     The major objective of the Study of Curriculums for Occupational Preparation
and Education (SCOPE) is to coordinate and contribute to national curriculum
development effort at the secondary school level aimed at increasing the relevance
of high school education for the large majority of our youth who must seek
employment or further job training upon graduation. The first phase of the SCOPE
program is Coordination of Occupational and Non-occupational Curriculums and
Technology (CONECT). The objectives of this first phase are: (1) to establish
communication among the state-supported vocational curriculum development centers,
(2) to assist center directors in becoming aware of behavioral approaches to
curriculum development, devices, and evaluation, (3) to refine and test a scheme for
classifying educational objectives in terms of performance requirements and
objectives, and (4) to develop a detailed plan of activity for Phase II of the SCOPE
program. These two progress reports outline major accomplishments and
developments during the first two quarters of SCOPE's first year of existance. (CH)

PROGRESS REPORT #1

Project No. 8-0334
Grant No. OEG-0-8-080334-3736 (085)

A STUDY OF CURRICULUMS
FOR
OCCUPATIONAL PREPARATION AND EDUCATION.
(SCOPE Program: Phase I).

Bruce W. Tuckman
Rutgers University
New Brunswick, New Jersey

September, 1968

ACKNOWLEDGEMENTS

PREFACE

SCOPE is an acronym for the Study of Curriculums for Occupational Preparation and Education. Its major objective is to coordinate and contribute to a national curriculum development effort at the secondary school level aimed at increasing the relevance of high school education for the large majority of our youth who must seek employment or further job training upon graduation.

The first phase of the SCOPE Program is CONECT, an acronym standing for the Coordination of Occupational and Non-occupational Curriculums and Technologies. The objectives of this first phase are as follows:

(1) To establish a functional communication link among the State-supported Vocational Curriculum Development Centers;

(2) To increase the familiarity of the directors of the above centers with recent advances in behavioral approaches to curriculum development, devices, and evaluation;

(3) To refine and test a scheme for classifying educational objectives in terms of the performance requirements and objectives rather than the subject-matter;

(4) To develop a detailed plan of activity for Phase II of the SCOPE Program, including the identification of staff and facility needs.

The SCOPE Program has aims which interface with those of a new Federally supported effort known as the Educational Systems of the '70's. The ES '70 program is an attempt to make an impact on the high school of the future by providing more closely for individual student needs, including those relevant to future employment opportunities. The notion of the truly integrated curriculum, i.e., one in which concepts common to different subject matters become the core of a curriculum rather than organizing the curriculum completely around the subject matters themselves, is at the heart of ES '70. It is here that the activities of SCOPE, as well as other University projects, will contribute

to the overall programmatic approach. During the first phase of SCOPE, a process-object model for the integration of objectives will be refined, written about, and tested. In so doing, the SCOPE Program will be helping to provide the basis for a highly individualized and reality-oriented curriculum.

OF BUREAU OF RESEARCH NO. 8-0334   Grant No. OEG-0-8-080334-
PERIOD: 6/24/68-9/24/68   3736 (085)

RUTGERS UNIVERSITY   Date of Submission:
                                                October 15, 1968

A STUDY OF CURRICULUMS FOR
OCCUPATIONAL PREPARATION AND
EDUCATION (SCOPE Program: Phase I)

BRUCE W. TUCKMAN

1. MAJOR ACTIVITIES AND ACCOMPLISHMENT DURING THIS PERIOD

Our initial accomplishment, a time-consuming series of
negotiations and maneuverings involving most of July, was
to secure housing for the SCOPE Project. We are pleased to
announce that the SCOPE Center has been located in the
WoodLawn Gatehouse, a beautiful site hidden among the regal
and majestic trees on the Douglass Campus. In addition to
an ever-present sense of history, with which this charming
old structure is so replete, we are afforded the luxury
of relative solitude in which to conduct our business.

The SCOPE brochure, our major instrument of introduc-
tion, has been printed (see enclosed copy). We are now in
the process of mailing copies to the State Directors of
Vocational-Technical Education, Curriculum Lab Directors,
members of the ES '70 Program, and various other people
who we think would be interested in our program. We have
also drafted letters of introduction to be sent along with
the brochure to the Curriculum Lab Directors and the State
Directors of Vocational-Technical Education.

As a follow-up to our introductory materials, plans
are being formulated for meeting the Curriculum Lab Direc-
tors. Schedules are being developed for visiting as many
of the Labs as time and funds will allow. A suite has been
reserved for the AVA Convention in Dallas during the second
week of December so that we can also meet with the Lab
Directors, hopefully many of those who we will not be able
to see otherwise.

The SCOPE staff has been completed during this initial
period. In addition to a full-time Assistant and secretary,
two part-time graduate research assistants have been added.
Their task will be to research literature on topics perti-
nent to the development of a set of behavioral objectives
and process-object model.

1. (continued)

Two visitations worth mentioning occured during this
initial period. Dr. Sidney High of the Bureau of Research
and Mr. William Berndt, Senior Program Officer of the Cur-
riculum Instructional Materials Program in the Office of
Education, spent a day at the SCOPE Center early in Septem-
ber. The objectives of the SCOPE Project, their implemen-
tation, and the Project's role in the development of an in-
tegrated curriculum at the high school level were some of
the topics discussed at this enlightening session.

The Manpower Training Skills Center in Newark was
visisted in August by the Director and his Assistant. The
trip included a tour of the plant, observation of some
classes, discussions with teachers and students, and an
interesting conversation with Mr. John Radvany, the chief
administrator of the school. A return visit is planned for
the near future.

In summation, the SCOPE Program is an operating reality.
The foundation necessary for fulfilling the Program's objec-
tives has been secured. We can now concern ourselves with
realizing these objectives.

2. PROBLEMS

   None to date

3. SIGNIFICANT FINDINGS AND EVENTS

   None as yet

4. DISSEMINATION ACTIVITIES

   You will find enclosed copies of the Project's first
   two incidental reports:

   1. "Structural Analysis as an Aid to Curriculum De-
      velopment"
   2. "Analysis, Classification and Integration of
      Educational Objectives"

   In addition to newspaper coverage, The Research Bulle-
   tin of the New Jersey School Development Council, Fall
   Edition, includes an article on the SCOPE Project.

5. CAPITAL EQUIPMENT ACQUISITIONS

   None

6. FORMS

   None

7. OTHER ACTIVITIES

   None other than those mentioned in #1

8. STAFF SUMMARY

		Federal	Local		
Bruce W. Tuckman	Director	$1,926	$566	7/1-9/30	3/4 time
Joseph H. Casello	Assist. Dir.	2,924		7/1-9/30	full time
Ricardo Grippaldi	Res. Assist.	275		9/1-9/30	1/2 time
Carol Porter	Res. Assist.	275		9/1-9/30	1/2 time

9. FUTURE ACTIVITIES PLANNED FOR NEXT REPORTING PERIOD

Our efforts during the next three months will concentrate on developing a step-by-step process for establishing and maintaining an effective working relationship with the Curriculum Lab Directors. We realize that the success of our program depends largely on our ability to establish positive, cooperative and mutually respectful relationships with these people.

Our research assistants will continue their review of the literature pertinent to our purpose. Mr. Grippaldi will concentrate his efforts in the area of the structure of knowledge, while Mrs. Porter will research grouping practices in the secondary schools.

The SCOPE Project is also looking to subsidize one or two doctoral theses related to SCOPE and the secondary school curriculum. In this way we would be making a further contribution to education, as well as providing our own efforts with additional sources of information.

10. CERTIFICATION

Bruce W. Tuckman

Signature of Contract
Officer

Date

Signature of Principal
Investigator or Project
Director

October 15, 1968

Date

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SCOPE PERSONNEL

Dr. Bruce W. Tuckman, Director

1. Degrees

    B.A. -- Rensselaer
    M.A. - Princeton
    Ph.D. - Princeton

2. Teaching and Related Experience Prior to this
   Project

    Naval Medical Research - Research Psychologist
    Institute

    University of Maryland - Instructor in social
                             psych. and educational
                             psych.

    Princeton University   - Postdoctoral research

    Rutgers University   - Teaching Social Psych.
                             and Psych. of Personal-
                             ity

3. Specialization(s)

    Interaction processes in the school and classroom

    The structure of knowledge and the learning
    process

    Research design and measurement

    The psychology of the disadvantaged

    Vocational development

Mr. Joseph H. Casello, Assistant to the Director

1. Degrees

    B.A. - Trinity College
    M.A. - Trinity College
    Presently a doctoral candidate at Rutgers
    University

2. Teaching and Related Experience prior to the
   Project

5

SCOPE PERSONNEL (continued)

Rockville High School Rockville, Conn.	– Instructor of United States History
Tolland High School Tolland, Conn.	– Assistant Principal

3. Specialization(s)

Historiography

Educational administration

Mrs. Carol Porter, Research Assistant

1. Degrees

B.A. – State University of New York (Stony Brook)

2. Teaching and Related Experience Prior to this
    Project

one semester as a research assistant in
experimental psychology

assistant to foreign student advisor (Dean of
Student's staff)

3. Specialization(s)

Counseling and guidance

College level administration

Mr. Ricardo Grippaldi, Research Assistant

1. Degrees

B.A. – Seton Hall

2. Teaching and Related Experience Prior to this
    Project

3. Specialization(s)

working with disturbed children

group psychotherapy

APPENDIX

12

SCOPE* PROGRAM

*Study of Curriculums for
Occupational Preparation
and Education

A Research Activity of the
Department of Vocational-Technical Education
funded by the
U. S. Office of Education
under Grant No. OE 8-0334

BRUCE W. TUCKMAN, Ph.D., *Director*
SCOPE Center
Douglass-Wood Lawn Gatehouse
Rutgers University
New Brunswick, New Jersey 08903
Phone: 201-846-4628

Project No.
8-0334

SCOPE PROGRAM

SCOPE is an acronym for the Study of Curriculums for Occupational Preparation and Education. Its major objective is to coordinate and contribute to a national curriculum development effort at the secondary school level aimed at increasing the relevance of high school education for the large majority of our youth who must seek employment (or further job training) upon graduation.

OBJECTIVES, PHASE I

Funding has been obtained from the U. S. Office of Education for the first phase of the SCOPE Program, named Project CONECT, another acronym standing for the Coordination of Occupational and Non-occupational Curriculums and Technologies. The objectives of this first phase of the SCOPE Program are as follows:

(1) To establish a functional communication link between the state-supported vocational curriculum development centers.

(2) To increase the familiarity of the directors of the above centers with recent advances in behavioral approaches to curriculum development, devices, and evaluation.

(3) To refine and test a scheme for classifying educational objectives in terms of the performance requirements of each objective rather than the subject-matter.

(4) To develop a detailed plan of activity for Phase II of the SCOPE Program, including the identification of staff and facility needs.

SCOPE AND THE VOCATIONAL CURRICULUM CENTERS

There are approximately 15 State-supported vocational curriculum development centers throughout the country that have been actively involved in the development of curriculum materials. The first task of SCOPE will be to assist these centers by helping to establish better communication and cooperation among them and by providing information concerning present modernizing trends in the production of curriculum materials.

To this end, two conferences will be held at Rutgers in the spring of 1969 so that the curriculum laboratory directors can participate in discussions concerning the latest developments in curriculum theory and educational technology.

The final task of the first phase of SCOPE will be to plan for the SCOPE Center to participate in the development and coordination of national efforts to move the curriculum toward greater relevance for more students.

THE INTEGRATED CURRICULUM

The SCOPE Program also has aims which interface with those of a new Federally-supported effort known as the Educational Systems of the '70's. The ES '70 program is an attempt to make an impact on the high school of the future by providing more closely for individual student needs, including those relevant to future employment opportunities. Seventeen participating school districts are attempting to develop and implement such promising innovations as the integrated curriculum, individualized instruction, etc. The notion of the truly integrated curriculum, i.e., one in which concepts common to different subject matters become the core of a curriculum rather than organizing the curriculum around the subject matters themselves, is at the heart of ES '70. It is here that the activities of SCOPE, as well as other University projects, will contribute to the overall programmatic approach.

Present plans in the ES '70 program call for an attempt to reorganize the high school curriculum in a direction away from separation of subject matter based on learning objectives. To this end, many subject matter experts may be called upon to identify the educational objectives included in their area of the high school curriculum. Thus, given the "pieces," it will be necessary to put them together in some meaningful way. The process-object model for the integration of objectives is an attempt to structure learning experiences in a manner more consistent with their application to the tasks of life than the present subject matter breakdown. During the first phase of SCOPE, this scheme will be refined, written about, and tested.

SCOPE AND THE SYSTEM

SCOPE will be concerned with a number of current curriculum practices at the high school level. Activity aimed at the development of an integrated curriculum fortunately will enable the SCOPE Project to confront many of these problem areas, such as ability grouping and tracking, the status of vocational offerings, curriculum evaluation, etc. Such a confrontation will focus on the promulgation of solutions aimed at more Rigorous, Respectable, and Relevant programs of studies for tomorrow's students.

SCOPE AND THE INDIVIDUAL STUDENT

The notions of systematic specification of educational goals in behavioral terms, hierarchial analysis of knowledge and competence, contingency management and the like are approaches that behaviorally-oriented psychologists and educators are attempting to introduce into the mainstream of curriculum development. Anchoring educational activities to the specific behavioral goals which they are intended to produce provides the basis for a highly individualized and reality-oriented curriculum. Moreover, it does not, as some have claimed, reduce the range of individual differences. By providing slow learners with a more adequate grasp of basic concepts, the behaviorally-structured curriculum increases their potential for unique individual development. Moreover, rapid learners can proceed at their own pace and can go "beyond" the curriculum.

Individual instruction, the integrated curriculum, the career-oriented curriculum (one which painlessly and respectably exposes more students to skill training and development) may seem like pipe dreams today. The SCOPE Program is an effort to bring them closer to the reality of tomorrow.

PROJECT DIRECTOR
DR. BRUCE W. TUCKMAN

B.S. Rensselaer
M.A. Princeton University
Ph.D. Princeton University

Associate Professor of Education

Departments of Vocational-Technical
Education and Educational Psychology

ASSISTANT TO THE DIRECTOR
MR. JOSEPH H. CASELLO

B.A. Trinity College
M.A. Trinity College

Formerly Assistant Principal—
Tolland High School, Tolland, Connecticut

Presently a Doctoral Candidate
in Vocational Education at Rutgers

DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
Office of Education
Washington, D.C. 20202

MEMORANDUM   September 27, 1968

Sent to: State Directors of Vocational Education

Sent by: David S. Bushnell, Director
           Division of Comprehensive and
              Vocational Education Research

           Leon P. Minear, Director
           Division of Vocational and
              Technical Education

Subject: Initiation of the SCOPE Project at Rutgers University
           (U.S.O.E. Project No. 8-0334).

The SCOPE Project (Study of Curriculums for Occupational Preparation thru
Education), which the United States Office of Education is pleased to
sponsor, is now operative at Rutgers University. Among its functions will
be the important task of helping to establish a viable communications link
among the many State-supported Curriculum Development Laboratories. This
is an important objective, for it will enable the Curriculum Labs to be-
come an even more potent force in meeting tomorrow's educational needs.

We attach great importance to SCOPE because we anticipate that the field
of vocational-technical education will profit from coordination and cooper-
ation among the States in the important domain of curriculum development.
It is our hope that you, as the Directors of Vocational and Technical
Education and persons having the responsibility for vocational curriculum
development in your States, will afford Dr. Bruce Tuckman and his SCOPE
staff your fullest cooperation. In doing so, you will be furthering our
joint efforts and programs in the national cause of vocational curriculum
development.

RUTGERS · THE STATE UNIVERSITY

NEW BRUNSWICK, NEW JERSEY 08903

SCOPE Center
Douglass–WoodLawn Gatehouse
(201) 846-4628

September 27, 1968

The SCOPE Center (Study of Curriculums for Occupational
Preparation and Education) Is now operative. With your
approval, along with that of the other State Directors
of Vocational-Technical Education, we would like to use
our Center and the Federal funds at our disposal to help
the State–supported Curriculum Development Laboratories
establish a viable communications link among themselves.
The Federal Government has authorized funds for this en-
deavor because it believes that these Laboratories can
become an even more potent national resource if the proper
catalyst for interlocking were provided. We feel, as I
am sure you do, that the entire field of vocational-techni-
cal education would benefit from such intensified inter-
action.

We would also like to use our resources to get the Curri-
culum Labs to conceive of and pursue a national role in
curriculum development. There is an urgent need to in-
crease the relevance of high school education for the large
majority of our youth who must seek employment or further
job training upon graduation. Tied to this necessity is
that of extending vocational offerings to more students,
particularly those in comprehensive high schools. To
accomplish such objectives would require not only a prolif-
eration of vocational curriculums, but the breaking of new
ground in vocational curriculum development. Collectively,
the Curriculum Labs have the means to be a strong and
recognizable influence in such a movement. We would like
to cooperate and be a part of that challenge with them. The

time for a vocational curriculum thrust in American education is now. Together we can do much to implement that thrust.

Our schedule calls for a visitation by SCOPE personnel of as many of the Curriculums Labs as time and funds will allow. These visitations will be followed by two conferences at Rutgers University early next spring, their purpose being to allow the various Lab Directors to get acquainted, discuss the possibility of a communications network, and converse with other specialists about the latest advances in curriculum theory and educational technology. If you do not object, we would like to carry on direct correspondence with the Curriculum Lab Directors. In addition, we would appreciate it if you would notify the Curriculum Lab Director of your endorsement of this Project, and urge them to attend our spring conferences.

In closing, let me express my sincere appreciation for your cooperation. Also, please accept my invitation to join us at the spring conferences, and at our suite in the Statler-Hilton Hotel during the AVA Convention. I look forward to meeting with you in the near future.

Cordially,

Dr. Bruce W. Tuckman
Director

Mr. Joseph H. Casello
Assistant to the Director

BWT/JHC/sjo'b

enclosure

RUTGERS · THE STATE UNIVERSITY

SCOPE Center
Douglass-WoodLawn Gatehouse
(201) 846-4628

September 27, 1968

The SCOPE Center (Study of Curriculums for Occupational Prepara-
tion and Education) is now operative. Our Initial focus is on
helping you and the other Directors of the State-supported Curri-
culum Development Labs establish a viable communications link
among yourselves. The Federal Government has authorized funds
for such an effort because it realizes that these laboratories
can become an even more potent national resource if the proper
catalyst for interlocking were provided. We feel, as I am sure
you and your fellow Directors do, that not only would the Curri-
culum Centers profit from such interaction, but the entire field
of vocational-technical education as well would gain from such
a combined thrust. Our contribution to developing tomorrow's
education would be that much greater.

To implement our effort at helping you to coordinate, two con-
ferences are being planned for Rutgers University during the
early spring of 1969. The initial conference will provide you
with an opportunity to meet with the other lab Directors and
establish some form of network if it is your desire to do so.
The second meeting will enable you to converse with educational
leaders from a variety of specialties about the latest advances
in curriculum theory and educational technology and their impli-
cations for vocational education. Hopefully, you and the other
Directors will be in attendance on both occasions. The SCOPE
Project will provide funds for your travel and lodging costs,
as well as providing you with a stipend for each conference.

My assistant and I will attend the AVA Conference in Dallas
during the first week in December. We hope many of you will
visit with us in our accommodations at the Statler-Hilton Hotel
so that we can get to know each other on a personal basis. We

would also like to visit as many of the Curriculum Laboratories as time and funds allow (which unfortunately will not be all of them). Each center that we can visit will be contacted shortly to make specific arrangements for such visits. In the meantime, we would appreciate receiving any brochures, pamphlets, etc., that you feel would be informative and useful to us in describing the mission and activities of your Center.

SCOPE's ultimate aim is to assist in increasing the relevance of high school education for the large majority of our youth who must seek employment or further job training upon graduation, a lofty but attainable goal. We, as you, realize that vocational education has achieved some noteworthy success in pursuing this goal for half a century. The present effort in vocational education, with which we would like to identify, is to extend vocational offerings to more students, particularly those in comprehensive high schools. We feel that all students should have some exposure to the world of work, if for no other reasons than to help them learn their "academic" subjects and be able to apply them. This would require not only a proliferation of vocational curriculums, but the breaking of new ground in vocational curriculum development.

We would like to use our Center and the Federal funds at our disposal to help you conceive of and pursue a national role. Collectively you have the means to be a strong and recognizable influence on the national scene. We would like to cooperate and be a part of this challenge with you.

I look forward to meeting you and discussing our common interests and the role we might play in your coordinated activities. I am particularly interested in understanding and appreciating your feelings and ideas concerning the notion of a network of the Curriculum Labs. The time for a vocational curriculum thrust in American education is now. Together we can do much to implement that thrust.

Please write back and give me your reaction to our plans. I hope to see you soon.

Cordially,

Dr. Bruce W. Tuckman   Mr. Joseph H. Casello
Director   Assistant to the Director

BWT/JHC/sjo'b
enclosure

RUTGERS · THE STATE UNIVERSITY

NEW BRUNSWICK, NEW JERSEY 08903

SCOPE Center

Douglass-WoodLawn Gatehouse

(201) 846-4628

September 27, 1968

I need your assistance. The SCOPE Center (Study of
Curriculums for Occupational Preparation and Educa-
tion) has been initiated through Federal funds to
carry on work in the area of vocational-technical
curriculum. Realizing that the State-supported
Curriculum Labs play a vital role in this area, I
am most anxious to know more about your operations.
If you would be kind enough to take a few moments
from your busy schedule and fill out the questionnaire,
I think you would be doing the field of vocational-
technical education a great favor.

I appreciate your cooperation. Please feel free to
call on SCOPE at any time if you think we can be of
service to you.

Respectfully,

Joseph H. Casello
Assistant to the Director

JHC:sjo'b

Name of Lab_____

QUESTIONNAIRE TO BE COMPLETED BY CURRICULUM LAB DIRECTORS

1. Approximate Annual Budget_____

2. Number of Employees_____

3. Size of Facilities (sq. footage)_____

4. Approximate Capital Value of Equipment_____

5. Brief Description of Machinery_____

   _____

   _____

   _____

   _____

6. Areas of Specialization (check those appropriate)

Agri.	
T & I	
Business & Office	
Distributive Education	
Home Economics	
Health	
Technical	
Vocational Guidance	

Others_____

_____

_____

_____

_____

_____

7. Approximate number of publications on file_____

8. Approximate number of publications per year_____

9. Annual gross receipts from annual sale of literature_____

10. Are publications available to out of state parties?_____

PROGRESS REPORT II

Project No. 8-0334
Grant No. OEG-0-8-080334-3736 (085)

A STUDY OF CURRICULUMS
FOR
OCCUPATIONAL PREPARATION AND EDUCATION
(Scope Program: Phase I)

Bruce W. Tuckman

Rutgers University
New Brunswick, New Jersey

December, 1968

U.S. Department of
Health, Education, and Welfare

Office of Education
Bureau of Research
U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

ACKNOWLEDGEMENTS

PREFACE

SCOPE is an acronym for the Study of Curriculums for Occupational Preparation and Education. Its major objective is to coordinate and contribute to a national curriculum development effort at the secondary school level aimed at increasing the relevance of high school education for the large majority of our youth who must seek employment or further job training upon graduation.

The first phase of the SCOPE Program is CONECT, an acronym standing for the Coordination of Occupational and Non-occupational Curriculums and Technologies. The objectives of this first phase are as follows:

(1) To establish a functional communication link among the State-supported Vocational Curriculum Development Centers;

(2) To increase the familiarity of the directors of the above centers with recent advances in behavioral approaches to curriculum development, devices, and evaluation;

(3) To refine and test a scheme for classifying educational objectives in terms of the performance requirements and objectives rather than the subject-matter;

(4) To develop a detailed plan of activity for Phase II of the SCOPE Program, including the identification of staff and facility needs.

The SCOPE Program has aims which interface with those of a new Federally supported effort known as the Educational Systems of the '70's. The ES '70 program is an attempt to make an impact on the high school of the future by providing more closely for individual student needs, including those relevant to future employment opportunities. The notion of the truly integrated curriculum, i.e., one in which concepts common to different subject matters become the core of a curriculum rather than organizing the curriculum completely around the subject matters themselves, is at the heart of ES '70. It is here that the activities of SCOPE, as well as other University projects, will contribute to

the overall programmatic approach. During the first phase of SCOPE, a process-object model for the integration of objectives will be refined, written about, and tested. In so doing, the SCOPE Program will be helping to provide the basis for a highly individualized and reality-oriented curriculum.

OF BUREAU OF RESEARCH NO. 8-0334   GRANT NO. OEG-0-8-
                                     080334-3736 (085)

RUTGERS UNIVERSITY
                                     DATE OF SUBMISSION:
A STUDY OF CURRICULUMS FOR
OCCUPATIONAL PREPARATION   January 20, 1969
AND EDUCATION (SCOPE PROGRAM: PHASE I)

BRUCE W. TUCKMAN

I. MAJOR ACTIVITIES AND ACCOMPLISHMENTS DURING THIS PERIOD

     The second quarter of SCOPE's first year of existence
found the SCOPE staff busy with establishing personal contact
with the directors of the state-supported curriculum
laboratories in an effort to form some viable confederation
among them, and working toward the development and perfection
of a process-object model for the integration of the
eventual behavioral objectives that will be determined for
each discipline. The logistics for our efforts included
numerous trips and conferences, the most important of which
are discussed at this time.

          MAN-EDUCATION-WORK CONFERENCE

          Dr. Tuckman and Mr. Casello attended the "Man-
     Education-Work" Conference at Rutgers University on
     September 30 and October 1. Sponsored jointly by
     the Department of Vocational-Technical Education at
     Rutgers, and the Center for Studies in Vocational
     and Technical Education at the University of
     Wisconsin, this important program was:

               ...one of six regional conferences designed
               to bring together representatives of business,
               labor, government, and education and other
               interested citizen groups for a discussion
               of the 1968 Report of the National Advisory
               Commission on Vocational Education...

               The regional conferences are intended to
               provide opportunity for informed discussion
               and exchange of viewpoints about the issues
               raised by this report. A final report
               synthesizing the discussions of the regional
               conferences will be published and made
               available to conference participants and
               others.

Talks were given by Dr. Martin Essex and Mr. Leonard
Rosenberg, Chairman and member respectively of the
Advisory Council on Vocational Education, Dr. Gerald
Leighbody of the State University of New York at
Buffalo, and Marvin Feldman, Educational Director
of the Ford Foundation. Participants were broken
into groups to react to three questions:

- To what extent should vocational and
  technical education be organized and
  administered separately from general
  education programs?

- How can education for work become more
  visible as an objective of school and
  college programs?

- How can counseling and placement
  activities best serve the objectives
  of vocational-technical education?

Responses from the various groups seemed to express
a general feeling that there must be a different
approach to vocational education rather than just
more of the same, redirection must come both in
program and curriculum, there should be no segrega-
tion of vocational and general education, and the
bridge between education and work must be built from
both ends. Strong sentiments were expressed in favor
of the behavioral objective approach to curriculum
development, similar to that being attempted by SCOPE.

JAMESBURG HOME FOR BOYS

On October 22, Dr. Tuckman and Mr. Casello
journeyed to the Jamesburg Home for Boys as the guests
of Mr. Houston, Director at the Home, and Dr. Bodhan
Cymballisty, the psychological examiner at the Home.
The administration is very anxious to develop a voca-
tional program so that the boys will have some job-
entry skills upon departure from the institution, and
to develop some criteria for evaluating various programs
already adopted. A lengthy discussion led to the
following possibilities:

(1) The establishment of an internship
for a student in the Vocational-Technical
Department of the Graduate School of
Education at Rutgers University, the

4

purpose being for the student to assist
in developing a financially and educa-
tionally sound vocational program for the
school, including new courses such as
ornamental horticulture, food services,
etc.

(2) The establishment of a dissertation study for
a student in the Department of Educational
Psychology in which certain aspects of the
school program would be evaluated. One
possibility for such a dissertation would
be the comparison of homogeneous and
heterogeneous personality groupings in the
living cabins as a new experiment in the
Jamesburg program.

(3) The establishment of a system for the
evaluation of the individual programs
within the school. Dr. Tuckman would
work closely with the school psychologist
in an advisory capacity.

(4) The location of assistance from within
the Graduate School of Education at
Rutgers University in helping Jamesburg
to draft proposals for Federal aid.

(5) The establishment of an internship
program for students in a teacher
training program.

The administration at Jamesburg was most receptive
to the suggestions and possible future assistance
advocated by the SCOPE staff. There is great hope on
our part that the SCOPE Project will be able to use
the Jamesburg facilities for research pertinent to the
process-object model for determining behavioral
objectives which we are trying to develop.

SCOPE ADVISORY COMMITTEE

The University Advisory Committee to the SCOPE
Project was organized during this quarter. The
gentlemen who have generously consented to give us
their time and talents are:

Dr. Charles W. Patrick
Assistant to the President
Rutgers University

Dr. James R. Watson
Assistant to the President
Rutgers University

Dr. Ernest Duncan, Chairman
Dept. of Curriculum & Instruction
Graduate School of Education
Rutgers University

Dr. Frank Scherer, Chairman
Dept. of School Administration &
  Supervision
Graduate School of Education
Rutgers University

Dr. Jack Bardon, Chairman
Dept. of Educational Psychology
Graduate School of Education
Rutgers University

Dr. James Wheeler, Chairman
Dept. of Social & Philosophical
  Foundations
Graduate School of Education
Rutgers University

Dr. Carl J. Schaefer, Chairman
Dept. of Vocational-Technical
  Education
Graduate School of Education
Rutgers University

Dr. Herbert Levine, Director
Labor Relations Center
Herrmann Labor Education Center
Rutgers University

Dr. Earnest McMahon, Dean
University Extension Division
University College
Rutgers University

Dr. Werner Boehm, Dean
Graduate School of Social Work
Rutgers University

Dr. Milton Schwebel, Dean
Graduate School of Education
Rutgers University

Dr. Donald H. Amick, Assistant Dean
Graduate School of Education
Rutgers University

Mr. O. Clayton Johnson
Assistant to the Dean
Graduate School of Education
Rutgers University

Dr. Margery Foster, Dean
Douglass College
Rutgers University

Dr. George Pallrand, Director
Secondary School Science Project
Graduate School of Education
Rutgers University

Dr. Martin Haberman, Director
Pre-Service Teacher Education
Graduate School of Education
Rutgers University

On October 29, Dr. Tuckman, Mr. Casello, and the Project's two graduate assistants, Mrs. Carol Porter and Mr. Ricardo Grippaldi, met with members of the Advisory Committee for lunch. The occasion was used by Dr. Tuckman to discuss the nature of the SCOPE Project in detail and to outline its objectives. A question-and-answer period produced some stimulating interaction.

Present plans call for the Advisory Committee to be used by the SCOPE staff as a resource group. The varied experiences and expertise of the committee members make them a most valuable addition to the SCOPE family. We are pleased to have the consultation of such a capable group of educators, and look forward to working with them often in the near future.

HIGH SCHOOL REPRESENTATIVES

On October 31, Dr. Tuckman, Mr. Casello, and graduate assistant, Mrs. Carol Porter, hosted a luncheon for representatives from the following five New Jersey school systems:

Mr. Paul A. Shelly
Assistant Superintendent of Schools
Montclair, New Jersey

Mr. John Rosser
Administrative Assistant
Willingboro, New Jersey

Mr. Nelson Gray
Administrative Assistant
Willingboro, New Jersey

Mr. Theodore Schor
Superintendent of Schools
Piscataway, New Jersey

Mr. Edward Moskowitz
Vocational Coordinator
Hackensack, New Jersey

Mr. Donald Hoagland
Superintendent
Monmouth County Vocational School
Freehold, New Jersey

The purpose of the meeting was to familiarize these gentlemen with the SCOPE Project and to glean their reactions to our efforts. A positive reaction on their part encouraged Dr. Tuckman to request permission to use their school systems for the purpose of undertaking an exploratory study of the characteristics and effects of ability grouping on students, primarily at the secondary level. (See Appendix 1) This request was enthusiastically received by all of the representatives, and plans are now underway to begin this study sometime in the spring of next year. It is the opinion of the SCOPE staff that the enthusiastic support received from these people for our efforts will enable us to use their facilities as experimental laboratories and resource centers for any needed data pertaining to our study of secondary school curricula.

SOUTHERN TRIP TO CURRICULUM LABORATORIES

During the week of November 12, Dr. Tuckman and
Mr. Casello flew to the State-supported curriculum
laboratories at Raleigh, North Carolina, Clemson,
South Carolina, and Murfreesboro, Tennessee. In
addition to being the recipients of generous southern
hospitality, Dr. Tuckman and Mr. Casello were afforded
an opportunity to meet with the director and staff of
each lab to present the SCOPE Project and its objectives
in great detail, to gain some awareness of the
philosophies and problems of each director, and to
begin to identify the issues for inclusion in the format
for the spring conferences at Rutgers University for
the laboratory directors. A tour was made of the
facilities at each laboratory, as well as the communities
in which they are located. Visits were also made to
Duke University, North Carolina State University,
Clemson University, Middle Tennessee State University,
and the W.W. Holding Technical Institute, where there
was a thorough exposure to the vocational-technical
program offered at this community college.

The trip to the three southern curriculum laboratories
was most beneficial in that it gave SCOPE staff members
an opportunity to meet three of the lab directors
personally, to evaluate their reactions to our efforts
to help form some confederation among them, and to
prepare for the spring conferences. It became quite
apparent, for example, that the following items must be
discussed at length in a meeting of the lab directors:

(1) the advantages that would accrue from some
     sort of communication network on their part

(2) the mechanics of such a union

(3) the possibility of a common repository to
     serve as a printing and distribution center

(4) the possibility of expanding the original
     planning group to include other existing
     laboratories

(5) the different administrative organizations
     and formats that exists among the laboratories

There also appears to be some need for the SCOPE

staff to look more closely at PPBS and PERT management
structures. Successful completion of our efforts to
help forge a strong union among the curriculum
laboratories will depend largely upon a well defined,
carefully implemented modus operandi.

AEROSPACE EDUCATIONAL FOUNDATION PROGRAM

On November 18, 19, and 20, Mr. Joseph Casello,
Assistant to the Director of SCOPE, attended the
National Laboratory for the Advancement of Education
program "Individualized Learning for the Inner City,"
sponsored by the Aerospace Education Foundation. This
was a new medium of communications to demonstrate,
analyze, and evaluate the Nation's most outstanding
examples of innovative classroom projects regarding
individualized learning. The program included four
outstanding features:

(1) Classroom Demonstrations - actual classroom
experiences demonstrated by teachers who
have provided effective changes in the
learning process through innovative concepts
and techniques, covering all grade levels
from pre-school through adult education -
and a wide range of subject areas

(2) Three-Phase Seminar - featuring reports
and panel discussions on actual results
achieved in the movement from classical
group instruction to self-paced individualized
learning - with concentration on education's
role in solving urban problems

(3) Exposition - industry displays and demonstra-
tions of products and services complementing
the subject areas covered in the Classroom
Demonstrations and Seminar Sessions - with
the Exposition areas adjacent to the conference
rooms - and a program schedule which not only
encouraged but required multiple visits to
the Exposition

(4) Talk-Back Sessions - to enhance personal
involvement, each evening of the conference was
devoted to a follow-on question-and-answer
discussion period with the principals involved
in the Classroom Demonstrations and Seminar
Sessions, and the Industry representatives as
well.

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The presentation was well received by the 1,500 participants. The speeches and demonstrations were stimulating, the comments by the reaction panels were incisive, and the program was well balanced between listening, viewing, and participating. It was encouraging to observe that changes in the learning process are on the march, and that effective innovation is proving to be a realistic goal.

AVA CONVENTION

During the week of December 9, Dr. Tuckman and Mr. Casello attended the AVA Convention in Dallas, Texas. The trip proved to be an excellent opportunity for disseminating information on the SCOPE Project and gathering data regarding progress in the field of vocational-technical education. Dr. Byrl Shoemaker, State Director of Vocational Education in Ohio, presented the SCOPE Program to the state directors at their annual meeting. Dr. Tuckman presented two papers concerning research methods, while Mr. Casello met with members of the AVA Agricultural Division Professional Information Committee and discussed SCOPE and curriculum laboratories in general.

The trip to Dallas also afforded the SCOPE staff an opportunity to develop further the communication network among the curriculum lab directors. A meeting was held at the SCOPE suite for all of the lab directors in attendance. A dozen directors came together, established personal contact, conferred concerning their common policies and problems, discussed the possibility of a union, and offered suggestions for the organization of the spring conferences at Rutgers University. A solid foundation has been laid for the spring conferences and the confederation of curriculum laboratories. Moreover, the SCOPE personnel now has some insight into the problems common to all of the laboratories and the issues which must be resolved before a viable communication network can become operative among them.

MAJOR ACTIVITIES AND ACCOMPLISHMENTS (continued)

Research

During the second quarter our two research assistants involved themselves in a study of ability grouping, the development of a model, and integrating behavioral objectives. Their reports concerning their activities are included at this point.

THE DEVELOPMENT OF A MODEL FOR BEHAVIORAL OBJECTIVES

In development of a workable taxonomy of behavioral objectives, the first step undertaken was a research review of all known classification systems pertinent to our domain of interest. Books, journals, etc. were surveyed; this included the fields of education, psychology, and other humanities as well as other appropriate areas such as systems analysis. (See References).

The literature did not contain much on the subject of taxonomies specifically; most of the material was of a general, abstract nature. We were interested in developing a detailed, workable taxonomy that could be applied to the creation of a curriculum. The most detailed and recent works along this line were the Bloom (et al.) and Krathwohl (et al.) taxonomies of educational objectives regarding the cognitive and affective domains respectively. (Figures 1 and 2). Taking the Tuckman process-object scheme for classifying educational objectives (Figure 3) as our starting base, we attempted to develop a model that would incorporate the most complete, diversified categorizations. It was felt that a three-dimensional model might best provide this.

The first model (Figure 4) depicted the goals considered basic for each object and the process whereby this could be acquired. The next step was to determine which verbs would best fit these categories. Model II was evolved (Figure 5) which utilized the above-mentioned taxonomies as well as a newly proposed taxonomy by Yagi (et al.) (Figure 6). Modification of this led to Model III (Figure 7) which was believed to be more concise and definitive. Discussion/Evaluation of this model in conjunction with our objectives resulted in the conclusion that, because of the

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traditional nature, present establishment and over-lapping subject content of school curriculums, a tri-dimensional model would not be practical, rather, a linear categorization appeared to be the most practical.

We then turned to the task of developing a listing of verbs (Appendix A) which would account for all the basic operations that are involved in learning. This listing was refined and broken down into six major categories (Perceptual, Thinking, Computational, Communication, Interactional, and Manipulation) which covered the major aspects involved in an individual's reaction to his environment. (Appendix B). While evaluation of this latest model continues, it was decided that we should begin to test our categorizations. To this end, we obtained games which require the solitary participant to utilize perceptual, conceptual, and motor skills. With these tasks, we intend to determine what processes are required in areas such as problem solving that have wide-range application in education as well as the daily experiences of life.

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Figure 1

BLOOM TAXONOMY
(a condensed version)

1.00 KNOWLEDGE

    1.10 Knowledge of Specifics
      1.11 Knowledge of Terminology
      1.12 Knowledge of Specific Facts
    1.20 Knowledge of Ways and Means of Dealing with
        Specifics
      1.21 Knowledge of Conventions
      1.22 Knowledge of Trends and Sequences
      1.23 Knowledge of Classifications and Categories
      1.24 Knowledge of Criteria
      1.25 Knowledge of Methodology
    1.30 Knowledge of the Universals and Abstractions
        in a Field
      1.31 Knowledge of Principles and Generalizations
      1.32 Knowledge of Theories and Structures

2.00 COMPREHENSION

    2.10 Translation
    2.20 Interpretation
    2.30 Extrapolation

3.00 APPLICATION

4.00 ANALYSIS

    4.10 Analysis of Elements
    4.20 Analysis of Relationships
    4.30 Analysis of Organizational Principles

5.00 SYNTHESIS

    5.10 Production of a Unique Communication
    5.20 Production of a Plan, or Proposed Set of
        Operations
    5.30 Derivation of a Set of Abstract Relations

6.00 EVALUATION

    6.10 Judgments in Terms of Internal Evidence
    6.20 Judgments in Terms of External Criteria

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Figure 2

KRATHWOHL TAXONOMY
(a condensed version)

1.0 RECEIVING (ATTENDING)

1.1 Awareness
1.2 Willingness to Receive
1.3 Controlled cr Selected Attention

2.0 RESPONDING

2.1 Acquiescence in Responding
2.2 Willingness to Respond
2.3 Satisfaction in Response

3.0 VALUING

3.1 Acceptance of a Value
3.2 Preference for a Value
3.3 Commitment

4.0 ORGANIZATION

4.1 Conceptualization of a Value
4.2 Organization of a Value System

5.0 CHARACTERIZATION BY A VALUE OR VALUE COMPLEX

5.1 Generalized Set
5.2 Characterization

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Figure 3

THE PROCESS-OBJECT SCHEME FOR CLASSIFYING
EDUCATIONAL OBJECTIVES

OBJECT

PROCESS	SYMBOLS (1)	IDEAS (2)	THINGS (3)	PEOPLE (4)	SELF (5)
(1) PERCEPTION					
(2) CONCEPTUALIZATION					
(3) APPLICATION					
(4) EVALUATION					
(5) MANIPULATION					

Figure 4

MODEL I

GOALS
- Knowing
- Application
- Evaluation

ACQUISITIVE SKILLS
- Perception
- Conceptualization
- Manipulation
- Communication

Symbols Ideas Things People Self

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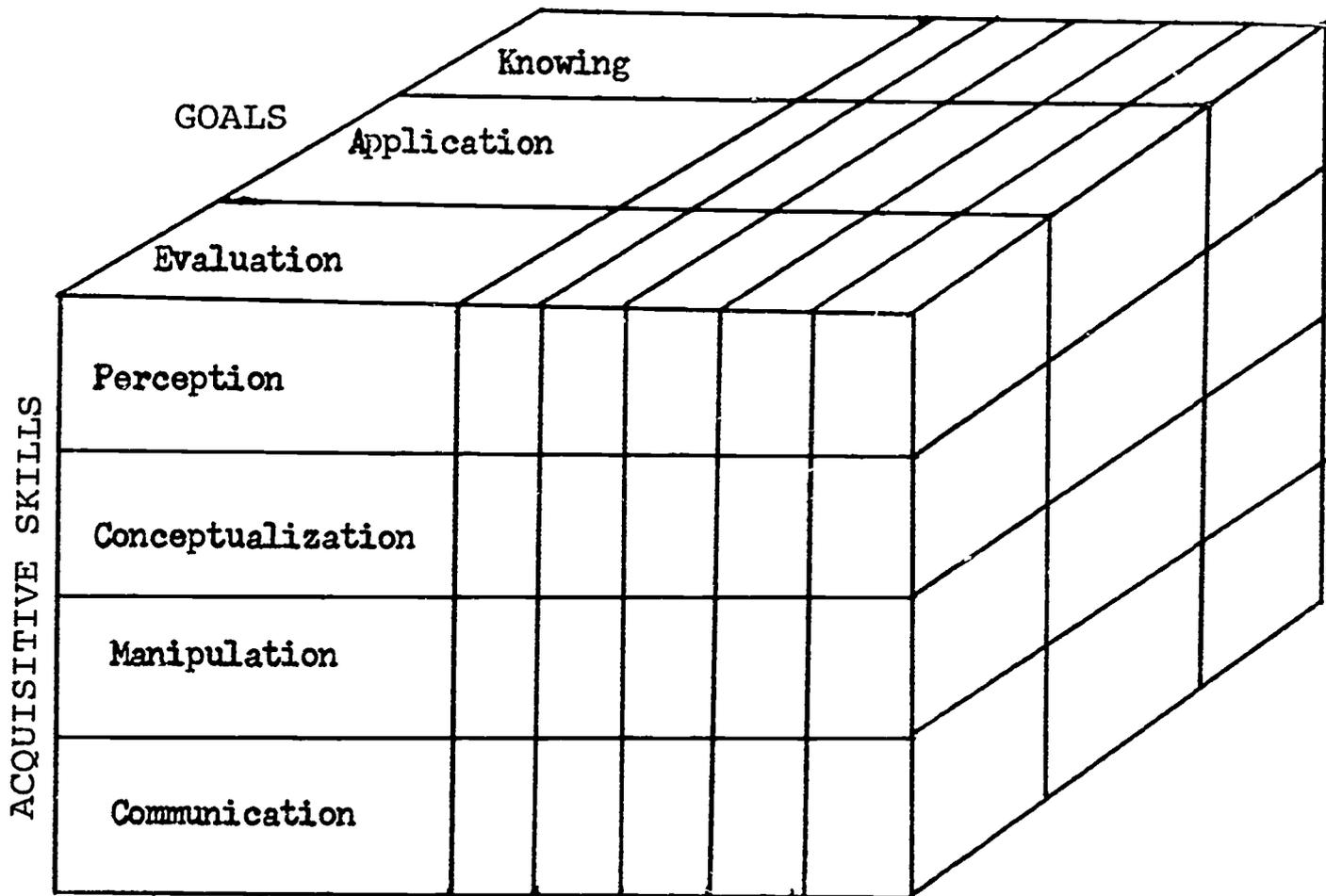
Figure 5

MODEL II
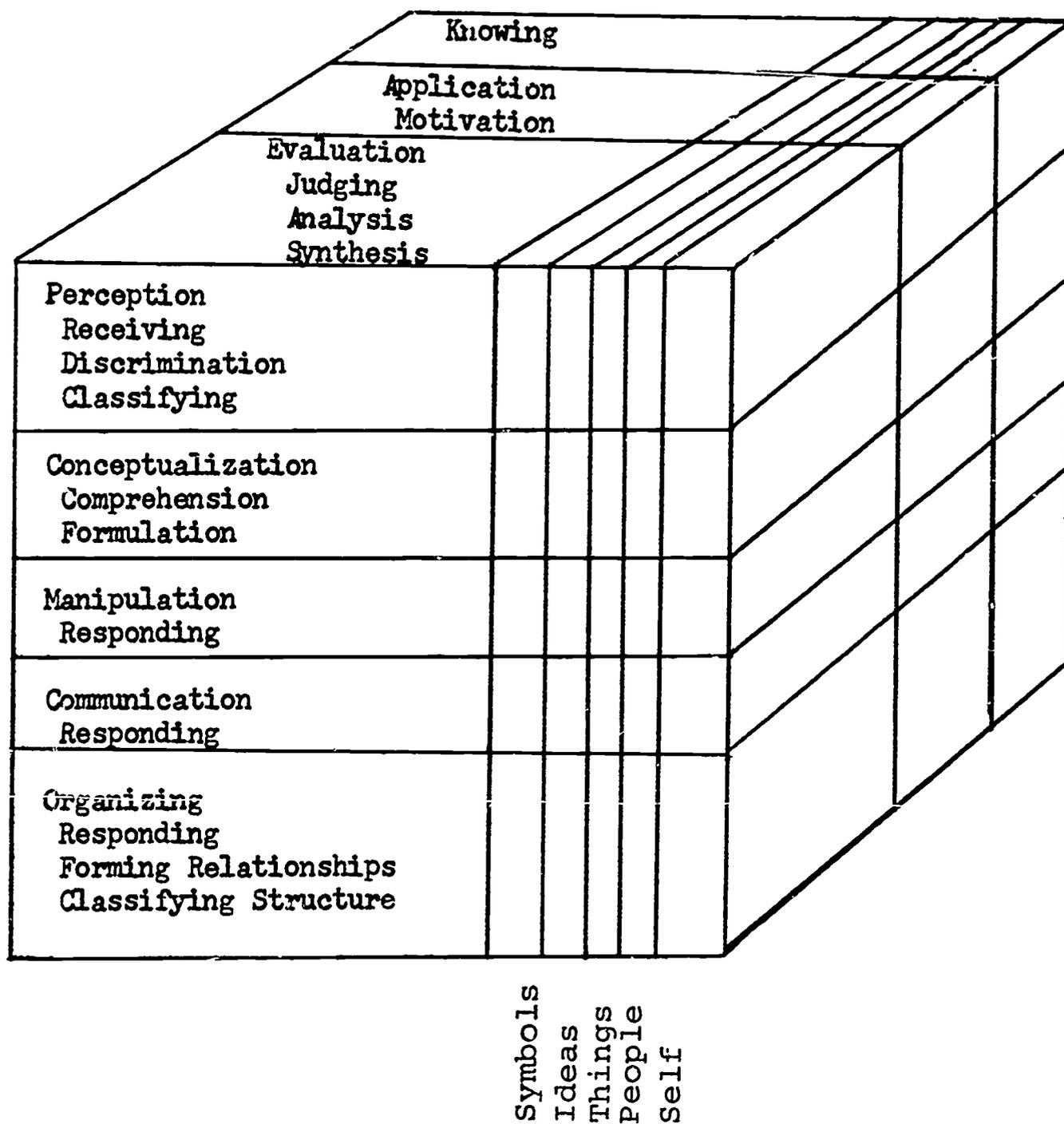
Figure 6

THREE DIMENSIONAL REPRESENTATION OF TAXONOMY

(After Yagi, K. et al. The design and evaluation
of vocational technical education curricula through
functional job analysis. Project #6-1659, Grant No.
OEG-2-6-061-659-2085. George Washington University,
August 1968.)
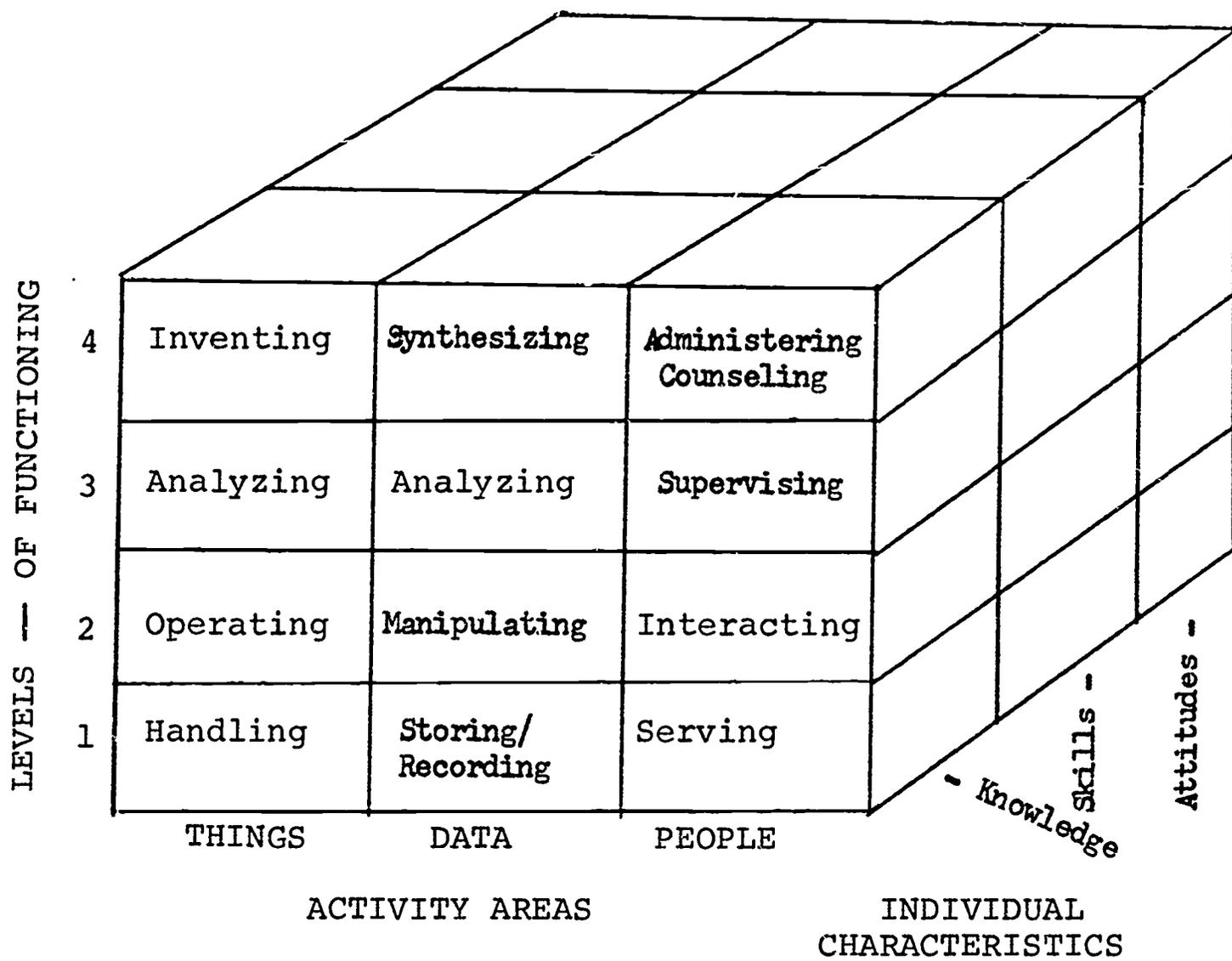
Figure 7

MODEL III

	SYMBOLS	IDEAS	THINGS	PEOPLE	SELF

Sensing
  Attention Span
  Acuity
  Scan					

Recalling
  Recording
   (encoding)
  Storing
  Remembering
   (decoding)					

Processing
  Associating
  Conceptualizing
  Organizing					

Responding
  Manipulating
  Communicating					

Figure 8

MODEL IV
(our most recent attempt)
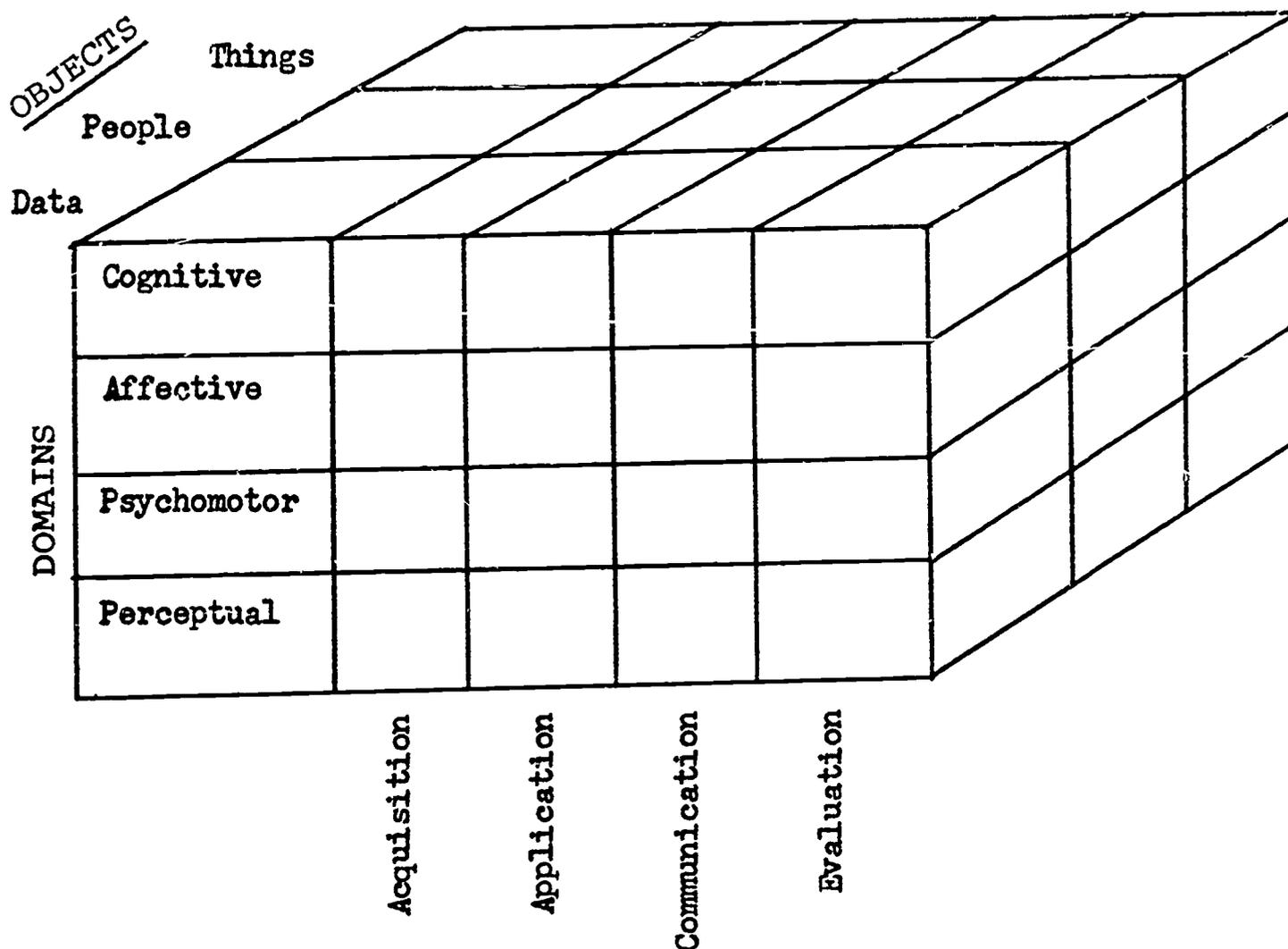
Step 1. analyze a terminal objective into its components

Step 2. classify each component in one of the above 48 cells

A

abolish	advance	appreciate	attract	bet
absorb	advise	approach	author	better
abstract	affect	approve	automate	bid
accelerate	affirm	arbitrate	avert	bill
accent	aggregate	arm	avoid	blame
accept	aggress	arrange	awake	board
accommodate	agree	arrest		bond
accompany	argue	arrive	**B**	book
accomplish	aim	articulate	back	bound
account	allocate	ascend	balance	brake
accumulate	allow	ask	ban	break
acknowledge	alter	aspire	band	breed
acquaint	alternate	assemble	bank	bridge
act	amend	assent	bar	brief
activate	amplify	assert	base	bundle
adapt	analyze	assign	beam	bump
add	animate	assimilate	bear	buy
address	announce	assist	begin	
adhere	answer	associate	behave	**C**
adjust	anticipate	assume	believe	calculate
administer	appear	attach	bend	call
admit	apply	attain	benefit	cancel
adopt	appoint	attempt	best	can

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capitalize	commute	contract	decide	designate
care	compare	contrast	declare	desire
carry	compensate	convene	decode	destroy
catch	compete	converse	decrease	detail
cause	complement	convert	deduct	detect
cease	comply	convey	defeat	determine
censor	compose	cooperate	defend	develop
change	conceive	copy	defer	devise
check	conclude	correct	define	diagnose
choose	condense	correspond	delete	dictate
circulate	condemn	cost	delineate	differ
cite	conduct	counsel	deliver	differentiate
claim	confide	couple	demand	diffuse
classify	confirm	cover	demonstrate	diminish
clear	conform	create	deny	direct
cognate	connect	credit	denote	disagree
collaborate	connote	critique	depart	disappear
collect	conserve	cue	deplete	discard
combine	consider	culminate	deposit	discern
command	construct	curb	depreciate	discharge
commence	consume		depress	discipline
comment	contact	**D**	derive	disclose
commit	contemplate	debate	descend	discontinue
commission	continue	debit	describe	discourage
communicate	contest	decelerate	design	discover

discuss	E	enunciate	exit	fend
disguise	earn	equate	expand	figure
disjoin	educate	erase	expect	file
dismiss	effect	erect	expedite	finance
dispense	elaborate	err	expend	find
disperse	elect	erupt	experience	finger
displace	elevate	escalate	experiment	finish
dispose	elude	escape	explain	firm
disprove	emanate	espouse	explore	fit
display	emerge	establish	export	fix
disrupt	emit	estimate	express	flex
dissent	employ	evade	extend	flee
dissolve	enact	even	extract	focus
distinguish	encounter	exact		follow
distort	enclose	examine	F	foot
disturb	encourage	exceed	face	force
diverge	end	excite	factor	forget
divert	endow	exclude	fail	form
divide	engage	excuse	familiarize	formalize
domineer	enjoy	execute	fatigue	formulate
dominate	enlighten	exercise	fashion	forward
dress	enrich	exhaust	fasten	free
drive	entertain	exhibit	fault	frequent
duplicate	enter	exist	feedback	function
			feel	

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G

gain
gamble
gauge
generalize
gesture
get
give
go
govern
grab
grade
grant
graph
gratify
group
grow
guess
guide

H

hamper
handle
happen
hasten
head
help
hide
hinder
hit
hold
humanize
humor
hunt

I

idealize
identify
illuminate
illustrate
imagine
imitate
impair
impede
imply
impose
impregnate
impress
imprint
improve
incapacitate
incite
include
increase
incur
indicate
induce
indulge
infect
inform
inhabit
inquire
inhibit
initiate
inject
inscribe
insert
inspire
install
institute
intend
interact
interest
interfere
internalize
interpret
interrogate
interview
intervene
intuit
invent
invest
irradiate
irritate
issue

J

join
judge

K

keep
key
knock

L

label
labor
lack
laminate
land
last
laud
lay
lead
leave
lessen
let
level
liberate
lie
lift
light
like
limit
line
liquify
list
litigate
live
load
locate
loom
lose
lower

25

lubricant

M

machine

magnify

make

manage

manifest

manipulate

man

manufacture

market

mass

master

match

mature

maximize

mean

measure

mediate

meditate

meet

memorize

meter

mimic

minimize

miss

mistake

mix

model

moderate

modify

modulate

mold

mollify

motivate

motor

mount

move

multiply

mutate

N

name

naturalize

navigate

near

need

negate

neglect

negotiate

nominate

normalize

note

notice

nullify

number

numerate

O

obey

object

obligate

observe

obtain

occupy

occur

offend

offer

omit

open

operate

oppose

order

organize

originate

oust

outline

P

pace

pack

package

paint

pair

parallel

part

participate

pass

pattern

pause

pay

penalize

perfect

perform

permeate

permit

persist

persuade

pertain

phase

phrase

pick

picture

piece

pile

pilot

pitch

place

plan

play

please

plot

ply

point

ponder

pool

popularize

populate

pore

pose

possess

post

pour

power	prove	rate	remember	rise
practice	propose	rationalize	remit	rule
precede	propel	reach	remove	
precipitate	protect	react	renew	**S**
predicate	protest	read	repair	save
prefer	prove	reason	repeat	say
prepare	provide	recall	replace	scale
present	provoke	recede	report	score
prescribe	pull	receive	represent	screen
present	punish	recess	reproduce	search
press	purchase	reciprocate	request	see
presume	propose	recite	reserve	select
pretend		record	reside	sell
prevent	**Q**	recover	resign	send
preview	qualify	rectify	resolve	sense
prevent	quantify	reduce	respect	sensitize
print	question	refer	rest	sentence
process	quiet	reflect	restore	separate
procure	quit	register	retire	service
produce	quote	regress	retrieve	set
profit		regulate	return	settle
program	**R**	reiterate	reveal	sight
progress	radiate	relay	reverse	sign
project	raise	relieve	review	size
promote	range	rely	ride	sort
	rank			space

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speak	supply	transmit	volunteer
specify	survive	train	
spread	suspect	transcribe	**W**
stabilize	suspend	transfer	wait
staff	sustain	transform	waste
stand	switch	translate	watch
start	sympathize	treat	weigh
state		trim	write
station	**T**	try	
step	take	turn	**Y**
stop	talk	type	yield
store	taste		
straighten	tell	**U**	
strain	tend	undertake	
stratify	terminate	unite	
stress	testify	use	
strive	theorize		
strike	throw	**V**	
study	time	value	
subject	tire	validate	
submit	tolerate	venture	
subscribe	toss	view	
succeed	total	violate	
sum	touch	visualize	
supervise	trace	vocalize	
		voice	

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APPENDIX B

PERCEPTUAL

acquire

approach

attend

collect

compare

contact

contrast

detect

differentiate

discriminate

distinguish

estimate

examine

feel

focus

hear

identify

indicate

label

listen

locate

look

match

measure

name

notice

observe

picture

receive

register

scan

search

smell

see

self-perception

sense

touch

watch

THINKING

abstract	decide	interpret	reason
analyze	define	intuit	recall
assess	derive	invent	reflect
assimilate	design	judge	remember
associate	develop	meditate	retrieve
believe	determine	memorize	review
change	diagnose	modify	self-concept
classify	differentiate	order	sort
coding	discover	organize	solve
cognate	establish	originate	store
compare	evaluate	outline	structure
comprehend	factor	plan	synthesize
compose	figure	possess	theorize
conceive	forget	predicate	translate
conceptualize	formulate	process	value
conclude	generalize	produce	validate
consider	idealize	project	verify
construct	imagine	quantify	visualize
contemplate	infer	rank	weigh
create	internalize	rate	trouble shoot

COMPUTATIONAL

abstract	factor
add	function
analyze	grade
ascend	increase
balance	lessen
bill	multiply
budget	number
calculate	program
compute	quantify
correct	scale
divide	sum
equate	total

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INTERACTIONAL

acquire	collaborate	disperse	lead
act(ivate)	commence	educate	manage
adapt	commit	employ	mediate
adjust	communicate	establish	meet
administer	compete	execute	moderate
advise	compliment	exercise	motivate
answer	comply	exhibit	negotiate
approach	conduct	explain	observe
arbitrate	convey	exit	participate
arrange	convince	experience	perform
arrest	cooperate	fatigue	persuade
assemble	correct	feel	place
assert	correspond	help	play
assign	counsel	imitate	practice
associate	criticize	improve	prepare
behave	debate	inform	prevent
brief	demand	initiate	program
buy	demonstrate	institute	promote
care	depress	interact	purchase
cause	designate	interfere	react
change	direct	interrogate	receive
choose	discipline	interview	reciprocate
classify	dismiss	join	reduce

32

register

represent

resolve

respond

search

sell

select

serve

service

stop

supervise

supply

teach

terminate

tolerate

train

transform

unite

use

COMMUNICATION

act	demonstrate	list	score
add	describe	name	sell
advise	dictate	numerate	send
announce	discontinue	outline	show
answer	discuss	picture	speak
articulate	display	predict	signal
ask	elaborate	present	specify
author	end	program	state
buy	enunciate	project	talk
call	estimate	propose	tell
change	exhibit	question	transmit
cite	explain	recite	transcribe
claim	express	record	transfer
command	feedback	refer	translate
commence	grade	regulate	vocalize
comment	illustrate	reiterate	voice
communicate	indicate	relay	write
connote	inform	repeat	
contact	inquire	report	
correct	initiate	reveal	
declare	instruct	review	
define	interrogate	revise	
delineate	label	say	

MANIPULATION (mechanical)

accelerate	connect	experiment	load
act(ivate)	construct	extend	lower
add	consume	extract	lubricate
adjust	continue	finish	make
allocate	contract	fit	manipulate
arrange	copy	fix	manufacture
arrest	correct	form	mechanize
ascend	decelerate	get	model
assemble	decrease	give	moderate
assign	deliver	go	modify
attack	depart	grasp	mold
automate	deplete	guide	move
begin	descend	handle	number
bend	direct	hit	obtain
break	displace	hold	operate
brake	drive	increase	order
carry	elevate	insert	outline
cause	enclose	install	package
change	end	issue	pair
collect	erase	label	pattern
combine	erect	lessen	place
commute	exhaust	lift	power
condense	expand	list	practice

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prepare	select
print	send
process	service
procure	set
produce	sort
pull	stop
raise	store
reduce	straighten
register	supply
regulate	terminate
remove	time
renew	trace
repair	transfer
repeat	transform
replace	turn
reproduce	type
restore	use
retrieve	weigh
reveal	
reverse	
scale	
score	

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Research (continued)

ABILITY GROUPING

An examination of the literature on ability
grouping, homogeneous grouping, "tracking,"
streaming" etc. was undertaken. All journal articles
and books dealing in any way with the above topics
from 1950 to the present time were collected and
examined. Those articles or books involving
experimental data based on a comparison of some sort
of ability group with a heterogeneous, random or
control group were taken to be especially important.
Articles of this sort totalled 18. The number of
articles, books, etc. labeled as discursive (con-
taining opinion or description of a certain system
in operation, not involving experimental data
collected and analyzed by the particular author)
was 41.

For each experimental study comparing homoge-
neous vs. heterogeneous grouping in some way the
following variables or factors were isolated: grade
level, sample size, sample range and level, type of
grouping (manipulated by experimenter or ex post
facto), criterion used for grouping students, cut-offs
and weighting for these criteria, diversity of homo-
geneous and heterogeneous groups, dependent measures,
and outcomes.

The discursive studies were quickly perused to
obtain new ideas for grouping systems and descriptions
of some already in existence but were not systematically
reviewed and are not reported on here. The 18 studies
are summarized in Table 1.

A REVIEW OF THE STUDIES GROUPED BY OUTCOME AND STUDENT

    I.   Studies Finding No Differences Between
        Homogeneous and Heterogeneous Grouping

      a. for all pupils

      Bicak's study used the 1960-61 8th grade
class at the University of Minnesota High School

Table 1

A SUMMARY OF THE GROUPING STUDIES

AUTHOR: Abramson, David A.   YEAR: 1959

GRADE LEVEL: High School

STUDENT INFORMATION:	New York City academic high school (high ability)
GENERAL GROUPING SPECIFICATIONS:	Homogeneous versus heterogeneous versus special school (on IQ)
SPECIFIC GROUPING SPECIFICATIONS:	Homogeneous: IQ $\geq$ 115 and special range $=$ 115-60 Heterogeneous: all IQ levels Study concentrated on high ability students
SUBJECT SPECIFICATIONS:	Student grouping ex post facto (done by schools)
ACHIEVEMENT FINDINGS:	1. grouping has no effect on GPA in 1st year college 2. grouping has no effect on grades in specific courses
OTHER FINDINGS:	1. women achieve more than men

AUTHOR: Baiow, Irving H.   YEAR: 1963

GRADE LEVEL: Elementary School

STUDENT INFORMATION:	6th grade in four California schools; in first five grades - heterogeneous grouping
GENERAL GROUPING SPECIFICATIONS:	Homogeneous versus heterogeneous versus clustering (high-average versus low-average) on achievement test, IQ, and teacher estimation

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Baiow, Irving H.   (continued)

SPECIFIC GROUPING SPECIFICATIONS:	Homogeneous on achievement test Cluster on IQ and estimate of emotional stability Heterogeneous - random IQ range: Low: 54-98; Mid: 99-110; High: 111-158
SUBJECT SPECIFICATIONS:	Student grouping ex post facto (done by schools)
ACHIEVEMENT FINDINGS:	1. Cluster group had highest growth in general ability - homogeneous next, then heterogeneous (trend) 2. Growth is inversely proportional to rank in the beginning
OTHER FINDINGS	-

AUTHOR: Bicak, Laddie J.   YEAR: 1964

GRADE LEVEL: Junior High School

STUDENT INFORMATION: University of Minnesota 8th grade (science course)

GENERAL GROUPING SPECIFICATIONS:	Homogeneous versus heterogeneous (on IQ)
SPECIFIC GROUPING SPECIFICATIONS:	Median IQ = 117 in homogeneous population Heterogeneous - random group High homogeneous $\geq$ 117 Low homogeneous $\leq$ 117
SUBJECT SPECIFICATIONS:	Grouping manipulated by experimentor two sections randomly chosen for homogeneous grouping
ACHIEVEMENT FINDINGS:	1. no achievement difference between homogeneous and heterogeneous
OTHER FINDINGS:	1. low homogeneous often discontented with placement 2. low heterogeneous often had to neglect other courses for this science course

AUTHOR: Borg, Walter R.   YEAR: 1965

GRADE LEVEL: Elementary, Junior High School, and
              High School

STUDENT INFORMATION: Two adjacent and comparable high
                      school districts (similar in IQ
                      and SES)

GENERAL
GROUPING   Heterogeneous(R) versus homogeneous(A)
SPECIFICATIONS: (on California Achievement Test)

SPECIFIC   Grouping depends on score on California
GROUPING   Achievement Test; lowest 20 = low,
SPECIFICATIONS: highest 30 = high, rest = middle

SUBJECT
SPECIFICATIONS: Grouping ex post facto

ACHIEVEMENT   1. no difference in ability gains in
FINDINGS: homogeneous or heterogeneous in
                          elementary school; tendency to
                          favor homogeneous for high ability
                          group and heterogeneous for low
                          ability group.
                      2. Some trend in junior high school and
                          high school

OTHER   1. Better study habits in heterogeneous
FINDINGS: (elementary)
                      2. No effect on social adjustment
                      3. More pupil problems in heterogeneous
                          group
                      4. Heterogeneous had more favorable
                          self-concept
                      5. Homogeneous had less sense of
                          belonging

AUTHOR: Borg, W. and Prpich, T.   YEAR: 1966

GRADE LEVEL: High School

STUDENT INFORMATION: 10th grade English classes

GENERAL   Homogeneous (low) versus heterogeneous
GROUPING   (on English achievement test and IQ and
SPECIFICATIONS: grade placement)

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Borg, W. and Prpich, T.   (continued)

SPECIFIC GROUPING SPECIFICATIONS:	70-90 IQ ≤ 8.2 gr. low homogeneous group and heterogeneous (from same population) - concentrated on low ability students
SUBJECT SPECIFICATIONS:	grouping manipulated (randomly to homogeneous or heterogeneous
ACHIEVEMENT FINDINGS:	1. no difference in English achievement 2. homogeneous did better on STEP in second year
OTHER FINDINGS:	1. homogeneous did better on teacher estimate 2. no difference in study method and attitudes 3. homogeneous participated more and better quality 4. homogeneous had more favorable attitude toward English 5. homogeneous had better self-concept

AUTHOR: Cawelti, Gordon   YEAR: 1963

GRADE LEVEL: High School

STUDENT INFORMATION:	42 North Central High School with three ability levels in 9th and 10th grade English and math
GENERAL GROUPING SPECIFICATIONS:	Homogeneous grouping - three levels (on IQ, achievement test, and teacher's marks)
SPECIFIC GROUPING SPECIFICATIONS:	-
SUBJECT SPECIFICATION:	Grouping ex post facto on three ability levels
ACHIEVEMENT FINDINGS:	-

Cawelti, Gordon (continued)

OTHER FINDINGS:	1.	mean class size greater for higher group
	2.	teachers did not feel bad social attitudes resulted
	3.	88% principals liked it and felt greater achievement
	4.	high group teachers better prepared

AUTHOR: Cochran, John R.   YEAR: 1961

GRADE LEVEL: Junior High School

STUDENT INFORMATION: flexible grouping in Kalamazoo
10% school chosen for experimental
group randomly

GENERAL
GROUPING
SPECIFICATIONS: Heterogeneous versus flexible grouping
(on IQ, achievement test, teacher
estimate)

SPECIFIC
GROUPING
SPECIFICATIONS: Students in two groups paired on sex,
age, 6th grade achievement and intelligence

SUBJECT
SPECIFICATIONS: Grouping manipulated 10% - homogeneous
rest - heterogeneous
matched groups

ACHIEVEMENT
FINDINGS: 1. no significant difference in achieve-
ment found

OTHER   1. 77% teachers were satisfied
FINDINGS: 2. 71% parents said students interest
was greater
3. 65% upward mobility

AUTHOR: Dyson, Ernest   YEAR: 1967

GRADE LEVEL: Junior High School

STUDENT INFORMATION: Two 7th grade populations equal in
age, achievement, IQ, SES, and
school - only difference is in
grouping method

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Dyson, Ernest (continued)

GENERAL GROUPING SPECIFICATIONS:	Homogeneous (244) versus heterogeneous (323) (on IQ, achievement, teacher estimate, and principal)
SPECIFIC GROUPING SPECIFICATIONS:	Students in different grouping methods comparable - number of groups unknown
SUBJECT SPECIFICATIONS:	Grouping ex post facto
ACHIEVEMENT FINDINGS:	-
OTHER FINDINGS:	self concept: 1. no sex difference 2. grouping did not affect self-concept or self-acceptance 3. academic self-concept predictive of school success 4. academic self-concept dependent on assigned group

AUTHOR: Goldberg, Miriam et al.   YEAR: 1961

GRADE LEVEL: Elementary School

STUDENT INFORMATION: 2,219 students from 45 elementary schools

GENERAL GROUPING SPECIFICATIONS:	Homogeneous (on IQ) versus heterogeneous
SPECIFIC GROUPING SPECIFICATIONS:	A = more than 130 B = 120-29 C = 110-19 D = 100-09 E = less than 99
SUBJECT SPECIFICATIONS:	Grouping manipulated - organized to represent all combinations of ability levels

Goldberg, Miriam, et al. (continued)

ACHIEVEMENT FINDINGS:	1. grouping had no effect on achievement 2. value of grouping depends on way it is used; effect is <u>neutral</u>
OTHER FINDINGS:	1. Interest increases with grouping 2. Self-attitude effected by grouping 3. Attitudes towards others and the school not effected 4. Teacher appraisal not effected by grouping

AUTHOR: Howell, Wallace J.   YEAR: 1962

GRADE LEVEL: High School (880 students)

STUDENT INFORMATION: Middle SES; residential suburban community (Penfield - Rochester, N.Y.)

GENERAL GROUPING SPECIFICATIONS:	Homogeneous (high) on IQ, achievement, teacher, counselor estimate, parental permission versus heterogeneous Homogeneous (honors) and heterogeneous (high) comparable in IQ, mean & range
SPECIFIC GROUPING SPECIFICATIONS:	Concentrated on <u>honors</u> (high ability) students
SUBJECT SPECIFICATIONS:	Median IQ = 114 for population 3/4 continued after high school grouping manipulated
ACHIEVEMENT FINDINGS:	1. high homogeneous had more achievement than in heterogeneous
OTHER FINDINGS:	1. grouping did not lead to bad social character 2. grouping did lead to a more realistic view of ability

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AUTHOR: Klausmeier, H.J. et al.   YEAR: 1960

GRADE LEVEL: High School

STUDENT INFORMATION: Three comprehensive high schools -
                        all used some ability grouping -
                        comparable GPA in three school
                        samples

GENERAL   Homogeneous grouping evaluated
GROUPING   M grouped on IQ and teacher estimate
SPECIFICATIONS: L grouped on achievement and teacher
                 estimate
                 S grouped on teacher estimate, reading
                 test, and IQ

SPECIFIC
GROUPING   population comparable in GPA across
SPECIFICATIONS: schools

SUBJECT
SPECIFICATIONS: Grouping ex post facto

ACHIEVEMENT
FINDINGS: -

OTHER   1. most students favored grouping
FINDINGS: (high - most; middle - least)
                 2. high group more often chose
                     friends within class; low group
                     chose friends within neighborhood
                 3. school or community size unrelated
                     to students attitude towards
                     grouping

AUTHOR: Lovell, John R.   YEAR: 1960

GRADE LEVEL: High School (Bay High School, Panama City,
               Florida)

STUDENT INFORMATION: sophomores ability grouped

GENERAL   Homogeneous versus heterogeneous
GROUPING   odd numbered students placed in
SPECIFICATIONS: experimental group to lessen individual
                 difference range - others placed to
                 increase individual difference (250
                 students in each)

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Lovell, John R. (continued)

SPECIFIC GROUPING SPECIFICATIONS:	Experimental group; top 30 - one class next 30 - next class - control group - balance of high, medium, and lows

SUBJECT SPECIFICATIONS:	Grouping manipulated

ACHIEVEMENT FINDINGS:	1. homogeneous made greater achievement in English (upper 1/3 most gains lowest - not significant) 2. no difference in biology and math (trends favored experimental)

OTHER FINDINGS:	1. no difference in self-acceptance and acceptance of others 2. significant difference more favorable student and teacher attitudes in experimental group towards subject and class

AUTHOR: Marklund, Sixten   YEAR: 1963

GRADE LEVEL: Elementary School

STUDENT INFORMATION:	6th grade (teacher and class factors controlled) by sub-population examination)

GENERAL GROUPING SPECIFICATIONS:	Homogeneous versus heterogeneous (on IQ)

SPECIFIC GROUPING SPECIFICATIONS:	Extraneous variables controlled Only homogeneity and class size were independent

SUBJECT SPECIFICATIONS:	Grouping ex post facto

ACHIEVEMENT FINDINGS:	Homogeneous grouping has no effect on high or low achievement classes

OTHER FINDINGS:	1. Crux is teacher's method and pupil's habits and extent to which homogeneous affects pupil's activity & reinforcement

AUTHOR: Millman, Jason   YEAR: 1964

GRADE LEVEL: Junior High School

STUDENT INFORMATION: New York State Education System
                        48 school systems - Iowa Test of
                        Basic Skills used

GENERAL GROUPING SPECIFICATIONS:	Homogeneous versus heterogeneous (on initial achievement level ITBL on English and math)

SPECIFIC GROUPING SPECIFICATIONS:		English			Math
	Gr.7	H	84.3	H	78.5
		M	75.5-84.2	M	74.8
		L	75.5	L	73.9
	Gr.8	H	91.8	H	85.8
		M	84-91	M	79.3-85
		L	83.9	L	79.3

SUBJECT SPECIFICATIONS:	Grouping manipulated by ITBL pre and post test scores - then it was examined which students were taught in same sections

ACHIEVEMENT FINDINGS:	1. no relation in either English or math between gains and section variability (ability grouping did not effect achievement)

OTHER FINDINGS:	-

AUTHOR: Pattinson, William   YEAR: 1963

GRADE LEVEL: High School

STUDENT INFORMATION: 120 students in technical high school
                        (England)
                        pupils very close in ability levels

GENERAL GROUPING SPECIFICATIONS:	Homogeneous versus heterogeneous (experimental = heterogeneous) (random)

SPECIFIC GROUPING SPECIFICATIONS:	Order of Merit Scores; range 87-596 less difference between marks - no grading of experimental group

Pattinson, William (continued)

SUBJECT SPECIFICATIONS:	Grouping manipulated (experimental or randomly grouped to achieve full spread of ability) - compared to itself when homogeneous grouping was used

ACHIEVEMENT FINDINGS:	-

OTHER FINDINGS:	1. greater student behavior and attitude in heterogeneous group
	2. less drop out rate
	3. class performance increased

AUTHOR: Peterson, Richard L.   YEAR: 1967

GRADE LEVEL: Junior High School

STUDENT INFORMATION: 317 7th & 8th grade students

GENERAL GROUPING SPECIFICATIONS:	Homogeneous versus heterogeneous (standard tests in language and math)

SPECIFIC GROUPING SPECIFICATIONS:	Homogeneous and heterogeneous matched for achievement

SUBJECT SPECIFICATIONS:	Grouping manipulated - comparable ability groups assigned to homogeneous or heterogeneous conditions

ACHIEVEMENT FINDINGS:	1. 8/27 post achievement tests favored heterogeneous

OTHER FINDINGS:	1. majorities of students and teachers favored ability grouping
	2. all teachers wanted high sections (only 50% wanted low sections)

AUTHOR: Pfeiffer, Isobel   YEAR: 1967

GRADE LEVEL: High School

STUDENT INFORMATION: Large suburban school

GENERAL GROUPING SPECIFICATIONS:	Homogeneous (high) on IQ, grade level, marks and achievement test versus homo (low)
SPECIFIC GROUPING SPECIFICATIONS:	Enriched = IQ $\geq$ 130 Average = rest Adjusted = below average English marks and two grade levels below on achievement test
SUBJECT SPECIFICATIONS:	Grouping ex post facto for three levels
ACHIEVEMENT FINDINGS:	1. no difference in achievement between high and low ability groups
OTHER FINDINGS:	1. no difference in teacher = student interaction between groups 2. 3/4 teachers of low groups expected little progress 3. teachers in high groups emphasized content more

AUTHOR: Zweibelscn, I. et al.   YEAR: 1966

GRADE LEVEL: Junior High School

STUDENT INFORMATION: New Rochelle school - 20% Negro sample; mean IQ = 112; same number each sex

GENERAL GROUPING SPECIFICATIONS:	Homogeneous versus heterogeneous (team taught) (on group IQ reading and math test and teacher estimate)
SPECIFIC GROUPING SPECIFICATIONS:	Four homogeneous groups (cut-offs unknown) - equivalent sample team-taught
SUBJECT SPECIFICATIONS:	Grouping manipulated (1/4 highs in each of four quarters) control group matched to experimental group

Zweibelson, I. (continued)

ACHIEVEMENT FINDINGS:	1.	team-taught heterogeneous group achieved <u>as well</u> as homogeneous

OTHER FINDINGS:	1.	heterogeneous group had better attitude towards other students with different SES
	2.	teachers favored team-teaching
	3.	team-taught lower 1/4 students participated more in discussion than equivalent homogeneous group

to examine the effects of homogeneous and
heterogeneous grouping on the achievement and
attitudes of students. Each student was randomly
assigned to one of three heterogeneous sections
maintained during the fall quarter. After that
two sections were transformed into homogeneous
ones on the basis of IQ and the other was left
intact as a control group. No difference in
mean achievement gains in meterological knowledge
was found between the homogeneous and heterogeneous
conditions. It was found on a course attitude
questionnaire that the low homogeneous group
was significantly more discontented with their
placement than were other homogeneous groups or
heterogeneous groups. Also the low heterogeneous
group stated that they often were forced to neglect
their other courses for this one in science.

Borg examined differences between homogeneous
and heterogeneous grouping on achievement, study
habits and methods, social adjustment and pupil
peer status and the self-concept and other
personality areas. He used two comparable school
districts in Utah, one of which employed random
grouping (District R), and the other - ability
grouping. (District A). Data was collected over
a four year period in order to appraise the long
term effects of the grouping treatments. Ability
grouping in District A was done on the basis of a
composite achievement test score (CAT), and three
levels were set up (superior, average, and slow).
There was found to be no significance between
homogeneous and heterogeneous groups (11 levels)
on achievement, as measured by the sequential tests
of Educational Progress (STEP). There was, however,
a tendency for homogeneous grouping to result in
greater achievement gains for superior students
and random or heterogeneous grouping to result n
greater achievement for slow pupils. The ability
differences for average pupils did not favor either
grouping treatment. On non-achievement measures
the heterogeneous group (on the elementary school
level) was found to have better study habits. No
differences were found between groups in social
adjustment. More pupil problems were found to
result in the heterogeneous groups. The heteroge-
neous grouping treatment seemed to result in a
more favorable self-concept being held by the
students. The homogeneous groups expressed less of
a general sense of belonging than did heterogeneous
groups.

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Cochran examined the program of "flexible grouping" used in junior high schools in Kalamazoo, Michigan. The criterion used for grouping were intelligence test scores, achievement test scores and teacher's estimates of interest, motivation and need. 10% of the student population was randomly assigned to the homogeneous condition (experimental group). Matched students were selected to serve as a control group. Through questionnaires submitted to teachers, it was found that 77% of the teachers were satisfied with the flexible grouping system. There was general agreement that grouping did little to improve the behavior of students or to improve their attitudes towards each other. Changes in teaching method were found in teachers of either high or low groups, but not in the average ones. 1% of the parents reported an increase of interest in school among students grouped homogeneously. There was found to be 65% upward mobility among students in moving from one homogeneous group to another. No differences in achievement as measured by achievement tests at the end of the 8th grade were found between students grouped homogeneously and those grouped hetereogeneously.

Dyson chose two seventh grade populations, comparable with respect to age, intelligence, academic achievement, school grades, school environment and the socioeconomic level of the community. Using the Index of Adjustment and Values (IAV) and the Word Rating List (WRL) Dyson examined possible differences in self-acceptance and academic self-concept between students grouped homogeneously and those grouped hetereogeneously. The homogeneous grouping was accomplished using the following criterion: IQ, achievement, and teacher and principal's evaluation. It was found that grouping did not affect the academic self-concept or self-acceptance. The academic self-concept was shown to be realistically predictive of school success, and also often depended on which group level the student was assigned to.

Goldberg examined the effects of the level and range of grouping on elementary school students. She used as her sample 2,219 students from 45

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elementary schools. The homogeneous grouping
was done soley on the basis of IQ, and five
groups were assigned, each having a range of
10 IQ points. These five groups were then
organized in all ways possible (15 combinations)
to represent all combinations of ability levels.
Grouping was found to have no effect on achieve-
ment. Student interest increased with homoge-
neous grouping. Grouping did not affect students'
attitudes towards other and the school. Teachers'
appraisals of students were also not affected
by grouping.

Sixten Marklund studied achievement gains as
related to the size and homogeneity of class in
grade 6. Homogeneity was defined by IQ variability
on conventional tests. An extremely large sample
of more than 4,000 students was used and in order
to control for extraneous variables, controlled
sub-populations measures were statistically
obtained and used. It was found that homogeneous
grouping had no effect on achievement in either
high or low achieving classes. Marklund inferred
that the most important determinant of achieve-
ment is the extent to which size and homogeneity
of class affects pupil activity and reinforcement
(which in turn, according to him, affect the
learning process). This means that the teacher's
instruction method and the pupil's method of study
determine the amount of achievement gains in a
given class of students.

Millman and Johnson examined the relationship
between achievement gains and section variability
(amount of homogeneity in the classroom) on the
junior high school level using 48 representative
New York State school systems. Grouping was done
by the experimenters on the basis of initial
achievement level in English and mathematics.
The standard deviation on the initial achievement
measures served as the measure of class variability
and the mean score on the same measure served as
the measure of level. No increase in achievement
resulted from a decrease in variability (homoge-
neous grouping) in general. Specifically, a
narrow range (homogeneous grouping) may have been
of some value to high level sections in mathematics.
However, no clear-cut relation between homogeneity
and achievement gains was found.

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Isobel Pfeiffer examined verbal interaction
and cognitive goals of teachers in 11th grade,
ability grouped English classes in a large
suburban high school. The Flanders Interaction
Analysis was completed for two ability level
classes for each of five teachers to measure
and evaluate teacher-pupil verbal interaction.
Bloom's Taxonomy of Educational Objectives:
Cognitive Domain was used to analyze cognitive
goals of test items from two tests from each
class. Categories of analysis were: knowledge,
comprehension, application, analysis, synthesis,
and evaluation. Three ability levels, formed
on the criterion of IQ, grade level and achieve-
ment, were used in the system studied. The
findings showed no difference in achievement
between high and low ability groups. Also no
difference in teacher-student interaction was
observed at different ability levels. Three-
fourths of the teachers of the low group said
that they expected little progress from their
students. The teachers of the high ability
groups were found to emphasize content more.
Pfeiffer suggested that the lack of differential
achievement between different ability levels
may be the result of the lack of differentiated
teacher behavior between groups.

Zweibelson, et al. examined the difference
between heterogeneous grouping, homogeneous
grouping, and team-teaching as manifested in
student achievement gains and student and teacher
attitudes. He used as his sample a New Rochelle
New York junior high school with 1,800 students.
Classes were ability grouped using IQ, reading
and math test scores, and teacher estimate as
criterion, and arranged so that approximately
one-fourth of the high-ability students were
in the upper quarter, one-fourth in the lower
quarter, etc. 100 students at each grade level
with one class from each of the four quarters
were selected at random to be the experimental
(team-taught) students. A matched group of the
same size and composition was used as a control
measure. It was found that the team-taught
heterogeneous group achieved just as well as the
homogeneous group (which had not been team-taught)
on social studies achievement tests. Students in
the heterogeneous sections were found to have

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better (more tolerant) attitudes toward other
students from different socioeconomic backgrounds.
The teachers favored team-teaching. The team-
taught low-group students (lower one-fourth in
ability) were found to have participated more in
the class discussion than when grouped homoge-
neously and taught by traditional methods.

b. for high ability pupils

Abramson studied the effectiveness of ability
grouping for high ability students on the high
school level. Effectiveness was taken to be
measured by the subsequent progress in college
of these students. Four types of grouping done
by 154 New York City academic high schools were
studied: heterogeneous (controls) grouping,
homogeneous in one or two major subjects, homoge-
neous in most major subjects, and homogeneous
throughout the school (only high ability students
were admitted to the school). The populations
of the different schools as far as the high
ability students went was examined and found to
be comparable on IQ, sex, and number of students
in each level of intelligence. The major finding
was that the type of grouping used or extent of
it had no effect on the grade point average (GPA)
in the first two years of college. Also grouping
had no effect on achievement in specific college
courses. Finally, women were shown to obtain
higher GPA's on the average than the men in the
sample.

II. Homogeneous groups better than heterogeneous

a. for all pupils

Baiow examined the effects of homogeneous,
heterogeneous and cluster (high + average and
low + average) grouping on the achievement at
the elementary school level. The sixth grades
of four southern California elementary schools
were used as the sample. Homogeneous grouping
was done using as a criteria the results of
an achievement testing program, and four groups
were formed. Clustering was done on the basis
of IQ and teacher estimate of emotional stability.
The Metropolitan Achievement Test was used to
measure achievement gains at the end of one

school year. The trend of the results was that
the cluster groups had the highest growth in
general ability, the homogeneous groups achieved
on the second highest level and the heterogeneous
had the lowest achievement score. Also it was
found that the achievement gain of a student or
a group of students was inversely proportional
to the initial rank.

Cawelti studied ability grouping programs
in 42 North Central Association high schools in
Iowa, Illinois, Minnesota, and Wisconsin. A
preliminary survey showed that all of these
schools grouped on at least three different
ability levels in ninth and tenth grade English
and mathematics. Results or descriptive knowledge
of grouping practices were obtained through
interviews with principals and counselors and
teacher questionnaires. Homogeneity was achieved
through the criterion of IQ, achievement test
scores, and past grades. The results were that
mean class size was found to be significantly
larger for the higher ability groups. The teachers
did not feel that bad social attitudes (i.e.,
conceit, snobbery and/or prejudice) were a result
of grouping practices. 88% of the principals
felt that grouping was good and resulted in
higher achievement by the students involved. The
teachers of the high ability groups felt that they
were better prepared in their classes than did
those who taught lower-level groups.

Klausmeier asked high school students and
teachers in three schools to evaluate the
sectioning practices used in their school. The
schools were comparable on type of sectioning
and the GPA of the students in each of the popula-
tions. The results of questionnaires and inter-
views were that most students favored grouping
by ability, with the high level students favoring
it most and the middle level students least. The
high level students also were proven to choose
their friends most often on the basis of those
in the same class section as themselves, whereas
lower level students were found to choose their
friends on the basis of geographical closeness
(i.e., same neighborhood). The last finding was
that the size of the school or community was
unrelated to the attitude of the student towards

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the practice of grouping.

Lovell evaluated the experimental method of grouping used at Bay High School in Panama City, Florida. The sophomore class was grouped by ability and then odd-numbered students were put into the experimental group (homogeneously grouped to reduce variation in all English, biology and algebra classes) and even-numbered students served as the controls (heterogeneous group). Standardized achievements tests, a sociometric instrument, the Index of Adjustment and Values and a student attitude questionnaire were employed to discover the effects of the grouping on the students. The homogeneously-grouped students were found to have made significantly greater gains in English, with the upper one-third of this group (high-homogeneous) making the greatest gains and the low-homogeneous group taken alone making insignificant achievement gains. No differences in achievement gains were found in either biology or mathematics, but the trends were in favor of the experimental (homogeneous) group. No difference was found between the two groups in measures of self-acceptance or acceptance of others. Student and teacher attitudes towards the class and subject matter were found to be more favorable among those involved in the experimental homogeneous grouping.

b. for high group

Howell studied the effects of grouping on high ability students in Penfield High School. Penfield is a middle-class, completely residential suburb of Rochester. The high school population has a median IQ of 114; 75% of the students continue their education after high school, with 60% entering four year colleges and universities. In this study an experimental 9th grade honors section (high-homogeneous) was chosen using the criterion of IQ, achievement tests, past grades, counselor and psychologist's judgment, teacher judgment and parental permission. Using final grades as a measure it was concluded that the high-hcmogeneous group achieved higher than those high ability students grouped heterogeneously. Grouping

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did not seem to have led to the development of any undesirable social characteristics. Also grouping was seen to result in the development of a more realistic view of individual ability of the part of these high-level students.

c. for low group

Borg and Prpich compared the performance of slow learning high school pupils in ability grouped and heterogeneously-grouped English classes. The low homogeneous group (and a comparative random or control group) was made up of those students with an IQ between 70 and 90 and grade placement of 8.2 or lower on English achievement measures. Results were found using the Pintner General Ability Test and the Metropolitan, an English achievement test, both of which were routinely administered near the end of 9th grade to both groups of students. Teacher and pupil attitudes were also examined using standardized surveys, tests, indices and questionnaires. No difference between the two groups was found on measures of English achievement, though the homogeneously-grouped students were found to have higher achievement on the STEP test in the second year. Teachers gave higher estimates of ability to the homogeneous group. No difference was found in study methods or attitudes. The homogeneously-grouped students participated more frequently and on a higher level in class. The homogeneous group had a more favorable attitude towards English, and also more favorable self-concepts.

III. Heterogeneous groups were better than homogeneous

a. for all pupils

Pattinson compared a randomly-grouped school to a streamed school, both of which he had worked in. His experimental group was composed of 120 students in a technical high school in England. These pupils were known to be very close to each other in ability (as measured by their previous scores on the Order of Merit exam). No subject or form lists, or promotions or deductions were done in this school system. He concluded

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that better student behavior and attitudes were found in a heterogeneously-grouped situation. There was a lower student drop-out rate from this school. Class performance, as a whole, also was found to increase in the random group situation.

Peterson studied the effects of ability grouping on grades 7 and 8 in Chisolm Junior High School, Chisolm, Minnesota. Achievement, student attitudes and teacher attitudes were examined. Homogeneous grouping was accomplished using standardized exam scores in language and mathematics as criterion. In 8 out of 27 post-achievement tests the heterogeneous group was found to do better. The majority of students and teachers favored ability grouping. All of the teachers wanted to teach only high level section, whereas only 50% of the teachers wanted to teach any low ability sections.

IV. Conclusions

A total evaluation of the literature reviewed here has not been made as yet. However, an initial evaluation leads to the conclusion that homogeneous ability grouping provides little if any advantage in school performance. Conclusions are difficult to draw from this data since the studies were done with different age groups, using different grouping criteria, and different outcome measures. A more complete set of conclusions and inferences will be forthcoming in a later report.

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II. PROBLEMS

    None to date

III. SIGNIFICANT FINDINGS AND EVENTS

    The following chart of data concerning the state-
supported curriculum laboratories with which SCOPE will
be working was compiled from a questionnaire sent to the
director of each laboratory. To our knowledge, it is the
first completion of such data.

IV. DISSEMINATION ACTIVITIES

    Numerous avenues have been utilized for publicizing
the efforts of the SCOPE Project. Descriptive articles
have been published in the Newsletter of the Vocational-
Technical Education Department at Rutgers University, and
in the Fall '68 Research Bulletin of the New Jersey School
Development Council. Mr. Casello has authored a general
narrative of project activities for the Winter edition
of Feedback, the publication of the Occupational Research
and Development Branch of the New Jersey State Department
of Education.

    The SCOPE brochure has been disseminated to
approximately 750 educators across the nation, including
state directors of vocational education, curriculum lab
directors, teacher educators, state and national officials,
and professors at various colleges and universities. Many
more were distributed at the AVA Convention to people who
stopped by the SCOPE suite, and on our travels throughout
the nation.

    Meetings with various groups have and will continue
to give the SCOPE staff an opportunity to publicize our
efforts. Dr. Byrl Shoemaker, Commissioner of Vocational
Education in the State of Ohio, generously consented to
present the SCOPE Project to other state directors of
vocational education at their annual meeting at the AVA
Convention. Mr. Casello had an opportunity to go before
the AVA Agricultural Division Professional Information
Committee to present SCOPE to the nation's agricultural
educators. Dr. Tuckman has spoken to the faculty of the
Vocational-Technical Department at Rutgers and to a group
of Rutgers alumni concerning our efforts, while Mr. Casello
has carried the program to high school vocational educators
in New Jersey. Meetings with university professors and
high school representatives such as those mentioned above

	ANNUAL BUDGET	NO. OF EMPLOYEES	SIZE OF FACILITIES (SQ. FEET)	VALUE OF EQUIPMENT
Texas - D.E.	38,000	5	1,134	-
Texas - Ind. & B.E.	240,000	37	4,560	40,000
Texas - Agr.	160,000	24	11,800	24,000
Tennessee	125,000	12	4,500+	125,000
S. Carolina	101,000	11	3,500	62,000
Oregon	24,000	NO LAB	NO LAB	
Ohio - T.&I.	15,000	6	2,800	25,000
Ohio - D.E.	10,000	3	900	20,000
Ohio - Agr.	30,000	6	700	800
N. Carolina	219,000	19	4,000	50,000
New Jersey	40,000	6	1,300	20,000
Missouri	20,000	12	2,600	7,000
Louisiana	100,000	10	8,500	75,000
Kentucky	14,000	11	-	-
Illinois	175,000	31	28,000	-
Georgia	13,500	2	-	-
Alabama	18,000+	4	3,220	40,000

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	Agr.	T. & I.	Bus. & Off.	D.E.	Home Ec.	Health	Technical	Vocational Guid.
Texas - D.E.				X				
Texas - Ind. & B.E.		X						
Texas - Agr.	X							
Tennessee	X	X	X	X	X	X	X	
S. Carolina	X	X	X	X	X	X		X
Oregon	X	X	X	X	X	X		
Ohio - T.&I.		X						
Ohio - D.E.				X				
Ohio - Agr.	X							
N. Carolina	X	X	X	X	X	X	X	
New Jersey	X	X	X	X	X	X	X	X
Missouri	X	X	X	X	X	X	X	
Louisiana	X	X	X	X	X	X	X	X
Kentucky	X	X	X	X	X	X		
Illinois	X							
Georgia		X						
Alabama		X		X		X	X	

AREAS OF SPECIALIZATION

	PUBLICATIONS ON FILE	PUBLICATIONS PER YEAR	ANNUAL GROSS RECEIPTS	PUBLICATIONS AVAILABLE TO OTHER STATES
Texas - D.E.	120	13	–	Yes
Texas - Ind. & B.E.	116	–	–	Yes
Texas - Agr.	50	20	15,000	Yes
Tennessee	None	104	None	Yes
S. Carolina	50	50	8,000	Special Printing
Oregon	–	–	–	–
Ohio - T.&I.	250	5	175,000	Yes
Ohio - D.E.	30	6-8	6,000	Yes
Ohio - Agr.	60	5	25,000	Yes
N. Carolina	1,800	50	None	Single copies
New Jersey	175	15-20	17,000	Yes
Missouri	24,000	25,000	21,000	Yes
Louisiana	50	15	4,000	Yes
Kentucky	–	–	–	No
Illinois	350	25	70,000	Yes
Georgia	52	23	Free	Single copies
Alabama	18,638	19,500	–	Yes

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Curriculum R&D Program Underway; Focus on Revolutionary Aims and Objectives

A new research activity has been initiated in the Department of Vocational-Technical Education under the directorship of Dr. Bruce W. Tuckman, Associate Professor of Education, in the Departments of Vocational-Technical Education and Educational Psychology. Funded for two years by a United States Office of Education (USOE) grant in the amount of $136,000—a Study of Curriculums for Occupational Preparation and Education (SCOPE Program) is underway with the primary objective of coordinating and contributing to a national curriculum development effort at the secondary school level. The effort is aimed at increasing the relevance of high school education for the large majority of youth who must seek employment or further job training upon graduation.

Divided into two phases, Phase One has four objectives: (1) to establish communications between state-supported vocational curriculum development centers; (2) to increase the familiarity of the directors of vocational curriculum development centers with recent advances in behavioral approaches to curriculum development, devices, and evaluation; (3) to refine and test a scheme for classifying educational objectives in terms of performance requirements of each objective rather than the subject matter; and, (4) to develop a detailed plan of activity for Phase II of the SCOPE Program, including the identification of staff and facility needs.

Two spring 1969 conferences will be held at Rutgers University to bring together the center directors in the Nation for the purpose of establishing communications and cooperation among them and for the purpose of disseminating information concerning present modernizing trends in the production of curriculum materials.

The aims of SCOPE support those of the Federally-supported Educational Systems Program of the 1970's, which attempts to impact on the high school of the future by providing more closely for individual students, especially those relevant to future employment opportunities.

SCOPE will confront problem areas such as ability grouping and tracking, the status of vocational education offerings, and curriculum evaluation and will focus on the advancement of more rigorous, respectable, and relevant programs of studies for high school students.

SCOPE will anchor educational activities to the specific behavioral goals to provide the basis of a highly individualized and reality oriented curriculum.

The SCOPE Center is housed in the Douglass-Wood Lawn Gatehouse on the Douglass Campus of Rutgers University. Joseph H. Casello is the assistant to the director.

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The SCOPE Program

BRUCE W. TUCKMAN[1]

SCOPE is an acronym for the Study of Curriculums for Occupational Preparation and Education. Its major objective is to coordinate and contribute to a national curriculum development effort at the secondary school level aimed at increasing the relevance of high school education for the large majority of our youth who must seek employment (or further job training) upon graduation. To serve the needs of these youth, the curriculum of the secondary school will require the inclusion of experiences relevant to future employment needs.

The SCOPE Program has aims which interface with those of a new Federally supported effort known as the Educational Systems of the 70's. (See the article by John Rosser "Willingboro ES '70 Projects" in the Summer 1968 Issue of the Research Bulletin). The ES'70 program is an attempt to make an impact on the high school of the future by more closely providing for individual student needs. Seventeen participating school districts are attempting to develop and implement various aspects of the program such as the integrated curriculum, individualized instruction, etc. The notion of the truly integrated curriculum, i.e., one in which concepts common to different subject matters become the core of a curriculum rather than organizing the curriculum completely around the subject matters themselves, is at the heart of ES '70. It is here that the activities of SCOPE as well as other University projects will contribute to the overall programmatic approach.

Funding has been obtained from the U.S. Office of Education for the first phase of the SCOPE Program, named Project CONECT, another acronym standing for the Coordination of Occupational and Non-occupational Curriculums and Technologies. The objectives of this first phase of the SCOPE Program are as follows:

(1) To establish a functional communication link between the state supported vocational curriculum development centers.

(2) To increase the familiarity of the directors of the above centers with recent advances in behavioral approaches to curriculum development, devices, and evaluation.

(3) To refine and test a scheme for reorganizing educational objectives in terms of the behavioral process used to accomplish each objective and the object of the process in each instance (the process-object model).

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1 Dr. Tuckman is Associate Professor of Education at Rutgers, holding joint appointments in Educational Psychology and Vocational-Technical Education.

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(4) To develop a detailed plan of activity for Phase *II* of the SCOPE Program including the identification of staff and facility needs.

There are approximately 15 State-supported vocational curriculum development centers throughout the country that have been involved for some time in the development of curriculum materials. These centers could become a significant resource in future attempts to provide greater occupational relevance to secondary education if they were to function in a more coordinated manner, and if they were to become sufficiently cognizant of, and enthusiastic about, present modernizing trends in the production of curricular materials. The first two objectives represent an attempt to accomplish both coordination and stimulation among these centers.

Present plans in the ES '70 program call for an attempt to reorganize the high school curriculum in a direction away from separation of subject matter based on learning objectives. To this end, many subject matter experts may be called upon to identify the educational objectives included in their area of the high school curriculum. Thus, given the "pieces," it will be necessary to put them together in some meaningful way. The process-object model for the integration of objectives is an attempt to structure learning experiences in a manner more consistent with their application to the tasks of life than the present subject matter breakdown. During the first phase of SCOPE, this scheme will be refined, written about, and tested.

If national curriculum reform at the secondary school level is to become a reality, and if this reform is to move the curriculum toward greater relevance for more students, then some central coordination of activities will be required. Planning for the SCOPE Center to participa in the development and coordinating of such national efforts will be undertaken as the final task of the first phase.

The notions of systematic specification of educational goals in behavioral terms, hierarchial analysis of knowledge and competence, contingency management and the like are approaches that behaviorally-oriented psychologists and educators are attempting to introduce into the mainstream of curriculum development. Anchoring educational activities to the specific behavioral goals which they are intended to produce provides the basis for a highly individualized and reality-oriented curriculum. Moreover, it does not, as some have claimed, reduce the ranges of individual differences. By providing slow learners with a more adequate grasp of basic concepts, the behaviorally-structured curriculum increases their potential for unique individual development. Moreover, rapid learners can proceed at their own pace and can go "beyond" the curriculum.

Individualized instruction, the integrated curriculum, the career-oriented curriculum (one which painlessly and respectably exposes more students to skill training and development) may seem like pipe dreams today. The SCOPE Program is an effort to bring them closer to the reality of tomorrow.

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Hidden among the stately oak, elm, and maple trees
in a corner of the Neilson Campus of Douglass College is
a weatherbeaten white gatehouse. Known to the small
handful of local residents who are aware of its existence
as the "Woodlawn Gatehouse," it has the tired look of a
structure whose useful and productive period has long
since passed. The outside belies the interior, however,
for inside a small revolution in the field of education
is brewing. This is the home of the SCOPE Project.

SCOPE is an acronym for the Study of Curriculums for
Occupational Preparation and Education. Under the able
leadership of Dr. Bruce Tuckman, Associate Professor of
Education at Rutgers, the project seeks to coordinate and
contribute to a new and exciting national curriculum
development effort at the secondary school level. Top
priority at the SCOPE Center will be given to the urgent
need to include experiences relevant to future employ-
ment needs of the large majority of our youth who must
seek employment or further training upon graduation or
withdrawal from high school. SCOPE's contribution toward
making high school a more meaningful experience will
include:

1. establishing a functional communication network
    among the various state-supported vocational
    curriculum development centers;

2. increasing the familiarity of the directors of
    the above centers with recent advances in
    behavioral approaches to curriculum develop-
    ment, devices, and evaluation, and;

3. refining and testing a scheme for reorganizing
    educational objectives in terms of the
    behavioral process used to accomplish each
    objective and the object of the process in
    each instance (the process-object model).

There are approximately fifteen state-supported
vocational curriculum centers throughout the country that
have been involved in the development of curriculum
materials. The Federal Government has authorized funds
for the SCOPE endeavor because it believes that these
laboratories could become an even more significant resource
in future attempts to provide greater occupational relevance

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to secondary education if they were to function in a more
coordinated manner, and if they were to become sufficiently
cognizant of and enthusiastic about present modernizing
trends in the production of curricular materials. The
first two objectives stated above represent an attempt
to accomplish both coordination and stimulation among
these centers.

Projected plans call for visitations to as many of
the curriculum centers as time and funds will allow to
enable SCOPE personnel to meet the directors, obtain a
"feeling" for their facilities and operations, and to
understand their problems and their ideas concerning a
cooperative effort on their part toward a more relevant
high school curriculum. These visitations will be
followed by two conferences at Rutgers University in
March and May of 1969. At this time the lab directors
will have an opportunity to become personally acquainted,
discuss the possibility of a communication network among
the labs, and converse with other specialists about the
latest advances in curricular theory and educational
technology.

Proceeding simultaneously with the above mentioned
efforts, the SCOPE staff will be examining, testing, re-
fining, and promulgating what is known as the process-
object model for an integrated curriculum. Briefly
stated, this is a process by which ultimate curriculum
objectives, stated in behavioral terms, are sequentially
analyzed to identify and specify each of the comptencies
which the student must acquire if the terminal objectives
are to be achieved. Synonomous with "structural analysis,"
this approach leads to the identification of not only the
competencies themselves, but the arrangement or sequence
in which the competencies must be arranged to make progres-
sion possible. Once such a hierarchy of competencies has
been developed for an instructional unit, the curriculum
director can then use it as a map to guide him in the
preparation of materials. If the hierarchy truly recreates
the internal logic of the subject matter, instructional
materials based on it can be expected to maximize learning.

SCOPE personnel hold great hopes for the process-
object approach to curriculum planning. We believe that
such a system will benefit not only vocational education
in states such as New Jersey, but all of the disciplines
in every state across the nation. By striving for
behavioral objectives such as perception, conceptualization,

application, evaluation and manipulation, rather than
subject matter per se, the high school curriculum can
transcend individual disciplines and lead to a truly
integrated curriculum, one in which English, math, the
social sciences, science, etc., can be taught in the shop
rather than in separate classrooms. By utilizing this
approach, perhaps we can begin to realize a truly
"comprehensive" high school.

From Occupational Research and Development Branch of
the New Jersey State Department of Education, Feedback,
Winter edition, 1968.

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are always looked upon as being valuable opportunities for publicizing SCOPE.

V. CAPITAL EQUIPMENT ACQUISITIONS

None

VI. FORMS

None

VII. OTHER ACTIVITIES

In an effort to increase our understanding of what constitutes a meaningful secondary school curriculum, we turned to materials published by the Ford Foundation. What follows below are abstracts written by Mr. Casello for two monographs produced by Mr. Marvin Feldman, Project Director at the Ford Foundation: Making Education Relevant, and Public Education and Manpower Development.

MAKING EDUCATION RELEVANT

In a blunt and uncompromising manner, Mr. Feldman lays a major share of the blame for the numerous social and economic ills facing this country today squarely at the feet of American educators, who, he claims, have failed to prepare people for the world of work. His thesis is that the great tragedy in American education today is the failure of educators from all disciplines to utilize the "hands-on" and learning by doing approaches to learning, resulting in the production of students who possess much irrelevant theory and few practical skills.

The appeal of this paper lies in its presentation of guidelines for a new direction in educational thinking. Mr. Feldman's message is a clarion call, hopefully sounding a renaissance in educational practices. The genesis of the change must originate in the mind, specifically with the acceptance of the notion that the difference between the graduate and the drop-out may not be a native ability to learn, but merely the ability to verbalize. Educators must reject the idea that non-academic students are generally of inferior academic quality, and substitute in its place as an educational objective

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that all students are to be considered potential candidates for post-secondary education and training. The alarming and almost fatal dichotomy that now exists between vocational education and the general or college preparatory curriculums must be ended, primarily by incorporating the world of work into the entire educational process. A much more meaningful educational structure would enable non-academic students to receive the training necessary for college entrance, while at the same time providing college-bound people with the opportunity to receive a vocational experience which would relate their learning to reality.

A more meaningful synthesis between the class-room and the world of reality outside its four walls entails a major upheaval in the educational structure. Out-moded training facilities must be brought in line with on-the-job working conditions. Training content itself needs review and revision so as to meet the needs of the job market. Vocational guidance must be provided for students, both quantitatively and qualitatively. At the base of the new edifice, however, is a curriculum which has been coordinated from the elementary through the secondary grades, one in which vocational and academic education embrace and reinforce each other, where a youngster is assisted in discovering, defining, refining, and using his talents in working toward a chosen career. To accomplish this, Mr. Feldman suggests an individualized program in which each student would be introduced early to the concept of choice between achievement through verbal or abstract performance, and achievement through manipulation and demonstration with objects. Commensurate with this approach would be an emphasis on familiarizing the student with the world of work and helping him to appreciate man's various talents and their relationship to the world of work.

The continuum at the junior and senior high levels would reinforce earlier training, as voca-tional and academic teachers combined in a team-teaching approach to the coordinated curriculum. Every male would take a general industrial arts course in which they would be introduced to the basic manipulative skills. Vocational guidance would complement what counseling proceeded and would acquaint students with the workings of

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industry, match individual talents to career
objectives as determined by a battery of continuous
testing, and complete an annual career-objectives
analysis which would enable the student to
comprehend the relevance of his school program.

For the growing numbers of students who would
be seeking post-secondary education because of this
more meaningful curriculum, community and four-
year colleges would include technical education in
their programs which would concentrate on the
teaching of specific skills. To do so would
necessitate close articulation between college and
high school, but this is critical if today's
education is to be the rigorous, respectful, and
relevant experience that Mr. Feldman suggests it
can.

PUBLIC EDUCATION AND MANPOWER DEVELOPMENT

The major thesis of this paper, an adaptation
from a talk given by Mr. Feldman at Columbia
University in June of 1967, is that the public
schools must be assigned and willingly accept the
responsibility for career preparation. This is a
vital undertaking, for it will enable members of
minority groups to take advantage of economic
opportunity at the time it is received, and will
help to avoid duplication of efforts among programs
to aid the disadvantaged that exist both within
and without the sphere of the formal educational
system.

Career preparation on the part of our school
system will not be an easy task, largely because
of the secondary role that vocational education
plays in the overall educational structure, and
because general educators neither understand the
process of vocational education nor recognize their
total responsibility in helping individuals progress
toward vocational competence. This is indeed tragic,
for many who could be saved by vocational education
are either lost because of the irrelevancy of their
early schooling, or an inadequately prepared to
receive further training.

Mr. Feldman is quick to hold out hope for

constructive change, as he views the problem to be
mainly one of understanding the purpose of voca-
tional education rather than resistance to change
itself. He suggests that educators begin by
accepting the notion that all children have a native
ability to learn and by recognizing that there are
alternative routes to achievement other than verbal
and abstract, such as doing, making, creating, and
performing. This will necessitate, of course, a
diagnosis of individual learning styles and an
implementation of individualized learning programs,
but both are long overdue innovations in the
public schools.

As a second measure, all learning should be
made relevant to the outside world. This can be
accomplished through what the author defines as
an "occupational-conscious curriculum," one in
which there is an explicit bond between school
activities and preparation for an eventual career.
Education, claims Mr. Feldman, can no longer ignore
the world of work, or provide occupational
preparation for only those who cannot achieve
success in the college-preparatory or general
curriculums.

Mr. Feldman concludes by clearly mandating
priorities for action. The first is to clarify
the role of all the components of education, whether
they be within the school or in the world outside.
The roles of city, state, and national governments,
economic opportunity programs, Labor Department
manpower programs, and the formal educational system
must be clearly delineated. It is Mr. Feldman's
belief that all pre-employment and pre-college
programs should be the responsibilities of public
education, leaving cooperative education programs
to provide a vehicle for advancement after employ-
ment, and the Department of Labor to oversee
registered programs for trade union opportunities.

In conjunction with role defining would be the
development of so-called supplementary centers.
Such centers would provide an environment in which
students and teachers from feeder schools would
come together to enrich their own educational
development and to work toward the improvement of
school curriculum content. In addition, such
centers could contribute greatly to the eradication

of the barriers that presently exist between blacks and whites.

Finally, Mr. Feldman proposes the inclusion of a continual analysis of each student's skills, interests, and learning style. Guidance personnel would become as proficient in their knowledge of job needs and occupational skills as they are in colleges and entrance procedures. The individual would be aware at all times of his skills, aptitudes, and interests so that he could wisely choose his eventual profession.

VIII. STAFF SUMMARY

		Federal	Local	
Bruce W. Tuckman	Director	$1,926	$566	10/1-12/30 3/4 time
Joseph H. Casello	Assist. Dir.	2,924		10/1-12/30 full time
Ricardo Grippaldi	Res. Assist.	275		10/1-12/30 1/2 time
Carol Porter	Res. Assist.	275		10/1-12/30 1/2 time

IX. FUTURE ACTIVITIES PLANNED FOR NEXT REPORTING PERIOD

The third quarter of SCOPE's first year of life should prove to be as hectic, if not more so, than the two previous quarters. Depending upon existing travel funds, plans are being made to visit the trade and industrial curriculum laboratory in Columbus, Ohio, and possibly those in Nachitoches, Louisiana, and Urbana, Illinois. We feel that our visits to curriculum labs have been most valuable, and we would like to visit as many of them as possible.

A request has been made to the Ford Foundation for funds with which to visit various innovative educational programs which they sponsored. If the request is granted, Dr. Tuckman, Dr. Carl J. Schaefer, chief consultant to the SCOPE Project, and Mr. Casello will visit:

1. The Nova School in Fort Lauderdale, Florida, to observe the many innovations practiced there

2. Central Michigan University in Mount Pleasant,

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Michigan, to observe the coordinated curriculum approach to vocational education, and

3. Cogswell Polytechnical College and the City College of San Francisco, California, to observe the "Richmond Plan" and programs in hotel and restaurant management.

Work must also be started on preparations for the two spring conferences at Rutgers University. Letters of invitation to the program will be sent to those speakers and consultants chosen by the SCOPE staff to participate in the program. Communication will continue with the lab directors in an effort to formalize the format to be used for the first meeting. Plans will be made for bringing the directors to Rutgers at SCOPE's expense.

The SCOPE staff will begin a scrutiny of the budget to determine next year's needs, especially with regard to additional staff members. There is every indication that in addition to the present staff, we will need another part-time graduate assistant, and probably a full-time staff member who would work closely with Dr. Tuckman in analyzing and in coordinating the enormous amount of research data that the staff will begin to compile.

X. CERTIFICATION

_____
Signature of Contract
Officer

_____
Date

_____
Signature of Principal
Investigator or Project
Director

_____
Date

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APPENDIX 1

Questions on Tracking

I. Characteristics of the tracks in the high school.

   1. How many tracks are there? How do these vary by subject matter?
   2. What curriculums (courses) are covered in the different tracks? In what way are these similar and different in subject matter? In skill level?
   3. What is the average class size of classes in the different tracks?
   4. What criteria are used for initial assignment of students to different tracks in the various subject matters?
      a. What are the criteria indices (i.e., measures or judgments)?
      b. What are the cutoff scores on these indices?
      c. How are these indices combined or weighted in making a tracking decision?
      d. How were these criteria determined (what basis)?

II. Characteristics of the students in the different high school tracks.

   5. What is the racial composition of the different tracks?
   6. What is the dropout rate in the different tracks?
   7. What percentage of students move from each of the tracks to higher tracks during high school? What percentage move to lower tracks?
   8. What is the probability that a student will be in the same track across all subject matters?
   9. What is the average score for students in each of the tracks on standardized measures of achievement, intelligence, and reading level at different grade levels?
   10. What relative gains or losses do students in each of the tracks show in achievement, intelligence, and reading level measured from high school entry to graduation?
   11. Are the performances of students in the different tracks more similar in the freshman or the senior years?

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12. Is final student ranking in the graduating class influenced by track?
13. What do the graduates of the different tracks do upon graduation?
14. What are subjective impressions of self (self-worth, growth) among students in each of the tracks?
15. What are the attitudes of students in the different tracks toward the education they are receiving?

III. The high school teacher and tracking.

16. What performance expectations do teachers have for students in the different tracks?
17. What kind of supervision do teachers receive relative to their dealing with the different tracks?
18. Are the teachers aware of what is being covered in their area in the different tracks and are they attempting to cover the same concepts at an appropriate level?

IV. The educational system.

19. Has tracking in your high school ever been evaluated?
20. Has heterogeneous grouping recently been tried in your high school? What were the outcomes?
21. How many innovations have been undertaken in your high school within the past five years? What were they?
22. How do your high school students compare to others on national norms? How does this comparison fare by racial groups?

Based on answers to the above questions, we will attempt to draw conclusions about the effects of tracking on student performance. We will attempt to determine whether the present system is an educational success for all students.