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ABSTRACT

          The visible claims of the current accountability
movement are examined critically, and an alternative philosophy and a
developing system are offered. Areas examined include the
psychological implications of accountability philosophies for
teaching staff, certain educational measurement problems, and the
availability or adequacy of operating systems required to support
broad applications of accountability. The alternative philosophy
offered focuses on operations for which teachers may legitimately be
held responsible, as opposed to the current movement's focus on
student outcomes. The comprehensive supporting information system is
presented in broad outlines, highlighted by a presentation of an
evaluative component called Comprehensive Achievement Monitoring.
(Author/LH)

ALTERNATIVES TO ACCOUNTABILITY: STOOL PIGEON VERSUS

SERVANT AND SOULMATE

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Schutz (1971) somewhat facetiously, labeled roles of measurement in education as including ". . . servant, soulmate, stool pigeon, statesman [and] scapegoat . . ." Each measurement era, it seems, emphasizes one or more of these roles to the relative exclusion of the others. Our observations of the current measurement era suggest that actors in the roles of stool pigeon and scapegoat are receiving the best reviews, while those in the more constructive roles of servant and soulmate are waiting in the wings. Sadly enough, this wait may be extended as the schools become the laboratory for a movement which again places the cart before the horse. We refer, of course, to the contemporary movement toward accountability whose unconstructive connotations may be partially communicated by its synonyms: reckoning, tidings, charge, score, inventory, report, and consequence. Judging from our ongoing efforts to establish performanced-based management information systems in the schools, it is the unconstructive connotations that teachers and others now associate with accountability in education.

Advocates of educational accountability, on the other hand, suggest that the movement will systematically aid educators to improve student achievement and effect needed changes in the schools (Lessinger, 1970). What can hardly yet be called a system appears to have as its prime elements: (a) evaluation procedures intended to measure growth in relation to desired outcomes of instruction, usually involving the use of standardized tests; (b) some form of public reporting of the extent to which desired outcomes were achieved; and (c) rewards to persons involved in the educational process, contingent upon the extent to which desired

outcomes are achieved. These elements may be augmented by additions to
the school program to be subjected to test, and internal or external con-
tractual agreements for program evaluation and/or the management of in-
struction.

Though recognizing the constructive spirit of accountability, we
would nevertheless argue that current translations of the concept into
operations (e.g., Dyer, 1970) and rational constructions (e.g., Barro,
1970) fail to take into account major contingent problems, which may pre-
vent the movement from achieving any practical results in the contemporary
scene. A first set of problems relates to the recognition of the psycho-
logical implications of the language and nature of the accountability
movement for teachers and other professional staff. Evaluation procedures,
for example, are explicitly external, (Martin, and Blaschke, 1971;
Lessinger, 1970); the criteria for evaluation are further likely to be
selected or designed by staff external to the school (Lessinger, 1970),
and there is clear intent to report discrepancy data to such audiences as
parents and boards of education. The most dense clinician would recog-
nize in this set of events a clear cut basis for anxiety induction in the
educational community, and would expect the usual chain of psychological
reactions, ranging from expressed hostility to organized defensive responses
designed to remove or afford escape from the offending stimulus. More
extreme end results may include a temporary increase in the local base
rate of paranoia, where accountability applications turn the educational
and surrounding community into camps of accounters and accountants.

A second set of problems arises when the discrepant data are reported

to the public because the accountability philosophy may easily erode any

remaining local confidence in the schools. This is particularly likely

where an irresponsible press interprets test data only dimly understood

by the public in the first place, and where there are organized community

groups whose fixed orientation is to negatively reinforce the educational

staff.

A third set of problems for the accountability philosophy relates to

the professional implications resulting from externally imposed additions

or changes to instructional programs. If the negative stimulus value of

public disclosure of student performance data and "objective" staff evalu-

ation are not sufficient to motivate instructional staff, then surely they

will react defensively to outsiders assuming instructional and program

responsibilities. On this matter, one may seriously question the general-

izability of the notion that any external agencies can reliably produce

meaningfully greater levels of achievement among children, given the re-

sults of large numbers of special efforts to date (Jenson, 1969; O'Reilly,

1970) and the quality of instructional programs and materials available

to agents of accountability.

A fourth set of problems relates to the outcome measures proposed for

use in accountability applications, typically standardized achievement

tests. Timid criticisms suggest such tests are not entirely adequate as

outcome measures, and must be supplemented by tests developed to measure

other important outcomes (Lessinger, 1970). Other critics flatly conclude

that standardized testing is irrelevant to the major questions asked in

the accountability context, including those questions asked about

achievement of basic skills (Skager, 1971). On a yet more basic plane,

one may convincingly argue that valid definitions of outcomes of school

performance are not yet generally available and that, therefore, no set

of adequate outcome measures exists. This last argument is convincingly

developed by Rohwer (1971) in a discussion of contemporary procedures

used to generate the objectives of formal schooling.

A fifth and final problem area relates to current capabilities to

develop and operationalize relevant information systems and necessary data

logistics and analytical systems required to answer primary questions of

the accountability movement. Potentially adequate information systems

are only now being tried on a small scale (Barro, 1970; Schutz, 1971).

Experience further shows the operations of such systems are exceedingly

complex, and greatly dependent on the active support of teachers and other

staff. Clearly, considerable research, development, and installation ac-

tivity is yet required before generally applicable systems are available

in support of accountability. Such information system applications are

also likely to be shortlived or superficial if the data generated do not

relate functionally to the short- and long-term information needs of such

audiences as teachers, supporting staff, and students.

The foregoing discussion presents a few supporting arguments for the

simple proposition that engineering in education should be accomplished

in full recognition of the nature and condition of the patient. The fla-

vor of the accountability movement poses a new and seemingly powerful

threat to the educational system. It is further a pretentious movement

which assumes that precise causal effects can now be clearly demonstrated

in education, that these effects adequately define current values and needs, and that, therefore, related rewards and punishments can be established. Carried to extremes, the movement may be utterly demoralizing to those who assume close responsibility for the educational process by making questionable inroads into the functions that school personnel now regard as theirs (Cf. Mecklenburger and Wilson, 1971, 1971a). The ideals of responsiveness, relevance, and responsibility in education may, however, yet be advanced given appropriate recognition of the organismic character of the system. The remainder of the discussion will focus in part on the philosophical basis of a system which embodies the inherently constructive spirit of accountability, but avoids many of the problems apparent in publicized notions which now communicate hostile intent to the teacher in the field. A major part of the discussion is given over to a description of the nature of the system, its operation, and the assistance it affords the educational process.

Alternatives to Accountability

Language of the System

In the system to be described, the usual language of accountability is eschewed in favor of a more palatable notion that assumes responsibility of teachers and others for acting upon information made available on the performance of certain job-related operations. Working with teachers, curriculum coordinators, and school administrators, we first identify educational decision-making domains for which supporting information can

be made available through computer based systems. Sample decision-making
domains and related responsible agents are summarized in Table 1.

Insert Table 1 about here

The first decision-making domain in Table 1 relates to the problems
of defining and validating the behavioral outcomes of education, other-
wise known as curricula. Currently, we show teachers how to proceed from
a formal analysis of local needs through the establishment of the four
levels of objectives defined in Table 2. All levels of objectives shown
are behavioral, and constitute, respectively, the standards of operation

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Insert Table 2 about here

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for a program, a level within a program (both approximations and course
objectives), and the series of behaviors which lead to the performance of
complex operations, such as those defined by course objectives. For the
past year, we have been engaged in the empirical derivation of a set of
terminal objectives in reading, based on analyses of roles and reading
performance requirements in actual life situations. Alternatively, for
the other areas of the curriculum, teachers involved in our efforts attempt
to establish their own terminal objectives on the basis of what they and
others know of actual life requirements.

In the domain of curriculum development, the appropriate agents assume
the responsibility of first defining tentative curriculum standards in the

form of the levels of objectives established for the sytem. From there,
information systems based on criterion-referenced testing (CRT) (see
Gorth, Schriber, and O'Reilly, 1971) deliver data relevant to the task of
constructing adequate curricula. The responsible agents then examine data
in relation to such curriculum issues as determining the relevance of
objectives, establishing more appropriate sequences of objectives, and
defining realistic levels of performance.

In the second domain in Table 1, the responsible agents initially
assume the tasks involved in the design or selection of the materials and
procedures which constitute a program of instruction. Appropriate CRT
based systems then deliver information at the course objective level and
above. Actions are then taken to continually adjust methods and materials
to the point where the standards specified by course and terminal objectives
are approximated by group performance data. Decisions in this area involve
the replacement of materials and approaches, the appropriate placement of
review, the addition of needed branches to the program, and so on.

In the third domain in Table 1, responsibility is assumed for the
daily management of the instructional process, with the goal being opti-
mization of learning environments for individual students. Teacher deci-
sions relate to such functions as: (a) placing the student within the
curriculum at a given level; (b) assigning appropriate instruction;
(c) tracking performance signals as the student proceeds through a given
package of instruction; and (d) assigning appropriate forms of remedia-
tion, selecting enrichment activities, or selecting the next set of
objectives.

Moving finally to the domain of comparative product evaluation, we

face a set of decision alternatives which ultimately must result in the

selection of the relatively better program. Though we have not generally

worked at this level, we would presume that program managers at different

levels would essentially wish to select the best program on the basis of

performance and costs. Included in this area is another set of decision

alternatives resulting from an evaluative stance regarding schools or dis-

tricts as objects to be subjected to comparative evaluation. Given ade-

quate sets of terminal performance objectives and related measurement

procedures, this may prove a useful stance upon which to base the rational

allocation of resources, such as those available for special programs.

SPPED: A Computer Managed
Information and Resource System*

The final phase of this discussion will consider the measurement,

evaluation, and resource systems used to support the decision-making

domains given in Table 1. The broad outlines of a project called SPPED

(System for Pupil and Program Evaluation and Development) will first be

presented, followed by a brief discussion of the characteristics of a

major evaluative component of the sytem known as CAM (Comprehensive

Achievement Monitoring).

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*The SPPED system is under development by the New York State Educa-
tion Department, in cooperation with staff from the University of Massa-
chusetts (Dr. William Gorth), Stanford University (Dr. Paul Pinsky) and
State University of New York at Stony Brook (Dr. Shelley Harrison).

The SPPED Project

The basic structure of the SPPED project is shown in Figure 1 as a
set of five interrelated parts, each with a computerized support compo-
nent.

Place Figure 1 about here

The first component of the SPPED is the central BOIR (Bank of
Objectives, Test Items, and Instructional Resources), which contains
extensively classified material used for: (a) curriculum development;
(b) test item access; (c) derivation of local paper-based or computer-
ized BOIR's; and (d) program design and installation. The complexity
of the BOIR may be judged to some extent from the set of reading objec-
tives now being stored. Approximately 2500 basic or generic objectives
are being filed for computer access, along with 1000 course objectives
and 800 terminal and approximate objectives. Each set of objectives is
classified along as many as 50 different dimensions, each with one or
several levels. In addition, the "O-bank" is to include several lists
of elements which will enable the user to fill out each objective to
the desired level of specificity (e.g., vocabulary lists, word ele-
ments, phonetic elements, etc.).

The primary intent of the "O-bank" is to automate the task of
curriculum development through the process of computerized selection
and modification. Entering the system, the user specifies a number of
classifiers for content, level, and other identifiers. He then receives

a set of general or generic objectives to which he adds or specifies lists of elements (e.g., a word list), and indicates the number of levels into which objectives are to be grouped (e.g., grade levels, modules). The resultant output is a structured curriculum with objectives and associated elements grouped into the desired number of levels. Objectives are further organized into subgroups within levels; for each subgroup, output includes one or more criterion objectives (course or summary objectives). Once this selection process is complete, the local reading curriculum is deliverable on hard copy, IBM cards, or magnetic tape. A computer program is also available to facilitate the processes of adding to the local bank, and editing and deleting material.

The remaining components of the BOIR serve to index items and specific instructional resources in relation to each objective. The utility programs for each banking function allows continual up-date and refinement. Two secondary programs, Test Scheduling (TS) and Test Construction (TC), operate on the contents of the I-Bank to generate, respectively, random or specified test forms for CAM and mastery testing (MAST-T), and the printing of test schedules employing random, stratified sampling for CAM testing. The TS and TC programs are not restricted to use of the BOIR as a data base.

The components of the SPPED described to this point serve school personnel as basic resources for such functions as curriculum development, test development, instructional materials selection, and test

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scheduling. The associated computer programs are designed to eliminate

much of the massive paper handling and other clerical work that are nec-

essarily part of any sizeable systems approach to instruction. The BOIR,

TC, and TS programs were designed after four years of developmental work

with CAM, and were meant to speed the process of CAM implementation.

The reason for the additional SPPED resources becomes more apparent

in the next section which briefly presents the specifications for CAM

testing.

Comprehensive Achievement Monitoring (CAM)

A detailed technical description of CAM and related implementation

procedures is presented in Gorth, Schriber and O'Reilly (1970). All of

the decision-making is made on the basis of criterion referenced test

results. The CAM design includes the following components:

1. The definition of a curriculum with behavioral
   objectives;

2. The writing of test items to measure student
   performance on each objectives which are
   criterion-referenced test items;

3. The organization of a set of randomly parallel
   tests, where each test is made up of all or a
   sample of items measuring all the objectives in
   the curriculum and therefore represents item
   sampling;

4. The design of a longitudinal, usually every
   three or four weeks, schedule of test occasions
   throughout the course;

5. The analysis of the test data and the reporting
   of results by computer, usually within a couple
   of days;

6. The interpretation of the results by evaluators,
    teachers and students as a means for making bet-
    ter decisions about their instruction and cur-
    riculum, and

7. The modification of curriculum, instructional
    activities and the CAM design based upon the
    results.

The CAM methodology has been designed to work well with any grade

level or curricular area. In fact, it has already been used successfully

in more than 20 schools, with more than 15,000 participating students, and

at grade levels from 3rd to 12th and in every academic subject area (Allen

and Gorth, 1971).

Particularly important to the success of this evaluation technique

is the use of the computer. It alleviates the frequently encountered

bottlenecks of most evaluations, the analysis of data and the reporting

of results. The CAM computer program allows extensive freedom in the

design of evaluations, incorporating both longitudinal testing with

item sampling and mastery testing to correspond with traditional or

unusual course designs.

The information which is typically provided in the CAM system

includes:

1. For individual students

    a. the total score on the current test
        and all previous tests, and

    b. information on the correctness of
        their response to each item corre-
        sponding to course objectives on
        the current test; and

  2. for any subgroup of students and any set of
    questions after each test administration

    a. the achievement level on each
      objective, and

    b. achievement profiles which dis-
      play graphically the level of
      achievement on all objectives
      on the previous test occasions.

The latter information is identifiable as pretest, posttest, and long-

term retention data for the duration of the course.

  The comr   er program allows students' achievement to be plotted on

any given objective (or group of objectives) for the entire course. This

plot, called an <u>achievement profile</u>, gives a graphic presentation of the

changes in group achievement throughout the course. Achievement profiles

are a unique type of information available from the CAM model.

  Figure 2 presents hypothetical achievement profiles for five objec-

tives from a course. Brief comments below the graph give possible inter-

pretations. It is obvious that achievement profiles provide a wealth of

information, at whatever point in the course they are calculated. On

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Insert Figure 2 about here

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the pretest in the foregoing example, all objectives except number 2 show

achievement at the chance level, or about 20 percent (five-option multiple-

choice items). Several decisions could have been made after test adminis-

tration one: (a) objective 1 was not learned, reteach it in some other

way; and (b) objective 2 has tested high on both the pretest and test
administration 1, suggesting it would be safe to skip instruction in
this objective. After test administration 5, two other decisions
might have been made: (a) achievement on objective 3 seems to be
slipping and review is needed; and (b) objective 8 seems closely
related to objective 5 and perhaps should be taught now instead of
later. CAM, therefore, represents an application of criterion-
referenced testing to program evaluation performed with longitudinal
evaluation using item sampling.

Conclusion

This has been a brief foray into the characteristics of a
developing system and underlying philosophy designed to enable a
systems approach to instruction in the local school context. In con-
trast with a great many articles on systems and models of accountability,
the efforts described here have been designed and partially or wholly
implemented in full realization of local needs and local potential for
change. The simple wisdom in the philosophical basis of our work ema-
nates from experiences with hundreds of teachers over several years.
Some contrasts between this developing philosophy and the characteristics
of accountability philosophies now prevalent in the literature are sum-
marized as follows:

1. The language and focus of the system is on
   assuming responsibility for acting on infor-
   mation to effect changes in curricula,

instruction, and the learning activities of
individuals -- as opposed to a direct focus
on outcomes.

2. Teachers and related staff assist in formu-
lating the outcomes of schooling in contrast
with the external imposition of performance
standards.

3. Teachers and related staff have a direct hand
in specifying the measurements to be used in
relation to determining performance, in
selecting options available from different
evaluation systems, and even in the formula-
tion of evaluation systems as they are
developed.

4. Program and instructional decisions are pri-
marily the responsibility of regular instruc-
tional staff; external agents assist and advise
in this process.

5. Public reporting of performance data, only now
being considered, is to be initially based on
simple (+, -) accounting of skills mastered,
with the intent of involving parents continuously
and functionally in the instructional process.
Comparative performance data on program, schools,
and individuals are not projected for use on the
local level.

Administrators, board members, and others interested in accountability

applications would do well to give very careful consideration to the various

interrelated philosophical, psychological, technical, and logistical issues

involved. Perhaps an appropriate starting point is to generate a local

philosophy of accountability -- one which would be generally shared by all

major participant groups. Once the sensitive issues are more or less set-

tled and organized into a set of acceptable guidelines for development, the

local leadership will more than likely find a more than adequate basis for

proceeding with the business of accountability.

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Table 1

Selected Decision Making Domains for Which Test Data
Are Made Available in CMI Systems

Domain	Primary Responsible Agent
1. Curriculum Development	Curriculum teams, administrators, parents
2. Product Refinement	Teachers, teacher teams, administrators
3. Instructional Management	Teachers, students, parents
4. Comparative Product Evaluation	Administrators, program managers

Table 2

Levels of Objectives as Related to Derivation

Levels of Objectives	Derivation (from)
Terminal Objective	Actual or intended life performance situations
Approximations to Terminal Objectives	Four successively less difficult levels derived from terminal objectives
Course Objective	A temporary "stand-in" for approximations; a criterion or course or summative objective
Enabling Objective	One of a series of lower level objectives derived from course objectives or approximations

Figure 1

Components of the SPPED Project

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                    ┌─────────────────────────┐
                    │   Central Bank          │
                    │ (Query for Resources)   │
                    └─────────────────────────┘
                               │
                               ▼
  ┌──────────────────┐                        ┌──────────────────────┐
  │ Three levels     │                        │ Test Construction    │
  │ of objectives    │                        │ Program              │
  └──────────────────┘                        │ Construct Tests      │
         ▲                                     └──────────────────────┘
         │                    ┌──────────────────┐
  ┌──────────────────┐        │ Banking Program  │
  │ Test items       │        │                  │   ┌──────────────────────┐
  │ mapped on        │───────▶│ 1. Store, Add    │──▶│ Scheduling Program   │
  │ objectives       │        │ 2. Access        │   │ Schedule Tests       │
  └──────────────────┘        │ 3. Edit          │   └──────────────────────┘
                              │ 4. Eliminate     │
  ┌──────────────────┐        │    Redundancy    │   ┌──────────────────────┐
  │ Instructional    │        │ 5. Search        │   │ Evaluation Systems   │
  │ resources        │        │ 6. Copy          │   └──────────────────────┘
  │ mapped on        │        └──────────────────┘          │         │
  │ objectives       │                              ┌────────┘         └────────┐
  └──────────────────┘                              ▼                           ▼
                                          ┌──────────────┐          ┌──────────────┐
                                          │ CAM          │          │ MAST-T       │
                                          │ Decision -   │          │ Decision     │
                                          │ Domains 1,   │          │ Domain 3     │
                                          │ 2, 4 (some 3)│          │ (some 2)     │
                                          └──────────────┘          └──────────────┘
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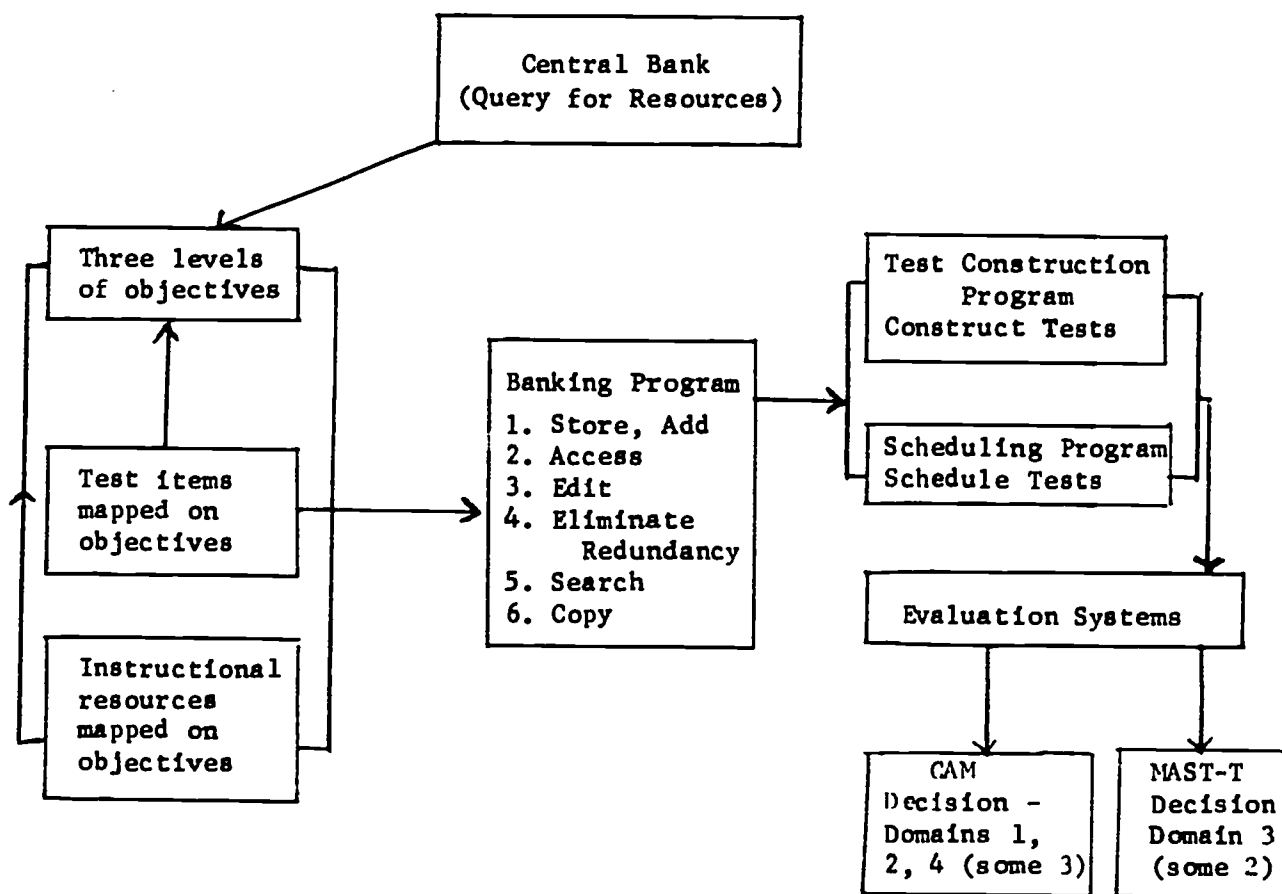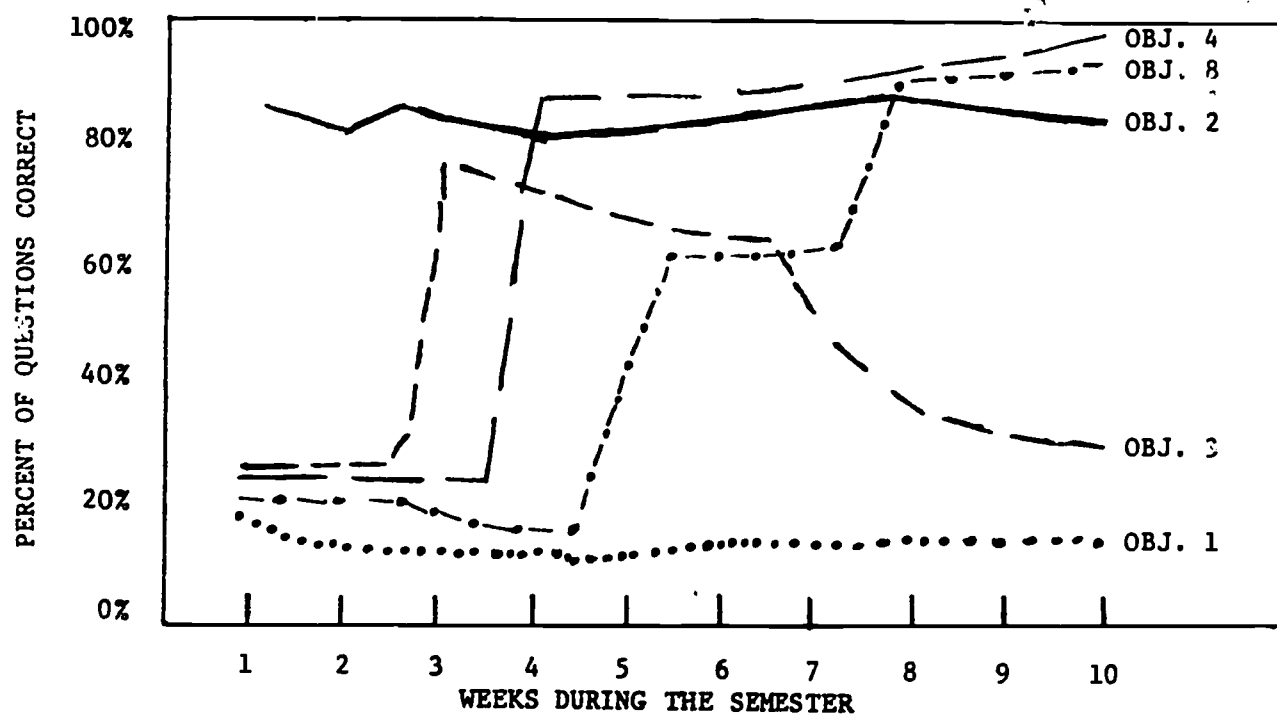
Figure 2

Achievement Profiles of a Group on Five Objectives

••••Objective 1: taught, but students did not learn; with rapid feedback, could be corrected with change in instruction (taught just before week 1)

—— Objective 2: previously known and not taught; without pre-test, this looks like student learning (taught just before week 2)

---Objective 3: taught and learned, but forgotten (taught just before week 3)

——Objective 4: well taught (taught just before week 4)

—•—Objective 8: appears related to objective 5, because achievement increases when 5 is taught (taught just before week 8)

Abstract

This paper critically examines the visible claims of the current accountability movement and offers an alternative philosophy and a developing system. Areas examined include the psychological implications of accountability philosophies for teaching staff, certain educational measurement problems, and the availability or adequacy of operating systems required to support broad applications of accountability. The alternative philosophy offered focuses on operations for which teachers may legitimately be held responsible, as opposed to the current movement's overriding focus on student outcomes. The comprehensive supporting information system is presented in broad outlines, highlighted by a presentation of an evaluative component called Comprehensive Achievement Monitoring.

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