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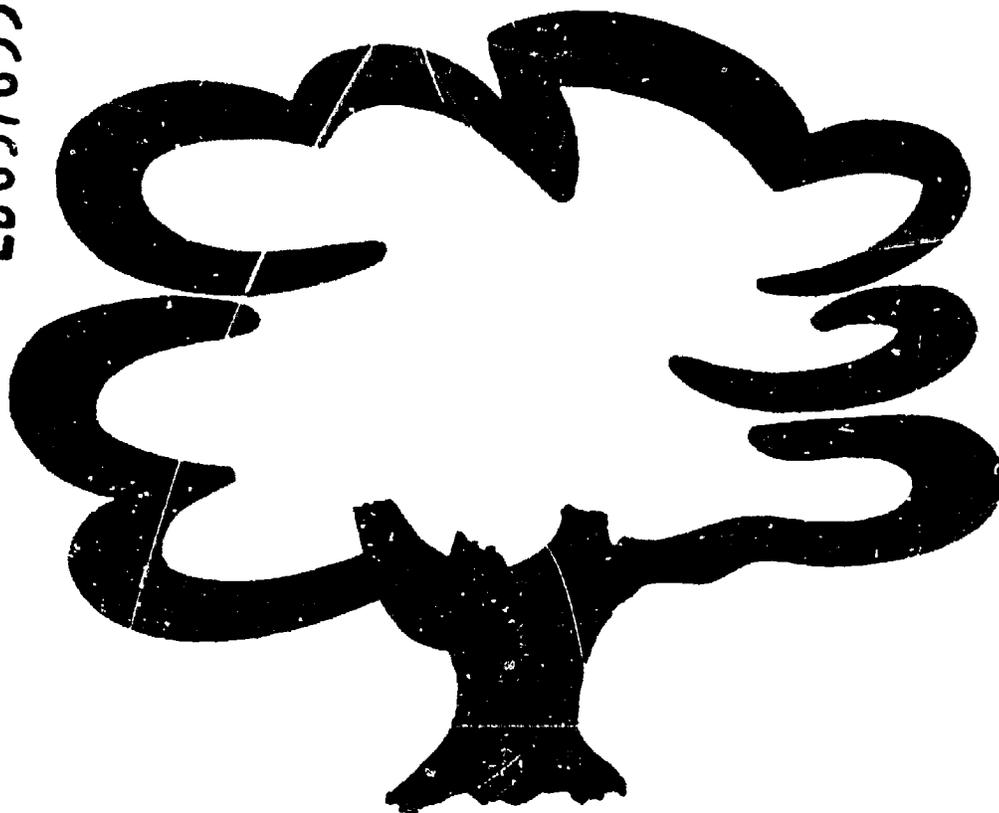
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ABSTRACT

In this companion paper to his earlier annotated bibliography of ERIC materials on individualized instruction, the author defines individualized learning as the tailoring of the educational process which takes into account the unique qualities and needs of each individual. He identifies and comments on general trends which seem to be emerging in individualized instruction at the elementary and secondary level, in teacher education programs, and in other education programs. A selective list of the equipment, materials, and pre-packaged systems available to implement an individualized program is provided, along with a review of the major features of several major national systems--PLAN (Program for Learning in Accordance with Needs), IPI (Individually Prescribed Instruction), I/D/E/A (Institute for Development of Educational Activities, Inc.), IMS (Individualized Mathematics System), and SCI (Student Centered Instruction). A selected list of publications, meetings, and sources of information about individualization is presented for those who wish to explore the concept in more depth.  
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TRENDS, ISSUES AND ACTIVITIES  
IN INDIVIDUALIZED LEARNING

By Robert A. Weisgerber  
American Institutes for Research  
Palo Alto, California

Issued by the ERIC Clearinghouse  
on Media and Technology  
Stanford, California 94305

In February 1972

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*You cannot teach a man anything.  
You can only help him to find it within himself.*

Galileo

## BACKGROUND

Learners, above all else, are unique individuals. If that simple proposition is accepted then subsequent educational considerations and decisions should be predicated upon it. Some experienced educators suggest that tailoring education according to the unique qualities of the individual is desirable but, as yet, is an idealistic dream. Others would argue that traditional instruction should be "preserved" or that costs have always made individualization "impractical," neither assumption being proven. Certainly the real world in education is one of expedient compromise, and, for generations of students, the availability of individually tailored *learning* has been a dream, while group oriented *instruction* has been reality in the schools.<sup>1</sup> It may not be reality much longer for many educators are daring to "dream the impossible dream."

It has been pointed out (Bloom, 1964; Tyler, 1968) that the environment has its greatest influence on children's development in the first five years of life and thereafter stabilizes and becomes predictable. Long before children enter school they have: a) learned a variety of motor skills, b) learned a body of knowledge, c) learned verbal and non-verbal communication techniques, and d) learned attitudes, values and love. It is noteworthy that they learn these things individually rather than in a group and without the discipline and the regimen of the formal school setting.

It is clear, then, that children make relatively great strides in learning during the pre-school years and come to school needing instruction suited to their individual differences. The teacher of these different youngsters can inculcate group oriented processes as new "life models," or she can build upon the youngsters' enthusiasm and interest, encourage their individual initiative, and provide a variety of experiences that challenges each child at his own level of ability.

Group oriented instruction has been expedient, but it has not been particularly effective, as evidenced by large numbers of educational dropouts and by non-readers who "graduate." Nor has it been efficient, as evidenced by the amount of re-learning that is necessitated yearly as students wend their way through spirally organized curricula and

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<sup>1</sup>While instruction and learning are customarily taken as "givens" in education, and learning has been thought of as the consequence of instruction, it is clear that instruction can take place for a group in which certain students fail to learn. This writer takes the position that *learning* is the only real given and that instruction is simply a way of increasing the likelihood of learning beyond that which would occur intuitively or through accidental experience. With this distinction in mind, the term "individualized learning" is used in this paper as being more relevant and a preferable generic term to "individualized instruction," even though the latter term is perhaps more widely used.

teachers "re-teach" the subject matter. Similarly, a high proportion of students "mark time" while extra explanations are given to slower members of the group or, conversely, a number of slower students really don't "get" the message being presented to them and are left to choose between becoming disruptive or merely sitting still until school lets out. It is probably true that most educators would prefer to develop each learner to his maximum potential, if they knew how, rather than teach to the "average" student and hope that above-average and below-average students will also profit to some degree.

During recent years the norm-referenced approach of teaching to group standards has been giving way to a criterion-referenced approach, wherein mastery is measured by absolute standards set at attainable levels in the light of a student's present educational development (Bloom, 1968). That is, the question put to the student is more nearly "How soon can you perform this task at this specified level of proficiency?" rather than "Can you perform this task as well as and as soon as your classmates?" The first standard is set largely as a function of the mastery needed for further study, while the second standard is largely a function of class composition, which can change independently of the individual's own efforts or accomplishments.

Of course, no one really explains this quite so bluntly to the norm-referenced child. Instead, he is encouraged to compete—to pass if he can or fail if he must. And when some do fail a new problem arises, for passing them on to the next grade level without their having "earned" it becomes a social (and chronological) necessity, robbing the child of the dignity of accomplishment and encouraging further mismatches between his own and his classmates' abilities.

Programmed instruction, with its emphasis on incremental learning and demonstrated, step-by-step mastery toward clearly defined goals, signalled the introduction of the criterion-referenced approach. Because programmed learning was adaptive to differing rates of progress by individuals, educators were able to monitor student progress much more closely than had been the case in groups. While enthusiasm ran high at first, the poor quality, abbreviated length, and lack of curricular relevance of many commercial programs left much to be desired, leaving most educators disenchanted. Those few programmed learning firms that continued to be profitable after the initial boom were those that provided incentives for learners, who "packaged" the product appealingly, and who kept hardware costs within bounds.

During the same period many educators tried their hand at writing programs and proved to themselves that alternatives to the group-oriented processes really were within their grasp. Many of them incorporated the principles, if not the programs, into their own teaching. Research and development personnel in education, business, and the military also were seeking viable alternatives and began to move beyond such issues as how many "frames" or how many contextual hints should be given. Instead they undertook a "systems approach," that is, they began to systematically structure the various components that affect classroom instructional practice in order to achieve pre-specified outcomes. Largely as a result of efforts by innovatively inclined teachers and systems-oriented R & D personnel, education is currently moving quite perceptibly toward a viable individualization of learning. Comprehensive individualized programs and guidance strategies will continue to be developed at centers such as the Learning Research and Development Center, under the leadership of Robert Glaser (1969), and the American Institutes for Research, under the leadership of John Flanagan (1970a).

This paper will attempt to define the process of individualized learning, describe the various trends, comment on the benefits and risks, and suggest further references for those who would like to explore the concept in greater depth.

## DEFINITION

In the generic sense, individualization of education implies a tailoring of the educational process which takes into account the unique qualities and needs of each individual. In attempting to accomplish the tailoring process, numerous operational approaches have been created, and numerous labels have been developed to identify them. Illustrative of the proliferation of terms, and the variety of meanings that can be ascribed to individualized learning efforts, the author accessed the ERIC computer file with some 59 descriptors (i.e., variants of the basic term "individualized learning") in order to generate the list of ERIC references published in the separate "Individualized Learning" bibliography issued by ERIC at Stanford.

Glaser (1968) has defined individualization simply as the adaptation of instructional procedures to the requirements of the individual learner. Cronbach (1967) has suggested that there are degrees of adaptative patterns, with variants in each pattern, as follows:

1. Fixed educational goals in a fixed educational treatment. In this pattern (minimal) adaptation is accomplished by manipulating students through sequential selection (i.e. failing the academically weak).
2. Determination of future roles for each student and assigning them to presumably appropriate curricula. In this pattern adaptation of subject matter is undertaken, and students are grossly "matched" in terms of their abilities or long-term goals. Examples are vocational courses, homemaking courses and/or differentiated levels of basic courses (i.e. business math vs. geometry) with students often being selected through counseling procedures.
3. Teaching different students by different instructional procedures. In this pattern adaptation can occur through diagnosis of specific needs, as in remedial work, or by attempting to "tailor" learning experiences based on a variety of characteristics for each learner.

Edling (1970) has classified the various operational approaches to individualization into four categories, all of which provide for individual pacing. They are: (a) "individually diagnosed and prescribed" wherein the school diagnoses and prescribes what the child will be taught, as well as the materials and the learning objectives; (b) "self-directed" wherein the child chooses learning materials and methods but the school sets objectives; (c) "personalized" wherein the child sets the learning objectives and the school specifies the learning materials and methods to be used; and (d) "independent study" wherein the child chooses his own goals as well as the materials and methods for attaining them. These categories have been repeated and paraphrased by the National School Public Relations Association (1971) in a special report on individualization in the schools.

A limitation to the labeling of types of individualized learning is that rarely (even in the school examples cited by Edling) are programs in the schools able to be classified neatly into one or the other of the categories. PLAN (Program for Learning in Accordance with Needs), for example, is described as a "Type A" program which prescribes objectives,

methods, and materials for the learner. But it would be more accurate to say it *suggests* programs of study, *recommends* instructional modules (both subject to teacher and student concurrence), and provides *choices* to the learner in *both* the method of study and the materials by having available *alternate* forms of Teaching-Learning-Units for many subject matter topics. Thus PLAN clearly overlaps with "Type B" and "Type C" programs as characterized by Edling.

Weisgerber (1971a, 1971b) has taken an eclectic view and, rather than introducing arbitrary classifications, has recognized developmental efforts as being on a continuum having learner-centered, group-centered poles. He has attempted to describe this continuum by providing examples of large-scale, totally-individualized approaches as well as small-scale, partially-individualized approaches as utilized for a variety of subjects and educational levels.

Because of the difficulty in meaningfully classifying the various operational approaches, no effort will be made in this paper to define individualization according to generic or popular labels. Instead, a definition will be offered which (surprisingly enough) is learner oriented.

Learning can be said to be individualized to the degree that the learner believes that his education is personalized to meet his needs and facilitates and encourages his independent progress. More fully stated, learning has been individualized to the extent that he believes:

1. his progress is largely dependent on his own effort,
2. his performance and preference can influence the selection of modules of subject matter,
3. he can decide whether he wants to work independently or interact with others in furtherance of his studies,
4. he has the freedom to select instructional resources to suit his own learning "style," such as a choice between print or non-print media, given comparable exposition of the subject matter,
5. he views the school personnel, including the teacher, aide, librarian, principal and others, such as his classmates, primarily as human resources rather than as supervisors or competitors,
6. he exhibits an active, purposeful approach to learning tasks when unsupervised, and thinks of school as only one of the settings in which learning can occur,
7. he has control, within admissible school standards, over where and when he studies,
8. he feels that the intended outcomes of instruction are relevant and attainable,
9. he understands how to proceed toward the accomplishment of those outcomes,
10. he is aware that he is evaluated against his own potential rather than that of others, and is given fairly frequent knowledge of his status relative to his learning goals.

Table 1 attempts to provide a basis for describing or "profiling" educational programs according to the strategies they use for individualizing and the extent to which the learner is instrumental in shaping the program. The reader is cautioned that the 15 items in the table do not comprise an instrument for distinguishing "good" or "bad" programs. Individualization efforts should be evaluated relative to their stated program objectives and should take into consideration a number of factors similar to those proposed by Jenks (1971).

TABLE 1

A Self-Analysis "Profile" of Individualization Status

(Check the column which is most characteristic of each item for *your* students)

Criteria	Primary Influence				
	School or Syllabus	Teacher or Peer Group	Preplanned Programming Within Materials	Adaptive Technological System	Individual Learner(s)
<i>Time</i>					
1. Rate of instructional presentation	_____	_____	_____	_____	_____
2. Duration of study sessions	_____	_____	_____	_____	_____
3. Frequency of study sessions	_____	_____	_____	_____	_____
<i>Subject Matter</i>					
4. Choice of topics	_____	_____	_____	_____	_____
5. Sequence of topics	_____	_____	_____	_____	_____
6. Depth of study in topic	_____	_____	_____	_____	_____
<i>Mastery</i>					
7. Selection of goals or objectives	_____	_____	_____	_____	_____
8. Criteria for evaluation	_____	_____	_____	_____	_____
9. Readiness for testing	_____	_____	_____	_____	_____
<i>Learning Methods</i>					
10. Media or materials to be used	_____	_____	_____	_____	_____
11. Extent of interaction with classmates	_____	_____	_____	_____	_____
12. Types of learning activities	_____	_____	_____	_____	_____
13. Instructional setting	_____	_____	_____	_____	_____
14. Teacher role	_____	_____	_____	_____	_____
<i>General</i>					
15. Overall program revision	_____	_____	_____	_____	_____

## TRENDS AND DIRECTIONS

As indicated previously, there is considerable diversity in the form and degree of individualization currently being practiced in the schools. Several trends seem to be emerging, though these are far from clearcut and overlap in some ways.

### General trends in the schools

One trend through the 60's has been organizational in nature and is typified by modular scheduling (Petrequin, 1968, Thomson, 1971), team teaching (York, 1971), variable grouping (I/D/E/A, 1971), and non-gradedness (Rollins, 1968; Howard and Bardwell, 1966). This trend has stopped short of complete individualization and instead has generally provided for some individual study and some group-paced study on the basis of certain variables such as interest, independence, work habits, or ability level. Goodlad and Anderson (1963) have pointed out that while groupings exist in non-graded programs they are essentially uni-dimensional in nature, e.g. reading level. They suggest that flexible and simultaneous groupings by achievement, interest and work study skills should be used in preference to overall ability grouping. New terms, such as "educational family units" (Hempstead, New York) are sometimes given to multi-class "home base" groups within which considerable organizational flexibility can occur. In any case, this represents a partial adaptation to individual differences in the sense of Cronbach's adaptation categories described previously.

Another trend is toward physical flexibility. Both the schools and the furniture within them have been designed with individual study in mind (Kohn, 1967; Ellsworth and Wagener, 1963; Weisgerber, 1971c). Open space is more in demand (and more used) than ever before, and even where collapsible partitions exist they are more often open than closed, e.g., Barrington, Illinois; Fountain Valley, California. Even "the school grounds" are being redefined and at certain "open campus" schools the students move freely to appropriate learning sites even when these are in the community rather than the school, e.g., Philadelphia; Seattle; Mankato, Minnesota.

There is a marked trend toward the application of behavioral methods in the design and in the procedures used in individualized programs, especially those that are school- or district-wide (Flanagan, 1970b). For instance, the stating of educational goals and instructional objectives is virtually a "given" now for school programs that are individualizing. Objectives have been pooled in an exchange or bank (Popham, 1968), organized into curricular sequences (Flanagan, Mager, and Shanner, 1971) and related to theoretical models (Metfessel, Michael, and Kirsner, 1971). Similarly, the methods for identifying individual differences, assessing learner status and prescribing learning tasks of appropriate difficulty are being based more and more on assessment instruments and less on teacher intuition (Messick, 1971; Bloom, 1968; Division of Curriculum Services, 1970).

Students with learning disabilities and physical handicaps are also receiving more individualized instruction based on a diagnostic-prescriptive approach (Valett, 1970) and individualized systems are seen as a viable instructional strategy for these children (Education and Training Division, 1968).

In addition, there is an increasing willingness on the part of most educators involved in individualization to view their instructional approach as a formative, evolutionary process, i.e. subject to revision and improvement based on feedback from learners (Rahmlow, 1971; Bolvin, 1971; Richard and Sund, 1971).

### Implications for teacher education

Regardless of the form of individualization that is introduced to the school or classroom the teacher's role is certain to be different than in traditional group-oriented instruction. Southworth (1971) has proposed a model of teacher education for the individualization of instruction and has stated the minimal teacher competencies required in the form of behavioral objectives. Some 95 objectives are identified in 9 competency areas.

Baird, Belt, and Holder (no date) have described a model for teacher education in use at Brigham Young University. The prospective teachers must take the initiative in accomplishing their own learning in a variety of observation, self-study, and interactive settings (using a remote information retrieval system, videotape recorders and other media) and satisfactorily demonstrate competencies appropriate to individualized instruction.

Like Brigham Young, many teacher education institutions have been moving rapidly toward the introduction of courses directed toward individualized learning. Recently, a variety of instructional materials have become available which should facilitate the design of courses to employ individual study techniques as well as teach about them.

As indicated elsewhere in this paper, teacher training institutions now have available a variety of print and non-print commercial instructional materials dealing with the how and why of individualization. In addition, colleges are actively producing instructional packages for local applications. For example, numerous institutions have developed self instructional packages using slides and tapes, 8 mm film loops, and videotape to teach inexpensive materials production techniques and the operation of equipment (Macklin, 1967; Curl, 1967). Some of these self instructional packages, such as those produced by Jerrold Kemp, at San Jose State College, and David Curl, at Western Michigan University, are of a quality that leads other institutions to adopt them or at least model after them. General Programmed Teaching, Palo Alto, California, also has made available a set of self instructional materials entitled *Principles and Practice of Instructional Technology* utilizing a workbook, audio tapes and filmstrips. The course is structured in 15 units of study covering topics such as behavioral objectives, stimulus and response, and validation.

### Other higher education approaches

As previously stated, individualization of college and university instructional methods has been rapidly increasing. Multi-media self instructional techniques have been introduced into such diverse courses as Biology (Postlethwait, Novak, and Murray, 1969), Nursing (Mentzer, 1970), and Geography (Richason, 1971). Computer assisted instructional techniques have been tried (Bundy, 1971; Rogers, 1971) but they are still considered largely experimental and are often restricted to specialized, low enrollment courses. The concept of time-shared computer administered instruction continues to be explored at Stanford, Harvard, University of Illinois, Florida State University, and Pennsylvania State University, to name a few. In contrast to on-line computer assisted instruction, the off-line use of computers in connection with individualized college instruction has already proven feasible

for major blocks of the curriculum (Schure, 1968).

It is likely, at least for the next few years, that trends at the college level will parallel present trends in individualization in the elementary and secondary schools, namely, the increased use of 1) independent study "contracts" for entire courses, 2) independent study mixed with group study in a team teaching context, and 3) systems of instruction which are designed in modular form, relying heavily on the audiovisual media and the expanded use of resource centers accessible at the student's convenience. Dial access and computers will probably not greatly influence colleges toward individualization in the immediately foreseeable future.

A trend which is just beginning and which may well lead to major rethinking of college and university curricula toward individual study is the current consideration of external degrees in lieu of formal, campus-oriented classes. Both the Carnegie Corporation and the Ford Foundation have made grants to spark American versions of the "lighthouse" effort in England, The Open University. A number of variations of earning "credits without classes" are already under way in the United States (Doran, 1971; American Council on Education, 1971) and with the advent of such non-traditional organizations as the U.S. Department of Housing and Urban Development into the field many more variations can be expected. Individualization of learning will be a theme common to them all.

## INSTRUCTIONAL TECHNOLOGY

Instructional technology is playing an increasingly important part in the individualization of learning. Hoban (1968) has described instructional technology as "the *management* of ideas, procedures, money, machines and people in the instructional process." While this use of the term may seem overly broad to some people, it is nevertheless true that in employing instructional technology fully one should consider each of these factors as components in a manipulable system. For instance, new capabilities provided by instructional media, electronic equipment and innovative facility designs can lead to a radical change in the role of the teacher and/or the ease with which subject matter can be stored and retrieved (Weisgerber, 1968).

The application of technology (in its broad systematic sense, along with cost/benefit considerations) has largely been the basis for the current trends toward educational accountability and toward performance contracting (Mecklenburger and Wilson, 1971). The assumption that underlies these trends is that learning can be planned, carried out predictably within known cost constraints, and measured on a child-by-child basis. It is generally agreed that the individualization of educational processes and instructional resources are critical elements underlying both of these concepts (Education Turnkey Systems, 1971). Special attention will be given in the following paragraphs to instructional resources and particularly to equipment, materials and large-scale systems.

### Equipment

Individualization in "hardware" and equipment design has been typified by several somewhat divergent, yet related, trends. The first trend began with language laboratories. In them, individual carrels were provided for listening but program dissemination was by pre-announced schedule, and individuals elected whether to listen or not. This was followed by learner-activated program dissemination via dial or push button control over remotely located instructional materials. Nevertheless, learners who were second to dial in would miss the first part of any message previously activated. Both audio and video materials can presently be accessed by dial demand and a number of schools (e.g. Coatesville Schools, Pennsylvania) and colleges (e.g. Oklahoma Christian College) are implementing some variation of individualized learning in this way (Crossman, 1970; Niles, 1970; Bosen, 1971). In a very few installations (e.g. Oak Park/River Forest High School, Illinois) the remote program materials can be dubbed very rapidly so that the learner can independently manipulate his own "copy" to suit himself (Educational Media, 1969) independent of other learners.

The most sophisticated version of this trend, still based on individual access and remote control over a file of program materials, is time-shared, computer-assisted instruction (Hansen, 1969; Atkinson and Wilson, 1969). The hands-on use of computers by students

both at the school and college level has been successfully demonstrated in a number of places (e.g. McComb, Mississippi; University of Illinois). Although extensive and optimistic cost projections have been made (Kopstein and Seidel, 1968), it nevertheless appears that "the cost in preparation and use of computer-based exercises will continue to be high and not readily distributed over a large number of students" (Zinn and McClintock, 1970). In general, the trend toward complex electronic networks in which students are "on line" to a data base or program file seems to have slowed and perhaps has reached a plateau. A variation of the interactive, computer-based approach is the "talking typewriter" which has been successfully used (Project Breakthrough, La Salle School, Chicago) for teaching reading to preschoolers from disadvantaged homes. While effective, this method of individualizing has not yet overcome the problems of cost which limit its broad adoption.

A second, but not unrelated, trend is toward multi-media learning centers, such as that at Shasta College, California, in which the learner has easy off-the-shelf access to a variety of materials and equipment (Brown, 1968; Brick, 1971). In comparison to the dial-demand trend, the learning center trend is 1) not dependent on a network of wiring for message delivery but requires the student to move to the materials, 2) increases the variety of materials and types of equipment that can be accessed by an individual, and 3) has lower start-up and maintenance costs. This trend seems to be on the ascendance at all educational levels. Multi-media learning centers are now decentralizing from district level locations to locations in schools, departmental clusters, and in special areas in classrooms.

The third trend is toward compact, portable and inexpensive equipment that can be used flexibly in a different setting (Weisgerber, 1971c). For instance, audio cassette recorders have been described as "the paperbacks of the audio field" indicating their inexpensiveness and handiness. The ease with which tape cassettes can be prepared, labeled, stored and operated has encouraged their use at all educational levels.

Similarly, hand held 8 mm projectors are now being distributed by Rheem Corp. and are particularly appropriate for individualized learning applications (Palmer, 1971). Small filmstrip previewers are quite appropriate as well.

Videotape cassette recorders have been announced by some American and foreign firms and within a year should greatly facilitate the use of home television for individual study. Weston (1971) has pointed out that the Philips equipment will be inexpensive (about \$720) and flexible, i.e., it will allow recording of one program while viewing another, and recording a program automatically for subsequent viewing.

## Materials

Individualization via the instructional media "software" has been typified by the trend toward small, discrete topics or concepts (such as can be covered with two-minute 8 mm "single concept" films) which lend themselves to being packaged into modules of instruction.

At least three trends are apparent in the materials commonly used for individualization. First, and most prominent of the trends, is the development of instructional modules. Although variously named, e.g. TLU's or Teaching-Learning-Units (Project PLAN), LAP's or Learning Activity Packages (Nova Schools), Unipacs (I/D/E/A), Contracts (Duluth Schools), skill sheets (IPD), lesson cards (Continuous Progress Laboratory), they generally share certain characteristics that are critical to individual learners. These critical characteristics are: 1) a clear statement of the expected outcomes or educational objectives, 2) provision of or directions to appropriate instructional media, 3) specification of appropriate independent activities or interactions with other students, and 4) provision for practice with self check questions or sample criterion test items.

A number of school districts like that in San Carlos, California, have committed themselves to developing a viable individualized system with learning units or modules

developed by their own staff (supplemented by materials from other sources) and providing their own scoring and reproduction services. At San Carlos, for example, nine teachers were paid by the school district to prepare SCILS (San Carlos Individualized Learning System) units for Grades 1-8 in reading and Grades 1-4 mathematics. Altogether, some 194 SCILS units were prepared in 19 days. During the 1971-72 school year the materials are being used by 22 teachers in six schools and double that number of teachers have asked to be included in the program. The SCILS program also foresightedly individualizes its explanation of the program to parents through a tape/slide presentation and a "Learning Unit" of eight stated objectives which the parent is supposed to "master."

### Selected pre-packaged commercial materials

The Continuous Progress Laboratory System (CPL), available from the Educational Progress Corporation (Tulsa, Oklahoma), provides individualized programs in the four major curriculum areas for Grades 1-8. Each laboratory utilizes a set of lesson cards, a variety of correlated textbooks, progress books, and audio progress tapes appropriate to particular grade levels. The lesson cards contain learning objectives, challenge tests (which the child scores himself) and performance tests. A symbol system refers to correlated materials and a wall chart (which is to be filled out at the local school) refers to related audiovisual materials that the school already owns. The Mathematics, Science, Social Studies and Language Arts laboratories all sell for \$98.50 each and, with volume purchasing, on-site teacher training is provided free. Other Educational Progress Corporation materials which are clearly individualized in nature are the Audio Reading Progress Laboratories (\$648 for Grades 1-8), the Spelling Progress Laboratory tapes (\$480), and the Career Development Laboratory (\$180).

Holt, Rinehart and Winston markets an individualized package for prekindergarten to 3rd grade entitled Developing Number Experiences involving a variety of manipulative activities (\$124).

The Macmillan Company has an individualized Decoding for Reading program, using records, booklets and tests (\$126), for remedial readers.

Science Research Associates have been marketing Reading Laboratories for Grades 1-3, 4-6, and 7-12 (\$75 each) for language skill building; Word Games Reading Laboratory (\$107) for phonics; and other packaged kits for composition, arithmetic and so on. Many individualized programs utilize the SRA Labs as important supplementary materials even if the main thrust of instruction is via another approach.

McGraw-Hill Book Co. has been marketing the colorful and well known Sullivan Reading Program which is used very widely in individualized programs as a way of teaching beginning reading. A basic classroom set of materials for a class of 25 students, for grades 1-3, is about \$420.

The Van Allen Language Experience in Reading, Levels 1, 2, 3 (Encyclopedia Britannica Press, 425 N. Michigan Avenue, Chicago) is a strategy for teaching communication skills (reading, speaking, writing) by having individual children dictate stories which are then typed. The child then learns reading from his own dictated "book." After mastering basic skills of reading, he begins to learn spelling, grammar, writing and composition as he improves upon his own work. Comprehensive teacher guides are available to explain the procedures in the system.

Follett Publishing Company markets Individualized English Set J and Set H (\$69 each set), for Grades 6-9, including diagnostic and mastery tests, class profile chart, teacher guide and 88 study cards. The Frostig Remediation Program (\$98 plus) from Follett is widely used for overcoming individual perceptual difficulties.

## MAJOR NATIONAL SYSTEMS

Summarized nicely by the National School Public Relations Association (1971) are a number of national projects aimed at individualization, certain of which are more extensively described by Weisgerber (1971a).

PLAN (Program for Learning in Accordance with Needs) is a comprehensive system of individualized learning developed and field tested over a three and one-half year period by the American Institutes for Research in cooperation with some 14 school districts in California, New York, Massachusetts, Pennsylvania, and West Virginia under contract from Westinghouse Learning Corporation. Spanning all twelve grades and the four major subject areas of social studies, mathematics, science and language arts, the system uses modules in the form of Teaching-Learning-Units (TLU's) as the basic elements of curriculum. The TLU or module contains educational objectives, specifies activities, media and printed materials to be used, and provides self-checks on progress. Alternative TLU's are available which are materials-specific or materials-general (i.e., which allow the use of locally available materials). The system also contains curriculum-imbedded guidance modules as well as achievement tests for evaluating students' developed abilities and tests for each module.

The PLAN system is neither dependent on programmed instruction nor on special grouping or staffing arrangements. Its focus is on developing personal commitment and acceptance of responsibility on the part of individual learners, the provision of meaningful choices of learning materials suited to particular educational outcomes, and the increased relevance of schooling to long-term career goals. Essential to the success of PLAN is its implementation by a professional staff who are informed about the contents and mechanics of the system, and who are willing to adopt a new role as manager of learning.

Determination of student placement, the specification of personalized programs of study, and the monitoring of student performance are facilitated by the existence of a large computer centrally located in Iowa and directly accessible by each school via telephone lines.

As of the fall of 1971 contracts existed or were being arranged for some 25,000 students in 65 schools in 14 states. Additional thousands of students in the original developmental schools continue to use adapted versions of the PLAN system, and additional TLU's are being developed for subject matter areas not included in the initial system.

Selected PLAN schools:

### *Illinois*

Brady School, Aurora  
Bryan Junior High School,  
Elmhurst

### *New York*

Glen Cove Middle School, Glen Cove

### *Pennsylvania*

Penn Claridge Junior-Senior  
High School, Claridge  
Harrison Park Elementary School,  
Jeannette

### *Utah*

Frost Elementary School,  
Salt Lake City

### *Michigan*

Cascades School, Jackson

### *Rhode Island*

Henry Barnard School, Providence

### *New Jersey*

Orchard School, Ridgewood  
New Jersey Avenue School,  
Atlantic City

*Connecticut*

Greenfield School, Wethersfield

Contact Westinghouse Learning Corporation, 2660 Hanover Street, Palo Alto, California 94304.

*Washington*

Adams Elementary School, Yakima

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Individually Prescribed Instruction (IPI) is one of the better known individualized instructional systems at the elementary school level. Developed initially at the Learning Research and Development Center at Pittsburgh University, in cooperation with the Baldwin-Whiteball schools in suburban Pittsburgh, the IPI approach is actively being disseminated by Research for Better Schools, in Philadelphia. Now, some seven years after its inception, about 80,000 children are using the IPI system. Some 300 schools are using the IPI mathematics materials, 50 schools the reading materials, and 6 schools the science materials.

The IPI system uses skill sheets, booklets, and other specified materials as the basic element of instructional materials. A child progresses through the skill sheets, prescribed for him on a daily basis, and gradually advances through a continuum of proficiency levels and topical units. As the child progresses in a subject area such as reading, the proportion of time spent in directed study decreases while self-selected study increases.

One of the strengths of the IPI approach is its use of student performance measures in the form of a) placement tests, b) diagnostic tests for individual units, and c) curriculum imbedded tests for monitoring pupil progress.

A limitation of the IPI system is its dependence on full time teacher aides, who score and record pupil performance on tests and skill sheets, assist students in finding materials and maintain the inventory of materials and skill sheets.

Selected IPI schools:

Lincoln Model School, Fresno, California

David W. Harland School,

Wilmington, Delaware

Oakland Terrace Elementary,

Panama City, Florida

Pine Grove Elementary, Valdosta, Georgia

Main Elementary, Marion, Iowa

Green Street Elementary, Tupelo,

Mississippi

Friend Elementary, Main, Nebraska

P.S. No. 134, Bronx, New York

Hoover Elementary School, Corvallis, Oregon

McAnnulty Elementary School,

Pittsburgh, Pennsylvania

Fort Jackson Elementary, Fort Jackson,

South Carolina

James Bowie Elementary, Abilene, Texas

John Marshall School, Newport News,

Virginia

Midland Elementary School, Tacoma,

Washington

Contact Research for Better Schools, Inc., 1700 Market Street, Philadelphia, Pennsylvania 19103.

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I/D/E/A (Institute for Development of Educational Activities, Inc.), an affiliate of the Charles F. Kettering Foundation, has been active for several years in advocating individualization in the schools. Cooperation between I/D/E/A's Research Division, headed by John I. Goodlad, and the League of Cooperating Schools in Southern California has enabled much practical experimentation to take place in recent years. Their non-graded approach, differential staffing and technological support has blended with a system of

individualization called IGE (Individually Guided Education), the culmination of work done by the Wisconsin Research and Development Center for Cognitive Learning. The central idea of this approach is the emphasis of motivation and personal commitment to learning in the context of "multi-unit" school organization (I/D/E/A, 1970; Klausmeier, Sorenson, and Ghatala, 1971). Team teaching (four teachers, one instructional aide, one clerical aide) is used for each 150 students with the students having a variance of three years in chronological age. The IGE approach is *not* completely individualized but calls for differential grouping in four modes. It is estimated that some 50,000 students at the elementary school level are now involved in the IGE non-graded approach in Wisconsin, Colorado, Ohio, Michigan, Florida, New York, and Minnesota.

Selected IGE schools:

Wilson Elementary School,  
Janesville, Wisconsin

Wayne Community School District,  
Wayne, Wisconsin

Toledo, Ohio—23 elementary schools

Dayton, Ohio—9 elementary schools

Youngstown, Ohio—6 elementary  
schools

School District No. 151,  
South Holland, Illinois

Lynchburg Public Schools,  
Lynchburg, Virginia

Jackson Public Schools, Jackson,  
Mississippi

Greensboro Public Schools, Greensboro,  
North Carolina

Merrimack Education Center, Chelmsford,  
Massachusetts

Des Moines Public Schools, Des Moines, Iowa  
Tulare County Schools, Visalia, California

Contact Wisconsin Research and Development Center for Cognitive Learning, University of Wisconsin, 1404 Regent Street, Madison, Wisconsin 53706, or I/D/E/A, 5335 Far Hills Avenue, Dayton, Ohio 45429.

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The Individualized Mathematics System (IMS) is an elementary school program developed by the Center for Individualized Instructional Systems, Durham, North Carolina, over a three-year period. Field tested in 1970-71 with some 10,000 students in four states, the program is expanding to 135 schools nationally.

Through the use of skill folders, each containing a number of plastic laminated worksheets (for reusability), the IMS system moves students step by step toward educational objectives. In effect, the skill folders represent a continuum since they are scaled by topic and level of difficulty. Students are placed in the sequence according to placement tests and their mastery is assessed by checkup tests, often self-scored.

Selected IMS schools:

*North Carolina*

Appalachian Elementary School,  
Boone

Clear Creek Elementary School,  
Charlotte

Frank Porter Graham School,  
Chapel Hill

*South Carolina*

A. B. Rhett School, Charleston  
Fairfax Middle School, Fairfax  
Willow Drive Elementary School,  
Sumter

*Virginia*

Deep Creek Elementary School,  
Scottsburg

Lemon Road Elementary School,  
Falls Church

Young Park Elementary School,  
Norfolk

*Florida*

William Jennings Bryan Elementary  
School, North Miami Beach

Contact Center for Individualized Instructional Systems, National Laboratory for Higher Education, Mutual Plaza, Durham, North Carolina 27701.

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Allen Calvin (1970), head of the Behavioral Research Laboratories, has criticized the non-graded and continuous progress approaches. He maintains that they "involve a tentative first step in breaking the traditional classroom straight jacket, but none of them have really moved far enough to be student centered rather than organization centered." He proposes, as a preferable approach, reorganization of schools according to a Student Centered Instruction (SCI) model. In place of "rooms" each school would have 1) a Reading and Language Arts Activity Center, 2) a Mathematics Activity Center, 3) a Natural and Social Science Activity Center, and 4) a Fine Arts Activity Center, plus a block of Physical Education activity. Each school undertaking a SCI approach would heavily use materials produced by the Behavioral Research Laboratories as well as receive in-service training and a full time SCI Project Director at the school. For 1971-72 some 100,000 students were projected to be involved in this approach, according to Calvin.

Selected schools using BRL approaches in one or more of the major disciplines and in some cases on a performance contract basis: (SCI is an outgrowth of Project READ and Project MATH.)

Banneker Curriculum Center, Gary, Indiana	New York City
Fair Lawn Elementary Schools, Santa Maria, California	Harlingen, Texas
Philadelphia	Mesa, Arizona
San Francisco	Clearwater, Florida
	Lansing, Michigan

Contact Behavioral Research Laboratories, 3280 Alpine Road, Menlo Park, California 94025.

## PUBLICATIONS, MEETINGS AND SOURCES OF INFORMATION ABOUT INDIVIDUALIZATION

Individualized learning is a topic of widespread interest. There are a number of sources to which educators can turn when seeking more information. In keeping with their own learning style, they can choose their instructional mode from among comprehensive texts, booklets, brochures, journals, newsletters, filmstrip/tape kits, study modules integrating films and other materials. If they prefer personal contact, they can attend workshops or conventions where individualization is being discussed.

### Selected multi-media

Available in 1970 from the Association for Educational Communications and Technology (AECT), 1201 Sixteenth Street N.W., Washington, D.C. 20036, were a series of six filmstrip/audiotape presentations entitled *Individualized Instruction*. These materials were produced as part of a U.S. Office of Education funded project which attempted to document and describe a number of individualized school programs around the country. The filmstrip/tape sets provide an excellent overview for the teacher trainee and should give the in-service teacher a new perspective. The materials are professionally prepared and each set may be used independently. The six sets are: (\$10 per filmstrip/tape)

Its Nature and Effects	Materials and Their Use
Its Objectives and Evaluation Procedures	Its Problems and Some Solutions
Diagnostic and Instructional Procedures	Recommendations for Implementation

Available as a complement to these audiovisual materials are printed brochures describing each of 46 schools visited. Available either from the AECT or from the ERIC Clearinghouse on Media and Technology, each case study brochure gives an overview of a given school, anecdotal comments and future plans. The set of 46 costs \$10. Also available from the DCE Publications, Waldo Hall, Corvallis, Oregon 97331 is an *Administrator's Manual* which, unfortunately, adds little new information to the filmstrip/audiotape and brochure materials previously described. The entire group of materials can be ordered from the Association for Educational Communications and Technology for \$77.50.

In 1971 L. Jean York compiled a useful and comprehensive seven-volume set of *Team Teaching Modules*. Each module (or text) has color-coded pages for different sections, describing contents, providing journal reprints and supplementary materials, directing trainee learning activities, or providing instruments for self evaluation. Although seven volumes on team teaching may seem too many, there is enough variety in the study approaches suggested to sustain trainee interest. A possible limitation of the volumes is the dependence on the learner's having access to certain audiovisual materials (virtually no illustrations are contained in the texts themselves), which may inhibit their use for individual study purposes by teachers in extension classes.

The seven volumes are available from Leslie Press, 111 Leslie Street, Dallas, Texas 75207, for \$19.60.

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| I. Philosophy and Background                       | IV. Grouping Children for Instruction     |
| II. Roles of the Professional and Paraprofessional | V. Team Teaching in the Nongraded School  |
| III. Materials and Resources                       | VI. Team Teaching and Children's Progress |
|  | VII. Prerequisites for Planning Sessions  |

Integrated with this set of text-modules are tapes, filmstrips and films, available through rental from the publisher. Some of these audiovisual media are:

*Films*

- "Team Teaching on the Elementary Level," 14 min., color. \$10.
- "Differentiated Teaching Staff," 28 min., color. \$12.
- "How Can You Apply Team Teaching and Nongrading to Your School?" 35 min., B&W. \$10.
- "Why Are Team Teaching and Non-Grading Important?" 49 min., B&W. \$10.
- "Make a Mighty Reach," 45 min., color. \$15.
- "Charlie and the Golden Hamster," 13 min., color. \$10.

*Tapes or Cassettes*

- "The Individualization of Instruction: Pupil Grouping Practices," 90 min., \$3.
- "Continuous Pupil Progress: Definition, Examples, and Essential Conditions," 60 min., \$3.

*Filmstrips*

- "Grouping Students to Learn," with accompanying manuals, \$1.25.
- "Design and Arrangement of Physical Facilities," with accompanying manuals, \$1.25.

**Newsletters, periodicals and related publications**

During 1971 a newsletter, *The Individualized Learning Newsletter*, came into being. Aimed at administrators, the newsletter may have wider readership since it also provides a source of information about current events, materials and recent school innovations. Subscription is \$40 per year for eighteen issues; Vol. 1, No. 5 contains 8 pages of news items, some of which may be slightly tangential to the stated individualization theme unless it is interpreted broadly. The newsletter is published at 67 East Shore Rd., Huntington, New York 11743.

In April 1969, the Individualizing Instruction and Learning Association published the first issue of the *One to One* Newsletter which, in turn, announced an "Annual Worldwide Conference" to meet that year in Seattle. Inquiries about the newsletter or current activities should be addressed to the association at 2948 N. Chippewa Way, Provo, Utah.

In April or May of 1972 the journal *Educational Screen and AV Guide* is scheduled to publish a special issue devoted to individualized learning, looking at the concept from a variety of viewpoints. The journal is published at 434 South Wabash, Chicago, Illinois 60605, twelve times yearly, \$4.

In May of 1972, EPIE Report 44 (Educational Products Information Exchange) was scheduled to be an "in depth" report on individualized instruction materials. The issue was to show how to differentiate between materials which individualize instruction and those that claim to. Consideration was to be given to major individualized instruction programs. Somewhere between 48 and 64 pages long, the report can be ordered for \$7 from EPIE Institute, 386 Park Avenue South, New York, New York 10016.

The Association for Educational Communications and Technology, 1201 Sixteenth St. N.W., Washington, D.C. 20036, publishes two journals which frequently include articles on

individualization. *Audiovisual Instruction* is \$12 for a yearly subscription (10 issues), while *AV Communication Review* is \$13 for a yearly subscription (4 issues).

Recent sample *AVI* articles on the topic are:

"A Suggestion for Individualizing Instruction Within a Traditional School Organization," Robert J. Starr, Oct. 1971, pp. 68-69.

"Systematizing a Nursing Degree Program = ILL," James Cabeceiras, Oct. 1971, pp. 12-15.

"Instructional Media Center Service in the Nongraded Elementary School," Leslie Gottardi, April 1971, pp. 30, 32-33.

Recent sample *AVCR* articles on the topic are:

"Computer Assisted Instructional Management for Teachers," John E. Coulson, Summer 1971, Vol. 19, No. 2.

"Using Student Performance Data for Improving Individualized Instructional Units," Harold F. Rahmlow, Summer 1971, Vol. 19, No. 2.

"Effect of Certain Individual Learner Personality Differences on Instructional Methods," Roger W. Haskell, Fall 1971, Vol. 19, No. 3.

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The *I/D/E/A Reporter* is a newsletter available from P.O. Box 446, Melbourne, Florida 32901. For a \$10 subscription all regular issues, supplemental issues and special reports are delivered. The theme of the newsletter is educational change and innovation; many of the people, places, and materials described are directly involved in the individualization of educational programs.

Another publication which regularly carries articles concerning various aspects of individualized learning and customarily has at least one issue each year which is devoted to it is *Educational Technology* (\$18 per year). They plan an issue during the coming year entitled "Individualized Learning Packages" which the publisher claims will "cover the entire field of learning packages." Back issues of *ET* are available (\$3 to \$3.95) on a variety of relevant topics such as accountability, the changing role of the teacher, and motivating learner-centered instruction by applying contingency management techniques. Selected articles from *ET* have been bound in book form and are available under the title *Individualizing Instruction* (\$3.95).

Finally, *Educational Technology* has made available several audio cassette tape series. One of these, *Behavioral Objectives in Education*, contains 12 presentations which would lend themselves to use in a workshop setting. Materials can be ordered from Educational Technology, 140 Sylvan Avenue, Englewood Cliffs, New Jersey 07632.

### Workshops, conferences, and conventions

A National Association for the Individualization of Instruction has been formed. A workshop was held at Harvard in June, 1971, and a conference in November, 1971, in New York City featured speakers on accountability, non-graded programs, microteaching, and the future of education. The future activities of the Association can be ascertained by writing to the Planning and Information Center, Wyandanch Public Schools, Wyandanch, L.I. New York 11798.

For a number of years the National Society for Programmed Instruction (NSPI) has been exploring various strategies intended to ensure mastery of instructional material by individual learners. The *NSPI Newsletter* is published 10 times yearly (\$20 for non-members, \$12.50 for members). This price also includes a quarterly publication, *Improving Human Performance*. Subscriptions and information about the Society's annual convention

can be obtained from NSPI, P.O. Box 137, Cardinal Station, Washington, D.C. 20017.

An Individualized Instruction Association has been meeting annually in Southern California, and the proceedings of their 10th annual conference are published as a 152-page monograph entitled *Individualized Instruction and Grouping of Pupils* with articles, photographs, and sample materials. It is available for \$5 from the Individualized Instruction Association, Tustin Elementary School District, 300 South C Street, Tustin, California 92680. Information about participation in the 11th annual conference should be directed to the Association's President, Mr. Tony Baratta, Director of Elementary Education, Santa Monica Unified School District, 1727 4th Street, Santa Monica, California 90401.

Three to four day workshops for teachers and principals are being conducted widely throughout California by the California Teacher Development Project for Systems of Individualized Instruction. A Title III project of the Fremont Unified School District, Fremont, California, the Development Project puts together (at costs of about \$25 per student) consulting expert teachers, experienced in individualization, with schools and districts who are interested in moving in that direction. Attractive printed and visual materials have been produced by the Project for explaining individualization to parents. An independent evaluation of the Project has found that it has significantly modified participants' knowledge, attitudes and behavior relative to individualization in the schools. Contacts relative to the Project should be addressed to Dr. Warren Kallenbach, San Jose State College, San Jose, California.

Two-day workshops for school boards and administrators are being offered across the country to acquaint key persons with alternative strategies for individualizing schools and how accountability and performance contracting are related to individualization. In keeping with the individualization process, each workshop participant, for a \$50 fee, can specify the particular kind of topic he wants to learn about and does so at his own pace. Pacific Learning Corporation, 770 Welch Road, Palo Alto, California 94304, offers the workshops and either Dr. Dale Strotmann or Dr. Margaret Steen can be contacted.

The League for Innovation in the Community Colleges, together with the Regional Education Laboratory for the Carolinas and Virginia (RELCV) has been conducting workshops for community college faculties in the individualization of instruction. In the workshops the faculty members have a hands-on opportunity to create individualized learning packages which they can use in their own courses. Interested persons or institutions should contact Dr. B. Lamar Johnson, University of California, Los Angeles.

The Association for Educational Communications and Technology, 1201 Sixteenth Street N.W., Washington, D.C. 20036, holds annual conventions at which a number of sessions deal with individualized learning. The 1972 convention is scheduled for April 16-21 in Minneapolis; the 1973 convention will be April 8-12 in Las Vegas.

### Selected books and booklets published in 1971

In 1971 several books became available which are directly relevant to teacher education about individualized learning. A companion set of volumes edited by Robert Weisgerber and published by F. E. Peacock Publishers Inc., 401 West Irving Park Road, Itasca, Illinois 60143, deal respectively with the principles and the practices of individualized learning. Each volume includes papers by acknowledged leaders in the individualization movement. Together they are meant to provide both a conceptual and an operational understanding of learner-oriented instruction for classes in curriculum and methods, educational psychology and instructional technology.

*Perspectives in Individualized Learning* (406 pages, paper \$6.50, cloth \$9.50) is organized into topical sections as follows:

- Part A. Some Underlying Assumptions Concerning the Need for Individualized Learning
- Part B. Mental Abilities: A Possible Basis for Individualization
- Part C. Individual Differences: Do They Make a Difference? (A Look at Reading)
- Part D. Individual Differences: How Should They Be Measured and Accommodated?
- Part E. Educational Objectives: The Key to What is to Be Learned
- Part F. Evaluation: The Key to Improving the Learning Environment
- Part G. The Teacher: A New Role
- Part H. Learning Activities: Individualized or Interactive?
- Part I. The Learning Environment: Instructional Technology
- Part J. Computers and the Individualization of Learning

The companion volume, *Developmental Efforts in Individualized Learning* (361 pages, paper \$6.50, cloth \$9.50) is organized into topical sections as follows:

- Part A. Individualized Programs at the National Level: The Project PLAN System
- Part B. Individualized Programs at the National Level: The IPI System
- Part C. Individualized Learning: The Present in the Elementary and Secondary Schools
- Part D. Individualized Learning: The Present in Colleges and Universities
- Part E. Individualized Learning: The Future of Education

During 1971 The Westinghouse Learning Press (Palo Alto, California) published a four-volume series by John C. Flanagan, Robert F. Mager and William M. Shanner entitled *Behavioral Objectives: A Guide to Individualized Learning* (set \$50). Comprehensive sequenced objectives spanning 12 grades in Science, Language Arts, Social Studies, and Mathematics make up the four volumes. While these objectives have been derived from the PLAN curriculums they also offer a starting point for school districts interested in individualizing on their own.

An altogether different type of book published in 1971 was *Creating Humane Schools*, by Don Glines, published by Campus Publishers, Box 1005, Mankato, Minnesota 56001 (281 pages). Based upon the philosophy of individualization of its author, this book describes the policies and the program of Wilson School, which the author directs. A school in which the student has an unusually high degree of control over his own educational program, Wilson might be difficult to emulate but many of the guidelines and principles put forth in the book can and should be implemented in all schools. Glines presents extensive rationales for such ideas as smorgasbord scheduling, year-round schools, and *no* required classes (even for primary children). In Wilson School the students "can go home and sleep if nothing relevant is offered that day."

Another type of book published in 1971 was a "how to" book by Richard Manatt and E. Bruce Weeks. Titled *An Educator's Guide to the New Design* and published by Kendall/Hunt Publishing Co., 135 South Locust Street, Dubuque, Iowa 52001 (196 pages, \$5.50 paper), this little book is organized into eight LAPS (Learning Activity Packages) having to do with the philosophy of individualized learning, behavioral objectives, patterns of staffing, student grouping in large, small and independent situations, auxiliary personnel, and techniques for producing LAPS. While it is an interesting strategy to "pre-package" individual study units for teacher education, the contents of the book are less accurate and complete than they should be. For instance, there are incorrect personal names (Postilewait instead of Postlethwait, p. 182 and p. 190; Phillip Kapper instead of Philip Kapfer, p. 190; Bob Glasser instead of Glaser, p. 191) as well as incorrect project names (Programmed Learning in Accordance to Need instead of Program for Learning in Accordance with Needs, p. 191). It is also unfortunate that no index is included.

A 1971 book by J. C. Meredith entitled *The CAI Author/Instructor* is an introduction and guide to teacher preparation of computer administerable instructional materials in the conversational mode. Published by Educational Technology, 140 Sylvan Avenue, Englewood Cliffs, New Jersey 07632 (\$5.95), the methods described in this book are

designed to allow the teacher who is unfamiliar with the technical characteristics and demands of a computer to prepare instructional materials for computer-assisted tutorial lessons. The techniques are not dependent upon the requirements of a particular CAI System, but are generalized for any system using a directed-dialog (as opposed to drill-and-practice) approach. The various types of answers a student may make are characterized.

Still another book published in 1971 dealt with administration of individualized school programs. James Lewis Jr. has written *Administering the Individualized Instruction Program*, published by Parker Publishing Co., Inc., West Nyack, New York 10994 (238 pages, \$15). As administrator at the Wyandanch Public Schools, Long Island, New York, and one-time poor child of an ethnic minority living in a ghetto, Mr. Lewis brings a unique perspective to his writing. He proposes the use of Individual Study Units of the type used at Wyandanch and gives suggestions for initiating an individualized learning program and for the teacher development of IS Units on a paid basis. Numerous examples are included in the appendix.

Parker Publishing Company also released in 1971 *Effective Teaching Strategies with the Behavioral Outcomes Approach* by Muriel Gerhard (256 pages, \$8.95).

Harper and Row, 49 East 33rd Street, New York, New York 10016, published Lloyd Bishop's book *Individualizing Educational Systems* (276 pages, \$7.95) in 1971.

A very fine summary of the major approaches to individualization extant today is the booklet entitled *Individualization in the Schools*. Published in 1971 by the National School Public Relations Association, 1201 Sixteenth Street N.W., Washington, D.C. 20036 (64 pages, \$4), the booklet is a special issue of the weekly newsletter *Education, USA*. Included in the booklet are an overview of the principles of individualization; descriptions and samples of systems such as PLAN, IPI, IGE, IMS and PLATO; local strategies as used in Duluth, Miami Springs, Honolulu, Cashton (Wisconsin), Granite (Utah), Melbourne (Florida); and school addresses.

Because individualized programs usually call for some group interaction or partner activities, a 1971 booklet entitled *Learning in the Small Group* seems relevant. Published by I/D/E/A (Institute for Development of Educational Activities) P.O. Box 446, Melbourne, Florida 32901 (31 pages, \$2), this booklet gives a comprehensive explanation of various small group configurations, the purposes of small groups, and the roles of the participants.

In the vein of self-instructional books about individualization, McGraw-Hill Book Company has published *Prescriptive Teaching System*, by Laurence J. Peter of the John Tracy Clinic, Los Angeles. The volume consists of a text (350 pages, \$7.95), a workbook of simulation exercises (\$4.95), and a record book (\$3.95) which includes a record for the teacher, a report to the supervisor, communication to the parents, data processing coding for research, and snap-out forms for 29 children. The set of three costs \$15.95, and is designed to be useful for in-service and pre-service application.

*Instructional Innovation and Individualization*, by David J. Klaus, is available from the American Institutes for Research, Fourth Floor, Chatham Center Office Bldg., Pittsburgh, Pennsylvania 15219, Attn: Librarian, for \$6. This 1971 book considers fundamental principles, computers and educational automation, programming, assessment, planning for change, gradual implementation, and research needs.

#### Additional publications

##### Books

ASCD 1964 Yearbook Committee, Ronald C. Doll, Editor and Chairman. *Individualizing Instruction*. Washington, D.C.: Association for Supervision and Curriculum Development, 1964. This collection of papers is directed at practicing educators, both teachers and students. It is primarily concerned with the recognition of the individual worth in

students and with ways that the teacher can act as a catalyst in promoting that human potential. The book is not intended as a handbook for implementation nor as an advocacy of any particular programmatic approach to individualization. Rather, it offers a philosophy for valuing the individual learner and for encouraging his progress. \$4.

- Atkinson, R. C., & Wilson, H.A. (Eds.). *Computer-Assisted Instruction: A Book of Readings*. New York: Academic Press, Inc., 1959. The editors have brought together 21 papers reflecting the current trends in research and development in Computer Assisted Instruction (CAI). The papers were selected to be readable and of general interest to students without a background in CAI. \$6.75.
- Brown, B. Frank. *The Appropriate Placement School: A Sophisticated Nongraded Curriculum*. West Nyack, New York: Parker Publishing Co., Inc., 1965. This book is the outgrowth of a working conference in 1963. It approaches the individualization of learning primarily as curricular change, i.e. the *phasing* of curriculum into more meaningful segments. Although the book is well written, few specifics are offered, there is more discussion of "classes" than "individuals," and the case studies are overly simplistic. Perhaps this is understandable in that the book was primarily intended as a general model for curriculum revision, a design which schools could adapt to suit their local situation. Taken in that light it can be quite useful to school supervisors and curriculum specialists. \$8.95.
- Drumheller, Sidney J. *Handbook of Curriculum Design for Individualized Instruction—A Systems Approach (How to Develop Curriculum Materials from Rigorously Defined Behavioral Objectives)*. Englewood Cliffs, New Jersey: Educational Technology, paperbound, \$8.95.
- Duker, Sam. *Individualized Reading: An Annotated Bibliography*. Metuchen, New Jersey: The Scarecrow Press, Inc., 1968. Forty-two pages of this book are devoted to a narrative explanation of individualized reading: what it is, how it works, some problems, research, when it should be used, the role of the librarian, and its future. Annotations form the remainder of the book and are generally quite succinct and informative. \$5.
- Eisele, James E. et al. *Computer Assisted Planning of Curriculum and Instruction*. Englewood Cliffs, New Jersey: Educational Technology, paperbound, \$3.95.
- Esbensen, Thorwald. *Working with Individualized Instruction: The Duluth Experiment*. Palo Alto, California: Fearon Publishers, 1968. This little book is organized in four parts: Part 1 is an overview of individualization as an instructional strategy, while Parts 2, 3, and 4 describe the implementation of individualization in three school projects, Franklin-Nettleton, Congdon and Chester Park. \$2.75.
- Gladstein, Gerald A. *Individualized Study: A New Approach to Succeeding Colleges*. Chicago, Illinois: Rand McNally, 1967. Aimed directly at the college student, this book is meant to be a self-help device for the student who wants to maximize the effects of his college effort. Numerous self evaluative aids (called activity sheets) are presented as well as tutorial material about how independent study skills can be developed. \$3.35.
- Glougau, Lillian, & Fessel, Murray. *Nongraded Primary School*. Englewood Cliffs, New Jersey: Prentice-Hall Inc., 1967. A report of the transition of Old Bethpage School to a form of nongradedness. It is presented in anecdotal, running-record form. An extensive appendix is provided and this may be of practical use to schools making similar transitions to nongradedness. \$7.95.

Goodlad, John I., & Anderson, Robert H. *Nongraded Elementary School*. New York: Harcourt, Brace & World, Inc., 1963. This is probably the single most important book on nongraded schools. Certainly it is one of the best written, best documented and most convincing treatments of the topic, and remains so even though some years old. The case presented for continuous progress in preference to the theory of grade standards or the theory of "social" promotion is a telling one. Throughout the book are words of caution as well as enthusiasm and the reader is given enough information to judge for himself whether nongraded schools are a viable alternative to present practices and whether the concept is well enough understood (by the reader) to be implemented in his own situation. All in all, the book is quite comprehensive in its coverage and therefore useful as a reference work. \$4.25.

Howard, Eugene R., and Bardwell, Roger W. *How to Organize a Nongraded School*. Englewood Cliffs, New Jersey: Prentice-Hall Inc., 1966, 64 pages, paperbound \$2.25. This little book uses the Ridgewood School (Norridge, Illinois) and other nongraded schools (a list of schools is included in the appendix) to illustrate the authors' concept of nongradedness. Part of the book gives an anecdotal accounting of what happens to a typical student. Another part deals with the way that school plant design affects the nongraded approach. The authors also describe what nongradedness can and cannot be expected to accomplish.

Howes, Virgil M. (Ed.) *Individualization of Instruction: A Teaching Strategy*. New York: The Macmillan Company, 1970. The book is organized into three parts: Why Individualize?, What is Individualization?, and Programs and Practices. Each part is a collection of reprinted articles published mostly between 1964 and 1968, and the lead article in each part is authored by the editor. While most of the articles are of an overview nature, a number are well chosen, e.g. by Arthur Combs, Fred Wilhelms, Dwight Allen, Robert Glaser, Don Parker, and a joint statement by AASA, ASCD, NASSP, and DRE. \$3.50.

Howes, Virgil M. *Individualizing Instruction in Reading and Social Studies*. New York: The Macmillan Company, 1970.

Howes, Virgil M. (Ed.) *Individualizing Instruction in Science and Mathematics*. New York: The Macmillan Company, 1970. The book is organized into two sets of readings. Part I deals with science and mathematics and includes reprints from *Science Teacher*, *Science and Children* and similar journals reporting current practices. Part II is concerned with technology, particularly computer technology, and how new instructional systems might "look" in the future. The papers in this part are drawn from *Science*, *Educational Technology*, *Phi Delta Kappan* and similar professional publications. While the book is really two half-books, it is nonetheless an interesting and timely collection of papers which deal with individualization as a process amenable to systematic development and application. \$3.50.

Kapfer, Miriam B. *Behavioral Objectives in Curriculum Development—Selected Readings and Bibliography*. Englewood Cliffs, New Jersey: Educational Technology, clothbound, \$9.95.

Kapfer, Philip G., & Ovard, Glen F. *Preparing and Using Individualized Learning Packages for Ungraded, Continuous Progress Education*. Englewood Cliffs, New Jersey: Educational Technology, paperbound, \$8.95.

Manlove, Donald C., & Beggs, David W. III. *Flexible Scheduling: Bold New Venture*. Bloomington, Indiana: Indiana University Press, 1965, \$5.95. An easy-to-read and well organized presentation of the ideas and methods of flexible scheduling. Described in detail is the *IndiFlexS* model. This calls for:

1. varying the rate, the depth and the breadth of instruction made available to an individual according to his needs,
2. assigning teachers according to the functions they seem best in performing,
3. altering the size of the class so students will have independent study opportunities, inquiry classes, and assembly classes,
4. assigning time to subjects according to their requirements for mastery.

- Marshall, Max S. *Teaching Without Grades*. Corvallis, Oregon: Oregon State University Press, 1970. For many educators the initial step toward individualization is taken when they examine and find wanting the concept of grading their students. This little book details the arguments against grading and suggests, as an alternative, a description of the strengths and weaknesses exhibited by the student as he progresses. \$2.95.
- McNamara, Helen. *Individual Progression*. Indianapolis, Indiana: The Bobbs-Merrill Co., Inc., 1970. \$1.75.
- Petrequin, Gaynor. *Individualizing Learning through Modular-Flexible Programming*. New York: McGraw-Hill Book Co., 1968. This small book is a highly readable description of the educational program at Marshall High School, Portland, Oregon, where the curriculum has been adapted to the individual students' preferences by application of the Stanford School Scheduling System, a computer-generated technique for modular flexible scheduling. Large group, small group, and independent study form the basis of the instructional approach at Marshall and are described in the text. Also described are the English, Science and Guidance programs, the validation design, and how individualization is accomplished within courses. \$5.95.
- Popham, W. James. *Criterion-Referenced Measurement (An Introduction)*. Englewood Cliffs, New Jersey: Educational Technology, clothbound, \$5.95.
- Postlethwait, S.N., Novak, J., & Murray, H.T., Jr. *The Audio-Tutorial Approach to Learning*. Minneapolis, Minnesota: Burgess Publishing Co., 1969. In 1962, at Purdue University, S.N. Postlethwait introduced the audio-tutorial approach to provide for independent study in a drastically revised biology course. This revised book not only explains and documents the audio-tutorial approach but is presented in sufficient detail that it could be used as a how-to-do-it manual. In the decade since its inception, the audio-tutorial approach has been the model for media-based self instruction in numerous subject matters, grade levels and institutions. While the audio-tutorial approach is *not* completely individualized (it involves small group quiz sessions and general assembly sessions as well) it is "must" reading for those who intend to provide for meaningful self instruction through the integration of media and student hands-on experimentation. \$4.75.
- Rollins, Sidney P. *Developing Nongraded Schools*. Itasca, Illinois: F.E. Peacock Publishers, Inc., 1968. A good treatment of the nongraded school as a way of meeting learner needs that is preferable to subject-oriented schools. The book begins with a rationale, then covers the role of the teacher, administration, physical environment, curriculum, and closes with a look at education circa 2000 A.D. Several Learning Activity Packages (LAPS) are included in the appendix, for social studies and biology as used at Nova Elementary School. \$5.75.
- Smith, Lee L. *A Practical Approach to the Non-Graded Elementary School*. West Nyack, New York: Parker Publishing Co., Inc., 1968. This is a chronicle of Brunswick Elementary School's organization for nongraded learning. As such, it gives a comprehensive coverage of the problems and methods for overcoming them. Not typically included in books of this type are discussion of Federal Aid (Title I), costs, approaches to pupil evaluation, and evaluation of the nongraded program itself. The book also is quite helpful concerning various administrative and instructional forms that are used as well as the graphic display of the concept of levels of progress.
- Smith, Lee L. *Teaching in a Nongraded School*. West Nyack, New York: Parker Publishing Co., 1970, 319 pages, \$8.95. This book gives specific examples and directions for organizing a school on a nongraded basis. It is extremely thorough in its presentation of the curriculum for language arts and mathematics, levels A through O, and encompasses social studies and science as well. Attention is paid to the resources, both human and physical, and the necessity for evaluation of program outcomes.

Stahl, Dona, & Anzalone, Patricia. *Individualized Teaching in the Elementary Schools*. West Nyack, New York: Parker Publishing Co., Inc., 1970.

Thomas, George I., & Crescimbeni, Joseph. *Individualizing Instruction in the Elementary School*. New York: Random House, 1967. As a basic methods and curriculum text this work bridges the gap between the "old" and the "new," that is, new in 1967. It is clearly a book that opens up most of the considerations which have led to our present trend toward individualization, but unfortunately does not cover curriculum developments in the last five years. Topics included are team teaching, flexible scheduling, programmed materials, individualized reading, and an especially good summarization of the historical background of education in America. Much of the book deals with ungraded approaches to teaching the various academic disciplines. \$7.95.

#### Monographs

Antico, Andrea. *The Self-Directed Learner: His Habits and Habitats*. Kansas City, Missouri: Mid Continent Regional Educational Laboratory, February 1968. This is a review of selected literature on independent study with an extensive bibliography, some of which is annotated.

Division of Curriculum and Instruction Services. *Intensification of the Learning Process*. Doylestown, Pennsylvania: Bucks County Public Schools, February 1970. These ten reports give a complete detailing of the methods used at Bucks County for personalizing instruction through prescriptions. Considerable emphasis is placed on pupil diagnosis and assessment.

National Association of Elementary School Principals. *The Nongraded School*. Washington, D.C.: National Education Association, 1968. A collection of reprints from issues of the *National Elementary Principal*. While most of the articles are quite short and there is little evidence that the papers were systematically chosen or organized, there are several which are thought provoking: In particular, a pros and cons appraisal by Anderson, a survey of practices by Shearron and Wait, and a paper on facilities and space by Carswell. An audiotape, 40 minutes long, covers the topic in an interesting manner. Some 22 questions about nongraded schools are posed in an interview situation with Robert Anderson and Evelyn Carswell responding to Dorothy Neubauer, Editor of *The National Elementary Principal*. A leaflet is enclosed containing the questions and a suggestion is made that these be used to stop the tape at logical points where discussion seems warranted. The content of the responses is convincing more than evangelistic and is recommended listening. \$2.00.

Passow, A. Harry (Ed.). *Nurturing Individual Potential*. Papers and reports from the ASCD Seventh Curriculum Research Institute. Washington, D.C.: Association for Supervision and Curriculum Development, 1964. A provocative collection of papers which provide perspective on the underlying needs for recognizing individual differences and for employing techniques more likely to develop the talent and productive potential in each learner. Chapters of special value are those by Flanders ("Teacher and Classroom Influences on Individual Learning") concerning dependence or independence as learner patterns, and by Cloward and Jones ("Social Class: Educational Attitudes and Participation") which concerns the special needs of the economically, socially or ethnically disadvantaged learners. \$1.50.

Rapport, Virginia, & Parker, Mary N.S.W. (Eds.). *Learning Centers: Children on Their Own*. Washington, D.C.: The Association for Childhood Education International, 1970. A compact booklet that serves nicely as an introduction to personalized learning. While it is primarily an explication of the reasons behind rather than the methods of individualization, it has been well edited. The paper by Day and Allen "Organization for Individual Work" is perhaps the most informative and most realistic.

Seidel, Robert J., & the IMPACT staff. *Project IMPACT: Computer Administered Instruction Concepts and Initial Development*. Technical Report 69-3. Washington, D.C.: George Washington University, HUMRRO (Human Resources Research Office), 300 North Washington St., Alexandria, Va. 22314, March 1969. A thorough coverage and explanation of a new computer based instructional system model called IMPACT. Includes specific plans for course development.

Spitzer, Lillian K. *A Selected Bibliography on Individualized Instruction*. Los Angeles, California: I/D/E/A (Institute for Development of Educational Activities, Inc.), June 4, 1968. This is a special listing of curriculum materials for individualizing in given subject areas, and strategies for individualizing such as nongrading, flexible scheduling, CAI and programmed instruction. Some 256 books, pamphlets and articles are listed. Some are annotated.

Tyler, Fred T., et al. *Individualizing Instruction*. N.S.S.E. 61st Yearbook, Pt. 1 (Ed. Nelson B. Henry). Chicago, Illinois: University of Chicago Press, 1962. Still an outstanding collection of papers some ten years later.

#### Journal articles

Bloom, Benjamin S. Learning for mastery. *Evaluation Comment*, May 1968, 1(2), 12 pp. An authoritative examination of the concept of mastery learning, this article is also an indictment of past instructional methods based on the normal distribution and an analysis of the implications of individual differences for improved personal development. The variables identified for mastery learning strategies are 1) aptitude for particular kinds of learning, 2) quality of instruction, 3) ability to understand instruction, 4) perseverance, and 5) time allowed for learning.

Cabeceiras, James. Systematizing a nursing degree program = ILL. *Audiovisual Instruction*, October 1971, 16(8), 12-15. This article reviews the steps involved in developing ILL, an Independent Learning Laboratory for San Jose State College's basic nursing skills course. By using systems analysis techniques, some eleven learning modules were developed in cooperation with the nursing faculty. The developmental model, which is illustrated diagrammatically, is clear and complete.

Crossman, David M. The current state of the Remote Access Audio Video Information System. *Audiovisual Instruction*, September 1970, 15(7), 20-3. A rather thorough review of the background, present status and major considerations affecting dial access systems.

Flanagan, John C. Individualizing education. *Education*, February-March 1970, 90(3), 191-206. This is the first of a series of articles in this issue (others are by Flanagan, Dunn, Jung, Rhett, Webster and McLeod, and Wright) explaining the origin and nature of Project PLAN, a system for individualization now in use across the nation.

- Gottardi, Leslie. Instructional Media Center Services in the nongraded elementary school. *Audiovisual Instruction*, April 1971, 16(4), 30, 32-3. A short listing of the major functions of and principles for a learning resources center for nongraded learners and instructional teams.
- Klausmeier, Herbert J., Sorenson, Juanita S., Ghatala, Elizabeth S. Individually Guided Motivation: Developing self-direction and prosocial behaviors. *Elementary School Journal*, March 1971, 71(6), 339-50. Since 1966 Wisconsin R & D Center for Cognitive Learning, Wilson Elementary School, Janesville, Wisconsin, and other schools have been developing IGM. The program is said to take into account pupil rates, styles, and motivation on an individual basis. Four general areas of motivation are involved:
1. motivation for knowledge acquisition beyond minimum school requirements,
  2. assuming greater self direction,
  3. conceptualizing a value system relative to his behavior,
  4. promptly starting and completing minimum school tasks.
- McKeegan, Hugh F., & Moore, J. William. Mediating individualized instruction at Bucknell. *Audiovisual Instruction*, May 1967, 12(5), 467-8. A brief discussion of the strategy for individualization at Bucknell.
- Mello, Lawrence T., Tannenbaum, Paula, & Campbell, Edward R. Project CAM: Reaching objectives through learning modalities. *Audiovisual Instruction*, May 1971, 16(5), 30-1. A description of Project CAM at the Joseph Coggeshall School in Portsmouth, R.I. In this instructional program media are integrated into the daily prescriptions for individual students.
- Savage, John F. Teaching reading with the aid of technology. *Audiovisual Instruction*, November 1970, 15(9), 24-5. A brief report on various ways that media are used to facilitate reading instruction in the schools.
- Starr, Robert J. A suggestion for individualizing instruction within a traditional school organization. *Audiovisual Instruction*, October 1971, 16(8), 68-9. This very brief article offers an example of a Student Proposed-Individual Learning-Activity form, suggested by the author as a way to get a "quick start" in individualizing a course within a non-individualized school. The method proposed involves self set goals and evaluation criteria on the part of the student with approval and grading by the teacher.
- Surpin, Shelley. The "fluid" university: Home terminals, hologram libraries, global transmitters, and a system unlike anything we know today. *College and University Business*, September 1971, 51(3), 8, 10, 90, 92, 94. Some interesting speculations on the relationship of technology to the facilitation of non-traditional study.
- Taylor, Gary R. The lone learner. *Audiovisual Instruction*, April 1971, 16(4), 54-5. A short, highly critical (even cynical) article which suggests that individualized learning fails to prepare learners for a viable role in society because it fails to give students "society-approved repertoires of experience." Alluding to a 1969 doctoral study for credibility's sake, the author selectively interprets the data relating to a comparison of three instructional techniques to favor his own point of view. It is worth noting that the same data could also be interpreted quite oppositely, depending on what goals were established prior to instruction.
- Weisgerber, Robert A., & Rahmlow, Harold F. Individually managed learning. *Audiovisual Instruction*, October 1968, 835-9. This is an overview of Project PLAN, describing its developmental schedule, how media are tested in the system, and giving several "case study" examples of how teaching-learning-units are used by the learners.

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