DOCUMENT RESUME

ED 095 634   EA 006 366

AUTHOR   Golladay, Mary A.; And Others
TITLE   Development of a Descriptor for Individualized
                Instruction.
INSTITUTION   Wisconsin Univ., Madison. Center for the Analysis of
                Individualized Instruction.
SPONS AGENCY   National Inst. of Education (DHEW), Washington,
                D.C.
PUB DATE   Apr 74
GRANT   OEG-0-72-1254
NOTE   32p.; Paper presented at American Educational
                Research Association Annual Meeting (59th, Chicago,
                Illinois, April 1974). A related document is ED 084
                861

EDRS PRICE   MF-$0.75 HC-$1.85 PLUS POSTAGE
DESCRIPTORS   *Classification; Educational Research; Elementary
                Grades; Individual Instruction; *Individualized
                Instruction; *Individualized Programs; Instructional
                Programs; *Program Descriptions; Secondary Grades;
                *Subject Index Terms
IDENTIFIERS   *Descriptor for Individualized Instruction
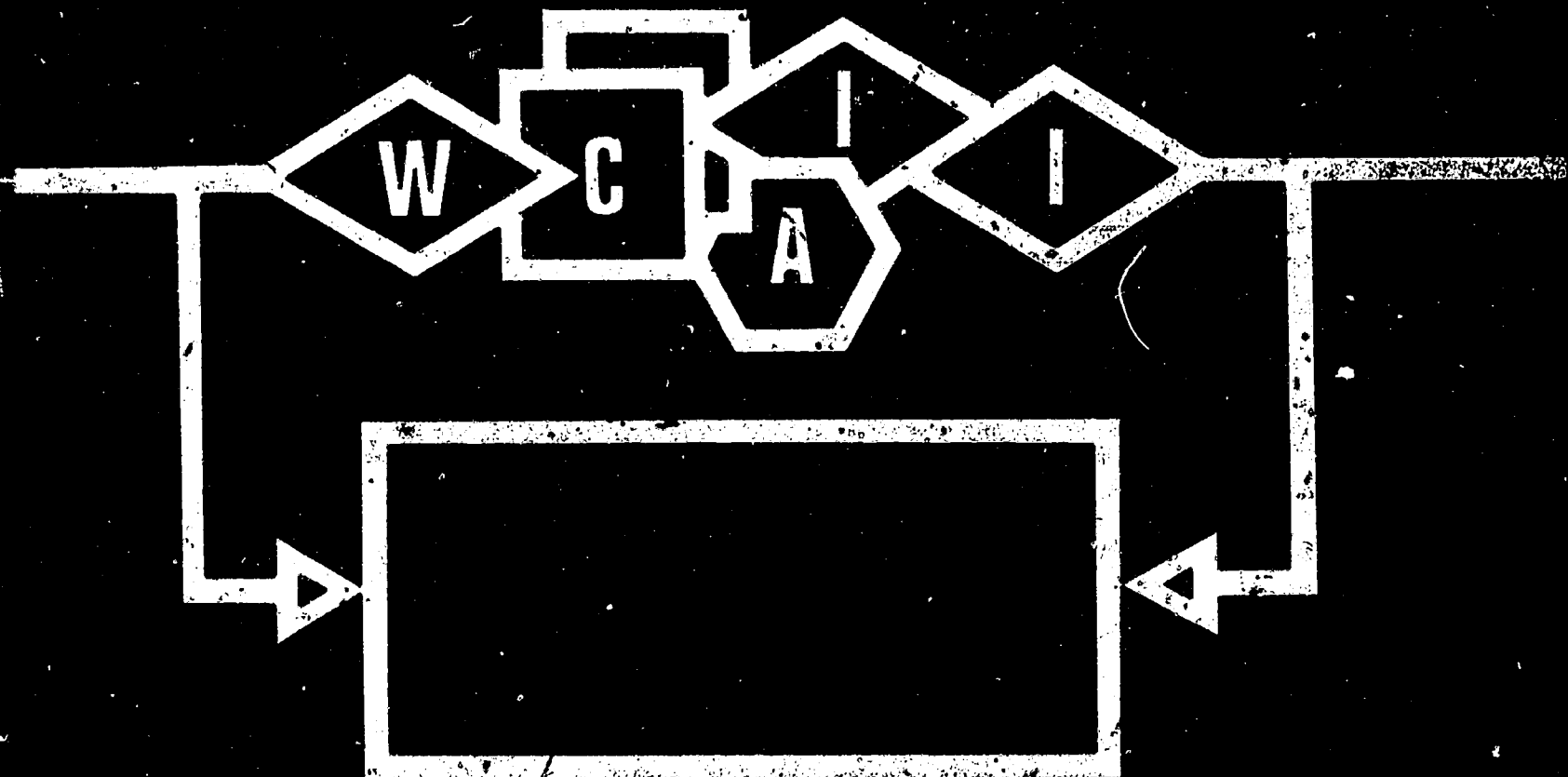
ABSTRACT

                Providing an education that meets the needs of
individual learners has generated a variety of programs to
individualize instruction. This variety has motivated the development
of a descriptor to relate features of instructional programs which
offer individualization. This descriptor identifies, quantifies, and
graphically represents the significant dimensions of a program's
individualization. During the development of the descriptor, a
preliminary version was field tested at 15 sites with programs in
mathematics, reading, and teacher education. The utility of the
descriptor was examined for purposes of description, comparison, and
development. The descriptor proved to contribute to communication,
dissemination, and development regarding individualization.
(Author)

DEVELOPMENT OF A DESCRIPTOR

FOR INDIVIDUALIZED INSTRUCTION

DEVELOPMENT OF A DESCRIPTOR

FOR INDIVIDUALIZED INSTRUCTION

Mary A. Golladay

G. Thomas Fox, Jr.

Karen Skuldt

School of Education
University of Wisconsin - Madison

Individualization of instruction is a goal sought by educators
at many levels and in many educational institutions. Public school
teachers and administrators, research and development centers, and
commercial publishers continue to seek ways to support the efforts
of teachers to serve the needs of individual learners. Currently a
wide range of instructional designs is identified as individualized
instruction. National programs such as IPI, PLAN, and IGE represent
but a small part of the total national effort to individualize instruction.

Progress in the movement toward increased individualization has
been hampered by an inability to communicate intent. Among professionals
this inability to communicate ideas about individualization of instruction
has many implications   Members\ of instructional teams are hampered
in their efforts to conceptualize program intent and implement a
coordinated instructional team effort. Classroom teachers are not
acquainted with the terminology which effectively expresses their needs
and instructional concerns. Researchers do not have the terminology
that they can use to construct hypotheses which have meaning to other
professionals. Developers are not fully aware of the intentions their
products are to serve. Observers cannot report clearly their impressions
about functioning programs from which they or others may wish to borrow.
Commercial publishers do not provide the materials required for
supporting individualizing instruction. Administrators have few bases
on which to make judgments concerning either individualizing goals they

i

seek for their schools or assessment of the progress being made toward
individualization by the schools for which they are responsible. To
serve these communication needs, the Descriptor for Individualized
Instruction has been developed.

This paper describes the process by which the Descriptor was
developed, the characteristics and use of the completed Descriptor
and the problems which must be resolved prior to the Descriptor's
use as a research tool.

DEVELOPMENT OF THE DESCRIPTOR

The Descriptor was developed over a two year period. This
process included an examination of the literature related to
individualization, consultation with qualified professionals,
preparation of instruments measuring activity in each component and
field testing of specific instruments prior to the testing of the
entire Descriptor.

The Descriptor was tested as a complete system in order to
evaluate its utility and practicality and to test its acceptability
to educators and researchers as a meaningful tool. In order to test
the Descriptor under different circumstances, field tests were performed
in a number of different settings and in different subject matter
areas. The subject matter areas selected as representative were
individualized programs in mathematics, reading and teacher education.
In field tests for each of the three areas selected, efforts
were made to test the application of the comprehensive system in
serving alternative purposes. Hence, field tests included: a) program

descriptions...b) comparisons between program descriptions of
different programs; and c) comparisons between the goals and practices
of certain programs to support program development.

Identifying Aspects of Individualization

The lack of consistency among educators as to either the nature
of the individualizing experiences or the characteristics of programs
which nurture such experiences was observed by students and faculty
participating in a mathematics education seminar in the spring
semester of the 1969-70 school year. Early in their efforts to study
instructional systems it became evident that communication about what
one observed was extremely difficult. To solve this communication
problem the group set out to devise a scheme for reporting their
observations. The present developmental effort is an extension of the
early work of that seminar.

Several literatures were reviewed in developing the Descriptor.[1]
First the subject of individual differences in learning as considered
from the two distinct perspectives offered by learning theorists and
school personnel was examined for insights into variables appropriate
for consideration in classroom learning.[2] Second, aspects of instruction
and instructional procedures dealt with in a variety of theoretical and
anecdotal reports were reviewed. These sources identified or examined

---

1. All sources consulted during the development of the Descriptor
are identified in Appendix A: Bibliography on Individualized Instruction,
Descriptor for Individualized Instruction: Development Procedures and
Results, Final Report, National Institute of Education, Office of
Education, Grant No. OEG-0-72-1254, pp. 117-131.

2. For example, see Robert M. Gagne, "Learning Research and Its
Implications for Independent Learning," in Robert A. Weisgerber (Ed.),
Perspectives in Individualized Learning (Itasca, Illinois: F. E. Peacock,
Inc., 1971) pp. 12-30.

specific features of classroom practices important to individualizing-instruction.[3] Finally, taxonomies describing individualizing procedures were studied. These references offered different category systems for describing instruction.[4]

The review of current literature relating to individualized instruction yielded several impressions. First, one notices a very narrow view of instruction. For example, learner rate is the one instructional feature that is most often addressed. Second, one is again impressed by the gulf between theoretical research in learning differences and studies of educational practice. Third, limited attention has been given to the mapping of a comprehensive picture of individualized instruction.

Conferences with consultants offered immediate responses to early versions of the Descriptor. Each of four consultant meetings addressed specific features of the current versions of the Descriptor. These features included the choice of major components identified to describe individualized instruction, the terminology used within the Descriptor components and the techniques being used to collect the data to support the description.

Conferences were scheduled during the months when the Descriptor was being designed and different versions and data gathering techniques

---

3. For example, see Fred T. Wilhelms, "The Curriculum and Individual Differences" in Nelson B. Henry (Ed.), Individualizing Instruction, 61st Yearbook NSSE (Chicago: University of Chicago Press, 1962) pp. 62-74

4. Maurice Gibbons, Individualized Instruction: A Descriptive Analysis (New York: Teachers College Press, 1971)

were being field tested by the staff   The topics of the sessions were
theory of instruction, public school use of the Descriptor, research
use of the Descriptor and the application of the Descriptor to
teacher education. The consultants for each session were chosen for
their background in those educational fields where expert responses
were considered to be necessary and most helpful to the continued
development of the Descriptor

Piloting of Data Gathering Strategies

The first step in devising techniques for obtaining information
was to visit several individualized instructional programs. These
initial visits were undertaken to respond to such concerns as, what
types of activity could one expect to see in an individualized
program? Which activities are relevant to observe? Who would one like
to talk to about the program? Conclusions from these visits contributed
directly to the development of a data-gathering strategy as well as to
component definition and delineation.

Experience began to suggest that many aspects of individualization
would be difficult to observe directly   These aspects included the
organization of instructional materials, the direction of learners through
the program, the handling of certain instructional decisions, the
perceptions of learners and instructors regarding their roles and
responsibilities, and the maintenance of program records   Because all
of these aspects were considered to be important to the complete
description of individualized instruction, an early decision was made

to try a variety of techniques for gathering information concerning the complex nature of individualized instruction.

Direct observation was examined as a technique for describing programs. Because individualized programs may be characterized as a variety of plans for activities over several days, one day's sampling not only produced limited results but probably produced biased reporting of the actual distribution of group sizes and media types. Interviews with learners and instructional personnel were also tried. The instructors were found to offer an essential source of information for the accurate portrayal of the program, even though their responses may have reflected some bias.

Combining observation and interview, a pattern was slowly developed that included presentation of the Descriptor. To acquaint program personnel with the Descriptor, its components of individualization and its terminology, a series of overlays for use with an overhead projector was developed. The transparencies showed the components and then showed a variety of program descriptions for each component. These transparencies were used to assist viewers in understanding components and the possible ranges of variation. Viewers were then called upon to describe the appropriate representation of the component for the program they were describing, either by relating it to one of the examples (if that were appropriate) or by suggesting a new pattern of representation.

This process was tried out both with individuals and with groups of persons associated with a single program. In the latter case, the

group achieved a consensus in their discussions before the Descriptor component was filled in. An anecdotal record noting points brought out in discussion or deliberation was maintained to provide clarification or additional information. This information was incorporated into a written statement of from two to four pages which accompanied the filled-in Descriptor. With little variation, this group interview was practiced throughout the remainder of the project during the field testing of the completed system.

Field Testing Procedures

The rationale of the Descriptor field test was to determine the utility of such a Descriptor in describing individualizing aspects of programs in mathematics, reading and teacher education, Fifteen sites were selected throughout the country including elementary schools, high schools and colleges.

The Descriptor was used in three different modes. One was to relate the characteristics of functioning individualized programs. A second mode was the comparison of a staff's functioning program with that staff's ideal program. A third use of this Descriptor was as a guide for those staffs that were developing their own individualized programs.

From the experiences that the developers had with the Descriptor during the field tests, modifications were suggested for the final form of the Descriptor. These modifications were made in order to clarify and simplify some of the terminology and organization of the Descriptor.

These revisions also clarify the Descriptor for educators who would be using the Descriptor themselves. To support the use of the Descriptor by other educators, a User's Manual was prepared as part of the final report. This Manual describes the color coding system, defines the terms used, and outlines procedures for gathering data.

COMPLETED DESCRIPTOR.

The Descriptor categorizes an instructional program into ten components: nine that may be considered procedural (objectives, sequence, media, record keeping, etc.) and one that tries to "set the scene" (program context). Each of the procedural components then examines the techniques used to individualize that component. This information includes: a) the variety of options that are used by different learners in the program, b) who is making decisions that learners will use a certain option, c) the extent to which these decisions are based upon recorded information about the learners, d) the extent to which planning sessions are held and regularly scheduled to manage the variety available and e) the participants in these planning sessions. The revised Descriptor is shown in Figure 1

All data is coded on the Descriptor in color. Red, blue and yellow indicate decision making by the learner, the instructor or the program, respectively. Other descriptive features of the program are shown with green

Descriptor for Individualized Instruction

AIMS INSTRUCTION MANAGEMENT

OBJECTIVES

SEQUENCE RATE

RECORD OF
INFORMATION

USE OF
INFORMATION

PROGRAM PATTERN

GROUPING

LEARNER ASSESSMENT
PROCEDURES

MEDIA

PROGRAM CONTENT

9.

Descriptor Components

The Descriptor focuses on three major areas of organization which may occur in an individualized program: aims, instructional features and management of program. Each of these areas is further divided into components. An introductory component, Program Context, identifies the institutional setting of an instructional program. It provides information about the general characteristics of the program being described, and identification of the source of data used in the description. The component has three sections. The first identifies whether the program being described is a functioning program or whether it is an image of an ideal program. The second examines the institutional characteristics of the program. The third identifies the sources through which the data was gathered.

Aims. The aims of an instructional program are the goals toward which the program is directed. The two components are Objectives and Learner Assessment Procedures. Objectives shows the directions toward which a program is designed. Learner Assessment Procedures shows the methods used within the instructional program to determine the extent to which the learners are progressing in the desired direction.

The Objectives component refers to the stated purposes of the instructional program. The description of instructional objectives is done in two dimensions: the type of objective, and the way the objectives are identified with the learners. The use of information in prescribing objectives is also documented. The Descriptor considers four types of objectives: skills and concepts, interests and attitudes, constructions and interpersonal relations. There are three ways in which

the objectives can be identified with the learner, the same for all learners, differentiated for certain groups of learners, or identified for individual learners.

. The Learner Assessment Procedures component relates how the learners are assessed by showing the kinds of learner attributes assessed as well as the procedures that are used for assessment. The recording of information from these procedures is also documented. The kinds of learner attributes assessed are in the same four categories as the objectives: skills and concepts, interests and attitudes; construction making, and interpersonal relations. The procedures for obtaining information about the learners include testing (pre-unit, mid-unit, and post-unit tests), conferences, products or other observations.

Instruction. Instruction is the specific procedural components of a program. The five components included are: Sequence, Rate, Media, Grouping and Program Pattern. Sequence shows the possible order(s) of instructional units. Rate shows the variability of the number of units completed by learners. Media shows the kinds of materials used for instruction. Grouping shows the number of learners working together during instructional situations. Program pattern shows the sequence of assessment and instructional activities repeated within each instructional unit.

The Sequence component refers to the order in which units of instructional material are studied by learners. In most individualized programs, materials are organized into chapters, units, or modules

or other packages. This component examines the options available
to learners for studying those units. Though units are made up of
instructional content, this component does not examine the organization
of content either within or across units, but only the alternative
sequential order of the units.

The Rate component examines the relative lengths of time learners
spend with the instructional program. The rate at which a learner
passes through a program depends both on the variety of options the
program makes available to him and on the speed at which he works.
The Rate component measures the extent of variation in learner progress
which results from a combination of program options and individual
differences. The bar graph relates learner progress through the program
to the number of units (however defined for each program) completed.

The Media component describes four different categories of media
being used to present the subject matter to the learners and identifies
the amount of time (as a percentage) learners spend with these four
categories of media. The four categories of media are: reading
materials, audio-visual materials, manipulative materials and learning
situations where no media is used. Also shown for each media category
is the variety of materials included in the category as well as who
determines that learners will use these materials and whether recorded
information is used in making these decisions.

The Grouping component describes three categories of association
with other individuals which learners may experience within the program.
These three categories are Self, Grouped Without Instructor and

Grouped With Instructor. The component also identifies four size classifications for the latter two grouping categories: peer tutor alone (1-to-1), small group (2-7) medium group (-20), large group (21 or more). These sub-divisions create a total of nine category-size characteristics for describing grouping. The use of these category-size characteristics is reported as a percentage of total instructional time. Also shown is who determines that learners will be grouped in these categories and whether recorded information is used in making these decisions.

The Program Pattern component describes the learner's progress through an instructional unit. It indicates the relationship between a learner's instructional activities and the assessment which may follow or precede these activities by means of flowchart symbols. Decisions identified within the unit are color coded.

Management. The management of an instructional program is the manner in which the learner resources are allocated. Two components under the Management area are Record of Information and Use of Information. Record of Information shows what specific classifications of information are kept. Use of Information shows who is using this recorded information. The extent to which planning sessions are used to allocate resources is shown within other components.

The Record of Information component relates the manner in which the program stores information both about the learners and about the program. Types of information about the learners are separated into two major classifications: Learner Assessment and Learner Use of Program

(ptions. Types of information about the program are separated into two major classifications: Instructors and Option Availability. These classifications are further categorized. Storage forms are established for each category of information. The storage forms identified are: computer, record file, portfolio and other.

The Use of Information component relates what recorded information is used by the participants of the program for program decisions. The categories of information are identical to the categories listed in the Record of Information component and can be read from that component by reading down. The rectangles are color coded to show who uses the particular categories of recorded information for making program decisions.

THE USE OF THE DESCRIPTOR AS A RESEARCH TOOL

This section discusses the Descriptor for Individualized Instruction in terms of its applicability to future educational research. There are many issues which must be resolved if the Descriptor is to be used as a research tool. The introduction of any new, proposed research instrument raises traditional questions concerning the validity and reliability of the instrument. The paradigm on which the instrument is based is also subject to scrutiny.

Complexity of Individualization

Because the complexity of individualization is a major contributing factor to the problems inherent in these traditional issues, it is useful to map out the complexity before considering the use of the Descriptor for empirical research.

The extent of information generated by this examination of
programs may easily be communicated. Figure 2 is a matrix showing the
procedural components of instruction that are identified by the
Descriptor for Indivdualized Instruction as well as the techniques through
which individualization of a component may be achieved. Each cell
of the matrix represents a set of responses for specific kinds of
information about a program. For example, cell 01 represents
information about the variety of objectives offered learners within
a program. This can include the kinds of objectives identified
within this program (skills and concepts, interests and attitudes,
construction making, and interpersonal relations) as well as the
extent to which each kind of objective is differentiated for different
students within the program (same for all, differentiated by group,
differentiated by individual). The possible range of responses for a
given program within this one cell is great. For example, there is
the possibility for a program description to include the extent to which
the objectives are differentiated (e.g., some of the objectives may be
"same for all," some may be assigned to groups and some may be identified
with individual learners). Similarly each cell in Figure 2 can
represent detailed information about specific techniques being used to
individualize an instructional program.

The amount of data which may be provided by this detailed
examination of procedures within an instructional program is demonstrated
by a questionnaire being developed to secure the information.

Figure I. Matrix Showing Possible Parameters for Individualizing Instruction

INSTRUCTIONAL COMPONENTS

INDIVIDUALIZING TECHNIQUES	OBJECTIVES	LEARNER ASSESSMENT PROCEDURES	SEQUENCE	RATE	MEDIA	GROUPING	PROGRAM PATTERN
Variety of Options* 1							
Who Determines Use of Options 2							
Recorded Information Used in Determination 3							
Nature of Recorded Information Used 4							
Who Uses This Recorded Information 5							
Planning Sessions Held 6							
Planning Sessions Regularly Scheduled 7							
Persons Included in Planning Sessions 8							

* Included in this category is whether the available options are recorded
(and how they are recorded). This information appears in the component
labeled Record of Information. Also included in this category is whether
the options used by or chosen for each student is recorded (and how
recorded). This information also appears in the component labeled Record
of Information

This questionnaire uses an interactive computer program, branching on the basis of responses to multi-choice questions. This computerized questionnaire will contain over 5,000 questions.

There are also interdependencies across cells and within cells in the information matrix. For example, if objectives are differentiated for groups or individuals (cell 01), the persons who decide that certain objectives are appropriate for groups or for individuals (cell 02) may differ, as may the kinds of recorded information used to make this identification of objectives with learners (cell 05). So too, the kind of assessment procedures used within a program (cell L1) may depend upon the kinds of objectives that are included within a program (cell 01).

Reliability and Validity in the Context of Individualization

The great detail in information describing all learner uses of instructional options within an individualized program makes it very difficult to apply traditional standards of validity and reliability. There are two major issues which must be addressed in this context before systematic research can examine programmatic features of individualized instruction. First, what do "validity" and "reliability" mean when applied to a descriptor that portrays considerable detail across an entire program? Second, what are the implications of the paradigms used to categorize and describe the complex programs observed?

There are precise meanings for the terms "validity" and
reliability.[5]   Although validity (face, content and predictive
validity) and reliability were considered throughout the development
of the Descriptor, they were not assessed by formal statistical
procedures.[6]   The face validity of the Descriptor (the educational
importance or usefulness of the Descriptor) and the content
validity of the Descriptor, although not formally satisfied through
statistical criteria, were supported by responses that the staff
received from many educators (consultants and site personnel) who
observed the Descriptor in both its developmental and final form.
The issues relating to face and content validity can be directly
assessed by traditional statistical procedures.

Assessing some of the issues raised by the predictive
validity and/or the concurrent validity of the Descriptor must be
postponed until more is known about the precise uses to which
educators put the Descriptor (and until alternative descriptive instruments
are constructed to describe individualized instruction). There are however
aspects of the predictive validity of the Descriptor which soon can be

5. Robert L. Thorndike (Ed.), Educational Measurement,
Second Edition. Washington, D. C.: American Council on Education,
1971.

6. Descriptor for Individualized Instruction: Development
Procedures and Results, Part I of a final report to the National
Institute of Education. Washington, D. C., Grant No. OEG-0-72-1254,
1973, pp. 42-53.

examined. First is the extent to which the Descriptor communicates the parameters that can be used for individualizing instruction.[7] Second is the extent to which the information recorded on the Descriptor describes the salient features of an individualized instructional program to persons who have never seen the program. Third is the extent to which the Descriptor picks up the salient differences between two programs that are individualizing instruction in different ways. Fourth is the extent to which the categories represented by the Descriptor (see diagram 1) can be used to identify discrete budget characteristics of individualized instructional programs. These issues can and will be tested formally in the near future.

Although the developmental staff has worked to limit the sources of error in completing the Descriptor[8], some aspects of reliability created real problems for analyzing the reliability of the data recorded on the Descriptor.

These problems stemmed from the fact that many individualized instructional programs offer extremely complex environments to an observer. The first problem is observing the variety of options used within a classroom providing instructional alternatives. The exercise of the full range of options within a program may only occur after a period of one or more school years. The second problem

---

7. Skuldt is presently conducting a study with practicing teachers to see to what extent the Descriptor communicates the variety that can occur within programs that are "individualized" as well as the possible techniques that can be employed to "individualize" an instructional program.

8. See the suggested procedures for gathering data, User's Manual, pp. 97-106. Also see discussion on pages 6, 7 of this paper.

is observing the decision making process being used to identify a particular instructional alternative with a particular student. Within a classroom that is employing individualized instructional programs, it is difficult to locate the events where specific decisions occur.[9]

If one had the time and resources to directly observe a classroom using an individualized instructional program over an extensive period of time (a year or more), the variety of options used within that classroom might be capable of being observed and recorded. In this way, the reliability of the information in cells 01 through P1 (see figure 2) could be determined by comparing the data on the Descriptor with the data from other kinds of direct classroom observation. This test of reliability, however, would cover only the variety of options used by learners within an individualized instructional program.

Reliability is also needed about other techniques used for individualizing classroom instruction in addition to the variety of instructional options used. Information about the techniques used to manage the variability within an individualized program also needs to be tested for reliability. These management techniques include, for example, who (learner, instructor, program) is determining that a particular alternative will be used and upon what kind of recorded

---

9. For example, it was observed by Philip Jackson that the number of daily decisions in a traditional classroom runs into the thousands. P. Jackson, Life in Classrooms, New York: Holt, Rinehart and Winston. 1968.

information (if any) these decision are to be made. It is important to realize that the management techniques being used to support different learner use of instructional alternatives can be extremely critical to analyzing the strategies being implemented in different individualized programs.

As important as the information about a program's management techniques is to understanding how that program is operating within a classroom, it is also this information for which there may exist no traditional methods for a reliability test to be realistically achieved by educators. Although it is certainly reasonable to ask how the alternatives offered within an instructional program are identified with learners, it may not be reasonable to expect to get answers that can be directly verified to the extent that a reliability test can be completed.

In fact, the experiences of the developers in trying to describe the management techniques used within an instructional program resulted in a specific procedure for gathering this information. This procedure (using the Descriptor as a guide) included an interview with a group of teachers involved in the program, an interview with a group of learners in the program, some observation of the program in action and feedback to the entire program teaching staff in order that previous answers and observations could be modified.

Although this suggested data gathering procedure provided less error than others attempted by the developers, it does not satisfy the requirements of a reliability study. For example, there are still unanswered questions about how to actually locate a particular set of

classroom decisions, and what kind of errors may occur with different interviewers, groups of teachers, learners or amounts of time spent with the Descriptor. Early in the project, the staff did attempt to produce observational forms for verifying the information collected about the management techniques used for identifying learners with alternatives. The practical difficulties encountered, however, included solving procedural problems that had not been successfull approached in past educational research. Many of these problems were related to identifying and verifying the complex decision making processes occurring within the classrooms offering many instructional alternatives.

These decision making processes must be identified and verified if meaningful educational research is to continue to analyze and describe the complex classroom environments in which instructional alternatives are being provided. Thus, this staff is still challenged to produce verification forms that can be used in a reliability study of the program information that is collected and recorded on the Descriptor for Individualized Instruction. Included within this challenge, however, is the caution that it may not be possible to verify directly the reliability of information that refers to the decision making processes being used in an individualized instructional program.

The importance of this drawback to educational researchers cannot be overemphasized. The most important features of individualized

instruction (describing how the variety of options are identified
and chosen for learners) may not be capable of being verified to the
extent that any description of that program is "reliable" in the
traditional sense of the term. If this is true, then meaningful
research upon the comparative effectiveness of different strategies
being used for individualizing instruction cannot be conducted. For
example, strategies that focus upon 'student responsibility" or
"diagnosis and prescription" cannot be compared if there is no way to
verify the description of these strategies in a complex, instructional
program. The experience of the authors suggests that a variety of
management techniques do occur in complex programs (e.g., programs
that are attempting to individualize along many of the instructional
components -- see Figure 2). To say that the individualizing
strategies being used in these programs cannot be accurately recorded
and verified to an extent that is required for scientific research
may be an unpopular statement with educational researchers. Yet
this possibility must be addressed and pursued by educational researchers
if meaningful empirical research into individualized instruction is to
be continued.

Suitability of the Paradigm

A more basic set of issues raised by the Descriptor for
Individualized Instruction is also suggested for public discussion
within the community of educational researchers. It has been stated
before that the Descriptor offers a paradigm for describing certain

procedural features for individualizing instruction. The term

'paradigm" has been chosen carefully. The term has been used by

observers of the scientific community to identify a set of categories

and relations used to intellectually organize a large amount of
                                 10
observed data. A paradigm is not a model, but is rather the set of

categories and relationships which may be used to make competing

models. In the field of physics, the paradigm (or set of categories

and possible models) offered by Newton differs from the paradigm

(or set of categories and possible models) offered by Einstein. Some

observers of educational research suggest that educators make public

the paradigms that are being used to organize the data to design

as well as support or refute current theories of learning and
                                 11
current theories of instruction.

The paradigm (or set of categories) suggested by the Descriptor

for describing instructional procedures are the kinds of objectives,

learner assessment, sequence of units, learner rate of progress, kinds

of media used. learner grouping patterns, ordering patterns of learning

activity and assessment and recordkeeping system. Although each of

these categories (with the possible exception of program pattern) are

10. For a discussion on the importance of paradigms in the scientific community. see Thomas S. Kuhn, The Structure of Scientific Revolutions. Chicago: University of Chicago Press, 1970.

11. Apple emphasizes the need for this kind of discussion to take place between educators in Michael W. Apple, "The Adequacy of Systems Management Procedures in Education" in Perspectives on Management Systems Approaches in Education, A. Yee (Ed.), Englewood Cliffs, N.J. Educational Technology Publications, 1973. pp. 82-98.

well known terms for educators and have been used in past research studies to analyze certain theories of effective instructional procedures, the Descriptor is the first instrument that uses all of these categories to describe the procedural features of an instructional program. This paradigm, although including many of the features mentioned in previous research, is also restrictive. It allows for only certain kinds of models describing the instructional procedures used within a program. For example, the media component of the Descriptor includes four categories of media used (reading or writing materials, audio-visual materials, manipulative materials and instructional situations where no media is used); the variety of media available within each category and the average percent of time that each student uses the four different kinds of media. This component does not describe how this media is used by students (e.g., for their own constructional purposes or in what kind of grouping patterns) or the extent to which the media use may differ between students. Thus, although first impressions of many educators towards the Descriptor are of its completeness in setting up categories for the description of instructional models, it is important to realize that the paradigm offered does not satisfy all possible models for describing instructional procedures.[12]

12. See, for example, Bruce R. Joyce, Alternative Strategies for Elementary Education, Waltham, Mass.: Blaisdell Publishing Company., 1969 and the discussion in M. Apple, "Curriculum Design and Cultural Order" in Educational Reconstruction: Promise and Challenge. H. Shimahara (Ed.), Columbus, Ohio: Charles Merrill, 1972.

There is also a paradigm used for categorizing the possible techniques for individualizing each instructional procedure. The body of past research in individualized instruction is relatively small and based mostly on differences in learner rate rather than on the other possible categories for instructional procedures (media, sequence, etc.) Therefore, these categories have been arrived at mostly through observational experience of the developers, discussions with consultants and practitioners of individualized instruction and some logic. This paradigm for individualization includes the variety of options used by learners, who chooses these options, the extent to which recorded information is used in these decisions, who uses this information, whether planning sessions are held and regularly scheduled to make these decisions and who participates in these planning sessions. The emphasis of this paradigm is upon the management of the available alternatives including the decision making processes occurring within an instructional program and the information support system offered within the program to make these decisions. Although this paradigm focuses upon the management of alternatives, it also has been seen as offering a category system that is quite complete when showing current operating or ideal techniques for individualizing an instructional program. The authors suggest that this is/not the only paradigm that is possible but our experience is that it is very useful to employ when describing the procedures and strategies being applied in many different individualized instructional programs. The paradigm can describe, for example, some of the specific methods

used within a program to "personalize" the instruction, to provide

"student responsibility", program "accountability," certain "diagnosis

and prescriptive" techniques and the program provision of alternatives.

Together, the categories for instructional procedures and the

categories used to describe individualizing techniques provide an

extensive matrix paradigm (Figure 2) for designing, describing or

analyzing individualized instructional programs.

The basic issues that the authors would like to see discussed

by educators are the exter to which the paradigm offered for

instructional procedures is applicable to current models for instruction

and the extent to which the paradigm offered for individualizing

is applicable to techniques being used to individualize instructional

procedures. In a sense, the authors raise a challenge to educators to

provide a more complete or useful paradigm with which to design,

describe and analyze different strategies for individualizing an

instructional program.

Conclusions

The Descriptor for Individualized Instruction must be supported

by stronger measures of validity and reliability than are now avail-

able before it can be used for empirical research into methodologies

used by individualized instructional programs. In discussing the

problems that lie in determining the validity and reliability of the

Descriptor, some issues were raised that need be addressed in any

instrument describing the complex environments which are found in

classrooms that are individualizing instruction. Researchers may wish to redefine the term "reliability" when applied to decision making in a complex environment. It was suggested that two basic paradigms offered by the Descriptor, one for instructional procedures and one for individualization techniques, be discussed in terms of their applicability to current models for individualizing instructional programs.

If the Descriptor does prove to record, communicate and differentiate between programs as efficiently as the developers' experiences suggest, and if the paradigms effectively transcribe the various strategies being employed in individualized instructional programs, then the Descriptor may be an important new instrument for conducting empirical research into individualization of instruction. In this case, the Descriptor may not only be used in answering traditional kinds of questions about different strategies being used to individualize instruction, it may also be used by sociologists and economists to open up certain procedural features of instructional programs that have recently been regarded by these researchers [13] as only input, output process boxes.

However, before the Descriptor can be used as a viable and reliable instrument for empirically analyzing procedural features of individualized instruction, the issues raised about the paradigms for instruction and individualization and the issues raised by the

---

13. Coleman and Jencks, for example.

reliability of the Descriptor as a descriptive, comparative
and communicative instrument must be addressed by members of the
educational research community. That these issues be resolved is
not only imperative for the continued development of the usefulness
of the Descriptor for Individualized Instruction, it is also imperative
before more definitive empirical research can be performed within
the complex environments that are being operated and designed under
the term "individualized instruction."