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ABSTRACT

The paper presents a research review on individualization of instruction in special education. An initial section analyzes the concept and definitions of the term, noting similarities with such terms as adaptive instruction, differentiated instruction, and prescriptive teaching. Related concepts of independent study and self directed learning are considered. Conditions seen to promote individual learning are addressed in terms of grouping practices and recognition of individual differences. Specific implications of individualized instruction in special education are noted, and methods of individualizing instruction are reviewed. The history of individualization of instruction in the United States is traced: administrative provisions and early systems of individualized instruction are pointed out. Services to special populations are described along with an account of the growing emphasis on individualization of a general education strategy. The implications of individualized education programs as mandated in P.L. 94-142, the Education for All Handicapped Children Act are described in the concluding section. A seven-page reference list is appended. (CL)

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An Examination of Individualized Instruction

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ERIC Clearinghouse on Handicapped and Gifted Children
Reston, Virginia

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AN EXAMINATION OF INDIVIDUALIZED INSTRUCTION

Jill S. Winter

This paper was developed under the auspices of a special project which is investigating the contribution of research to special education practice. The first practice identified for investigation was individualization of instruction. This paper provides background information on the concept, definitions, and history of individualized instruction in American education. Through an analysis and synthesis of representative literature, it is hoped that it will be useful in the design of future project research activities.

CONCEPT AND DEFINITIONS

Leamon (1975) observed that "individualized instruction" is one of the most commonly used expressions in American English. Indeed, discussions of its applications in the educational literature typically presuppose an understanding of its meaning. Defining individualized instruction is an undertaking which most authors ignore, presumably because they feel it is unnecessary. It is obvious, however, that there are perceived differences in interpretation, judging from the different ways in which it is used.

> To some the concept denotes a philosophy. To some the term means a method, a technique, or an approach. To others the words refer to an attitude toward learning or toward people, or both. Or perhaps, in the unforgettable terminology of the objective-type quiz, we could add: All of the above; None of the above.

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> Yet does anyone know what the expression really means? Or is the term... 'semantically empty'? (Leamon 1975, p. 345)

Wolfe (1971) illustrated the dimensions of the problem rather precisely when he pointed out the two major differences in interpretation of the term "individualized reading," noting the need to distinguish between its use as "(1) a descriptive label for a learning approach in reading; and (2) descriptive labels of accommodations for pupil differences within various learning approaches and within various administrative procedures" (p. 122). A similar need exists to distinguish between the broader and the more specific interpretations of the term "individualized instruction" when it is discussed in a particular instructional or research context. Without concurrence on at least the general parameters of the definition, misunderstandings may occur. The difficulty of the task, however, is recognized by Menefee (1981), who quoted the remark of a frustrated Supreme Court justice who was trying to get a grip on the concept of pornography. "He stated that he couldn't define it but he knew it when he saw it. The ability to 'recognize it when you see it' may be a useful operational definition" (p. 39).

Scope of definitions

Certainly it would be difficult to arrive at a single definition of individualized instruction whose precise wording would satisfy all educators. Nevertheless, defining the broad boundaries of common agreement is a feasible task. At one end of the

continuum is a generic family of definitions which center upon the notion of adapting instruction to meet the needs of individual learners--in whatever form of individual or group learning experience that adaptation may take (Chastain 1975, Clem 1932, Dunn 1971, Reynolds & Rosen 1976, Weisgerber 1971a). Among the most succinctly stated of these definitions is Cooley and Glaser's (1969) reference to individualized education as "essentially the adaptation of instructional practices to individual requirements" (p. 574). (To substitute the word "instruction" for "education" does not distort either the intent or the interpretation.) Another typical definition is that of Clymer and Kearney (1962), who describe individualization of instruction as "...the steps taken to meet the needs of pupils, each of whom is a unique individual" (p. 268). Even more broad, perhaps, is Musgrave's (1975) assertion that "anytime...the school situation is focusing on the individual student in the teaching-learning process, another step is being made toward the ultimate goal of individualization of instruction" (p. x).

When the notion of individualized instruction is defined in this very general sense, it is for all practical purposes (short of finely tuned philosophical differences) synonymous with the more recently popularized term <u>adaptive instruction</u> or adaptive education. As noted by Johnson and Johnson (1985), "adaptive instruction may be defined as the use of alternative instructional strategies and school resources to provide learning experiences that meet the needs of individual students" (p. 105).

Adaptive instruction, as well as the broadest interpretation of the term individualized instruction, refers to "instruction that effectively accommodates differences in the learning characteristics and needs of individual students...." (Wang & Walberg 1985, p. 325). The term differentiated instruction has parallel connotations. According to Stahl and Anzalone (1970), "you differentiate when you recognize and accept the different learning needs within the class and modify your methods to meet some of those needs" (p. 26).

The definition of prescriptive teaching (or diagnostic teaching) also contains most of the major elements of a broad definition of individualized instruction. Hobbs, Bartel, Dokecki, Gallagher, and Reynolds (1979) noted that this term, in special education, "has come to describe instructional practices based on an individual learner's characteristics and competencies" (p. 32). The role of assessment in this concept is certainly a dominant one (Laycock 1980b) compared to the more balanced part it plays in a traditional concept of individualized instruction.

At the other end of the continuum of definitions (Thomas, Habowsky, Doyle, & Hertzler 1981) is the literal interpretation of "individualized instruction" as truly individual instruction (one-to-one teaching or tutoring). Whether this notion is acknowledged in principle and then rejected as impractical and costly (Martin 1972), or whether it is rejected in theory at the

outset (Clymer & Kearney 1962), individual instruction is generally seen as a narrow, discrete concept which may, on occasion, be a particular method of providing individualized instruction. The steps taken to individualize instruction, according to Clymer and Kearney,

> include...the creation of situations in which pupils will work and be considered both as individuals and as members of groups. In no sense should 'individualizing of instruction' be equated with 'individual teaching' or tutoring. (p. 268)

Somewhere in the middle of the continuum one finds an historically accepted definition of individualized instruction (one which is still applied today) as specially designed programs of instruction with which students interact on an individual basis. These programs are

> primarily oriented to conveying a specific curriculum, especially in math, reading, and language....The idea is...to break the content and behaviors into small, sequential units, to keep detailed records as to each child's placement in [a] preconceived hierarchy, and to provide each child with materials and experiences which will facilitate attaining the criterion behaviors. (Stern & Keislar 1975, p. 50)

Mastery learning, self-paced instructional materials, and individual evaluation (rather than comparisons with group achievement) are standard characteristics of these instructional programs. Historically, it is this relatively well-defined concept of individualized instruction which is reflected in early twentieth-century efforts to "individualize" elements of the curriculum that did not require group instruction, and in the

elaborate systems of individualized instruction developed during the 1960s and beyond.

In specially designed programs of this type, instruction is indeed delivered "individually" -- albeit by interaction with curriculum materials rather than with a teacher or tutor. In this vein, Wilkins and Miller (1983) defined <u>individualize</u> as meaning "to gear the curriculum so that each student reads and does written work at his or her own level and pace. Methods are built in to deal with each student's weaknesses" (p. 263). Consistent with this definition is Baine's (1982) list of characteristics which may be used to evaluate the degree to which an instructional program is individualized.

> 1. The rate of progress (pacing) can be slowed or accelerated as required.
> 2. Program steps can be omitted by capable learners.
> 3. Remedial exercises are included.
> 4. The instructional presentation mode can be modified.
> 5. The manner of student response to materials can be adapted.
> 6. Directions, instructional format, materials, and the style of learner response are suitable to age, grade, sex, functional level, and diagnostic category. (p. 283)

Programmed instructional modules and computer-assisted instructional software are good examples of instructional materials that have all or most of these features.

It is this more strictly confined perception of individualized instruction which appears to guide the responses of teachers who applaud the goal of individualization, but point out the lack

of time, curriculum resources, and funds to provide it in practice (Bosco 1971, Haring & Schiefelbusch 1976, Stern & Keislar 1975). When individualized instruction is equated with such structured programs, the concept may also elicit the type of criticism leveled by Wassermann (1984), who noted that concern for the development of interpersonal skills, moral and ethical behavior, and thinking abilities is "chillingly absent from...individualized, self-paced, self-selected learning programs" (p. 691).

Mastery of content is indeed the primary objective of this type of individualized instruction, and the built-in characteristics described by Baine are the factors which are perceived to provide flexibility--primarily by adapting the rate and mode of delivery to suit the idiosyncrasies of the learner. Wilhelms (1962) observed that

> [The] conception of a curriculum as a set body of content is not altogether false. There <u>are</u> specifics of knowledge which in our culture need to be learned by everyone, and some of them must be acquired in a sequence that builds brick by brick....Provision for differences is not the only 'good' to be sought in a curriculum. It must also guarantee the knowledge and skill which is a <u>common</u> necessity. (p. 67)

Nevertheless, Wilhelms concluded that educators have historically had a tendency to define individualization in too narrow and restricted a sense, confining the concept

> ...to little more than <u>rate of progress</u>. One must have a meager conception of individualization to settle for students merely being

> able to do [the] same things at a different pace. Such 'individualization' largely fails to come to grips with the fundamental differences among students--differences in their interests and purposes, their personal needs, and their whole mode of thinking and learning. (p. 65)

On the other hand, should one seek the broadest implications of individualizing instruction, it is easy to be overwhelmed by Dunn's (1971) listing of factors that must be considered in the individualization of educational programs:

1. What the students needs to know
2. What the students would like to know
3. What the student already knows
4. The rate at which the selected content should be presented
5. The sequence in which that content should be presented
6. The size of the steps in the sequence of that content
7. The mode of presentation of that content
8. The amount, type, and schedule of feedback associated with the presentation
9. The difficulty level of the learning materials used to teach the content
10. The meaningfulness of the content to the individual learner
11. The nature of the physical and social context in which the teacher-learning takes place
12. The contemporary affect state, including the motivational state, of the learner at the time of learning
13. The amount of teacher supervision--media richness--technology involved
14. The amount of variation provided for in the learning program
15. The amount of overlearning and/or periodic review built into the program, and so forth. (pp. 29-30)

Dunn argued that this "massive monitoring task" requires computer support services. Certainly it does appear to require something

superhuman, and suggests why teachers may be wary of the practical implications of individualization of instruction.

It is interesting to note that broad definitions of individualized instruction are child-centered, while the narrower definitions tend to be subject-centered. In practice, the concept of individualized instruction has served both philosophies, which Goodlad (1962) called the two "ideal" perceptions of school function. He pointed out, however, an inevitable degree of overlap as proponents of one view or the other attempt to translate their convictions into practice.

> Teachers who passionately extol the school's obligation to promote human variability (child-centered?) protest the lack of readiness for grade-level work (subject-centered?) in the entering group. Teachers who see the school's function as developing the 3 R's (subject-centered?) engineer reading programs wherein every child advances at his own rate of speech (child-centered?). (p. 212)

Independent study is a related term which encompasses a group of methods for individualizing instruction through arrangement of the learning environment (Brick 1971) (learning carrels, learning resource centers) or through providing materials with which students interact individually (programmed instruction, CAI, learning packets, courses offered through television or videotape). Musgrave (1975) cited the need to balance independent study methods with other methods, warning that 'independent study is not individualized unless the student is accomplishing a task that he is able to do" (p. 92).

The notion of self-directed learning is another component of individualized instruction, one which is reflected at a somewhat primitive level in programs where students set their own pace and evaluate their own performance, and in a more sophisticated way when students also participate in the selection of learning objectives and content. Wang and Walberg (1985) stated that "the learner is the ultimate agent of adaptation" (p. 329). The concept of "open education" is the administrative expression of this philosophy (Hassett & Weisberg 1972). In an examination of ways in which teachers individualized instruction in their classrooms, Shiman, Culver, and Lieberman (1974) noted that teachers differed in their definitions of individualization, but all "share the belief that [it] must have as its ultimate goal the possibility that each child can become a self-directed learner" (p. 4).

Hunter (1978) defined individualized instruction according to three critical attributes:

> 1. A learning task at the correct level of difficulty;
> 2. A learning mode or style which reflects the learner's needs (not necessarily his/her preference or proficiency); and
> 3. Teaching behavior which promotes optimum probability of success. (p. 5)

She maintained that establishing the correct level of difficulty has been the easiest task to accomplish, but that diagnosis has become an end in itself. Furthermore, "now that learning modes and styles have become more recognized, they are in danger of becoming the new diagnostic collection fad" (p. 6). A number of

educators question the drive to apply instructional methods that are exclusively adapted to the idiosyncrasies or particular "learning style" of individual students. Doyle (1985) addressed this concern when he discussed the objectives of adaptive instruction.

> Student adaptability, that is, the skills and executive routines necessary to cope with a variety of academic tasks and instructional systems, would seem to be an important outcome of schooling. In this light, adaptive instruction has value primarily as a temporary system that does some of the work of learning for students to enable them to get started on a set of learning tasks. Such adaptations must then be removed when they begin to interfere with learning to be adaptive. (p. 101)

Cooley and Glaser (1969) described three major factors as elements of individualized instruction, "each of which defines a set of variables in the system: (i) educational goals, (ii) individual capabilities, and (iii) instructional means,...which include what is taught and how it is taught...." (p. 574).

It is generally agreed that educational assessment or diagnosis is a critical component of individualized programming (Cartwright, Cartwright, & Ward 1984, Laycock 1980a, Wilkins & Miller 1983). Laycock, for example, asserted that the effectiveness of the entire process of prescribing individualized instruction depends on the accuracy of assessment. Yaseldyke and Algozzine (1984) cited curriculum-based assessment, instructional diagnosis, and analysis of engaged time (amount of time students actually spend engaged in academic activities) as "three prac-

tices in assessment that focus on the child within the classroom instructional environment" (p. 279).

Weisgerber (1971b) and Tyler (1981), among others, reminded us of the fact that learning is, indeed, a process that occurs individually, regardless of the setting for instruction. What is at issue, therefore, are the conditions that will best promote individual learning.

Grouping practices

Shane (1962) observed correctly that "most of the historically significant plans for dealing directly with human individuality have been related to grouping for instruction" (p. 48). Thus, it is not possible, within a more inclusive definitional framework, to ignore grouping practices (including the provision of special classes and separate schools) as examples of efforts to individualize instruction. Anderson (1962) pointed out the efforts of administrators to "achieve greater flexibility in the arrangement of instructional groups" (p. 255) in an effort to meet the learning needs of individuals more adequately.

A variety of grouping strategies, supported over the years by refinements in psychological measurement and educational testing, have tried to create appropriate environments for learning. Groups have been structured in such a way that its members are homogeneous along one or more lines of definition such as achievement (ability grouping), social maturity, or developmental level. The hope is that instructional methods selected with the

group's common characteristics in mind will then be "appropriate" for most, if not all, individuals within the group, more so than if the class were more heterogeneously constructed.

Brueckner and Bond (1955) cautioned that "whatever plan of grouping is used by the school, the teacher still faces the problem of arranging educational experiences that are adapted to the needs and to the level and rate of development of each individual within the class" (p. 406). Baine (1982) offered the following guidelines as conditions for group instruction. It must be possible:

> 1. to deliver instruction within a relatively small area within which the response of all learners can be continuously monitored;
> 2. to provide appropriate assessment, feedback, reinforcement, assistance, and correction, quickly and effectively to facilitate individual development without retarding group progress....
> 3. for all individuals within the group to perform in unison so that learners unable to respond independently in the correct manner, do not simply imitate the responses of other learners. (pp. 122-123)

All of these suggest attention to the principles of individualization of instruction.

The need for instructional diversity in terms of curriculum content was implied by Wilhelms (1962) when he said, "It is idle to talk about individual differences so long as there is only one way to get to the common goal" (p. 71). He observed that curriculums are planned for groups, not for individuals--no matter how specialized the group for which they may be designed.

Recognition of individual differences

Interest and efforts in the area of individualized instruction have been based on educators' growing knowledge about the nature and range of individual differences. Payne (1975) summed up this relationship when he stated:

> Throughout educational literature it is redundantly and axiomatically stated that not all children develop at the same rate or in the same manner. The truth of this statement is apparent in the range of individual differences. The major goal of public school education is to provide an opportunity for each child to achieve his maximum potential. If these statements are true...then it appears that the best way to achieve this educational goal is through individualized programming and instruction. (p. 4)

Pritchard (1963) traced the beginnings of attention to individual differences to Francis Bacon and the seventeenth-century realists, who emphasized use of the senses and the inductive method in education; "here was the beginning of the scientific approach to education and the study of the child as an individual" (p. 9). In the eighteenth century, Locke's philosophy of sensationalism and Rousseau's naturalism helped foster the development of child study, "for if education was to be based on a child's capacities, then it was essential that these be studied" (p. 11).

According to Brueckner and Bond (1955), "perhaps the most important fact that has been revealed by educational measurement, as far as instruction is concerned, is the wide range of individual differences in achievement and intelligence among the mem-

bers of any typical class in our schools" (p. 21). They stated that standardized tests provide basic data that must be used in evaluating organizational and instructional practices in schools. Aspects of individuality which can be measured in order to evaluate their instructional implications include intelligence, achievement, cognitive style, learning skills, set for learning, personality, social development, values, and motivation (Chastain 1975).

One of the applications of standardized testing has been to attempt to provide for individual needs by creating more homogeneous groups for instruction. Grouping practices make it possible, according to Brueckner and Bond (1955), to "adjust the work of the class to individual differences in the needs, rates of growth, ability, and interests of the various pupils" (p. 25). They cautioned, however, that standardized test scores should not lead to identical standards for achievement--again because of the wide variety of individual differences along a variety of intellectual, experiential, social, emotional, and physical dimensions. Paradoxically, the information provided by educational testing not only highlighted individual differences, but also led to the identification of "normal," "expected," or "average" levels of performance. In 1932, Clem acknowledged that "we have come to recognize that medians are often a delusion and a snare. It is what happens to each individual child that is important" (p. 521).

Musgrave (1975) pointed out the importance of recognizing differences that exist within the individual student (intraindividual) as well as those that exist among individuals in a group (interindividual). He called this awareness "a prerequisite for accepting [sic] instruction that focuses on the learner" (p. 110). The concept of intraindividual differences is reflected in educators' concern with learning style, defined as "an individual's characteristic way of responding to certain variables in the instructional environment....All individuals have developed personalized techniques for acquiring and remembering information" (Laycock 1980a, p. 275). Laycock maintained that learning style is the aspect of student performance which has the greatest implications for teaching methods. Efforts to individualize instruction have, in recent years, focused on ways of identifying learning styles as a basis for selecting instructional strategies and materials. However, Hunter (1978) remarked,

> Results of research caution us that it is more important to lifelong learning for students to increase their facility with many modes and styles of learning rather than specialize in the one or two they initially find most comfortable. (p. 6)

Educators have no difficulty agreeing with the view that "real individualization of education must begin with the acceptance of the child, or the learner, as the central focus of concern" (Martin 1972, p. 518). Nevertheless, the tension between subject-centered and child-centered education continuously recurs. Beginning in the late 1950s, the implementation

of nongraded methods by school systems was seen as a movement toward a more child-centered approach (Goodlad 1962). However, Martin believes that educators have, over the years, mostly paid "lip service" to the concept of individualization of instruction.

> We have been concerned with fitting the child into the system, with curriculum, with class size and structure, with characteristics of the education of teachers, and with any number of other aspects of a complex process. If we examine closely the process which occurs in classrooms, we do not see unique teacher-student interactions which represent individualization, including variations in approach to the task, rate of presentation, or response to the feeling of the learner as he attempts to master the tasks presented. (p. 518)

Cruickshank (1974) suggested that

> The capacity of teachers to individualize instruction has limitations, both in terms of teacher ability and in terms of the fact that most teachers have rarely been taught what this means or how to accomplish it successfully. (p. 71)

Special education and individualized instruction

It is when individualized instruction is defined at the broader end of the spectrum that special educators can "own" its philosophy most clearly and comfortably. The extent to which that philosophy is and has been translated into actual practice is debatable. Nevertheless, individualized instruction may be perceived as the foundation on which special education is based. The language of the federal definition of special education--"specially designed instruction...to meet the unique needs of a handicapped child..." (USOE 1977, p. 42480)--is in fact quite

adequate as a definition of individualized instruction; it is only the intended recipients of instruction who constitute a more specialized group.

Hobbs and his colleagues (1979), in their report to the Ford Foundation, cited the recognition of individual differences in children by schools as one of four major concepts in the field of special education which could be particularly valuable to regular classroom practice. "What special educators have to offer springs largely from their intense experience with individuals or small groups of children whose special problems demand diligent and imaginative application of what is known about teaching and learning" (p. 4).

Brueckner and Bond (1955) described three approaches to working with learner difficulties, all of which may be considered methods of individualization: improve the limiting element (e.g., correct a visual defect and then "re-educate" the student); alter the method of instruction to use a different modality (compensatory instruction); or revise the expected outcome (educational goal) based on the learner's characteristics. Haring and Gentry (1976) listed the following steps in providing "direct and individualized instruction" to handicapped students:

1. Assessing pupil performance
2. Setting goals, objectives, and aims
3. Systematic planning of instructional or management programs
4. Selecting or preparing suitable instructional materials
5. Specifying instructional procedures
6. Arranging motivational factors, and
7. Evaluating pupil progress. (p. 81)

Weisgerber (1974) observed that "much has been written about the principles and practices employed in individualized learning for regular students,...and for the most part these systematic procedures are equally appropriate for handicapped students: (p. 33).

The Individualized Education Program (IEP) is the component of Public Law 94-142 with direct instructional implications. Individualized, in this context, "means that the program must be addressed to the educational needs of a single child rather than a class or group of children" (Abeson & Weintraub 1977, p. 5). Turnbull and Schulz (1979) ventured the hope that the requirement to develop an IEP for each handicapped child would ultimately improve the quality of education provided for all children, with "the ultimate goal of complete individualization" (p. 99). The use of written objectives in the IEP provide clear statements of individually suitable goals of instruction (Baine 1982). The requirement that the IEP be written prior to placement "is designed to ensure that the curriculum [is] adapted to meet the needs of the child rather than forcing the child to adjust to the structure of an existing curriculum" (Odle & Galtelli 1980, p. 245).

Additional dimensions of individualized instruction for handicapped students are reflected in administrative and organizational practices in the schools. Standard approaches, according to Stephens (1977), have consisted of "corrective instruction occurring in special schools, full-time special classes, and

services provided by itinerant and resource personnel" (p. 4). With the swing toward a preference for educating exceptional students in the "least restrictive environment" came a shift in philosophy. Traditional, "separatist" ways of providing for the individual needs of special students were not criticized.

> Although the logic of individual services for individual children appears unquestionable, the lack of effectiveness of special education classes should not go unnoticed.... Special classes were supposedly developed to provide individualized services to exceptional children, but the efficacy of these special arrangements remains questionable. (Payne 1975, p. 4)

Indeed, Ysseldyke and Algozzine (1984, p. 190) stated that "to a great extent, the differences between regular education and special education treatments have been a matter of geography"--i.e., the locations where instruction is provided.

In 1968, Dunn argued that regular school programs "are now better able to deal with individual differences in pupils" (p. 10), making self-contained special classes less justifiable. He cited changes in school organization, more curriculum options, increased numbers and types of support personnel, and new teaching technology as being the basis for the ability of regular school programs to deal with individual differences. Haring and Schiefelbusch (1976) questioned the validity of the assumption that a homogeneous special class (with a smaller enrollment) is necessarily the best setting for offering individualized instruction. Reynolds and Rosen (1976) stated flatly that "mainstreaming is based on a philosophy of individual programming" (p. 558).

The argument thus came full circle. Hunter (1978) observed,

> We have learned that effective individualized instruction can occur in a regular classroom. While materials, aides, and a reasonable pupil-teacher ration are desirable for any quality program, they are not the most essential ingredients. Individualized instruction is not things you see in a classroom, but is the result of a professional's skill in educational decision making. (p. 6)

Ovide Decroly, who established a special school for the retarded in Brussels in 1901, proclaimed individualization as one of five fundamental principles of teaching (Scheerenberger 1983). Hobbs et al. (1979) cited individualization of instruction as one of thirteen "instructional themes" which special education can "contribute to the process of renegotiation" with regular education (p. 18). The authors stated:

> Special educators have had to be governed by one basic rule: when expected learnings do not occur, the instructional program is inappropriate. Again, the idea is not new but its serious application is. Schools generally operate on the principle that if learning fails to occur, the child is at fault....The common solution is to move the child, not to change the program. Special educators have had no such recourse; they teach the children who have already been removed and are at the end of the line. Perhaps no single concept growing from special education would be as demanding or as productive as this one if applied to the public schools in general. (p. 16)

Methods of individualizing instruction

Special educators, and indeed all educators who seek to justify the notion of individualized instruction in a democratic

society (particularly with reference to education of the gifted and talented), have a philosophical friend in Thomas Jefferson, who asserted that "there is nothing more unequal than equal treatment of unequal people" (Clark 1983, p. 132). In the 1980s, when it is no longer society's preference that its children be blended into the melting pot of a uniquely American identity, the sentiment continues to thrive (Grossman 1984), this time in reference to the goals of multicultural education.

From a broad perspective, methods that have historically been used to individualize instruction are legion. They include administrative arrangements such as multiple-track systems, non-graded or "continuous progress" plans, and a variety of homogeneous grouping patterns according to ability, interest, developmental level, social maturity, handicapping condition, or other criteria. Remedial and compensatory instruction have attempted, respectively, to correct deficits or to provide alternate ways of coping with limitations. Alternative grading methods have sought to take into account developmental characteristics and an individual's past performance, rather than simply measuring achievement against a group standard.

Administrative arrangements intended to meet the needs of gifted students have included special classes, separate schools, acceleration and advanced placement, skipping grades, and telescoping (moving through the curriculum at a more rapid pace) (Gearheart 1972). Enrichment experiences provided in connection with the regular curriculum have been prevalent in recent decades.

Differentiated staffing is another approach to meeting individual needs. Diagnostic, resource room, clinical, remedial, itinerant, and team teachers, as well as curriculum specialists, all played specialized roles in trying to design and deliver individually appropriate instruction. In fact, Husen (1985) complained that

> Large schools with formally structured social contacts tend to fragment students' contact with adults in the school. Instruction becomes increasingly divided among teachers with specialized competences....Different aspects of different children are parceled out among the specialists. (p. 400)

Current media and information technology devices that enable the learner to control the flow of information (Menefee 1981) are methods of individualization compatible with a more narrow definition of individualized instruction. Earlier versions of such devices included programmed instructional modules, teaching machines, and learning activity packages (LAPs). Computer assisted instruction (CAI) provides individualized (in fact, truly individual) instruction using the techniques of drill and practice (repetition), tutorials (to teach new academic content), educational games, and simulation (using higher level cognitive skills). Technology is further harnessed in the individualization of instruction by computer managed instruction (CMI), which can assist in planning instructional sequences (Cooley & Glaser 1969).

The research on ALT suggests that self-paced programs of individualized instruction may not, in fact, be the most profit-

able in terms of student achievement. Teachers probably sense this, as well. Bosco (1971) commented:

> The philosophy of individualization may well have had a strong influence on teachers, but other beliefs may partially explain the teachers' reluctance to devote more time to small-group and individual instruction. Teachers may be influenced by the belief that the children who are working with the teacher at any given moment are receiving the maximum value from the program, while children who are working in small groups or as individuals are 'marking time.'" (p. 130)

Flanagan (1971) identified four major types of adaptations as ways of individualizing instruction: differentiated assignments (according to ability and interest), rate of learning, methods and media which reflect different learning styles, and the restructuring of educational goals. Specific instructional techniques which are used in the service of individualization include precision teaching, direct instruction (which relies on task analysis and instructional sequencing), cognitive behavior modification, and the diagnostic teaching model. The latter, also called the diagnostic-prescriptive teaching model (DPT), includes the following steps (Cartwright, Cartwright, & Ward 1984):

1. Identify relevant attributes or characteristics of the child.
2. Specify teaching objectives.
3. Select instructional strategy (beginning at the child's present level).
4. Select appropriate materials.
5. Test strategy and materials (i.e., teach the child).
6. Evaluate performance (criterion-referenced testing).

Hunter (1978) pointed out:

> Probably the least implemented but critically important attribute of individualization is the teacher's deliberate use of principles of learning demonstrated by research to have an effect on student achievement. These principles become individualized by their thoughtful interpretation in terms of student need. For example, 'mass practice at initial stages of learning' is a principle that applies to all learners. But the amount of practice that constitutes adequate massing for each learner must be individually prescribed. (p. 6)

Cook and Clymer (1962) expressed this principle in more general terms when they stated simply, "A well-prepared teacher is the crucial factor in individualizing instruction" (p. 207).

HISTORY

Tailoring instruction to the needs and abilities of the learner is, in most informal teaching situations, a natural--often instinctive--application of common sense. The desire to respond appropriately to individual differences takes on a entirely different complexion, however, when teaching is delivered in an institutional context. When the content and scope of instruction take on formal dimensions, educational purposes and philosophies are hotly debated; economic and political factors muddy the waters; and strategies for the efficient and effective delivery of knowledge are proposed, tested, abandoned, and enthusiastically reinvented as history repeats itself. Indeed, individualization of instruction in a large society whose

educational institutions depend upon bureaucratic mechanisms in order to function is seen by some as fundamentally paradoxical (Husen 1985).

Changing educational goals

In the United States, emphasis on individualization of instruction has surfaced and resurfaced at various points in our nation's history. Ungraded schooling was the norm during the colonial period, a consequence of economic and social conditions in which students of all ages crowded together in one-room schoolhouses and progressed at their own pace through the few and diverse texts that were available (Cook & Clymer 1962). The goal of formal education was primarily to give students the tools of literacy so that religious teachings, as well as the principles of an emerging democracy, could be communicated (Grinder & Nelsen 1985). Although instruction was indeed individual, it was not individualized; that is, it was not in any sense adapted to the learning needs of individual students.

The first half of the nineteenth century marked the lifespan of the monitorial plan, whereby student monitors assisted a master teacher in large, ungraded classes. This plan foreshadowed the more highly developed concepts of peer tutoring, peer teaching, and differentiated staff (Grittner 1975), all of which have been applied in the twentieth century as techniques for coping with individual instructional needs in a group setting.

The development of graded classes during the second half of the nineteenth century was a natural outgrowth of prevailing social and economic pressures. Schools were no longer seen primarily as providing the tools for religious and moral understanding; rather, they were now perceived as bearing the responsibility for integrating the nation's influx of immigrants and developing common national ideals (Cook & Clymer 1962). At the same time, the rise of industrialism had a profound effect upon educational thinking (Grinder & Nelsen 1985). The principles of mass industrial production were enthusiastically translated to the educational sphere, where their results were expected to be equally impressive. Grouping and grading were obviously the most efficient and practical approach to education. By 1870, nearly all elementary schools in the United States were graded, and mastery of the basics (especially in reading, writing, and arithmetic) was emphasized (Goodlad 1962).

Administrative provisions for individual differences

Compulsory attendance laws, which were initiated around 1850 and extended to all states by 1916 (Yaseldyke & Algozzine 1984), had the effect of increasing both the numbers and the diversity of students who attended school. Gradually, instructional provisions for individual differences were also increased (Dunn 1973). For educators, an increasingly persistent thorn in the side was the fact that not all students were able to achieve established levels of content mastery. The birth of special classes for

those who were failing in school was a natural consequence (Sarason & Doris 1979; Yaseldyke & Algozzine 1984). Whether the establishment of special classes was motivated primarily by the desire to meet individual instructional needs through more specialized grouping practices, or by a desire to oil the squeaky machinery of mass instruction by removing obstacles to its efficiency, is a matter for individual historical judgment. Like most educational solutions, a mixture of underlying motivations was undoubtedly operative.

It was not only the failure of low-achieving students that drew attention, but also the ill-fitting match between graded content and the abilities of brighter students whose progress was held in check by the lockstep methods of prevailing practice. Criticisms of the rigidity and inflexibility of the graded structure increased (Anderson 1962). Flexible promotion systems, which began with the acceleration of rapid learners in the St. Louis schools in 1868, were the most popular approach to meeting the individual needs of gifted students until the end of the nineteenth century (Gearheart 1972; Tannenbaum 1983).

By the late 1890s, concern for individual differences and their implications for teaching resulted in action. A number of plans and systems were developed to promote individualized instruction. Altering the rate of instruction was the basic concept underlying these efforts (Grittner 1975). Multiple-track plans allowed students to progress through an established curriculum sequence at an accelerated pace (for bright students) or at

a slower rate. The Cambridge Double-Track Plan (1891), for example, permitted students to enroll in classes that covered the work allotted for grades three through nine in only four years (Tannenbaum 1983). By 1910, special teachers were appointed to coach the brighter pupils in this program. Ultimately, the plan embodied a set course of study which could be completed by an accelerated group in six years and by a slower (average) group in eight. There were a number of structured opportunities along the way for students to switch from one track to the other (Sarason & Doris 1979). New York City's Rapid Advancement classes were another example of a flexible promotion system in place around the turn of the century.

The first public school classes for mentally retarded students were established in Providence, Rhode Island in 1896 (Reynolds & Birch 1982). Students who were considered "mentally deficient" were, by and large, nevertheless expected to master the basic skills--it was assumed that it would simply take longer to do so. Activities designated as "handwork" (basketry, woodwork, sewing, etc.) typically supplemented the traditional curriculum (Witty & Beaman 1932).

Variations in promotion plans (acceleration or retardation) could be considered crude methods of individualizing instruction in the sense that students moved ahead or were held back based on their individual mastery of a set body of content. However, "the philosophy was essentially one of adjusting students to fit the

rigid curriculum" (Cook & Clymer 1962, p. 182). For slow-learning pupils, extra teachers, after-school tutoring, and supplementary summer instruction were all used in an effort to maintain grade standards.

Early systems of individualized instruction

Preston Search, superintendent of schools in Pueblo, Colorado, has been described as "the first educator to reject completely the lockstep method of mass instruction" (Grinder & Nelsen 1985, p. 36). His Pueblo Plan, implemented from 1888 to 1894, emphasized individual work and individual progress (in contrast to group work and group progress) at rates determined by the students themselves; the plan also eliminated the concept of nonpromotion (Anderson 1962).

The concept of individualization was at the heart of the progressive education movement which sprang from the writings of John Dewey, published around the turn of the century (Stern & Keislar 1975). At about this same time came a rush of interest in educational testing, sparked by a growing awareness of individual differences in ability and by the confidence that these differences could be measured. The implications for educational practice were that classification, grouping, and promotions could be determined much more efficiently and precisely (Grinder & Nelsen 1985). Cattell, Ebbinghaus, Thorndike, Binet, Terman, and many others produced a myriad of tests to measure various aspects of individual differences. Their results were applied in an

effort to individualize instruction through more sophisticated grouping practices.

The Batavia Plan in New York, developed during the early 1900s, sought to solve the problem of overcrowded classrooms by the addition of a teacher who worked with individual students who were having difficulty keeping up, while the regular teacher continued to conduct group lessons (Sarason & Doris 1979). Although the Batavia Plan in effect blended two separate types of instruction (individual and group), the introduction of an additional teacher to assist individual students was clearly an attempt to meet individual learning needs within the group setting. It suggests the later use of support teachers, resource teachers, and, to some degree, teacher aides. The costs associated with employing two teachers for a single classroom eventually led (whether directly or indirectly) to the spread of attempts to replicate the system by having a single teacher perform both individual and group teaching functions (Sarason & Doris 1979).

A nongraded system of individualized instruction for students in grades K-8 was established in 1912 at the training school at San Francisco State College by Frederic L. Burk. Students were given a course of study for each academic subject and were allowed to progress continually at their own rate (Grinder & Nelsen 1985, Grittner 1975, Mincks 1976). One of Burk's faculty members, Carleton Washburne, developed the system more fully in the form of the Winnetka Plan, which operated in Illinois from

1919 until the 1940s. Those elements of the curriculum which did not require group contact were individualized (Wilhelms 1962), while creative and social activities such as art, music, and drama were conducted in ability groups.

A basic principle of the Winnetka Plan was the statement of "goals of achievement" which "are almost identical with the 'behavioral objectives' or 'specific performance objectives' of the 1970s" (Grittner 1975, p. 330). Quoting Washburne,

> These must be isolated--on paper at least--and stated in very definite terms. To say that a child must learn long division, for example, is not sufficiently definite. To say that every child shall be able to divide four-place dividends by two-place divisors, involving a naught in the middle of the answer, a naught at the end of the answer, a remainder or a trial divisor, and that he shall be able to divide such examples at the rate of two in three minutes with 100 percent accuracy, is a definite statement. (p. 330).

Materials and methods applied in the classroom under the Winnetka Plan included self-checking assignment sheets, a system to record individual children's progress, and assignment booklets with tests and self-correcting answer sheets. Grittner noted the similarity of these instructional devices to the programmed texts of the 1960s and beyond, as well as the fulfillment of the "learning for mastery" concept wherein students must master each successive unit of instruction before proceeding to the next. "Time at work, not quality of work, was permitted to vary" (Grinder & Nelsen 1985, p. 37).

Instituted almost simultaneously with the Winnetka Plan was the Dalton Laboratory Plan, which Grinder and Nelsen described as "perhaps the most innovative of programs in individualized instruction" (p. 37). The Dalton Plan was first developed in 1919 by Helen Parkhurst in a school for crippled children and, a year later, in the Dalton (Massachusetts) high school. Lasting until the 1930s, it was intended as a sociological rather than a curricular experiment (Anderson 1962, Grittner 1975) in which students assumed responsibility for their own learning. Not only did they complete assignments at their own pace, but they also collaborated with the teacher to choose their courses of study, structured their own time and physical movements within the school building, and recorded their own progress on graphs. Teachers provided a basic structure as they helped each pupil identify a series of assignments to be completed within a set time frame of 20 days. The arrangement is suggestive of the concept of student contracts (Grittner 1975). Students could not move ahead in one subject, however, until they had reached a comparable level in all other subjects. The Dalton Plan also arranged instruction around the use of rooms set up as single-subject "laboratories" rather than traditional classrooms, reflecting today's instructional materials centers and learning resource centers (Mincks 1976).

From his examination of these and other early educational experiments, Grittner drew a number of conclusions, among them the following:

1. Not all students want to be individualized.
2. Students do not develop self-discipline merely because a program based upon it has been implemented.
3. Isolated task completion is demotivating to many students. (p. 333)

In addition, he noted the high implementation costs of individualized instructional programs in terms of materials, equipment, evaluation, and staffing--a cautionary note that has been echoed throughout the history of American education (Wang & Walberg 1985).

Serving special populations

During the 1920s, provisions for meeting the instructional needs of gifted students favored the establishment of separate classes and special programs which provided enriched educational experiences rather than merely a more rapid progression through a standard curriculum (Gearheart 1972, Tannenbaum 1983). Special programs were set up in Los Angeles, Cleveland, Detroit, and New York City. As criticism of the validity of attempting to group gifted students homogeneously grew, educators in the 1930s began to favor enrichment in regular class settings.

Some differences of opinion can be noted in the evaluation of the degree to which special classes met the individual needs of exceptional students during the first quarter of the twentieth century. Witty and Beaman (1932) charged that educators' love affair with testing and identification had led them to ignore the content of instruction--and that most of it was indistinguishable

from that offered to regular students. It was only the exceptions, they felt, which exemplified "the best features of individualized instruction and intrinsic interest programs; [and] employ carefully graded units, integrated in accord with the child's developmental level in interest and ability" (p. 12). Sarason and Doris (1979), looking back from the perspective of history, maintained that special education classes influenced educational practice in the regular classroom despite the fact that this influence was "rarely alluded to in the literature of the time" (p. 264). "Chief among [its] lessons," they observe, "was the studying of each child's individuality and the adjustment of the teaching to that individuality" (p. 264).

The assertion that provision of individualized programs has always been a characteristic of special education (Odle & Galtelli 1980) seems to withstand scrutiny only in the broadest and most ideal sense. Perhaps the effects were indeed real at the level of theory, rather than in actual practice--at least as far as teaching methodology was concerned (as opposed to identification of individual differences through testing). Sarason and Doris pointed out, however, that the isolation of handicapped students for instructional purposes placed a barrier between regular and special class teachers which prevented the flow of learning, sharing, and communication.

Anderson (1962) noted the formation of ungraded "opportunity classes," which were established during the early decades of the twentieth century for "backward" children (Wallin, n.d.) as well

as for gifted students (Ingram 1932, Tannenbaum 1983). Miller (n.d.), in a ten-month evaluation of 48 children selected for placement in special ("opportunity") classes during the 1930s, concluded that "the definitely feebleminded children do not profit under any methods which a special class can offer" (p. 269). (These were subsequently identified as severely mentally handicapped and eventually institutionalized.) "The children otherwise handicapped," said Miller,

> could be taken care of along with the 'average' children if the grouping were more flexible, the tasks more individualized, and the class achievements were less standardized. Consequently, when progressive educational methods become more widely used in public schools there will be no place for special classes. (p. 269)

Betts (1935) noted that "educational emphasis is increasingly centering upon personal needs and social adjustments. The individual child "has recently become the subject of a new concern in education" (p. 4). Interest was shifting during this period from a concern for mastery of academic subject matter to "the ability to cooperate with others, to function in corporate community life, to adjust successfully to vocation,...to live richly as a person...." (p. 3).

Clem (1932) mused that "'to meet individual differences' has been the slogan of junior high schools in the last decade....We have come to recognize that medians are often a delusion and a snare. It is what happens to each individual child that is important" (p. 521).

Christine P. Ingram, supervisor of special education in Rochester, New York, wrote that "it is interesting to note that some of the outstanding objectives recognized from the beginning for special classes are those which schools generally are only now coming to demand for all children" (Ingram 1932, p. 515). Among those she cited as "indicative of what all progressive schools are striving for" are "social virtues for cooperative living; abilities, skills, powers and appreciation, rather than a uniform body of knowledge; [and] individual personalities and abilities in children--variation, not a type" (p. 515).

The problem for all educators, but brought home most sharply, perhaps, to special educators, was expressed by Witty and Beaman (1932). More than half a century later, it still has meaning. The authors observed that the effort to classify special students for instruction still results in a

> ...wide variation in mental ages and IQ's, [thus revealing that] the special classes do not conform with the objectives of reclassification, [which are] (1) to put together those of similar mental and educational status, and (2) to assemble those who will progress at similar rates....In other words, the problem of the special class is not only to provide the highly specialized instruction expected for a selected group, but also to devise a highly complex curriculum for children who vary greatly in chronological age, mental age, and rate of mental growth. (p. 6)

In a similar vein, Hobbs et al. (1979) stated that "the familiar categories of handicapping conditions have come to be regarded as impediments to adequate planning for individual children, on the

basis that handicapped children differ at least as much from each other as they differ from other children" (pp. 8-9).

Special class placement for handicapped students continued strong, bolstered by advancements in testing as well as new diagnostic categories and descriptive labels. The years 1900-1970 have been described as "the era of special classes" (Gearheart & Weishahn 1984). Meeting the instructional needs of individual students was still perceived to be best accomplished by ever more refined methods of homogeneous grouping--a practice which may be defined as an effort to reduce the range of individual differences (Anderson 1962, Martin 1972). Educators were concerned primarily with manipulating the learner variable rather than the variable of instructional content. Nevertheless, child study specialists during the 1930s and 1940s advocated keeping rapid learners in regular class settings (Tannenbaum 1983), and educators apparently found no difficulty in agreeing that--for this population at least--homogeneous grouping was really a pipe dream.

The launching of Sputnik by the Soviets in 1957 sparked new interest, rhetoric, and funding for education of the gifted and talented, particularly in the area of science and technology. Instructional methods, however, did not change dramatically; acceleration and enrichment remained the methods of choice.

General education strategies

Goodlad (1962) reported that the mid- to late-1950s marked

"the first really significant movement toward replacing grading by nongrading methods" (p. 214), reflecting greater attention to individual differences and acceptance of a child-centered philosophy of education. During the decade of the 1960s, independent study methodology was in vogue as the preferred method of individualizing instruction (Musgrave 1975). For example, Postlethwait's audio-tutorial system for college-level instruction (using the tape recorder) was developed during this period (Postlethwait 1981). A proliferation of materials in support of independent study methodology spilled out into the educational marketplace: programmed textbooks and "modules," learning activity packages (LAPs), and audiovisual aids of all types (including television, videotapes, and computers). These materials were housed in such settings as "learning resource centers," instructional materials centers, and "automated schools."

At the same time, administrative arrangements designed to assist regular class teachers grew more widespread. These included resource rooms, consulting teacher programs, and diagnostic-prescriptive teaching centers (Dunn 1973, Hobbs et al., 1979), all aimed at diagnosing the needs of individuals and helping teachers adapt instruction accordingly for students who did not achieve in response to traditional instructional methods.

One of the major systems of individualized instruction developed during the early 1960s was Individually Prescribed Instruction (IPI), created at the University of Pittsburgh's Learning Research and Development Center. Hammill and Bartel

(1978) noted that IPI is "based on the view that providing for individual differences requires the individualizing of both goals and instructional resources" (p. 132). Designed for elementary level (K-6) students, it was based on detailed, behaviorally stated instructional objectives in math, reading, and science, and consisted of "planning and conducting with each student a program of studies...tailored to his learning needs and to his characteristics as a learner" (Weisgerber 1971a, p. 115). Curriculum content was organized into units with related performance objectives, and a variety of commercial learning materials were matched to these objectives (Lipson 1981).

IPI exhibited the expected characteristics of self-pacing, demonstration of mastery of academic skills, and self-evaluation, but ventured into less familiar territory with the stated goal of fostering "the development of problem-solving thought processes" (Weisgerber 1971a, p. 120). Six elements are cited as distinguishing IPI from conventional teaching methods:

1. Detailed specifications of educational objectives;
2. Organization of methods and materials to attain these objectives;
3. Careful determination of each pupil's present competence in a given subject;
4. Individual daily evaluation and guidance of each pupil;
5. Provision for frequent monitoring of student performance, in order to inform both the pupil and the teacher of progress toward an objective;
6. Continual evaluation and strengthening of the curriculum and instructional procedures. (p. 120)

The similarities to required elements of the individualized education program (IEP) for handicapped students are self-evident.

The Personalized System of Instruction (PSI), also called the Keller Plan, was developed in the early 1960s by Dr. Fred Keller. Designed for application at the college level, it, too, contained the familiar elements of self-pacing and mastery, but also incorporated the use of peers who served as "proctors" in evaluating student performance. Its author described it as "an effort...to develop a system of instruction that would be consistent with behavior science and that would make use of what was known about its applications in the field of teaching" (Keller 1981, p. 37).

A third major approach to providing for differences among students in rate and style of learning was Individually Guided Education (IGE), a creation of the Wisconsin Research and Development Center for Cognitive Learning at the University of Wisconsin (Madison) from 1965-1971 (Montare, Tuckman, & Butler 1977). In this system, instruction was delivered in the sequential context of the establishment of instructional objectives, followed by pre-assessment, selection of strategies and materials, and post-assessment. Administrative arrangements included the use of instructional teams and multi-age grouping within teams. Stern and Keislar (1975) maintained that systems such as IPI, IPS, and IGE

> are, in a sense, a step backward. They leave room for individual differences in rate of learning, leaning heavily on the objective

> measurement of skill acquisition, but the assumption is that all children will complete the course content. In other words, each child is required to master the same program but is permitted to proceed at his own speed. (p. 115)

Another development of this decade was Peter's Prescriptive Teaching System (PTS), couched in the language and concepts of behavior science. It is based on an analysis of the child's "entering behavior," the subsequent establishment of behavioral objectives (referred to as "terminal objectives"), and curricular implementation of "enroute objectives" to produce the ultimately desired changes in behavior (Peter 1972). Other elements of this model included elicitors, reinforcers, and evaluation components. The sequence of instructional and behavioral planning in PTS more closely resembles the IEP approach.

Expanded educational opportunities

Legal and judicial developments during the decade of the 1970s focused renewed attention on individual needs, suggesting that "the purpose of education was no longer the benefits that may accrue to society but rather the benefits that may accrue to each child" (Reynolds & Rosen 1976, p. 552). With the passage of Public Law 94-142 came not only the requirement that handicapped students attend school, but also that an individually prescribed program of instruction (the IEP) be devised for each one. While the simple assurance of the availability of a variety of educational alternatives might have been considered sufficient "individualization," it was now proclaimed that the handicapped child

had a right "not just [to] any educational program, but [to] quality education appropriate to their individual needs" (Anderson, Martinez, & Rich 1980, p. 24).

The IEP follows the sequence of assessment, establishment of objectives, instructional implementation, and evaluation. It is significant that, in contrast to the planning sequence of individualized systems such as IGE, the establishment of instructional objectives follows rather than precedes assessment. By implication, the purpose of assessment is not, therefore, to measure the child against the standards of a rigid, pre-set body of subject matter, but to conduct an independent evaluation of the child's present level of skill acquisition, learning needs, and learning style. Based on the information gathered, an educational program is then designed to meet those needs.

Hobbs and his colleagues (1979) noted that the public policy changes of the 1970s were "accompanied by a variety of technical developments in measurement and instructional management systems to support individualized education for all students" (p. 9). Stephens (1977), for example, described the Directive Teaching Instructional Management System (DTIMS) as a "skill training approach for individualizing instruction" for learning and behavior disordered students (p. 249). It provided teachers with assessment and instructional plans, management suggestions, and a student reporting and tracking system.

An example of programs of individualized instruction for regular class students during this period was Project PLAN (Pro-

gram for Learning in Accordance with Needs), which was carried out in 1970 with 2,000 students in grades 1, 5, and 9 in fourteen school districts. Components included: personalized programs of study in social studies, language arts, science, and mathematics; comprehensive lists of educational objectives (with students participating in the selection of content and objectives); short- and long-term evaluation (performance tests); counseling support for students; and inservice teacher training in implementing the program (Flanagan 1971, Weisgerber & Rahmlow 1971). This system was computer-supported.

Special educational experiences for gifted students during the 1970s continued to be provided largely in the enrichment mode. Special instructional systems designed during this period included Renzulli's Enrichment Triad, instructional adaptations of Bloom's Taxonomy, and Meeker's adaptation of the Guilford Structure of Intellect (SOI) model to the classroom, as well as curriculum development in the area of values clarification (Tannenbaum 1983). It is worth noting that these models were intended to "offer experiences to the ablest that were uniquely appropriate for them. not just promising practices from which all children could derive benefits" (p. 36).

The Learning Research and Development Center at the University of Pittsburgh, which developed IPI in the 1960s, has proposed the Adaptive Learning Environments Model (ALEM) in the 1980s. It combines prescriptive instruction for basic academic

skills with aspects of open education intended to foster self-directed learning and social cooperation (Wang, Gennari, & Waxman 1985). The design of this model suggests some of the basic features of the Winnetka and Dalton Plans. However,

> modification of the environment to accommodate student differences (for example, use of alternative instructional strategies, provision of different amounts of instruction, allowance for individual differences in rates of learning, provision for a variety of learning options) has been an important design consideration in the development of the ALEM. (p. 192)

The philosophical issues with which educators wrestled more than 150 years ago continue to surface and resurface. Every generation examines them anew. Talmage (1985) asks, "What goals are uppermost, self-actualization of each individual or the larger societal goals? Can instructional approaches accommodate both or are they mutually exclusive?" (p. 321). Approaches to individualized instruction have served the objectives of both goals, but seldom within the same model.

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