakes depends on his actual level of achievement rather than on the grade-level curriculum. Also, the student is permitted to proceed through learning tasks at whatever rate, fast or slow, he can master the tasks.

Exercise 3

These six modes of individualization take into account the sorts of differences among students that were discussed above (pages 14-19). Four sorts of differences were discussed on those pages: in achievement levels, in learning rate, in learning "style," and in motivation to learn. A useful exercise is to check which of these four sorts of differences each mode of individualization takes into account. Exercise 3 offers practice in making such match-ups. When you have filled in the table on the Worksheet, turn to Exercise 3 - Answer Key, on page 29, and read the material on pages 30-32 that explains the check marks made on the Answer Key.

EXERCISE 3 - WORKSHEET

Modes of Individualization as Related To Types of Student Differences

Directions: This exercise calls upon you to check opposite each of the six modes of individualization those types of student differences that mode is especially well suited to take into account. Place only one or two check marks opposite each mode, indicating the one or two sorts of student differences that mode is best suited to deal with.

You probably will need to re-study the description of each mode of individualization before you fill in the table.

This exercise is rather tricky. Don't let it fool you.

MODE OF INDIVIDUALIZATION	STUDENT DIFFERENCES IN:			
	ACHIEVE-MENT LEVEL	LEARNING RATE	LEARNING STYLE	MOTIVATION TO LEARN
1. Different learning goals or tasks				
2. Different learning materials or equipment				
3. Different learning settings				
4. Student assigned to a particular teacher				
5. Different instructional methods				
6. Different rates of advancement (nongrading)				

Check your answers by turning to Exercise 3 - Answer Key on page 29 and to Exercise 3 - Explanation of Answer Key on pages 30-32.

EXERCISE 3 - ANSWER KEY

The check marks on this Answer Key indicate the relationships between modes of individualization and learner characteristics in the judgment of the authors of this unit.

A discussion of reasons for these check marks is given on the Exercise 3 - Explanation of Answer Key that follows.

MODE OF INDIVIDUALIZATION	STUDENT DIFFERENCES IN:			
	ACHIEVEMENT LEVEL	LEARNING RATE	LEARNING STYLE	MOTIVATION TO LEARN
1. Different learning goals or tasks	✓			✓
2. Different learning materials or equipment			✓	
3. Different learning settings			✓	✓
4. Student assigned to a particular teacher			✓	✓
5. Different instructional methods		(✓)	✓	(✓)
6. Different rates of advancement (nongrading)	✓	✓		

EXERCISE 3 - EXPLANATION OF ANSWER KEY

Obviously, rational and informed people will disagree about which boxes to check in Exercise 3. What is important is thinking through the relationships between the sorts of individual differences and the six modes of individualization. Here is an explanation of the check marks on the Answer Key.

Mode 1 (different goals or tasks): Check achievement level and motivation to learn.

The choice of elective goals or tasks should be influenced most by the student's interests or motives. Also, his achievement level should be taken into account since he should not take on tasks for which he lacks the pre-requisite knowledge or skills.

Mode 2 (different materials or equipment): Check learning style.

The chief reason for offering different students different learning materials or equipment for study of a given task is to take account of differences in learning style, that is, in preferred or most effective ways of learning. Also, you could check any of the other three sorts of individual differences. The materials or equipment one uses can influence motivation to learn. Differences in learning rate may call for different learning materials or equipment, but mainly because they are related to differences in learning style. Similarly, differences in achievement level are related to differences in learning style.

Mode 3 (different learning settings): Check learning style and motivation to learn.

Once again, the chief reason for offering different learning settings is to suit the student's characteristics as a learner. A second reason is to take his interests (motivation to learn) into account by providing an appropriate learning setting.

Mode 4 (assignment to a particular teacher): Check learning style and motivation to learn.

When one says that a given student works better with one teacher than with another it usually means that that teacher can deal better with the student's preferred ways of learning and his motivation to learn than another teacher. However, you could quite properly have checked achievement level or learning rate since some teachers work better with less advanced or slower learners than do other teachers.

Mode 5 (different instructional methods): Check learning style and either learning rate or motivation to learn.

The reason for checking learning style seem obvious. The reason for checking learning rate is that, in the view of many educators, slow and rapid learners differ in that slower learners require more concrete approaches to learning, more repetition, and more continual guidance. Different instructional methods also may be important for appealing to differences in interests or motivation to learn.

Mode 6 (different rates of advancement): Check achievement level and learning rate.

All approaches that break away from the grade-level system of advancing through the curriculum and provide for nongraded advancement do so because students of the same grade or age differ greatly from one another both in achievement levels and learning rates.

For the student who wishes to explore further the topic of modes of individualization, an excellent treatment of the subject will be found in Lee J. Cronbach, "How Can Instruction be Adapted to Individual Differences?" This paper can be found in two publications. It appears as a chapter in Robert M. Gagne (ed.), Learning and Individual Differences (Columbus, Ohio: Charles Merrill Publishing Co., 1967). It has been reprinted in Robert A. Weisgerber (ed.), Perspectives in Individualized Learning (Itasca, Illinois: Peacock, 1971).

Without attempting to summarize Cronbach's chapter, it is possible to convey a notion of its contents by listing the titles of the chapter sections. These are, "Adaptation within a Predetermined Program," "Adaptation by Matching Goals to the Individual," "Adaptation by Erasing Individual Differences," and "Adaptation by Altering Instructional Method." Examining these four sections will reveal that Cronbach covers substantially the same set of modes of individualization as that presented above, though his way of presenting the modes differs considerably from ours.

A General Instructional Model for Individualization

A general model for individualizing instruction should satisfy the requirements set forth in the definition of individualization offered above. The heart of that definition involves planning with each student what he is to learn and how he is to learn through the provisions made for employing the appropriate modes of individualization. Instruction, once a lesson plan has been made, becomes a matter of assisting the student with his individual lesson and monitoring his progress with the use of appropriate assessment procedures.

While there is no generally accepted individualization model, the following 8-step model states the requirements for fully-individualized instruction in curricula having specific learning objectives and a definite sequence of learning units. It is particularly appropriate for learning the basic skills of reading, language arts, and mathematics. The eight steps also call attention to requirements that should be met by individualized instruction in less structured curriculum areas, though in these areas (social studies, science, the arts, or personal/social development) teacher and student judgments, as well as student preferences, are more prominent in decisions as to what to be learned, and how.

1. Determine with each student what learning task he should next pursue in the given curriculum area.

2. Assess the extent to which the student already has mastered the objectives of the task chosen for him.

3. Assess the student's learner characteristics as they relate to his performing the learning task effectively and efficiently.

4. Design with the student a lesson plan that specifies what he will study and how.

5. Make the necessary arrangements (space, setting, materials, equipment, etc.) for class members to undertake their individual assignments.

6. Assist individual students as needed in performing their learning tasks.

7. Monitor each student's progress, revising his lesson plan if required for his achieving mastery of task objectives.

8. When the student demonstrates mastery of his learning task, re-cycle back to Step 1 to begin planning his next task.

Each of these steps requires some elaboration to make clear its function. This is done in the paragraphs that follow. Further clarification will be offered under later unit objectives that offer practice in applying the model to the analysis of different approaches to individualization.

Step 1. Select the student's learning task. Planning with an individual student requires that the learning task he undertakes at any given time be chosen as appropriate for him, not for the grade and class to which he happens to belong. In a required curriculum whose units are sequenced in a particular order, the appropriate task is the next unit beyond the highest one the student has mastered. Where the required curriculum lacks such sequence, the task chosen can depend on the student's preference and/or the teacher's judgement as to which task best suits the student's current learning needs. If the task to be chosen is in an elective area, again some combination of the student's preference and the teacher's judgement should decide the choice.

Step 2. Assess the student's extent of mastery of the chosen task. Merely because a student has not studied a given task under the teacher's guidance is no evidence that he has not already mastered all or part of it. He could have encountered the task elsewhere. Pretesting is essential to determine what parts of the learning task require study. Where formal pretests are not appropriate, teacher or student judgments must be relied on.

Step 3. Assess the student's learner characteristics in relation to the task. A teacher who has worked with a student for a period of time should have a good deal of information about his learning style and his motivation to learn. Often, however, a new learning task may require gathering new information about

how the student can work most effectively or enjoyably. Information on learner characteristics is needed in deciding how to employ several of the modes of individualization (materials and equipment, setting, and instructional methods in particular).

Step 4. Design the student's individual lesson plan. Each student's plan for studying a given task should be based on the data obtained in Steps 2 and 3. It should specify what the student is to study and how. Properly, it will be a contract entered into by student and teacher rather than merely an assignment decided upon by the teacher.

Step 5. Make instructional arrangements. Usually the teacher will need to run a many-ringed instructional circus. The problem the teacher faces in conducting individualized instruction is that of making effective use of learning resources, including his own time, in making arrangements for each student to proceed with the individual lesson plan. Frequently, the teacher will cluster students who have similar learning tasks and who can benefit from working together.

Step 6. Assist individual students as needed. Since individualized instruction means that different students will be working on different tasks, at different rates, and in different ways, a teacher will need to offer assistance much of the time on an individual basis. Of course, when two or more students are working on the same task and have similar learning problems, the teacher can offer them help together. Students can also help each other.

Step 7. Monitor each student's progress toward mastery of his task. In individualized instruction, the teacher needs to keep close track of the student's progress with his task. When the assessment data obtained indicate that the student is not going to master the task with the initial lesson plan, the teacher needs to offer a revised or supplementary plan.

Step 8. Re-cycle to the next learning task when the current task is mastered. This step assumes that each student will achieve mastery of the objectives of a learning task before proceeding to the next task. Also it assumes that each student will exhibit mastery of a task according to his learning rate. The teacher determines when a student has reached mastery, then proceeds promptly to planning the next task. (The justification for using a mastery criterion, and the procedures for employing it, will be treated in detail under Objectives 6 and 7 of this unit.)

The 8-step model of individualization just presented focuses on the process of planning and conducting individualized instruction. Such a model should not be confused with models for individualized instructional systems that go beyond the conduct of instruction to include such concerns as curriculum organization and uses of technology, including electronic computers.

Objective 3. Justify student self-direction as a learning goal and as a requirement for individualized instruction.

Definition and description of student self-direction

Student self-directed learning refers to the extent to which the student plans and conducts learning tasks on an independent basis rather than with help from someone in an instructional capacity. Student self-direction can exist in varying degrees rather than being all-or-none. Thus, a student can be self-directing in performing some parts of a learning task but not others.

There is no one official or correct list of aspects of a learning task. Below is a suggested list of 10 aspects of any task. Each of these a student might or might not perform on an independent basis. For example, a teacher might choose the learning task but call upon the student to plan and conduct the task independently. As another illustration, the student might be called upon to judge when he had completed the task, or the teacher might assume this responsibility.

1. Choosing the learning task.
2. Planning how to perform the task.
3. Budgeting one's time in performing the task.
4. Conducting the task, step by step, without assistance.
5. Assessing one's progress and identifying difficulties with the task.
6. Analyzing the difficulties encountered.
7. Revising one's approach to the task to overcome difficulties.
8. Persisting in the task toward a solution, despite difficulties.
9. Communicating one's progress and problems to the teacher.
10. Judging when one has completed the task.

If a student performed all of these aspects of a task without assistance from a teacher, a high degree of self-direction would be shown. Most often, the teacher offers direction or assistance with several aspects of a learning task. Choosing a learning task, and planning how to perform it, represent a high degree of self-direction. Analyzing one's difficulties and revising one's approach to the task also call for a high degree of self-direction.

In addition to performing aspects of a learning task independently, a student can exhibit self-direction in other ways as listed below.

1. General competencies in use of learning materials and equipment

   Exhibiting conceptual knowledge of how to use materials and equipment
   Employing skills in appropriate manipulations
   Exhibiting trouble-shooting skills (making adjustments, minor repairs, etc.)
   Exhibiting responsibility in caring for materials and equipment

2. Capabilities in following directions for learning tasks

   Showing understanding of oral and written directions
   Remembering directions while performing tasks
   Organizing and monitoring one's behavior in terms of directions

3. Acceptance of mastery criteria

   Exhibiting understanding of criteria for tasks by offering justification for them
   Working to achieve mastery
   Judging progress in task according to mastery criterion

4. General personal-social management competencies

   Taking care of one's person and possessions (cleanliness, hanging up wraps, etc.)
   Conforming to school rules:

      Being where one belongs
      Being on time
      Moving from place to place as permitted
      Using learning materials and equipment as directed
      Exhibiting acceptable inter-personal behavior

5. Expressing self-assertion

   Standing up for one's rights
   Contributing to decision making in groups
   Expressing one's views, wishes

Some of the items listed above may seem to you to contradict self-direction. Thus, capabilities in following directions may strike you as the opposite of self-direction. You may think the same is the case for conforming to school rules. The justification for including these on the list is that they refer to the capability of performing these activities without supervision.

As has been noted, self-direction can occur in varying degrees. It need not always involve complete independence on the part of the student; in fact, the ability to initiate a search for help or information from appropriate sources is an important form of self-directed behavior. Students may exhibit self-direction in their use of the library or other learning resources, and in their ability to work in the classroom or study hall without continual prodding or assistance. Completing homework assignments is another example of self-directed activity, especially if it is accomplished with minimal reminders or assistance from parents.

Justification of student self-direction as a learning goal

The particular value of self-direction as a learning goal is its potential application throughout life to a variety of situations, especially in terms of an individual's coping with problems met in a rapidly changing world. Since the major part of one's life is not spent in school, competencies developed through performing self-directed learning tasks in the school setting can obviously also be utilized in the home, on the job, or in planning for leisure time.

Unfortunately, most of today's students are critically lacking in self-direction skills. They are unable to take responsibility for choosing, planning, and conducting their learning activities, or for applying what they have learned. This lack is due in large part to failures of the schools, which so far have not permitted self-direction among other than the most gifted

students. What has not been realized is the importance of teaching self-direction competencies to all students regardless of academic ability. Indeed, it is crucial that those students of lower academic standing be particularly helped in developing self-direction -- since these are the ones who need it most.

Self-direction is not effective unless the student is able to transfer his knowledge into new problem situations. To accomplish this he must be capable of self-directed problem solving. An essential feature here is that he can develop his own solutions rather than relying on those developed by others.

Self-direction as essential for individualized instruction

Normally, it is essential that students employ self-direction a large proportion of the time if instruction is to be individualized. The only exceptions to this statement occur with a very low student/teacher ratio which permits the teacher to spend a great deal of time with each student. Classes in remedial reading or special education often provide for sufficient attention from the teacher for each child to allow for individualization without an emphasis on student self-direction. Of course, when a student has a private tutor, self-direction is not essential for individualization.

Individualized instruction calls for each student to work on his own lesson at any given time; for his having learning materials and equipment, a learning setting, and instruction suited to his learning style; and for his taking the time needed to master his task.

Consider the demands such instruction places on the teacher, assuming a student/teacher ratio of 25/1. To plan, manage, guide and evaluate individualized instruction with this number of students, the teacher can average less than two minutes of personal attention to each student during a

normal daily period of instruction in a given subject. With individualized instruction, the teacher's time needs to be divided among the activities of testing certain students, planning lessons for other students, making classroom assignments, and individual tutoring. Sometimes the teacher finds it appropriate to help a cluster of students who are studying similar tasks; this permits a bit more time for working with some students in the class.

This analysis of the teacher's role in an individualized instructional program makes it obvious that instruction of the sort described can occur only when the majority of students during a considerable portion of class time are able to carry on their learning tasks without interacting with the teacher. The teacher needs to plan with the student the extent to which he will employ highly-structured learning materials, the extent to which he will be able to assume the responsibility of planning and conducting his learning task independently, and the extent to which he should count on help from his classmates.

Objective 4. Describe three modes of student self-direction and show how each contributes to individualizing instruction.

Since student self-direction is essential for individualized instruction, it is important to identify ways in which self-direction can be achieved. Three basic modes of self-direction are described below.

1. Student self-direction may occur with use of highly structured materials.

This form of self-direction requires that the learning materials contain specific instructions or cues to guide the student, step-by-step, while performing the task. The student does not need to possess more than the capability of following precise and complete directions; the materials make all the choices for him. Notice that some textbooks offer the student this sort of guidance. Study guides provided by the teacher may offer comparable directions.

The programmed instruction movement during the past quarter century has contributed a rich variety of instructional materials designed for student self-managed learning. In 1954 B. F. Skinner, in an article in the Harvard Educational Review, described his development of teaching machines. His article, entitled "The Science of Learning and the Art of Teaching," presented a description of his application of learning theory to the design of materials for student-managed learning. Since 1954, programmed instruction has become commonplace in education at all levels of schooling. It is also widely used in industrial and military training programs.

Programmed instruction is characterized by breaking each learning task into a sequence of steps or "frames" to be studied in a particular order. Each step calls for an immediate response from the student, applying the information supplied him in making the required answer. Immediate feedback on the correctness of his answer is given in an answer key that is part of the

learning material. Successive frames provide practice in what has been taught in earlier frames as well as introducing new material.

The following exercise gives you an example of programmed instruction that may justify your attention.

Exercise 4

In case you are not familiar with this approach, an exercise in linear programming is given below. If you wish to do the exercise, answer the four frames in Exercise 4, noting how the materials give you all the cues you need to make correct responses; note also how there are answers given for use in checking your responses, frame by frame. These features enable you to study the program on an independent basis, using self-direction that depends on the cues given you.

There is no answer key to this exercise.

EXERCISE 4 - WORKSHEET

An Example of Programmed Instruction*

Directions: In studying the material in this exercise, first cover the entire right-hand column with a sheet of paper or cardboard. Read frame number 1 and write on the blank lines the words you think will make the statement correct. Slide the answer cover down just far enough to read the correct answer for step 1. If your answer is correct, go to the next and following steps in the same manner. If your answer to any step is different from the one in the right-hand column, draw a line through yours, reread the step, and write the correct answer next to your original answer. Then go to the next step.

1. The subject matter in a programmed text using the linear technique is presented in small steps. Learning is easier when you study new material in _____ _____.	small steps
2. Each step in a linear programmed text is called a frame. Since the subject matter is presented in _____ _____, the text contains many _____.	small steps frames
3. Each frame is designed to help you make the correct response. Blank spaces are provided for your _____.	responses or answers
4. Your answers are called "constructed responses" because you write them out. Your response to each small step, or _____ in a linear text is called a _____ _____.	frame constructed response

*Taken, with slight modifications, from Programmed Learning, Air Force Training Manual No. 50-1. Washington, D.C.: Department of the Air Force, January 1967, Page 22.

2. Pupil-team learning is another form of student self-direction.

This may not seem to be a form of self-direction. However, it is if one views it as a matter of students solving their own learning problems without the help of the teacher. This applies to students of the same age working together or to older students helping younger ones.

The pupil-team learning plan was developed at Boston University under the direction of Dr. Donald Durrell, and is described in his article, "Adapting instruction to the learning needs of children in the intermediate grades" (Journal of Education, 1959, 142, 2-78.) The following is a resume of Dr. Durrell's article, describing the key features of the pupil-learning approach.

Pupil-team learning consists of dividing pupils into pairs, or slightly larger groups for mutual aid in learning. Tasks are set in which pupils work together, sharing thinking and planning, exchanging methods of approach, and evaluating each others' answers, resulting in either individual products or a single group product.

Team learning should be used only when it is more effective than other methods. It is not a panacea to replace all other classroom activities. Whole class instruction is often a more efficient way to present some types of learning, while others require each pupil to work alone. Team learning is a way to serve the needs of pupils, such as differences in achievement levels, rates of progress, and special difficulties. Children are grouped on the basis of abilities, usually in the basic skills of arithmetic, spelling and reading. As soon as each student feels ready to do so, he can take a mastery test to determine his readiness to move into another group on another level.

The problem of course arises as to what to do with those teams who finish the year's work in record time. Durrell suggests (1) Unlimited team progress, in which teams work through the program as fast as mastery permits; this is best suited to an ungraded system, where pupils can move along at varying time rates; (2) Limited team progress, in which the year's work is divided into sections with set dates for introducing new sections; those who finish one section before the next is introduced are given enrichment work, independent study, or the opportunity to help slower learners; (3) Combination progress patterns in the same subject; high achievers follow unlimited progress design, average achievers follow a limited pattern, and low achievers are given extra help by pupils or teachers; (4) Temporary or alternating use of limited patterns; teacher can combine above patterns, varying them according to different subject areas, sometimes combining whole class, when necessary, other times giving enrichment or remedial help in certain areas.

Team discussion provides the opportunity to use knowledge acquired by

other methods. Teams of three to five pupils are presented with questions based on knowledge acquired through various resources, and are asked to dictate their answers to a team secretary; one team secretary then reports the team product; the other teams check their answers and make additions and corrections.

The effectiveness of the discussion technique depends on the quality of questions asked and the problem set for discussion. Varying degrees of intellectual effort are demanded by questions requiring multiple choice or relationships; inference is required when the questions go beyond the materials presented; integration is called for to relate new knowledge to old; critical thinking when questions ask for evaluation. Team thinking is developed only through the design of questions requiring various types of intellectual practice.

Discussion teams may be made up of pupils with differing abilities; once all pupils have been exposed to the same information, every child can contribute to the discussion. Even those who provide wrong answers add to the learning, since others must discover why these answers are wrong.

Team planning calls for many suggestions; it is an ideal situation for pupils to work together, since one suggestion sparks another and the team product is likely to be better than the sum of individual products without stimulation by discussion. Room decorations, exhibits, assembly programs, field trips and other class projects call for team discussion. This is better than open class discussion, since many timid individuals will speak up in a team who would remain silent before the whole class. The ultimate decision, after all teams have voiced their suggestions, may be by class vote, or may be made by the teacher alone. In any case, teamwork has contributed to the final product.

In his discussion, Durrell points out that the Winnetka approach and its successors in individualized skill learning have made excellent educational contributions. He sees team learning as an adjunct which adds the advantage of mutual aid of partners. "This increases incentive and security as well as exchange of techniques and understandings. If one pupil can aid another, there is no need for the teacher to provide the assistance; teachers often report that children are highly effective in explaining processes to their mates."

Durrell's plan represents a formal, well-structured approach to student teamwork. More commonly, such teamwork occurs in less formal ways. Thus, two or three students may choose to work together on a learning task, helping one another with difficulties and checking one another's work. Group project activities obviously are a form of pupil-team learning.

Pupil teamwork contributes to individualization by bringing together two or more students who are prepared to work together on the same learning task.

It provides each student in the team with individual tutorial assistance whenever needed. When group projects are conducted by student teams, the members of the team are chosen because of their common interest in performing the particular project. When new group projects are undertaken, new project teams are formed to retain the emphasis on suiting the learning needs of individual students.

3. Student self-direction of the highest form occurs when students select, plan, and conduct learning tasks independently.

The sign of a competent student is the ability to manage one's own learning without depending on programmed materials prepared by others. In other words, the competent student is his own programmer, capable of selecting appropriate learning tasks, planning how to conduct them, and carrying them forward to completion independently. Obviously there would be many times when it is essential to turn to others for help with learning tasks. Knowing when to seek such help and where to seek it are aspects of being competent in self-directed learning.

In 1918, William H. Kilpatrick at Columbia University described an approach to self-directed learning in his famous brochure titled The Project Method: The Use of the Purposeful Act in the Educative Process (New York: Teachers College, Columbia University, October, 1918. 18 pages). Kilpatrick differentiated four types of "hearty purposeful acts" or projects. In Type 1 "the purpose is to embody some idea or plan in external form, as building a boat, writing a letter, presenting a play." In Type 2 "the purpose is to enjoy some (esthetic) experience, as listening to a story, hearing a symphony, appreciating a picture." In Type 3 "the purpose is to straighten out some intellectual difficulty, to solve some problem, as to find out whether or not dew falls, or to ascertain how New York outgrew Philadelphia." In Type 4 "the purpose is to obtain some item or degree of skill or knowledge as learning to

write grade 14 on the Thorndike Scale, or learning the irregular verbs in French."

Kilpatrick gives particular attention to Type 1 for which he proposes the steps of purposing, planning, executing, and judging. He proposes that, insofar as possible, the students take each step independently, though careful teacher guidance may be necessary to prevent failure. Type 3 he identifies as problem solving, employing the familiar model proposed by John Dewey. Both Types 1 and 3 clearly have much in common in that both call for a process of analyzing, planning, and creating or testing.

Since 1918, the performance of projects has occupied an increasing part of the instructional program in both elementary and secondary school. In the elementary school, projects are to be found particularly in the areas of social studies, science, and language arts (independent reading and creative writing). In secondary schools, additional areas emphasizing the project approach are arts and crafts, homemaking, and shop. The project method currently holds a central place within many of the new enquiry-focused curricula in science, mathematics, and social studies.

In assessing the manner and degree of individualization characterizing the project method, it should be noted that it provides well for five of the six modes of individualization presented on pages 25-27:

Different students can work toward different goals

Different materials and equipment can be employed in studying a given topic

Students can study in different settings

Instructional methods are individualized

Students can work at different rates toward completing their projects

By its very nature, the project method contributes to individualization by departing from whole-class teaching. It is of particular interest that

Kilpatrick, in his Type 4 project, provides for the student to learn needed skills on an individual basis.

In elementary schools, the project approach to individualization is prominent in the Kettering-funded work of John Goodlad and colleagues at University Elementary School of UCLA and the associated League of Cooperating Schools. Also, it receives marked emphasis in the currently popular "open classroom" approach within elementary education. In high schools, the method is especially identified with independent study, honors programs, or advanced placement. Generally, in both elementary and secondary schools, the project approach has been used much more often with relatively gifted students than with those of average or lower ability. An example of the project approach in a secondary school is found in "The Independent Study Program at Melbourne High", which follows.

Pages 50-53 removed due to copyright restrictions.

Contents:
Whitmire, Janet. "The Independent Study Program at Melbourne High."
Phi Delta Kappan; v47 n1 pp43-46 Sep 1965

Objective 5. Review your own experiences with self-directed learning, within and outside of school.

In considering how student self-direction should and can be involved in the instructional programs of elementary and secondary schools, it will be helpful for you to examine how self-direction was provided for in your school experience and how you employ self-direction in your life outside of school. Exercise 5 offers you a framework for conducting this self-examination.

Exercise 5

The Exercise 5 - Worksheet invites you to jot down your recollections of the extent to which self-direction was involved in your studies at the secondary and college levels, then to review ways in which you employ self-direction in your life outside of school. It will not be surprising if you find that opportunities for self-direction were fewer in school than in day-to-day living outside of school. If this is the case, it may lead you to conclude that schools should increase their emphasis on having students learn and employ self-direction competencies while in school.

Since this exercise involves your experiences, obviously there is no answer key.

EXERCISE 5 - WORKSHEET

Personal Experiences with Self-Directed Learning

Directions: In response to the following questions, describe and evaluate your experiences with self-directed learning both in school and in your daily life outside of school. Your answers will necessarily be sketchy. The purpose of the exercise is to guide you in making a quick over-all review of your experiences with self-managed learning.

1. As you recall your high school studies, to what extent was self-directed learning involved:

   a. In the choice of learning tasks?

   b. In the conduct of learning tasks?

2. Reviewing your undergraduate college work, to what extent was self-directed learning involved:

   a. In the choice of learning tasks?

   b. In the conduct of learning tasks?

3. What recommendations have you for increasing the emphasis on student self-direction in schools?

EXERCISE 5 - WORKSHEET (Cont'd.)

4. Outside of school, how have you exhibited self-directed learning in hobby or recreational activities (reading, music, dramatics, photography, golf, bowling, etc.)?

5. Filling out your income tax statement requires studying and following a complex set of instructions. Do you fill out your statement independently or do you seek help? Comment on this as an example of programmed instruction.

6. On your job, you doubtless are called upon to learn things with self direction. What are some of the sorts of tasks where you need to select, or plan, or conduct learning tasks independently?

Objective 6. Define mastery-referenced instruction and state the advantages of employing a mastery criterion for students and teaching staff.

Definition

A relatively new, radical, and commonly misunderstood concept in education is that of mastery-referenced instruction. What is meant by this term? Here is a definition: Mastery-referenced instruction means that instruction is planned and conducted on the working assumption that all students undertaking a given learning task will achieve its learning objectives at the same high level of proficiency specified in the performance criteria set for that task.

If you are not familiar with this definition, it calls for your careful study. Notice that it does not say that all students in a grade or class will master the same tasks at the same level. What it does say is that, with mastery-referenced instruction, when any student undertakes a given learning task, it is expected that he will master its objectives at essentially the same level as any other students undertaking the same task.

Feasibility of mastery-referenced instruction

Many educators, while agreeing that it would be highly desirable for all students to master their learning tasks, doubt that this is possible. Teachers' experiences are that a considerable proportion of students never master learning tasks and apparently are incapable of doing so. Most educators who draw this pessimistic conclusion are basing it on instruction within the grade system when all students of a grade are assigned the same tasks and are called upon to complete them in the same amount of time. Obviously, under these conditions, a large proportion of students will fail to achieve mastery.

Considerable evidence has accumulated in recent years to demonstrate that instruction can be conducted in ways that enable a high percentage of

students to master the learning tasks they undertake. This outcome has been achieved in individualized instructional programs such as IPI and PLAN in which each student works on tasks specifically suited to his learning readinesses and learning style. Also it has been obtained in research conducted by Professor Benjamin S. Bloom of the University of Chicago. In his studies he found that 90% of students, given proper instruction, can learn to master learning tasks. Also, he found that initially some students required three times as much study time to achieve mastery of a task as other students, while at the end of a semester of mastery learning, the differences were reduced to 1.5-1 or less. This reduction in time required to achieve mastery is evidence that students can learn how to use their time effectively in achieving mastery. (Bloom, Benjamin S. and Conner, James E., EVERY KID CAN - Learning for Mastery. Washington, D. C.: College/University Press, 1973. See also Bloom's chapter, "Learning for Mastery", in Bloom, Hastings and Madaus, Handbook on Formative and Summative Evaluation of Student Learning. New York: McGraw-Hill, 1971, 43-57; and his article titled "Recent Developments in Mastery Learning", Educational Psychologist, 1973, 10, 53-57. Other key references, containing articles by Bloom and others, are Block, James H. (ed). Mastery Learning: Theory and Practice. New York: Holt, Rinehart and Winston, 1971; and, by the same editor and publisher, Schools, Society, and Mastery Learning, 1974.)

It is also true that many educators doubt that it is possible, with high student-teacher ratios, to conduct instruction in ways that enable all students to achieve mastery. A solution to this problem has been found in various individualized programs where teachers are enabled to differentiate instruction, student-by-student, in ways that take account of differences in level of achievement, styles of learning, and rate of learning. Instructional programs

permitting this to happen include IPI, PLAN, Individually Guided Education (IGE), and the open classroom. The characteristics of these programs that permit mastery learning are dealt with under Objective 7 of this unit.

Advantages of mastery learning for students and teaching staff

Exercise 6

In considering the advantages of mastery instruction it will be helpful for you to set down your views on the benefits of this focus on all students achieving excellence. The following exercise asks you to list the advantages that occur to you. On the page immediately after the worksheet you will find suggested answers.

EXERCISE 6 - WORKSHEET

Advantages of Employing Mastery-Referenced Instruction for Students and Teaching Staff

Directions: In this exercise write down all the advantages that you believe mastery instruction holds for students and for members of the teaching staff. There is no answer key to this exercise, but you will find following it comparison lists that will help you clarify your ideas.

1. Benefits of mastery-referenced instruction for students:

2. Benefits of mastery-referenced instruction for the teaching staff:

Review of Benefits from Mastery Learning

Now that you have offered your lists of benefits that are likely to result for both students and teachers from mastery-referenced instruction, comparison lists are presented here to assist you in developing a fuller conception of these potential benefits. These lists have been derived both from research evidence and from conceptualization about the logical consequences of employing a mastery criterion with all students.

1. Benefits of mastery-referenced instruction for students

   Longer retention of material studied

   Increased success at learning other tasks for which the task just learned is a prerequisite

   Increased ability to apply what has been learned in situations to which this learning is applicable

   Improved rate of learning (supported by Bloom's evidence)

   Increased enjoyment of subjects studied in this manner

   Increased motivation to learn

   Greater liking for school in general

   Development of more positive attitudes toward taking tests

   An improved self-concept

2. Benefits of mastery-referenced instruction for teaching staff:

   Relative freedom from burdens of remedial instruction

   Satisfaction derived from succeeding with all students

   Improved competencies in teaching individual students

   Improved relationships with students

How do these lists correspond with yours?

Objective 7. State the requirements for employing a mastery criterion in individualized instruction.

The two most fundamental requirements for mastery-referenced instruction are that the objectives of the learning task must be clearly specified and that standards must be set indicating the level at which the objectives are to be achieved. Each of these requirements merits discussion.

Every learning task deals with a topic (the law of gravitation, cultural differences, use of prepositions, etc.). The statement of the task must go beyond naming the topic by indicating what the task requires the student to know or be able to do (explain why gravity causes objects to fall, demonstrate skill in the use of a microscope, etc.)

The same topic can be represented in different learning tasks having different objectives. For example, consider the topic of "finding the missing addend" in mathematics. Answering the problem, 6 + 7 + X = 21, could require merely filling in the X without specifying the method used; it could require achieving the answer by adding 6 and 7 and subtracting the sum from 21; or it could require demonstrating three or more ways of getting the answer (6 + 7 = 13 and 21 - 13 = 8; 21 - 6 = 15 and 15 - 7 = 8; or 6 + 7 + 9 = 22, and that's one too many, so it has to be 8.) In each case, the topic is the same but the task is different since different objectives are set (each task requires arriving at the correct answer by use of a different method). It is essential to mastery-referenced instruction that the specification of the learning task be clearly identified. These specifications must not only identify the task topic, but must indicate just what objective the student is to achieve in mastering the task.

Frequently one sees the statement that task objectives must be stated in "behavioral" terms, meaning the behavior the student demonstrates in

accomplishing the objective. The point is that evidence of such accomplishment must come from the student. Behavioral evidence can consist of performing what the task calls for, answering questions orally or in writing, and presenting products created in doing the task. The task objectives should indicate what sorts of evidence are required.

Setting standards of mastery that all students are expected to satisfy is relatively unfamiliar in education, where it is assumed that only a small percentage of students will achieve high levels of excellence, while the remainder will range from "good" through "fair" to "poor" or "zero" performance. In other lines of endeavor, mastery criteria are more familiar, particularly when performance really counts. For example, certifying a person as a life guard requires evidence of ability to swim strongly, break a strangle hold, tow a person to shore, and perform artificial respiration. Passing a driving test requires demonstrating knowledge of driving regulations and skills in driving, signaling and parking. Failure to meet the set standards calls for further practice and a second test.

A reason many educators doubt that all students can master more traditional learning tasks in school is that they think in terms of "grading on the curve", in which some students must automatically fall below the average for the student population; and they also think in terms of the grade system where all students of a given age or grade level are presented with the same learning tasks. Obviously, under these conditions not all students can master the tasks assigned to them.

Essential to mastery-referenced instruction is the use of "criterion-referenced" rather than "norm-referenced" tests. Most achievement testing heretofore has been norm-referenced, indicating an examinee's relative position in a population taking the same test. Scores on such tests are typically reported as grade-equivalent values. In mastery-referenced instruction,

however, there is a need for diagnostic testing that will tell specifically what the student does and doesn't know, and thus enable his placement at an appropriate task level. (Distinctions between norm-referenced and criterion-referenced tests can be found in Robert Glaser and Anthony Nitko, "Measurement in Learning and Instruction", R. L. Thorndike, (ed.), Educational Measurement, Washington, D. C.: American Council on Education, 1970).

Besides calling for criterion-referenced testing, mastery-referenced instruction adds a specific standard of accomplishment that the student is expected to attain. Most often the standard approximates 100 percent. In other words, the student is not judged to have mastered a learning task until he has demonstrated full achievement of each task objective through his performance on a criterion-referenced test.

While the word "test" implies pencil-and-paper exercises, it should not always be conceived in this manner. As has already been pointed out, actual performance of a task, or exhibition of required behaviors, must be evaluated through observation, ratings, and judgments of the instructor. (Ratings by other students and self-rating by each student may supplement the instructor's rating of task performance.) It is vital that the criteria for satisfactory performance on any type of test be clearly stated beforehand. In programs requiring students to choose and perform their own projects, criterion specifications are often delineated in the form of a student-teacher contract in which certain task achievements are clearly required and agreed to.

The dependence of mastery-referenced instruction on individualization is one of logical necessity. It has already been noted in Objective 1 of this unit that within any class group, there are important differences in achievement level, learning rate, learning style, and motivation to learn. These differences will be found in so-called homogenous as well as heterogenous

groups. If instruction is organized and conducted in terms of every student mastering the learning tasks he undertakes, it is essential that such important individual differences be taken into account. This calls for meeting the following requirements:

> Different students will undertake different tasks reflecting the achievement levels they individually have attained in each subject area under consideration.
>
> All students must be allowed varying amounts of time to complete their tasks corresponding to differences in their rates of learning.
>
> Lesson plans for individual students and the instruction they receive must take account of differences in their motivational patterns and learning styles.

If these requirements are to be met, some form of individualized instruction is called for. A summary of the individualization model presented in Objective 2 includes the following points: placement testing of each student in a given curriculum area to determine his level of achievement in that area; pretesting to determine the extent to which he already has mastery of the task to be studied next; diagnosis of individual learning styles; creation of individual lesson plans, specifying task objectives, materials, and procedures; arrangement by the instructor for the student to carry out the individual lesson plan (e.g. provision of needed materials, appropriate learning setting, etc.); provision of time and help needed for mastery either from the teacher or other students; checking the student for mastery on a post-test; and planning for restudy if needed to bring the student to the point of mastery.

Exercise 7

You may find it helpful in your study of mastery-referenced instruction to examine your own educational experiences in relation to mastery. Exercise 7 offers you an invitation to do this. The exercise is optional, and obviously requires no answer key, since your responses are entirely personal.

EXERCISE 7 - WORKSHEET

Personal Experiences with Mastery Learning

Directions: If you choose to do this exercise, use the space provided on the worksheet to state your reactions to the questions and describe your experiences.

1. In your school experience (elementary, secondary, and college levels) to what extent, and how, were you required to master learning tasks (rather than getting average grades, or merely passing)?

2. To what extent, and how, was the instruction you received organized and conducted in terms of your achieving a high level of mastery?

EXERCISE 7 - WORKSHEET (Cont'd.)

3. What personal standards in your course work did you set for yourself in terms of level of mastery? Did you set higher standards in some areas than others?

4. Did you participate in co-curricular activities (science fairs, dramatics, instrumental music or chorus, competitive sports, etc.) where you achieved higher standards of mastery than in your course work?

EXERCISE 7 - WORKSHEET (Cont'd.)

5. What criticism have you of the way universities prepare school leaders and teachers to foster mastery in their students? The following is one college professor's view of current standards of achievement in higher education.

> In a recent article in The New York Times (Dec. 28, 1974) Steven M. Cahn of the University of Vermont criticized the lax standards imposed on today's college students in meeting academic requirements. The following is a resume of his remarks.
>
> American higher education faces a crisis stemming from the increased acceptance among faculty and administrators that students should not be required to do work that displeases them, to take examinations, or to earn better grades. Students have been led to believe they can achieve without effort or self-discipline. They do not realize that the satisfaction of learning must be earned through overcoming challenges, accepting criticism, and setting personal standards.
>
> "...the success of a democracy depends...upon the understanding and capability of its citizens...In the complex world..., to acquire sufficient understanding and capability requires a rigorous education. If we fail to provide that education, we shall have only ourselves to blame, as misguided policies in our universities contribute to the decay of our democracy."

Is his criticism true of university course-work in liberal arts and education according to your experience? If so, what changes would you recommend?

Objective 8. Describe and evaluate varieties of homogeneous grouping as approaches to individualizing instruction.

By far the most frequent way educators have sought to provide for individualizing instruction is that of setting up class groups that are relatively homogeneous in ability or achievement level. The assumption made is that the teacher is better able to adjust instruction to student differences when the range of such differences within a class is reduced. What methods of homogeneous grouping have been employed, what is their potential for individualization, and under what conditions can their potential be realized? What are common failures to achieve individualization via homogeneous grouping?

Varieties of homogeneous grouping

Probably you already are generally familiar with forms of homogeneous grouping. In this case, the brief review that follows will simply refresh your memory in preparation for examining such grouping in relation to individualization. If you desire a more detailed treatment of the topic, four valuable general references are available. These are:

Yates, Alfred (ed). Grouping in Education. New York: Wiley, 1966.

Heathers, Glen. "Grouping." In R. L. Ebel (ed), Encyclopedia of Educational Research. (4th ed). New York: Macmillan, 1969.

Findley, W. G., & Bryan, M. M. Ability Grouping: 1970. Athens, Ga.: University of Georgia Center for Educational Improvement, 1971.

Heathers, Glen. "Overview of Innovations in Organization for Learning." Interchange, 1972, 3, 47-68. (Ontario Institute for Studies in Education.)

Each of these references not only surveys grouping practices but also reviews the research literature evaluating their instructional outcomes.

Grade-level ability grouping. The commonest practice of homogeneous grouping is that of dividing students in a given grade into classes of low, middle, and high "ability" on the basis of tests of general intellectual

performance, scores on academic achievement tests, teacher judgment, or a combination of these criteria. At the elementary level, performance in reading and mathematics provides the chief academic data for setting up groups. This practice at the secondary level usually is called "tracking" in this country, "streaming" in other countries.

Usually the student groups remain the same for study of all of the major subjects. However, sometimes differential grouping, subject-by subject, is employed. At the elementary level, the Joplin plan illustrates this practice by taking students out of homeroom groups and placing them in ability groups for reading. The Stoddard Dual Progress Plan for the elementary school provides for grouping students differentially for study of the English-social studies core, mathematics, and science. (Heathers, Glen. Organizing Schools Through the Dual Progress Plan. Danville, Illinois: Interstate, 1967.) In secondary schools, differential grouping, subject-by-subject, is quite a frequent practice.

intra-class ability sub-grouping. In elementary schools, very often the teacher divides the class into two or three achievement-level sub-groups to help in accommodating students' differences in reading level or math achievement. This sub-grouping is especially likely to occur in heterogeneous classes but it will also be found in classes that result from grade-level ability grouping.

Grouping for remedial instruction in reading or speech. Most elementary schools have the services of a special teacher in remedial reading and speech. Students are taken from their regular classes periodically and assigned to small groups for special instruction in one or both of these subjects.

Special grouping for the intellectually or physically handicapped. Virtually all school systems either conduct or have access to special

education for the intellectually retarded or the physically handicapped. Often the range of differences in special-education classes is large and the classes can be called homogeneous only in that the students have in common types of problems that call for taking them out of the regular class groups. Normally, because of the severity of their educational problems, these students are taught in classes having a very high teacher/student ratio.

Special grouping for the intellectually gifted. Many school systems make provisions for exceptionally talented or advanced students through setting up special groupings for them. This is more apt to happen in secondary than in elementary schools since the high-ability groups at the earlier level in effect constitute gifted groups. However, some school systems that employ heterogeneous grouping in their elementary schools modify this practice by setting up within-grade gifted groups. In secondary schools, provisions for the intellectually gifted are illustrated by honors programs that stress independent study.

The forms of homogeneous grouping just described by no means exhaust the list of methods used. One important additional form, multi-age achievement grouping, will be discussed under Objective 9 as an aspect of nongraded programs, sometimes combined with team teaching.

The potential of homogeneous grouping for individualizing instruction

Essentially, homogeneous grouping seeks to adapt to individual differences among students while retaining an emphasis on group teaching. The chief justification offered for ability grouping is that students at each level have much in common with respect to achievement level and learning rate. The claim is made that such commonalities permit the teacher better to adapt learning materials and equipment, and teaching methods, to the characteristics of individual students assigned to the different groups.

Proponents of homogeneous grouping go beyond claiming that the practice permits adapting instruction in ways that improve learning in groups at all levels. They claim also that such grouping improves both motivation to learn and students' self concepts, because students now are competing with their academic peers; and that students in the low groups now can experience success much more often.

Some formal limitations of homogeneous grouping as an approach to individualization are apparent. A first one is that students seldom are so much alike in relation to studying any learning task that it is proper to assign a predetermined group of them to study the same task at the same time in the same way and at the same pace. Except for remedial, special education, and multi-age ability grouping, it usually is true with homogeneous grouping that the same grade-level curriculum is presented to students grouped at different levels, though instructional methods may differ, group to group.

A second limitation is that homogeneous grouping usually holds the same groups together for study of different curriculum areas, even though it is evident that students' achievement levels vary widely from one curriculum area to another--as was noted in the discussion of student differences in Objective 1 of this unit. Differential grouping, subject-by-subject, is required to take such differences into account; yet such is not the usual practice with homogeneous grouping.

A third limitation of homogeneous grouping for individualization is that it usually makes no specific provisions for distinguishing the instruction offered low, middle, and high groups; this is left up to the teacher to work out. What most often happens is that elementary teachers, in the areas of reading, language arts, and mathematics assume a remedial stance with the low groups, stick to the basic curriculum with the middle groups, and offer enrichment activities to the high groups to keep them within the grade-level

curriculum. This limitation is much less true with formal remedial instruction and with special education where there is more attempt to take individual differences into account. The favorable teacher/student ratio with remedial instruction and with special education of the retarded or handicapped makes this feasible. In gifted groups, the stress on independent study allows for individualization.

In assessing the extent to which homogeneous grouping satisfies the requirements for individualization set forth earlier in this unit (Objective 2), a brief checklist of features of individualized instruction can be used. The eight questions below have been selected to represent the model of individualization presented in Objective 2. For typical homogeneous (or ability) grouping, answers are given opposite the questions. The basic answer for homogeneous grouping, for each question, is NO (though some differentiation on a group basis is apt to occur). Note that this score card for homogeneous grouping does not say that homogeneous grouping never provides for true individualization. It merely says that, when individualization occurs, it is because specific provisions for it have been added to homogeneous grouping as such.

Feature of Individualization	Answer for Homogeneous Grouping
1. Is lesson planning done for individual students rather than for a group.	No.
2. Are students allowed to progress in a subject at individual rates?	No. (Though different ability groups often do so.)
3. Are different learning tasks assigned different students at a given time?	No. (Though often true for different ability groups.)
4. Do different students use different materials or equipment in a lesson?	No. (This may be true for different ability groups.)
5. Are different instructional techniques used with different students?	No. (Except on a group basis.)

Feature of Individualization	Answer for Homogeneous Grouping
6. Is help usually offered students individually rather than in a group?	No.
7. When group teaching occurs, are groups reformed each time the task changes?	No.
8. Are students tested individually whenever they finish a learning task?	No.

The score card for homogeneous grouping, if this summary is correct, indicates a low degree of formal provision for individualization. While the teacher is still free to individualize within ability groups in various ways, the point is that homogeneous grouping as such offers the teacher little help in doing so. Other provisions for individualization clearly are needed.

The research findings on homogeneous grouping that follow are to be expected in view of the limited provisions for individualization just described.

Evidence on homogeneous grouping in relation to individualization

Research studies of homogeneous grouping, as reviewed in the surveys cited above by Findley and Bryan, Heathers, and Yates, give a generally unfavorable report on this approach to individualization. This finding is reinforced by observation of instruction in ability groups where group teaching is the rule. Does your personal experience with ability grouping, either as teacher or observer, support this conclusion?

Only a few major research findings are listed here. If you wish to have a fuller picture, you should turn to one of the research surveys cited. The Findley and Byran study probably is best for this purpose. Seven general findings are presented below.

Finding 1. Teachers try to "cover" the grade level curriculum with all ability groups, urging the low groups forward regardless of their inability to master the learning tasks presented to them and holding back the high groups

so as not to invade the curriculum of the next grade level.

Finding 2. With the low groups, teachers report that they have to "stick to the basics," stressing drill and memorization, while with the high groups they tend to treat learning tasks conceptually and to employ a project approach. This sort of differentiation of instruction is calculated to make school boring and meaningless to students in the low groups. (See Heathers' report on the Dual Progress Plan.)

Finding 3. Teachers generally dislike being assigned low groups, having a strong preference for teaching the high groups. Schools tend to assign the low groups to less-experienced teachers since their status is lower on the staff than older teachers. (See Heathers' report on the Dual Progress Plan.)

Finding 4. Most research studies indicate that students in the low groups learn less well than comparable students assigned to heterogeneous groups. Further, there is no consistent evidence that students in high groups do substantially better than comparable students assigned to heterogeneous groups. (See Findley and Bryan, and Heathers reports.)

Finding 5. Ability grouping results in a segregation of lower-class and minority students into the low groups. (See Findley and Bryan, and Yates reviews.)

Finding 6. Students, once assigned to a low group, tend to remain so assigned, year after year. Once caught in the ability grouping system, a slower student has little chance to move into more-favored groups. (See Yates review.)

Finding 7. There is a stigma associated with being assigned to low groups that tends to have debilitating effects on both academic achievement and self-concept. Findley and Bryan conclude: "The effect of ability grouping on the affective development of children is to reinforce (inflate?) favorable

self-concepts of those assigned to high achievement groups, but also to reinforce unfavorable self-concepts in those assigned to low achievement groups."

This unfavorable report card for homogeneous grouping can be taken as evidence that homogeneous grouping is a poor way to provide for individual differences among students. The inconsistencies in research findings can best be interpreted as evidence that some teachers or some school systems have been successful in finding ways of individualizing instruction within homogeneous groups as well as ways of avoiding the stigma that accompanies being assigned to low groups.

What has been said in criticism of homogeneous grouping generally also needs to be qualified in the case of special education and remedial instruction where there is a strong tradition of individualization aided by favorable teacher/student ratios.

Objective 9. Describe and evaluate nongrading, cooperative teaching, and the open classroom as approaches to individualization.

Three general approaches to meeting student differences that have been widely adopted since 1960 are nongrading, cooperative teaching, and the open classroom. All three have been employed mainly at the elementary level, though nongrading and cooperative teaching are represented in some secondary programs.

Brief descriptions of the three approaches follow, with key references supplied in case you wish to learn more details about any of them. If you already are familiar with any of the three, you will need only to review the descriptive material quickly. Your task in this objective is to become prepared to describe each of the approaches and to evaluate it using a checklist of features of individualized instruction.

Offering descriptions of representative programs for the three approaches is difficult because of the numerous variations of each. With nongrading, the chief focus will be on elementary programs, though attention will also be given the nongraded high school program developed by B. Frank Brown. Cooperative teaching will be presented as a major feature of the Wisconsin program of Individually Guided Education that employs instructional teams in the Multi-Unit School. Only a general description of the open classroom approach is given since there are dozens of programs bearing that label, each differing from the others in significant features.

Following the description of each approach, a checklist on individualization will be used in assessing the extent to which that approach provides for individualizing instruction. A copy of the checklist follows. You will note that the first section contains the same questions that were used in assessing homogeneous grouping. Added are sections on mastery and self-direction.

CHECKLIST FOR ASSESSING INOIVIOUALIZATION, MASTERY, AND SELF-OIRECTION

INDIVIOUALIZATION

1. Is lesson planning on an individual basis?
2. Are students allowed to progress in a subject at different rates?
3. Do students in a class work on different (individual) tasks at a given time?
4. Do different students use different learning materials or equipment in doing a lesson?
5. Do teachers use different instructional techniques with different students?
6. Is help usually offered students individually rather than in a group?
7. When group teaching occurs, are groups reformed each time the learning task changes?
8. Are students tested individually whenever they finish a learning task?

MASTERY

9. Is a mastery criterion set for accomplishing the objectives of a learning task?
10. Are students pretested, then excused from studying those parts of the task on which they showed mastery?
11. Are students posttested to determine their mastery of the objectives of a learning unit?
12. Are students who do not show mastery of unit objectives on the posttest required to study further to reach mastery?

STUOENT SELF-OIRECTION

13. Do students conduct a major part of their learning on a self-directed basis?
14. Oo students have a hand in choosing their learning tasks?
15. Oo students help plan their ways of doing learning tasks?
16. Are programed learning materials used in skill learning?
17. Is student teamwork used so students help one another rather than always depending on the teacher for help?
18. Oo teachers place stress on teaching students competencies in self-managed learning?

NONGRADING

Nongrading refers to any approach that focuses on breaking away from conventional grade-level instruction and enables students to advance in any or all curriculum areas at rates that correspond to their individual capabilities. The assumptions basic to nongraded plans are that learning effectiveness, motivation to learn, and satisfactions at school all are enhanced by accommodating the student's advancement to his learning rate. With slow learners, placing them at their actual level of advancement and allowing them the time required to master tasks are meant to ensure success and reduce needs for remedial instruction. With rapid learners, nongrading is intended to permit moving ahead of the usual grade-level curriculum, thereby reducing experiences of boredom and easy success associated with a pace geared to slower learners.

Most often provisions for nongrading (also called ungrading or continuous progress) occur in elementary schools, particularly at the primary level. In a typical program in a primary school (grades 1-3), students may take between two and four years to accomplish the learning that conventionally is included in the first three grades. Grade-level divisions in the curriculum are erased to allow for continuous progress. Typically, sequences of levels are set up in reading and mathematics. Sometimes grouping is done separately for reading and for mathematics.

Some secondary schools have introduced nongraded programs following the leadership of Melbourne High School, Florida where B. Frank Brown initiated such a program. Brown's program replaces grade-level grouping with a system permitting continuous, nongraded advancement in mathematics, science, English, and history. In each of these areas, the level of work the student performs depends on the scores he has obtained in nationally standardized achievement

tests, while the setting in which he studies depends on his learning skills. The different learning settings, called "phases," includes the remedial Phase 1 in which students receive special assistance in small classes and Phase 5 that allows gifted students to conduct independent study with tutorial supervision by their teachers. (A description of the Melbourne independent study program by Janet Whitmire can be found on pages 50-53 of this unit.

Non-grade-level grouping and advancement assume that teachers will differentiate instruction from group to group and from individual to individual within the group. Such differentiation of instruction is especially apt to occur if nongrading is combined with "cooperative teaching" or "team teaching" as described by Robert Anderson in an article entitled "Some Types of Cooperative Teaching in Current Use" (The National Elementary Principal, special issue on Cooperative Teaching, 1965, vol. 44, pages 22-26). This combination of nongrading and cooperative teaching is a feature of the Wisconsin IGE program that is described next. Unfortunately, in many nongraded programs, there is an almost exclusive reliance on whole-class teaching. Further, studies of such programs have revealed that teachers often are reluctant to depart from the traditional grade-level pace of advancement either with retarded or advanced learners.

The student who wishes to turn to the literature on nongrading should first examine the classic books on the subject. One is The Nongraded Elementary School by John I. Goodlad and Robert H. Anderson (New York: Harcourt, Brace & World, 1959 and 1963 - the revised edition). Another is The Nongraded High School by B. Frank Brown (New York: Prentice-Hall, 1963). Another by Brown, The Appropriate Placement School: A Sophisticated Nongraded Curriculum (West Nyack, New York: Parker Publishing Co., 1965), applies the

"multi-phased" approach to all levels from primary school through senior high school. A more recent work is Continuous Progress Education by Maurie Hillson and Joseph Bongo (Chicago: Science Research Associates, 1971).

Assessing Nongrading for Individualization, Mastery, and Self-Direction

To what extent do nongraded programs satisfy the requirements for individualization? This is a difficult question to answer since there are many varieties of nongraded programs and since in most such programs the extent of individualization practiced depends more on the teacher than on the formal structure of the program.

In assessing individualization in nongraded programs, a major confusion to avoid is that of calling all programs that involve non-grade-level advancement "nongraded programs." This term should be reserved for those programs whose primary, if not sole, purpose is to break from the usual grade-level pattern of advancement. Most of the major individualized programs that are current today incorporate non-grade-level advancement as one prominent feature. However, they have other central features that cause them to bear other labels than nongrading.

Is lesson planning done for individual students?

In most nongraded plans, lesson planning is done for the group rather than for the individual. In Brown's multi-phase plan, individual lesson planning is called for, particularly in Phase 5 that offers gifted students opportunities to do independent study.

Are students allowed to progress in a subject at different rates?

Most generally, the answer to this question is YES for groups, NO for individuals. Aside from programs such as Brown's, the amount of individual variation in advancement rates depends on the teacher rather than the program.

Are different learning tasks assigned class members at a given time?

The answer to this question is YES if one is referring to differences in the tasks assigned different groups set up on a multi-age or multi-grade basis. However, the answer usually is NO if one is referring to individual assignment of tasks.

Do different students use different learning materials or equipment in doing a lesson?

This usually is not formally provided for in nongraded programs. If it occurs from group to group, or individual to individual, it is worked out by the teacher.

Do teachers use different instructional techniques with different students?

Usually, no specific provisions are made for such differentiation, even from group to group. It's ordinarily up to the teacher.

Is help usually offered students individually rather than in a group?

Usually, the answer is NO. In some instances, with specific children, some teachers offer help on an individualized basis. Also, Brown's phases providing remedial instruction and independent study are exceptions.

When group teaching occurs, are groups reformed each time the learning task changes?

Generally, the answer is NO. Nongraded groups tend to be kept the same for instruction within a subject, though often students are grouped differently at the elementary level for instruction in reading and math. Also, in plans combining nongrading with cooperative teaching, grouping often is flexible, changing from task to task.

Are students tested individually whenever they finish a learning task?

The answer is NO. Group testing is the rule in nongraded programs.

Is mastery provided for in nongraded programs?

Questions 9-12 on the checklist concern the setting of a mastery criterion, employing pretesting and posttesting, and holding all students to the criterion set. Nongraded programs ordinarily make no mention of mastery as a criterion either for individual or group progress, though the concept of nongrading implies mastery as a basis for student progress.

Is student self-direction an emphasis in nongraded programs?

Questions 13-18 on the checklist concern student self-direction in terms of choosing, planning, and conducting their learning tasks. Generally, nongraded plans are silent with respect to employing student self-direction except for plans such as Brown's where high school students are encouraged to exhibit self-direction and are permitted to exercise it in independent study.

Summarizing the answers given to questions on how well nongraded programs provide for individualization, the conclusion is that such programs (with the major exception of Brown's Multi-Phase program for the high school) do a poor job. What individualization there is occurs mainly on a group basis, or occurs in those instances where the teacher has worked out ways of differentiating the instruction given individual students. With respect to the related themes of mastery and student self-direction, the answers given also are unfavorable. Do these conclusions correspond to your knowledge of nongrading as an approach to individualization?

COOPERATIVE TEACHING

While informal collaboration of two elementary teachers in teaching the same classes of students has long been a frequent practice, formal programs of cooperative teaching (or team teaching) date from the development of the Harvard model about 1957 with leadership from Francis Keppel, Judson Shaplin, Robert Anderson, John Bahner, and others. The Harvard plan was first installed in the Franklin Elementary School at Lexington, Massachusetts under Superintendent Medill Bair. Cooperative teaching, as defined by Shaplin, occurs when two or more teachers, working together, share responsibility for teaching the same group of students.

Cooperative teaching in the Harvard model, as well as in most other versions, has two major purposes, improving the academic quality of instruction, and taking fuller account of individual differences among students. The first purpose is met by assigning teachers on the team those areas of instruction where they have the greatest knowledge and interest, by having senior teachers on the team help beginning teachers on the team plan and conduct instruction, and by employing teacher aides to perform nonprofessional duties, relieving professional members of the team to devote full time to teaching.

The second purpose--improving individualization--is met through great flexibility in grouping students, through assigning students to teachers they can work best with, and through allowing for variations in the time students spend on learning tasks. There is an emphasis on small-group and tutorial instruction to meet special student needs. Also, it is very common to set up multi-age student teams that are taught on a non-grade-level basis.

Three major references describing cooperative teaching are the following:

Shaplin, Judson T., and Olds, Henry F. Jr. (eds). Team Teaching. New York: Harper & Row, 1964.

Bair, Medill, and Woodward, R. G. Team Teaching in Action. Boston: Houghton-Mifflin, 1964.

"Cooperative Teaching." Special issue of National Elementary Principal, 1965, 44, No. 3.

The best current programs employing cooperative teaching combine team organization with nongrading and numerous specific curriculum provisions for individualization. The program chosen for examination in this objective, Individually Guided Education (IGE) in the Multiunit Elementary School was created under Herbert J. Klausmeier at the Wisconsin Research and Development Center for Cognitive Learning at Madison. According to a 1973 report, the program then was in use in over 1000 elementary schools in 18 states.

IGE is a system for formulating and carrying out instructional programs for individual students in which planned variations are made in what each student learns, how rapidly he learns, and how he goes about learning. The multiunit organization in the program provides for cooperative teaching in multi-age student groups.

Another program called Individually Guided Education having most features in common with the Wisconsin version has been created by the Institute for the Development of Educational Activities (I/D/E/A) of the Kettering Foundation. I/D/E/A's Innovative Programs Division is located in Dayton, Ohio (Suite 300, 5335 Far Hills Avenue) and is directed by Dr. John M. Bahner. Work on testing the program is conducted by the I/D/E/A Research Division located in the University of California at Los Angeles School of Education under Dean John I. Goodlad. This program also is used in many elementary schools across the nation.

Detailed descriptions of the Wisconsin program are to be found in the reference excerpted below, and in the following references:

IGE: Individually Guided Education and the Multiunit School. Education U. S. A. Special Report. National School Public Relations Association, 1972.

Evaluating Instructional Systems: PLAN, IGE, IPI. EPIE Educational Product Report, No. 58. EPIE Institute, 413 West St., New York City, 1974.

The following account is excerpted from Herbert J. Kausmeier and others. Individually Guided Education in the Multiunit Elementary School: Guidelines for Implementation. (Madison, Wisconsin: Wisconsin Research and Development Center for Cognitive Learning, 1971. Pages 14-22 and 25-27.) In reading the program description, keep in mind the features of individualization, mastery, and self-direction given on the checklist.

IGE AND THE MULTIUNIT ELEMENTARY SCHOOL

(Excerpts from Herbert J. Klausmeier and Others, Individually Guided Education in the Multiunit Elementary School. Madison, Wisconsin: Wisconsin Research and Development Center for Cognitive Learning, 1971. Pages 17-22, 25-27.)

IGE is a comprehensive system of education and instruction designed to produce higher educational achievements through providing well for differences among students in rate of learning, learning style, and other characteristics. Much instruction in the IGE system takes the form of a teacher instructing small groups of eight to twenty. There is also considerable independent self-directed study in the instructional materials center by children who can read reasonably well and who have already acquired fundamental concepts. Self-instructional materials or systems are simply one important kind of material or medium to be used in instructional programing for the individual student. The major components of IGE are:

An organization for instruction, a related administrative organization at the building level, and another arrangement at the central office level, together called the MUS-E. This organizational-administrative structure is designed to provide for educational and instructional decision-making at appropriate levels; open communication among students, teachers, and administrators; and accountability by educational personnel at various levels. A staff development program involving the state educational agency, local school systems of the state, and teacher-education institutions has been created to demonstrate, install, and adapt the prototype to local needs.

A model of instructional programing for the individual student. The model, with related guidance procedures, is designed to provide for differences among students in their rates and styles of learning, level of motivation, and other characteristics and also take all the educational objectives of the school into account. This model is outlined in figure 1 and is used by R & D Center personnel in developing curriculum materials and by school staff in implementing IGE.

A model for developing measurement tools and evaluation procedures. The

model includes preassessment of children's readiness, assessment of progress and final achievement with criterion-referenced tests, feedback to the teacher and the child, and evaluation of the IGE design and its components. This model is used by R & D Center personnel in constructing criterion-referenced tests and observation schedules and by school personnel and others in implementing IGE.

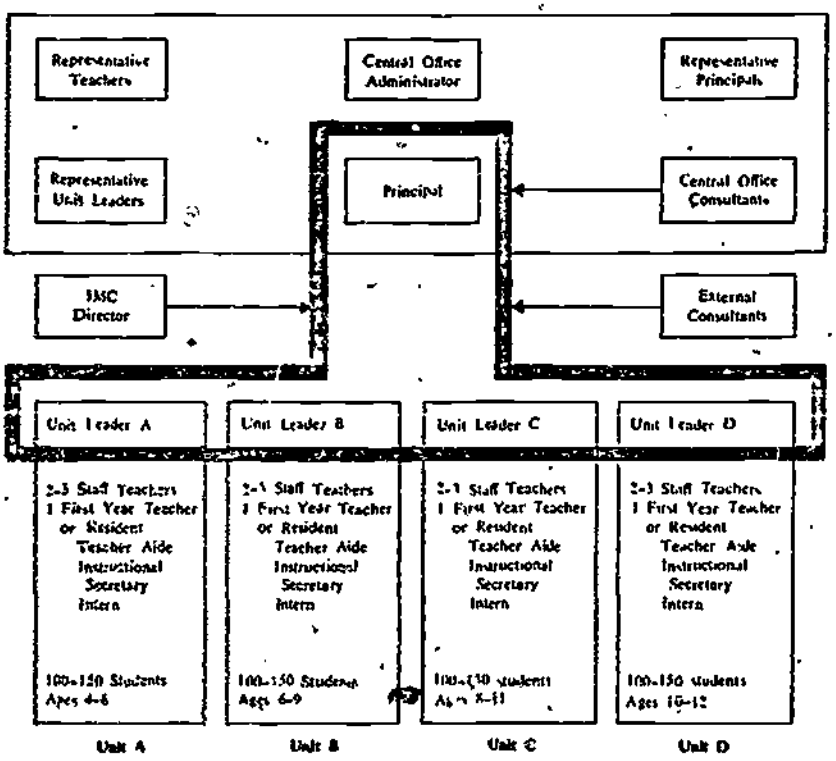
Curriculum materials, related statements of instructional objectives, and criterion-referenced tests and observation schedules. These can be adopted or adapted by the staffs of individual school buildings to suit the characteristics of their students. The R & D Center in 1970-71 was developing materials and instructional procedures in reading, prereading, mathematics, environmental education, and motivation.

A program of home-school communications that reinforces the school's efforts by generating the interest and encouragement of parents and other adults whose attitudes influence pupil motivation and learning. /I/D/E/A/, an affiliate of the Kettering Foundation, is producing staff development materials related to this component.

Facilitative environments in school buildings, school system central offices, state education agencies, and teacher education institutions. Helpful in producing these environments is a staff development program which includes inservice and campus-based educational programs to prepare personnel for the new roles implied by the other six components. Also helpful are state networks comprised of the state education agency, local school systems, and teacher education institutions to install, adapt, and refine IGE practices. The Center in 1970-71 was developing these elements cooperatively with other agencies; however, each school building must also have its own staff development program in order for IGE to be implemented initially and improved thereafter. /I/D/E/A/ is also making a major effort in developing networks.

Continuing research and development to generate knowledge and to produce tested materials and procedures. Especially needed are development and development-based research to refine all the IGE components, and research on learning and instruction to generate knowledge that will lead to improved second-generation components or their replacements. The R & D Center is engaged in these efforts. Each school building must innovate and evaluate and also engage in practical research in order to design, implement, and evaluate instructional programs for individual students.

Figure 2
Organizational Chart of a Multiunit School



The MUS-E Organizational Arrangements

The MUS-E was designed to produce an environment in which instructional programing and the other components of IGE can be introduced and refined. It may be thought of as an invention of organizational arrangements that have emerged since 1965 from a synthesis of theory and practice regarding instructional programing for individual students, horizontal and vertical organization for instruction, role differentiation, shared decision-making by groups, open communication, and administrative and instructional accountability. Space does not permit tracing the historical antecedents of each of these; however, the R & D Center and school personnel attempted to bring together the available research and theory in the formulation of the MUS-E.

Figure 2 shows the *prototype* organization of an MUS-E of 400-600 students.[1] Variations from the prototype are made in terms of the number of students enrolled in the building, the availability of noncertified personnel, the size of the school district, and the like. The organizational hierarchy consists of interrelated groups at three distinct levels of operation: the I & R unit at the classroom level, the IIC at the building level, and the SPC or a similar administrative arrangement at the system level. Each of the first two levels is itself a hierarchical structure with clearly defined roles for personnel. The MUS-E is designed to provide for accountability and responsible participation in decision-making by all the staff of a school system. Each element, while taking the initiative for certain decisions, must secure information from one or both of the other elements. Personnel who serve at each of two levels, as noted in figure 2, provide the communication link.

The I & R Unit

The nongraded instructional and research (I & R) unit replaces the age-graded, self-contained classroom. Research is included in the title to reflect the fact that the staff must continuously do practical research in order to devise and evaluate an instructional program appropriate for each child. In the prototype shown in figure 2, each I & R unit has a unit leader, or lead teacher, two or three staff teachers, one first-year or resident teacher, one instructional secretary, one intern, and 100-150 students.

The main function of each unit is to plan, carry out, and evaluate, as a hierarchical team, instructional programs for the children of the unit. Each

[1] A more complete description is given in H. J. Klausmeier, R. Morrow, and J. W. Walter, *Individually Guided Education in the Multiunit Elementary School: Guidelines for Implementation* (Madison, Wis.: Wisconsin Department of Public Instruction, 1968).

unit engages in a continuous on-the-job staff development program. Some units plan and conduct research and development cooperatively with other agencies, and some are involved in preservice education.

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A Model of Instructional Programing for the Individual Pupil

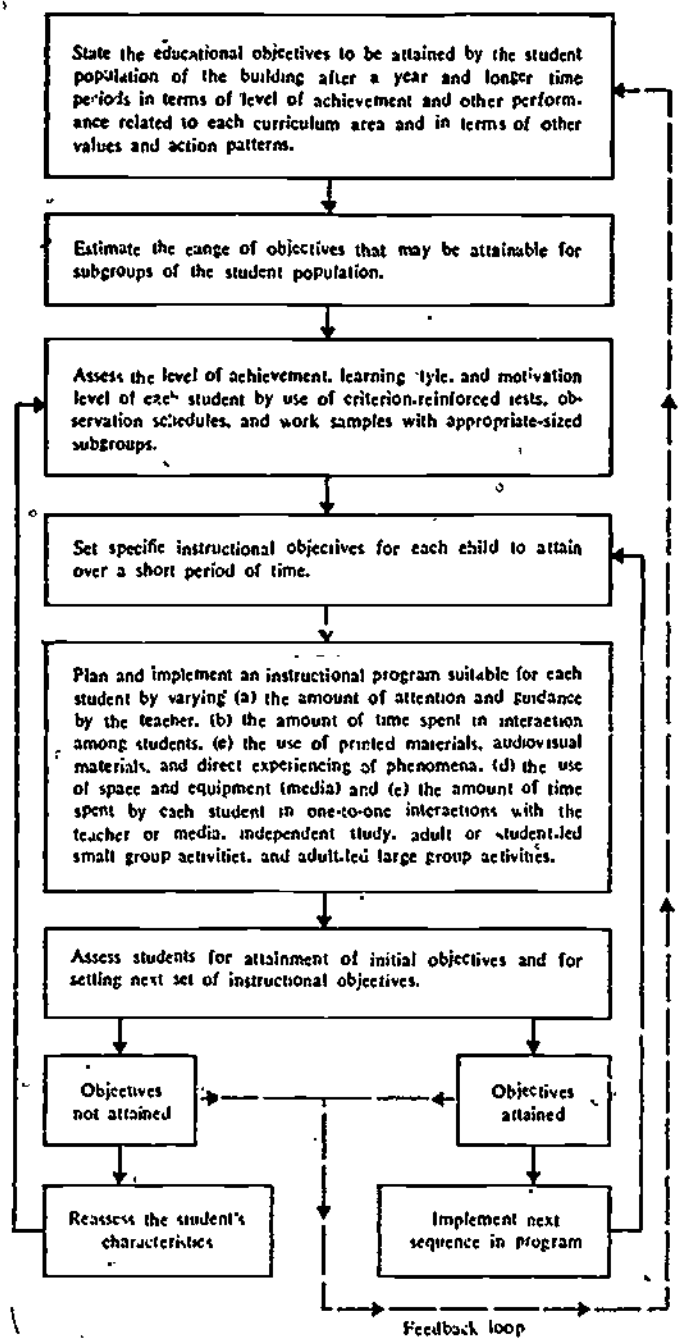
The model of instructional programing in individually guided education is relevant for any area in the cognitive, psychomotor, or affective domain. Thus far it has been carried out most widely in schools that use the Word Attack element of the *Wisconsin Design for Reading Skill Development* and the system of individually guided motivation under development at the Wisconsin (R & D) Center. The model may be applied to a short sequence of instruction for only some children—as is true for the system of motivation—or to all the children in a kindergarten-grade 6 sequence, as is the case for reading.

Individually guided education is different from programed instruction, which involves only the pupil's use of material with little or no assistance from teachers. In the IGE system instructional programing is done by the teachers with assistance from the staffs of the building, central office, and state educational agency. The instructional programing model is designed specifically to take into account the pupil's beginning level of performance, his rate of progress, his style of learning, his motivational level, and other characteristics in the context of the educational program of the building. Figure 1 was presented earlier. The sequential steps are clarified by relating them to the Word Attack element of the *Wisconsin Design for Reading Skill Development*. In chapter 4, the sequence is described in more detail.[2]

Step 1 involves the IIC setting educational objectives in Word Attack for the children of the building. A terminal objective for reading might be: 90 percent of the children attain independence in Word Attack by age ten, 95 percent by age 11, and 99 percent by age 12. Initiative for setting this objective is taken by the IIC; of course, before the objective is set, the unit leaders consult with the unit staffs. Setting this school-wide objective focuses attention of the unit staff on priorities, including setting instructional objectives for individual children and related instructional planning. For instance, if tutoring is possible in only one curriculum area, it will probably be in Word Attack. Similarly, criteria and means will be formulated for assessing independence in Word Attack; and attainment of the objective, rather than age of the child or grade level in school, will deter-

[2]W. Otto and E. N. Askov. *Wisconsin Design for Reading Skill Development, Rationale and Guidelines* (Minneapolis, Minn.: National Computer Systems, 1970).

Figure 1
Instructional Programing Model in IGE



mine when instruction in Word Attack skills ceases for an individual child.

Step 2 calls for identification by the I & R unit staff of a subset of specific instructional objectives that may be appropriate for a group of children. Only some of the forty-five Word Attack objectives, for example, are suitable for children in the early stage of reading.

Step 3 is the actual assessment of each child's level of skill development, either by observing oral reading performances or by administering a machine-scorable group test. A criterion-referenced test has been developed and validated for use in assessing mastery or nonmastery of the skill described by each behavioral objective of the Word Attack element. When the appropriate subset of objective-based tests is administered, the skill deficiencies of each child are pinpointed, and instructional objectives for the individual child can be identified.

Step 4 involves setting instructional objectives for each child in the unit. The behavioral objectives related to the skills in which the child is deficient become the child's instructional objectives. The child and the teacher should discuss these objectives in an individual conference.

The first phase of Step 5 involves planning an instructional program whereby the child attains his objectives. Reasonable cost and adequate pupil progress are provided for by proper grouping of the children for instruction and by utilizing the instructional staff according to the strengths of each member.

Once general plans for the children are set, an individual teacher completes the detailed plan and carries it out for certain children, taking the suggestions of the other professionals in the unit into account. Generally each teacher instructs one or more groups of children who are working toward mastering the same skill. Further grouping may be done within each of these original groups. At this point materials, methods, use of time, and the like are matched to individual pupils with consideration given to their present level of skill development, rate of learning, preferred learning style, and other characteristics. Personal characteristics such as sociability and emotional maturity are also given attention. To the extent that staff is available, individual tutoring and goal-setting conferences are provided for children who profit from them. Some schools have also developed other means of carrying out instruction at this point in the sequence.

A school should have an adequate supply of materials to take into account differences among pupils in rate of attaining the same instructional objectives. Providing for differences in learning style requires audiovisual as well as printed materials. As an example, many children are apparently learning to discriminate among letters and numberals through viewing *Sesame Street*. Some of these children would probably have difficulty using only the materials available in most kindergartens.

In Step 6 of the model pupils are assessed to determine their attainment

of objectives. If the child has attained his instructional objective or a configuration of objectives—that is, if he has met the 80 percent criterion level on the post-assessment—then he moves ahead in the sequence to the next objective. Assessment and related regrouping may occur every four weeks or less. If a child has failed to attain the objectives, his readiness to attain them must be evaluated, as should other parts of the instructional programing sequence as indicated in the feedback loop of figure 1.

The instructional programing implied by the model is considered by some critics to be simply an explicity statement of what excellent teachers do every day. Indeed, one of the features of the model that facilitates its translation into practice is the familiarity of key points to teacher. Certainly the ideas of readiness, frequent assessment, grouping and regrouping, ad hoc grouping and individualization within groups, individual tutoring, and independent study are not new. Many, perhaps most, excellent teachers in self-contained classrooms, however, do not have the time to plan and carry out this pattern of instructional programing. Also, many of our schools have a rapid turnover among teachers and children. A substantial number of teachers are not expert in more than two or three curriculum areas and are unaware of individual programing practices. The best staffs need some help with nearly every step in the sequence. Some of this assistance can be provided by making available criterion-referenced tests, rapid scoring of tests, more suitable instructional materials in the various curriculum areas, and computer management of the testing program and the related indentification of alternative next steps in the sequence.

Assessing IGE for Individualization, Mastery, and Self-Direction

Careful reading of the description of IGE indicates that nearly all of the items on the checklist are provided for in the program. As is true with most programs stressing individualization at the elementary level, provisions for accommodating student differences are more fully worked out in the skill subjects where it is easier to specify learning objectives and where curriculum units designed for student self-direction can more readily be built. Note that the IGE excerpt illustrates individualization by describing instruction in reading.

Individualization

All eight of the items on the checklist dealing with features of individualization receive a YES answer from the description of the Wisconsin IGE program, though the account is not detailed enough to indicate just how the features of individualization are carried out. Much of the time, it appears, planning, teaching, and testing are done with small groups of students, rather than with individuals.

According to the account, lesson planning is done for individual students (Item 1), students progress at different rates (Item 2), students work on different tasks at a given time (Item 3), students working on a task use different materials and equipment (Item 4), and teachers use different instructional methods with different students (Item 5).

The account is less clear with respect to the remaining three items. Help is offered individual students at least part of the time (Item 6), student groups are frequently reformed as learning tasks change (Item 7), and students are tested individually upon completing tasks at least part of the time (Item 8).

Mastery

The description of IGE indicates that mastery is a definite basis for planning and conducting instruction. Mastery criteria are set (Item 9), students are pretested and posttested (Items 10 and 11), and further study is required if students fail to show mastery on the posttest (Item 12). Once again, it should be noted that the illustrations given are of skill learning.

Student Self-Direction

IGE, according to the description, employs a considerable degree of student self-direction: students participate in choosing and planning learning tasks (Items 13 and 14) and perform a good deal of their learning on a self-directed basis (Item 15), with considerable use of programed instructional materials (Item 17). The only item on the checklist that does not receive mention is that of teaching students to be more self-directing (Item 18).

In assessing the program, it should be stressed that a description of the intended features of instruction does not guarantee that all these features are effectively implemented. It is significant that descriptions of IGE place a major responsibility on teachers to work out ways to accomplish the purposes of the program. As is true with other innovative programs, the extent of implementation depends greatly on teachers' acceptance of the instructional procedures called for, and their skill in putting them into practice.

THE OPEN CLASSROOM

The movement to introduce the "open classroom" approach in elementary schools in the United States has derived mainly from recent developments in the English infant schools. A series of articles in 1967 by Joseph Featherstone in The New Republic first attracted widespread attention in this country to the British model. Featherstone's articles bore the title "The Primary School Revolution in Britain." Since then several volumes on the open classroom have appeared including one by J. Blackie, Inside the Primary School (New York: Schocken, 1971), one by A. Hertzberg and E. F. Stone, Schools Are for Children (New York: Schocken, 1971), and one by L. Weber, The English Infant School and Informal Education (Englewood Cliffs, New Jersey: Prentice-Hall, 1971). Charles Silberman's book, Crisis in the Classroom (New York: Vintage Books, 1970) made a strong case for the open-classroom and influenced adoptions of this approach in the United States. A recent excellent description is Informal Education, an Education U.S.A. Special Report published by the National School Public Relations Association in 1972.

Key features of the open classroom, identified by Hertzberg and Stone as frequent though not universal in the programs adopted in the United States are these: the "integrated day" during which students are free to select their learning tasks without set time periods for the different areas of instruction; the use of vertical or "family grouping" which brings together in a class students of different ages; and the setting up of classroom space into "learning bays" or "stations" equipped for study of different types of learning tasks. Blackie stresses the lack of uniformity in arrangements and procedures in British infant schools. A similar lack of uniformity has been noted in this country.

The open classroom approach does not depend on specifically structured and sequenced learning objectives. There usually are no required subjects or required assignments that all students must perform. The intent is to provide a rich and varied set of learning opportunities making much use of concrete materials and stressing interactions among students. The effort is continuously made to let the individual student's interests, learning speed and style, and abilities to relate to other children determine his learning activities. Usually there are no examinations or report cards. Instead, parents receive reports in terms of detailed case histories of their children's work and accomplishments.

The following description of the open-classroom approach has been culled from written accounts and from interviews with practitioners of the open classroom. Before turning to it, it may be useful for you to remind yourself of the questions on the checklist for Individualization, Mastery, and Self-Direction (page 78). Following the description, the checklist will be used in assessing this type of program.

Summary Description of Open Education

The structure of the elementary open classroom is foreign to the observer who has been limited to observing the formal classroom. One notes the absence of desks or places assigned to individual students. Instead, the room is sectioned off by dividers into various areas. The reading corner, for example, may be a cozy nook with an easy chair and a rug. This area is filled with books within easy reach. The arithmetic area may have several tables pushed together to form a large working space. The area is apt to be well supplied with manipulative materials. There is likely also to be a table-height sandbox and a water table for water play. The junk area will have all sorts of boxes, paper, wood, oaktag, etc. A play house may be found somewhere between the music area and the science area. The classroom spills out into hallways that are crammed with display tables and experiments, and into playgrounds, too.

The daily schedule is as flexible as the physical layout. The teacher has full responsibility for classroom scheduling and she, in turn, gives a wide range of options to the children. The teacher lists the activities that are available. The children then proceed to activities of their choice. There is no clear distinction made between subjects in the curriculum, or between work and play. Time allotments to learning activities are highly flexible, depending on the student's interests and learning rate.

The child's role in the open classroom can be described as that of an activist. He chooses his own activities. He may talk freely with others. The two basic rules the child must follow are that he must clean up any messes he has made when he finishes an activity and that he must not bother other children. The noise level of the open classroom is usually high since children are free to move about and talk to one another as they choose.

The open classroom teacher has a very important role in helping the students plan and conduct their learning activities. Since the program lacks formal structure, the teacher assumes the obligation of seeing that the individual children select significant learning tasks and carry them out successfully. The teacher needs to remain continuously aware of what each child is doing, how he is progressing, and how well he is using his capabilities for learning. Observing the open classroom teacher, one notes the continual moving about the room, advising students on their projects, listening to children read, asking questions, offering suggestions, giving approval, and sometimes prodding students to get busy.

Curriculum content and learning materials place emphasis on the child's learning by doing. Thus, in mathematics, stress is placed on materials and activities whereby the child explores uses of mathematics rather than merely memorizing arithmetic facts. The mathematics area may be set up in such a way that the seven-year-old learns:

Sorting and classifying into sets by handling different materials

Counting items or individuals in the classroom

Learning the number line and understanding place value by having several number lines to manipulate

Measuring things in the classroom and making change at the grocery counter

Learning fractions, addition and subtraction, multiplication and division through working with concrete materials

Learning shape and size, including simple proportion, as by using a length of rope and squares of linoleum on the floor to make various shapes and determine their areas

The reading program is not limited to textbooks. Opportunities for reading abound in the open classroom. Five-year-olds may hang around the library as the older children read. The teacher prepares individual experience charts for the children. Vocabulary notebooks are kept. Students ask the

teacher for needed words. Formal phonics and sign vocabulary are given to children if judged necessary. There is no ability grouping and tracking of children according to their reading levels. The child is allowed to proceed at his own rate and in his own way. Teachers sometimes prod but only when they judge that the child's capabilities are up to the task.

Other threads of content that run through the activities of the classroom are highly individualized and creative art, often in the form of group projects. For example, in one classroom there is a large collage of birds made of old pieces of fabric, straw, grass, and other things that produce a variety of textures and colors. Physical activities are stressed. Communication is learned by keeping records, recording experiments, talking with teachers and peers, writing poems or stories, and the like.

Evaluation of the child's performance in open education does not depend on standardized achievement tests. Mainly it involves teachers keeping diary records on the individual children and making case history reports. The Educational Testing Service has proposed an emphasis on such evaluation criteria as the child's resourcefulness, self-perception, interaction with other children, cognitive style, and general language functioning.

In studying the description given above, the reader should hold in mind that it offers a representative account of what is apt to be found in an open classroom. Since the approach depends heavily on the teacher who is called upon to implement a philosophy and a general set of procedures, and since teachers differ greatly in their values and teaching styles, much variation is to be expected from one open classroom to another. The description that has been given here does, however, represent the core of the open classroom approach as developed in Great Britain and as set forth by leading proponents in this country.

Assessing the Open Classroom for Individualization, Mastery, and Self-Direction

In using the checklist, to assess the open classroom's provisions for the individual student, a difficulty is that the program is properly described as informal, meaning that great variation is permitted in the conduct of instruction. Indeed, a chief criticism of the approach as employed in many American schools is that often teachers employ laissez faire procedures, placing so much reliance on students' inclinations that instruction becomes chaotic and ineffective. The assessment that follows is based on the features of the approach described by its leading proponents.

Individualization

The program description calls for virtually all the features of individualization on the checklist. Lessons are individual, students progress at different rates, working on different tasks at a given time. Different learning materials and equipment are used in performing tasks, and teachers employ different instructional methods with different students, offering help mainly on an individual basis. However, considerable use is made of small-group teaching, with groups continually changed. Student work usually is assessed on an individual basis, though teachers depend on informal methods rather than tests.

Mastery

The open classroom does not employ mastery criteria in any formal sense. Again, judging student performance is up to the teacher.

Student self-direction

The program places very strong reliance on student self-direction. Students choose and plan their learning tasks and conduct them mainly on an independent basis or in informal student teams. Little use is made of programed instructional materials; instead students are expected to learn and practice skills in organizing their learning activities.

In summary, the open classroom is distinctive for the strong emphasis it places on student self-direction and on the teacher's role in assisting students to learn on a highly individual basis. (It is of interest that the open classroom can readily accommodate the use of programed materials for skill learning; for example, IPI materials as described later under Objective 10 have been effectively used for learning reading and math skills in open classrooms.)

Objective 10. Describe and evaluate IPI and PLAN as approaches to individualizing instruction.

Two major individualized instructional programs represent a highly-structured approach to curriculum design and instructional procedures. These are Individually Prescribed Instruction (IPI) and Program for Learning in Accordance with Needs (PLAN). Both programs follow closely the eight-step model of individualization presented in Objective 2 and both explicitly employ mastery criteria in planning and monitoring student learning. Both programs have been extensively described in the literature and are widely adopted. In case you already are familiar with either through reading or observation, you will need only to skim the description given in preparation for reading the program assessment.

INDIVIDUALLY PRESCRIBED INSTRUCTION (IPI)

The program named Individually Prescribed Instruction (IPI) originated at the Learning Research and Development Center (LRDC) of the University of Pittsburgh and was designed and developed by Robert Glaser, John Bolvin, C. Mauritz Lindvall, and associates. The program was first implemented in Oakleaf Elementary School in the Baldwin-Whitehall School District in suburban Pittsburgh. Since June 1966, Research for Better Schools (RBS), an educational laboratory located in Philadelphia, has cooperated with LRDC in field development, field testing, and nationwide diffusion of the IPI program.

IPI has been developed mainly for the K-6 elementary school though extensions of the program have been made for the preschool years and for the intermediate school, with adaptations also in adult education (Individual Learning for Adults, or ILA). The program's model for individualization has been applied to the development of instructional programs in reading, spelling, mathematics, science, and social studies.

The IPI system of instruction. IPI follows the instructional model described by Robert G. Scanlon and Mary V. Brown ("Individualizing Instruction." Chapter 7 in Bushnell, David S. and Rappaport, Donald, Planned Change in Education. New York: Harcourt Brace Jovanovich, 1971). They give the essential features of the system in the following quotation:

> "Individually Prescribed Instruction is a system based on a set of specified objectives correlated with diagnostic instruments, curriculum materials, teaching techniques, and management capabilities. The objectives of the system are
>
> 1. to permit student mastery of instructional content at individual learning rates;
> 2. to ensure active student involvement in the learning process;
> 3. to encourage student involvement in learning through self-directed and self-initiated activities;
> 4. to encourage student evaluation of progress toward mastery;

5. to provide instructional materials and techniques based on individual needs and styles."

These authors describe the IPI "developmental model" as made up of these six aspects in relation to the individual student:

"1. detailed specification of educational objectives;

2. organization of methods and materials to attain these objectives, including a variety of paths for mastery of any given objective;

3. a procedure for the diagnosis of student achievement in terms of the educational objectives;

4. individual daily evaluation and guidance of each pupil, including a system for individually prescribing the learning task that the student is ready to undertake;

5. provision for frequent monitoring of student performance in order to inform both the pupil and the teacher of progress toward an objective; and

6. continual evaluation and strengthening of curricular and instructional procedures."

IPI learning materials. In the curriculum areas where the IPI model has been applied, the basic learning materials are organized in terms of a sequence of units. Each unit has an explicit set of learning objectives. For each objective, there are learning materials designed for self-managed learning. The materials may be in the form of booklets, audiotaped lessons, or unit packets containing both written, taped, and manipulative materials. Where appropriate, practice exercises or problems are included.

In each IPI curriculum area, four sorts of tests are provided. Placement tests provide a gross picture of each student's mastery of units along the learning continuum. This information tells the beginning level of instruction for each student. Unit pretests assess the degree to which the student has mastered the unit objectives prior to studying the unit. Curriculum embedded tests (CET's) are included within the learning materials at the end of each objective within a unit to assess mastery of that skill. The CET also contains a second part that serves as a short pretest of the next objective of the unit.

The unit posttest assesses mastery of unit objectives after study of the full unit.

Key references on IPI are given below. The final reference on the list is reproduced on the following pages as a further basis for assessing IPI using the checklist.

Lindvall, C.M., and Bolvin, John O. "Programed Instruction in the Schools: Individually Prescribed Instruction." In Phil C. Lange (ed), Programed Instruction. Sixty-sixth Yearbook of the NSSE, Part II. Chicago: University of Chicago Press, 1967.

Glaser, Robert. "Adapting the Elementary School Curriculum to Individual Performance." Proceedings of the 1967 Invitational Conference on Testing Problems. Princeton, N.J.: Educational Testing Service, 1968. Pp. 3-36.

Weisgerber, Robert A. (ed). Developmental Efforts in Individualized Learning. Itasca, Illinois: Peacock Publishers, 1971. Chapters 7-12, by different authors, are on IPI.

Individually Prescribed Instruction. Education U. S. A. Special Report. Washington, D. C.: National School Public Relations Association, 1968.

Individually Prescribed Instruction - Mathematics. Product Development Report No. 17 by Steven M. Jung. Palo Alto, California: American Institutes for Research, 1972.

Evaluating Instructional Systems: PLAN, IGE, IPI. EPIE Educational Product Report, No. 58. New York: EPIE Institute, 463 West St., New York City, 1974.

The Schools and Individualized Instruction: 6 Perspectives. Philadelphia, Pa: Research for Better Schools, 1700 Market Street. Undated. (This item is of special interest since it describes the use of IPI materials and procedures within IGE and Open Classroom programs, on urban education, etc.)

Pupils Determine Pace. D & E Report, Vol. 1, No. 8, Denver, Colorado: Conference for Educational Development and Research, 1971.

Pupils Determine Pace

Individually Prescribed Instruction (IPI), probably the best known and most widely used individualized instructional system in the country, correlates specific objectives to diagnostic instruments, teaching materials, and methods.

These sequenced, specific educational objectives are used in planning most of the other aspects of the instructional system. Lesson materials, teaching methods, instructional settings, diagnostic tests, as well as the monitoring systems, are geared to these objectives. Thereby, pupils proceed independently at their own pace.

Basic to IPI is a diagnosis of pupil skills and abilities and a continuous monitoring of progress. The learner's initial skills coming into a particular instructional system are diagnosed carefully. The system uses four types of assessment instruments: a placement instrument to locate students on a learning continuum; a pretest of each unit of work to measure the specific objectives within a unit; a posttest of each unit to determine mastery; and a curriculum-embedded test to measure progress.

Uniquely, IPI requires that each pupil's work be guided by a written Prescription. The teacher communicates to the student the choices made in different materials and different settings to achieve an objective. Information about student progress, then, is communicated back to the teacher.

For the initial prescription, the teacher generally considers the following factors: the child's ability level and general maturity, the type of learner, and the student's reaction to various instructional settings.

The core of any individualized program resides in the instructional materials and the prescribed techniques. Figure 1 of IPI student activities illustrates the relationship of this instructional core to the rest of the program.

Historically, IPI originated at the Learning Research and Development Center of the University of Pittsburgh. Research for Better Schools, Inc., responsible for the field development, field testing, and dissemination of IPI, has hastened its development and refinement.

In 1971, 300 schools used the IPI mathematics system with about 80,000 children. In addition, RBS retrained over 3,000 teachers and administrators to work effectively with IPI. (See "additional information" on page 15 regarding availability of IPI math.)

Using the knowledge and technology gained during the development of IPI mathematics, RBS has branched IPI into such areas as reading, science, and social studies.

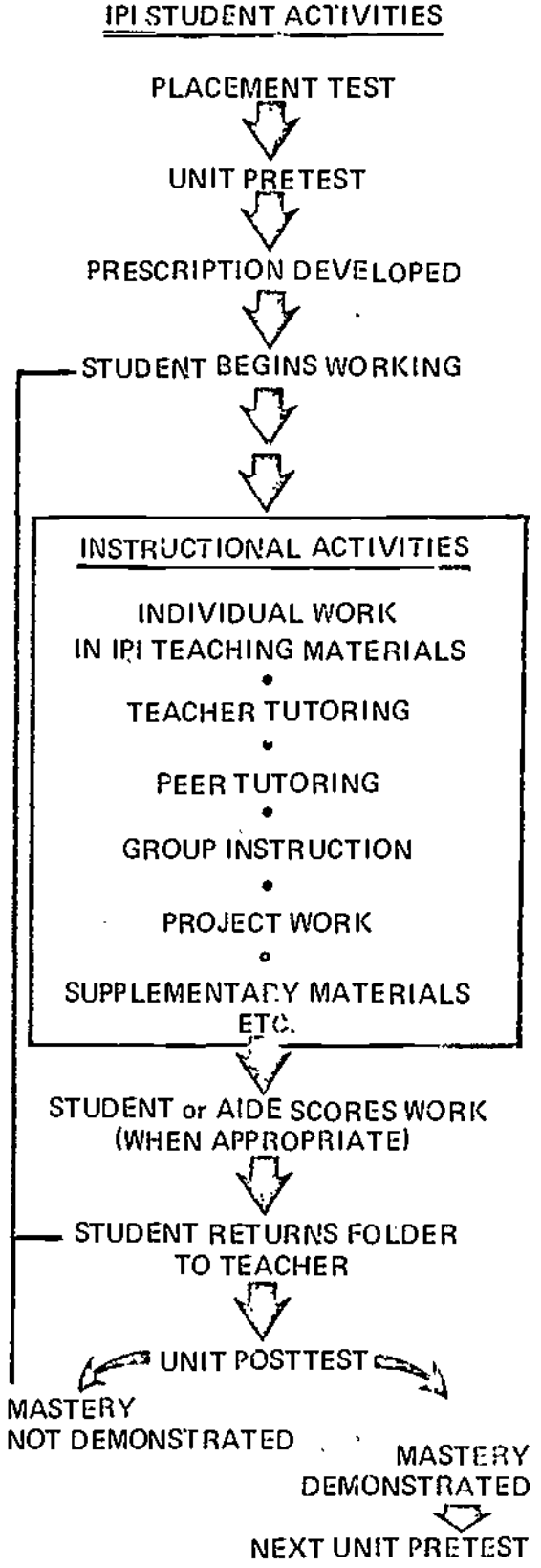


Figure I

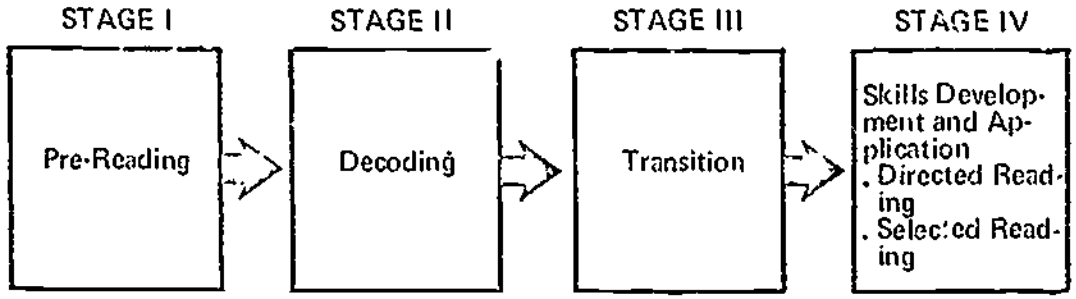


Figure II

The IPI reading curriculum was developed by sequencing specific reading skills and organizing them into units and levels of work.

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IPI reading is built around a set of objectives closely correlated with diagnostic instruments. Through daily diagnosis and evaluation, then, a child is guided through a continuum of skills that he needs to become a fully comprehending reader. This is accomplished in four stages: Prereading, Decoding, Transition, and Skills Development and Application. (See Figure 11.)

Through the use of self-instructional readers and their accompanying tapebooks, early instruction in the reading-skills continuum occurs in stages I, II, and III, without the use of additional instructional materials. Specific tests enable the teacher to pinpoint the child's strengths and weaknesses in the areas of Structural Analysis, Vocabulary Development, Literal Comprehension, Interpretive Comprehension, and Evaluative Comprehension. These tests also maintain, reinforce, and improve the child's reading skills.

The fourth stage, Skills Maintenance and Application, uses specially prepared instructional aids plus library and commercially prepared materials.

Two other sections round out the program. The first, Directed Reading, brings student and teacher together in the reading activity. The second, Selected Reading, allows the student to read books of his own choice and to share his reading experience with the class through activities, and with the teacher through student-teacher conferences.

IPI reading is being tested in approximately forty elementary schools. This number will increase to over 100 by September, 1972. Feedback from these schools will form the basis for further revision and development of the program.

•

RBS also is field testing two innovative elementary science programs, hoping to expand them into complete K-12 programs.

The first is Individualized Science (IS). RBS is field testing, evaluating, and preparing teacher-training materials for the program, which utilizes cassette tapes, special science kits, and student booklets.

Individualized Science has the following major goals:

- *Student Self-Directed Goal* in which the student views the learning process as primarily self-directed and self-initiated
- *Student Coevaluation Goal* in which the student plays a major role in evaluating the quality, extent, and rapidity of his learning
- *Affective goal* in which the student displays positive attitudes toward his study of science, scientific inquiry, and scientific enterprise
- *Scientific Literacy Goal* in which the student acquires a foundation of scientific literacy.

The student plans and manages his own program of studies and chooses among several options to achieve the program's goals.

The IS program, K-3, will be available commercially in fall of 1973. (See page 15 for "additional information.")

The second science program, Science Curriculum for Individualized Learning, involves three instructional modes entitled Exploration, Invention, and Discovery. The student selects his own exploratory lesson from several choices. The student's choice, based on his own interests, provides the teacher with ample information to place him in invention lessons. The student then applies his knowledge from the invention lesson to a discovery lesson.

The first unit of the package, approximately a half year's work, is being field tested by about 160 students in the third and fourth grades.

•

A recent addition to the Laboratory's scope of activities involves the development of a K-12 individualized, multimedia learning program of the social sciences. The interdisciplinary Social Encounters and Research Curriculum for Humanization (SEARCH) will include original instructional materials for students, teachers, and administrators.

RBS' goal for SEARCH is to present a program that fosters the knowledge and skills functional in the life of the learner relative to his individual patterns and potentials. The student's goal is to understand reality well enough to deal with it effectively through encounter, research, and action.

(continued)

The nationwide network of Individualized Schools, established at RBS in 1971, intends to demonstrate to the educational community that individualization is an effective teaching and learning strategy. To date, a three way partnership of state education agencies, local education agencies or districts, and RBS has encouraged forty schools in twenty-six states to join the " network as IPI Demonstration-Training Centers.

The basic objective of the network is to allow school officials interested in an individualized curriculum to visit and see first-hand how a school with an individualized curriculum operates. Hopefully, these network schools can serve as training centers for administrators and teachers who expect to adopt some form of an individualized instructional system.

RBS hopes to establish two Demonstration-Training schools in each state. (See page 15 for "additional information" about how your School may participate.)

Assessing IPI for Individualization, Mastery, and Self-Direction

The descriptions given of IPI make clear that most of the items on the checklist are provided for in this type of program. The program makes explicit provisions for mastery and student self-direction within its individualized framework. The summary assessment in terms of the checklist will help you review or round out your conception of the program's features.

Individualization

IPI makes formal provisions for all eight items on the checklist dealing with individualization. Lesson planning is done for individual students. Different students in a class work on different tasks at a given time, using different learning materials or equipment often. Students usually receive help on a tutorial basis, though often the teacher works with clusters of students where all members of a cluster are working on similar tasks. Teachers use different instructional techniques according to the student's needs. Students proceed with their tasks at different rates. Students are tested individually when they finish a learning task.

Mastery

IPI sets high criteria for mastery of learning tasks. Students are pretested before undertaking a task and, for any task objectives where they show mastery on the pretest, they are permitted to omit those parts of the task. Posttests are used to check mastery of the task after study; if a student does not satisfy the mastery criterion (calling for nearly 100 percent command of the task objectives), further study is required.

Student Self-Direction

In this area, too, IPI rates well. Most student learning is self-directed, using mainly programed learning materials providing the student

with the cues needed for successful performance of the task. Student teamwork is encouraged among students working on similar tasks. In the skill areas, IPI curriculum materials are organized into sequences of units that allow little choice as to which task is undertaken next. Also, in these areas, the programed materials do not allow much choice as to the way of studying a unit. However, in other areas of IPI, such as independent reading and individualized science, students employ considerable self-direction both in the choice of task and of the way of performing it. Teaching competencies in self-direction is not a formal part of IPI; however, teachers help students improve their capabilities in self-direction through tutorial help.

PLAN

PLAN (Program for Learning in Accordance with Needs) was initiated by John Flanagan of the American Institutes for Research (AIR) and developed by AIR in collaboration with Westinghouse Learning Corporation. The program provides a computer-monitored, individualized approach to instruction in four major curriculum areas -- language arts, mathematics, science, and social studies -- for grades 1-12.

PLAN can be described as an ungraded, learner-oriented, computer-supported program in which objectives, content, rate and instructional materials are tailored to the individual student. Its major aims are to help the student:

Develop his own abilities, interests and values

Estimate the level of development of his own abilities, interests and values

Develop skills in planning and personal decision making

Take responsibility for carrying out his individual development

Formulate immediate and long-range educational, occupational, leisure time, social and civic goals based on the information and skills developed in the preceding activities.

To accomplish the above aims, PLAN offers both instruction and guidance. The guidance program deals with the normal development of the student, including awareness of his own capabilities. This includes acquisition of learning skills, realistic goal setting, evaluation of personal alternatives, and management of one's own behavior. The guidance component can also focus on problem detection and remediation via prescribed learning experience and special tutorial treatment.

PLAN learning materials provide Teaching Learning Units (TLU's), or instructional modules, for each student in each major subject area. The various TLU's are adapted from materials the schools already have on hand, making use of audiovisual equipment, and capitalizing on the differences in

instructional approaches of a number of authors and publishers. One TLU may use tape-recorded materials, another printed materials, and another a slide presentation. The student uses the TLU best suited to his own learning style to achieve mastery of module objectives.

When test results indicate that the desired mastery level has been achieved, the student moves on to the next TLU; if tests indicate more work is needed, the student reviews the materials or does further work before retaking the test.

The PLAN computer is an essential factor of the program's design and serves a number of functions; it scores tests, updates students' performance files, provides teachers with weekly status reports, monitors students' schedules, and recommends specific TLU assignments on the basis of empirical data from past performances of other similar students.

The PLAN system of instruction breaks the educational program into sets of behavioral objectives which can be assigned as learning tasks to individual students. At the start of the year, the teacher plans with each student his general educational program for that year. There is no predetermined sequence; rather, each student selects his own educational objectives under the teacher's guidance. About five objectives for a given subject area are grouped in a module, or TLU; since each objective requires about two or three hours to master, the module is therefore about a two-week instructional segment. On the bases of the curricular requirements of the school district plus knowledge of each student's abilities, the teacher indicates both required and recommended objectives. On the basis of his own skills, abilities, learning style and long-range goals, the student selects additional optional objectives.

Monitoring and evaluating individual pupil progress is accomplished through use of test questions related to a particular TLU's objectives. Computer printouts keep track of test scores and performance progress. These

printouts serve a diagnostic function for teachers, enabling them to spend time in both individualized instruction and small group tutoring, as appropriate to the student's needs.

If you are seeking a detailed description of PLAN, an excellent source is the following:

Weisgerber, R. A. (ed). Developmental Efforts in Individualized Learning. Itasca, Illinois: Peacock, 1971.

A summary description of PLAN may be found in a brochure produced as an educational service by Westinghouse Learning Corporation, 100 Park Avenue, New York City 10017. This description, which follows, will help you obtain a clear picture of the features of PLAN.

Description of PLAN

No two children are alike. And no two children learn in the same way. Some learn quickly, others take more time. Almost all do better in one subject than in others. Yet until recently our schools have had to act as if all children learned alike. Success or failure for each student has been measured against a single standard--with the progress of both fast and slow learners judged against an arbitrary system of grade levels. And each child, no matter what his learning strengths and preferences, has had to learn from the same materials, listen to the same lectures, and participate in the same activities as all his classmates.

PLAN (Program for Learning in Accordance with Needs) offers your child the individualized education that best suits his abilities, interests and goals. In addition, PLAN helps each child, in close cooperation with his teacher, to assume active responsibility for his own learning. By encouraging him to plan and manage his own life in the classroom, it helps prepare him to take his place in the world beyond the school.

When your child enters the PLAN program--and he may do so at any level from first grade to senior high depending upon the program available in his school--he is given a series of tests that help his teacher determine where it is best for him to begin work. These tests provide information for student, parent and teacher to use in planning his program. Together, student and teacher determine what his first learning objectives should be and set up a tentative schedule for meeting them. This program is constantly re-evaluated--and revised when necessary--as the child moves along. The PLAN student knows from the first exactly what he is expected to learn, and how long he is expected to take to learn it.

The child's study is guided first by the teacher, who remains at the heart of the PLAN system, and then by a series of printed study guides, or "Teaching-Learning Units". These TLU's have been prepared by classroom teachers and professional educators to suit individual learning styles and to take advantage of a wide range of contemporary learning tools and techniques. The teacher selects the TLU best fitted to each student's abilities, established objectives and interests. For example, the TLU of a student who learns best by listening might direct him to listen and respond to a series of tape recordings. Another student who responds best to the printed page might be asked to go to the library and seek out his own source material.

The student asks to be tested when he and his teacher agree that the student has achieved the objectives set forth in his TLU. PLAN tests are used to determine whether or not the student has mastered his material. They are not used to find out how he stands in relation to his classmates. If the test shows that he has mastered all the objectives, he and his teacher may agree that he should proceed to the next set of objectives. If he has failed to grasp some part, he and his teacher review it before he moves on.

When he completes a TLU, your child will have the satisfaction of having achieved his own goals and having achieved them in the way best suited to his talents.

By allowing children to participate in decisions about their own education, PLAN helps them to develop both as pupils and as people, to discover their own strengths and triumph over their own shortcomings. PLAN students are taught to become independent, resourceful adults.

The teacher is the center of the PLAN program. Studies show that in the standard classroom, teachers are forced to spend too much of their time on administrative and clerical details, from taking attendance to grading tests. PLAN allows the teacher to spend virtually all of her time responding to the needs of individual students, helping them to help themselves.

This new-found freedom to teach is provided by a computer which performs most non-teaching tasks. The instructional management system stores and assesses the findings of each child's tests, suggests how he should proceed, keeps his records up-to-date, grades and records the results of the tests that follow each TLU, and uses the knowledge of many experts in recommending which TLU the student should work on next.

The PLAN classroom is an exciting, active place. There are no rows of desks facing front. No teacher's desk backed by blackboards. Instead, small groups of students cluster together for discussion. Others work alone, quietly absorbed in reading, listening to tapes, watching films, taking tests, performing experiments. Still others move purposefully from one activity to another, following the directions given in their TLU's or working with their classmates. The PLAN teacher instructs students individually or in small groups, providing each student with guidance and encouragement.

PLAN works. Since 1967, children in classrooms across the country have taken part in the PLAN program. Both children and teachers like it; children, because PLAN respects and rewards their independence and initiative; and teachers, because they can see a dramatic rise in the enthusiasm and achievements of their students.

PLAN combines imaginative teaching, today's best learning materials and the most up-to-date technological backing in a program of individualized education, precisely suited to the needs of every child.

Assessing PLAN for Individualization, Mastery, and Self-Direction

PLAN is in many respects like IPI in providing highly-structured learning units and an explicit set of procedures for achieving individualized instruction. Major differences between the two programs are that PLAN's instructional units are syllabi calling for the use of existing curricula rather than being new curricula as is the case with IPI; and that PLAN employs a computer in recording data on each student, in lesson planning, and in scoring tests.

Individualization

PLAN provides for all of the features of individualization in the checklist with the possible exception of setting up group teaching with students who are on the same learning task. Students in a class work on individual lessons planned for them and proceed at different paces. They use different materials and equipment in performing a task. Teachers employ different instructional methods with different students, offering help usually on an individual basis. Students are tested individually when they finish a learning unit.

Mastery

As is the case with IPI, PLAN sets definite criteria of mastery and requires students to satisfy them, with pretesting and posttesting used to monitor progress. With PLAN, very often teacher judgment is relied on in assessing accomplishing of objectives.

Student Self-Direction

PLAN relies very heavily on student self-direction in carrying out learning tasks. A feature of the program is that there is training in self-direction as part of the guidance component. More than is the case

with IPI, students play a role in choosing and planning the tasks they undertake. PLAN makes less use of programed materials than IPI; in PLAN, the chief element of programing lies in the syllabus for a Teaching Learning Unit (TLU) rather than in the structure of the learning materials as such. PLAN is not explicit about student teamwork; as is true with numerous features of the program, teacher judgment is relied on here also.

Objective 11. Compare IPI, PLAN, IGE, and the Open Classroom in terms of their provisions for student self-direction and mastery.

As a way of reviewing your understanding of individualized programs, this objective calls upon you to compare four of the five approaches covered in Objectives 9 and 10. These are IPI, PLAN, IGE, and the Open Classroom. The remaining approach, nongrading, is not included here since its defining feature--non-grade-level advancement--is incorporated in the other four plans in various ways.

The comparisons you are asked to make are limited to self-direction and mastery since all four programs, in one way or another, satisfy the features of individualization on the checklist. The reason for focusing on self-direction is the fact that student self-direction is essential for individualization--as was explained in Objective 3 of this unit. Comparing the four plans in terms of how they provide for self-direction is thus important. The reason for focusing on mastery is that a major purpose of individualizing instruction is to take account of student differences in ways that enable every student to succeed with the tasks undertaken. (You may wish to review the advantages from employing mastery criteria as presented in Objective 6 of this unit.)

To help you in comparing the four plans in terms of their provisions for self-direction, an article by Hull entitled "Selecting an Approach to Individualized Education" follows. This article gives a summary description of each of the four programs, and relates each to a model by Jack Edling. Edling's model simply asks whether the school or the student selects the learning objectives the student pursues, and whether school or student determines the "media" to be employed in performing the learning task.

In reading the Hull article, you will probably note that decisions about what learning task is chosen, or what media are to be used, may be made by the program itself rather than by the school (i.e., the teacher) or the student. Also, in making your comparisons, it is important to hold in mind that each of the programs under review is continually undergoing change or further development. Thus new materials are constantly being built for IPI and IGE. Also, new variations in content or procedures occur in all of the programs as they are placed in operation in various settings.

In comparing the programs, you will doubtless draw on your knowledge of them as gained from study of Objectives 9 and 10. If you wish to gain a further basis for comparing three of the four programs, you will find the following reference helpful:

Evaluating Instructional Systems: PLAN, IGE, IPI. EPIE Evaluation Report Number 58. EPIE Institute, 463 West St., New York City, 1974.

Exercise 8

In the following exercise, write a brief description of how each of the four programs provides for student self-direction. Also indicate the extent to which, and how, each program conducts instruction in terms of a mastery criterion.

When you complete the exercise, compare your answers with those given in the Exercise 8 - Answer Key, understanding that your answers are not expected to agree exactly with those given.

Pages 122-126 removed due to copyright restrictions.

Contents:

Hull, Ronald E. "Selecting an Approach to Individualized Education." Phi Delta Kappan; v55 n3 pp169-173 Nov 1973

EXERCISE 8 - WORKSHEET

Comparison of IPI, PLAN, IGE and the Open Classroom

Directions: For each of the four programs, describe briefly how it provides for student self-direction in the choice of learning tasks and media (materials, equipment, etc.) to be used in performing them. Are decisions built into the programs, made by the teacher, made by teacher and student jointly, or made by the student? Then, for each program, describe the extent to which, and how, mastery of learning tasks is provided for.

STUDENT SELF-DIRECTION

IPI

PLAN

IGE

OPEN CLASSROOM

EXERCISE 8 - WORKSHEET (Cont'd.)

MASTERY

IPI

PLAN

IGE

OPEN CLASSROOM

EXERCISE 8 - ANSWER KEY

Comparison of IPI, PLAN, IGE, and the Open Classroom

STUDENT SELF-DIRECTION

IPI

In this program, the amount and type of self-direction varies with the curriculum area. In the skill areas (reading, spelling, math), the next task the student undertakes is determined by the curriculum sequence. Students often have a hand in choosing the particular materials they use in performing a task, and in the learning setting (alone, with another student, etc.) A high degree of self-direction is called for in working ahead with the prescribed learning materials. Also students are self-directing in checking their work with use of check tests.

In the science area, students have considerable choice of learning tasks and of learning materials, as well as proceeding with tasks on a self-directed basis.

In guided and independent reading, students have a high degree of self-direction in choosing and conducting learning tasks.

PLAN

In this program, students share with the teacher decisions about the choice of learning task and the learning materials to be used in studying it. Study of Teaching Learning Units is conducted on an independent basis, following the guidelines provided in the TLU.

Training in self-direction is provided in the guidance component.

IGE

IGE provides for students having a hand in choosing and planning their learning tasks. Self-directed learning is provided for through the use of programed materials in some areas of instruction. More than is the case with IPI and PLAN, this program makes considerable use of group instruction.

OPEN CLASSROOM

Student self-direction is a very prominent aspect of the open classroom. Students normally choose their learning tasks (though the teacher very often intervenes to influence the choice of task undertaken). Learning proceeds with a high degree of self-direction, with the teacher functioning mainly as a stimulus and guide to learning. The open classroom makes little use of programed learning materials; students, more than in the other plans, are expected to structure their learning activities.

EXERCISE 8 - ANSWER KEY (Cont'd.)

MASTERY

IPI

Mastery is formally provided for in IPI through having a set mastery criterion for each learning unit, and through the use of pretests and posttests to check the student's accomplishment of unit objectives. If a student shows mastery of any unit objectives on the pretest, study of those objectives is not required. If, on the posttest, the mastery criterion is not met, the student is given additional study materials on the objectives not yet mastered, then a further posttest is given.

PLAN

PLAN provides for student mastery in much the same way as IPI. Students are pretested to determine their initial level of achievement. A posttest is used to measure mastery of lesson objectives. If mastery of any objectives is not shown, review or further work is required until the mastery criterion is reached. Often, teacher judgment, rather than answers to formal test questions, is used in assessing mastery.

IGE

This program sets mastery criteria for accomplishing learning objectives, and employs pretests and posttests to assess initial levels of performance and performance after study. If mastery is not shown on the posttest, further study is required.

OPEN CLASSROOM

The description of the open classroom approach does not refer to the use of mastery criteria, or to pretesting and posttesting. If mastery criteria are set and made a basis for judging a student's progress, it is because the teacher decides to do so. Teacher judgment is relied on heavily in assessing a student's work since formal testing is not a feature of this type of program.

Objective 12. Identify or describe an individualized program you would recommend to a school district and justify your choice.

From your previous experience, as well as from study of this unit, you have your own conception of what constitutes a sound program for individualizing instruction. Perhaps you believe that one of the programs described in this unit is the best approach, perhaps not.

In this objective, you are asked to set down your own view of what would be a good program for a school system to adopt, assuming the district indicated the desire to introduce individualized instruction. In addition, you are asked to give your reasons for recommending the program.

Exercise 9

In this exercise, select the level of instruction--elementary school, middle school, or senior high school--for which you choose to recommend an individualized program.

Next, either identify the program if it is one of those described in this unit, or specify features of two or more programs you would combine into a recommended program, or describe some program you would recommend other than those presented in this unit.

After indicating or describing your recommended program, offer a justification for your recommendation that would help a school system see the merits of your choice.

EXERCISE 9 - WORKSHEET

Personal Recommendation for an Individualized Program

Directions: Indicate or describe the program of individualized instruction you would recommend to a school district and justify your recommendation by pointing out its merits and indicating why you consider it superior to other individualized approaches.

LEVEL OF SCHOOLING (Check): Elementary___ Middle___ Senior High___

PROGRAM RECOMMENDED

Check if one of these: IPI___ PLAN___ IGE___ Open Classroom___ Nongrading___

Program Description (if not one of the above):

REASONS FOR RECOMMENDING THIS PROGRAM

Use back of sheet if more space is needed.

Objective 13. State your view on the values for the student's intellectual and personal development of individualization, self-direction, and mastery.

This unit has reviewed individualization, mastery, and student self-direction as themes of the instructional program and has examined various programs designed to place those themes in operation in schools. This concluding objective of the unit gives you the opportunity to state your view--based on prior knowledge of these themes as well as on study of the unit--of the values for the student of instruction that is conducted in terms of these three purposes.

Assume that the three themes were effectively implemented in an instructional program--perhaps the program you recommended under Objective 12. What would you expect this to contribute to a student's intellectual development--skills, knowledge, competencies in dealing with academic and practical tasks, interests, etc.? Also, what would you expect this would contribute to the student's development as a person--values, attitudes toward self, effectiveness in relations with others, etc.?

In giving your view, think of individualization as any sound approach that suits instruction to the needs and learner characteristics of the individual student. Think of self-direction in terms of the use of structured learning materials, capabilities of planning and conducting independent learning, or student teamwork in performing learning tasks. Think of mastery as meaning that every student achieves a standard of excellence in whatever learning tasks are undertaken.

Since you are expressing your view, there is no Answer Key given. However, following the exercise, some suggestions are given as to points you might have included.

EXERCISE 10 - WORKSHEET

Your View on How Individualization, Self-Direction, and Mastery Contribute to the Student's Intellectual and Personal Development

Directions: On this page, state your view on how the three themes, if effectively implemented, would contribute to the student's intellectual development. In your answer, you can treat the three themes separately, or together. On the following page, give your view on how implementing these themes would contribute to the student's personal development.

If effectively implemented, how would individualization, self-direction, and mastery contribute to the student's intellectual development?

EXERCISE 10 - WORKSHEET (Cont'd.)

If effectively implemented, how would individualization, self-direction, and mastery contribute to the student's personal development?

Suggestions on Values of Individualization, Self-Direction, and Mastery for the Student

The student's intellectual development

Individualization, through adapting the contents, methods, and pacing of instruction to the learner, should greatly help each student reach his intellectual potential. Individualizing the choice of learning tasks should ensure that what the student works on is relevant to that student's learning needs. Individualizing the selection of learning materials, equipment, settings, and procedures should ensure that each student makes effective use of learning resources. Allowing for individual differences in learning rate would provide each student the time needed to complete a learning task and to proceed to another task immediately upon completing a given task.

Individualization with mastery would ensure that each student learned well what he studied, with several benefits from this: better retention, a better foundation for further learning, and an enhanced interest in learning resulting from experiences of success.

Student self-direction in an individualized program would give the student a basis for proceeding with learning tasks without depending on constant help from the teacher. Also, through learning how to employ self-direction, the student would gain in intellectual independence, becoming able to deal with learning tasks outside of school as well as in school without having to rely on others.

The student's personal development

Individualized instruction, by permitting each student to feel that the learning task was his own, should enhance the student's sense of being an unique individual rather than merely a member of the "human herd." Also, the experience of being helped by teachers on an individual basis should help the student develop a sense of identity and personal worth.

Individualization with mastery can be expected to enhance the student's sense of competence and personal worth. Nothing succeeds like success and many students who would fail in traditional instructional programs, would now, through having success with learning tasks, experience learning as an enjoyable experience.

Learning with self-direction would enhance the student's sense of competence, lessen dependence on others, and produce feelings of confidence in undertaking various tasks at school, at work, or elsewhere in life.

POST-ASSESSMENT EXERCISE - UNIT 4

Directions: The purpose of this post-assessment is to enable you and your instructor to check your mastery of unit objectives after study.

It is not essential that you answer on this post-assessment those questions dealing with objectives where you showed mastery on the pre-assessment.

If you have difficulty in offering an adequate answer to any of the questions, it is recommended that you review the material under the objectives those questions involve.

Your instructor may wish to review your answers with you, or to conduct a group discussion on the unit based on the Post-Assessment.

Objective 1. Describe individual differences among students of the same age in achievement, learning rate, learning "style," and interests.

Achievement differences

Differences in learning rate

Differences in learning style

Differences in interests

Objective 2a. Give a one-sentence definition of individualization.

Objective 2b. What are several ways ("modes") in which instruction can be conducted to take account of individual differences?

Objective 2c. What steps should a teacher follow in planning and conducting instruction offered an individual student?

Objective 3. Justify student self-direction as a learning goal and as a requirement for individualization.

Objective 4. Describe three ways of having student self-direction in an instructional program.

Objective 5. This objective deals with your personal experiences. .It is not appropriate for this Post-Assessment.

Objective 6a. Define mastery-referenced instruction.

Objective 6b. State the advantages for students of instruction based on having all students master their learning tasks.

Objective 6c. State the advantages for teachers of instruction where all students master their learning tasks.

Objective 7. State the requirements an instructional program must meet if all students are to achieve mastery of their learning tasks.

Objective 8. Evaluate homogeneous or "ability" grouping as a way of meeting individual differences among students.

Objective 9. Indicate by checking below how well acquainted you are with each of these approaches to individualization. H - highly familiar; M = moderately familiar; L = low familiarity; 0 = unfamiliar.

	H	M	L	0
Nongrading (non-grade-level-advancement)	___	___	___	___
Cooperative teaching in Individually Guided Education (IGE)	___	___	___	___
Open classroom plans for organizing instruction	___	___	___	___

Objective 10. Indicate by checking how familiar you are with these two programs for individualizing instruction. Use the same code.

	H	M	L	0
Individually Prescribed Instruction (IPI)	___	___	___	___
Program for Learning in Accordance with Needs (PLAN)	___	___	___	___

Objective 11. This objective, calling for a specific comparison of four approaches to individualization, is not appropriate for this Post-Assessment.

Objective 12. This objective calls for a statement of your conception of individualization and is not appropriate for this Post-Assessment.

Objective 13. This objective also asks for your personal judgments and is not appropriate for Post-Assessment.

PRE- AND POST-ASSESSMENT EXERCISE - ANSWER KEY

Explanation of Answer Key. Rather than giving complete answers to the questions in the Pre- or Post-Assessment Exercise, this Answer Key offers you a basis for judging your answers by indicating key points you should have included. Full Answers to the questions will, of course, be found in the unit contents.

Obj. 1. Describe individual differences among students of the same age.

Achievement differences

Students at any age or grade level differ from one another by several grade levels.

For the same student, achievement level usually varies considerably from one subject to another.

As students advance through the grades, the differences in achievement level between the lowest and highest students increases.

Differences in learning rate

The key point here is that slower learners may take five or more times longer to complete a learning task than rapid learners.

Differences in learning style

Different students require different materials, settings, and methods for effective learning.

Examples of learning style differences: concrete vs. abstract materials, individual vs. group settings, aural vs. visual modes, teacher-direction vs. self-direction.

Differences in interests

Here you should have noted differences in interests in various school subjects, and differences in hobbies, social concerns, career orientation, esthetics, sports, etc.

Obj. 2a. One sentence definition of individualization.

Your definition should have referred to planning and conducting instruction of the individual learner in ways that take account of his learning needs, achievement level, and characteristics as a learner.

Obj. 2b. Modes of individualizing instruction.

For an adequate answer you should have included most of the following ways of differentiating instruction from one student to another:

--- assessing the student's initial level of achievement

--- diagnosing the student's learner characteristics

--- planning for each student rather than for a group

--- offering students individual help as needed

--- assessing achievement of a learning task on an individual basis

Obj. 3. Self-direction as a learning goal and a requirement for individualization.

Learning to be self-directing is important because many times in life we need to learn things without a teacher's help. Also, if we are not self-directing we have to depend on others for answers to our learning needs -- acquiring new skills, learning about jobs, evaluating political candidates, etc.

Since a teacher cannot give constant attention to each individual student, individualization requires that students spend most of their time learning without immediate help from the teacher.

Obj. 4. Three ways of having student self-direction in an instructional program.

An adequate answer should include learning with the use of structured materials, receiving help from fellow students, and being able to plan and conduct learning tasks independently.

Obj. 5. Not included in the Pre- and Post-Assessment Exercises.

Obj. 6a. Definition of mastery-referenced instruction.

Your answer should have indicated that this calls for having all students satisfy the same standard of excellence in performing a learning task they undertake.

Obj. 6b. Advantages for students of mastery-referenced instruction.

An adequate answer would include these points:

--- better retention of what was studied

--- provision of a foundation for further learning in a subject

--- better basis for applying what was learned

--- contribution to feelings of competence and personal worth.

Obj. 6c. Advantages for teachers of mastery-referenced instruction.

Key points to include would be:

--- freedom from remedial instruction

--- satisfaction from succeeding with all students

--- improved relationships with many students

Obj. 7. Requirements for mastery-referenced instruction.

These are critical requirements that need to be met:

--- standards of mastery must be set for all learning tasks

--- students must be assigned tasks based on their actual levels of achievement

--- students' lesson plans must take account of their individual learning styles

--- students must be allowed different lengths of time to complete their tasks

--- teachers must offer students help with their learning difficulties

--- if a student does not show mastery of a task, further study must be required until mastery is reached

Obj. 8. Evaluating ability grouping as a way to individualize instruction.

No method of ability grouping can produce truly homogeneous groups because each student differs from each other in achievement from subject to subject, or within a subject, as well as in learner characteristics.

Whole-group or sub-group teaching is the rule with ability grouping and thus does not take account of individual differences within the group.

Students assigned to low groups generally feel stigmatized and are apt to have less motivation to learn.

Objs. 9 & 10. With these objectives your judgment of how familiar you are with each approach to individualization was the only answer required.

Objs. 11-13. These objectives are not included in the Pre- and Post-Assessment Exercises.

Training for Leadership in Local
Educational Improvement Programs

UNIT EVALUATION FORM

Unit 4. Individualization, Mastery, and Student Self-Direction as Themes of Educational Reform, with Related Innovations

Evaluation by_____ Date_____

Position_____ Organization_____

Please give your reactions to this unit by checking and writing in your opinions and recommendations. Returning this form to Research for Better Schools, 1700 Market St., Philadelphia, Pa. 19103 (Attention: Glen Heathers) will help us judge the value of the unit as well as aiding in its revision.

A. Your judgment on the importance of a unit on this topic as training for leadership in local educational improvement programs.

Check: Very High___ High___ Moderate___ Low___ Very Low___

Your comments:

B. Your judgment of the quality of the introductory section of the unit.

Check: Very High___ High___ Moderate___ Low___ Very Low___

Your comments:

C. Your judgment of the adequacy of the set of unit objectives.

Check: Very High___ High___ Moderate___ Low___ Very Low___

What objectives do you recommend omitting? Why?

What objectives do you recommend adding? Why?

Unit Evaluation Form - Con't.

D. Your judgment on the quality of the unit contents.
Check: Very High___ High___ Moderate___ Low___ Very Low___
Your comments:

E. Your judgment on the quality of the unit exercises.
Check: Very High___ High___ Moderate___ Low___ Very Low___
Your comments:

F. Your judgment on the quality of the unit pre- and post-assessments.
Check: Very High___ High___ Moderate___ Low___ Very Low___
Your comments:

G. About how many hours did you take to complete this unit?_____

H. How valuable do you judge this unit to be for training each of the following categories of educational leaders? Please enter the appropriate symbol.
H - Highly valuable. M - Moderately valuable. L - Low value

___ School system central administrators

___ Building principals

___ Curriculum coordinators

___ Field consultants of state education departments

___ Graduate students in administration or supervision

___ Other: