

**NATIONAL ASSOCIATION
FOR RESEARCH
IN SCIENCE TEACHING**

Marked

**THE RESEARCH PROCESS
IN
SCIENCE EDUCATION**

**1981 ANNUAL MEETING
GROSSINGERS'
IN THE CATSKILLS
April 5 - 8, 1981**

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NARST OFFICERS

1980-81

PRESIDENT

Stanley L. Helgeson
Science and Mathematics Education
The Ohio State University
Columbus, OH

IMMEDIATE PAST PRESIDENT

John W. Renner
323 Physical Sciences Center
University of Oklahoma
Norman, OK 73019

EXECUTIVE SECRETARY

William G. Holliday
NARST-EDCI
University of Calgary
Calgary, Alberta
Canada T2N 1N4

RESEARCH COORDINATOR

Arthur L. White
Science and Mathematics Education
The Ohio State University
Columbus, OH 43210

NSTA REPRESENTATIVE

Donald W. McCurdy
National Science Teachers Association
1742 Connecticut Avenue, N.W.
Washington, D.C. 20009

EDITOR, JOURNAL OF RESEARCH IN SCIENCE TEACHING

James A. Shymansky
Science Education Center
University of Iowa
Iowa City, IA 52242

BOARD MEMBERS

James P. Barufaldi
Science Education Center
University of Texas at Austin
Austin, TX 78712

J. A. Easley, Jr.
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University of Illinois
Urbana, IL 61801

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Department of Chemistry
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West Lafayette, IN 47907

Ann C. Howe
101 Heroy Building
Syracuse University
Syracuse, NY 13210

Anton E. Lawson
Science Education
Department of Physics
Arizona State University
Tempe, AZ 85281

John T. Wilson
Science Education Center
University of Iowa
Iowa City, IA 52242

THE NATIONAL ASSOCIATION FOR
RESEARCH IN SCIENCE TEACHING

THE NATIONAL ASSOCIATION FOR RESEARCH IN SCIENCE TEACHING (NARST) was founded for the purpose of promoting research in science education at all educational levels, and for disseminating the findings of this research in such ways as to improve science teaching. NARST is incorporated as a non-profit corporation in the state of Minnesota. The official publication of the Association is the JOURNAL OF RESEARCH IN SCIENCE TEACHING. The major areas of concern are experimental and analytical research studies (theoretical or applied) encompassing curriculum development and organization, evaluation, learning theory, teacher education, programs for the talented and underachievers, and methods of instruction in science. Surveys of current practices, enrollment, and course offerings represent other interests.

NARST meets with the American Education Research Association one year and the National Science Teachers Association the next year. At these meetings research papers in the areas listed above are presented along with symposia on topics of interest to teachers and educational research workers.

NARST cooperates with the ERIC Clearinghouse for Science, Mathematics, and Environmental Education (SMEAC) located at The Ohio State University to conduct and publish reviews of research in science education at the elementary, secondary and college levels and to compile and publish the abstracts of papers presented at the annual meeting.

The constitution of NARST specifies that membership shall be drawn from those active in research in science education and those outstanding in science education leadership such as teachers, supervisors and curriculum developers. Patron membership is available to individuals and organizations who would like to contribute more than the basic dues to support the work of our organization.

The Association maintains a Placement Information Service which, each year, provides lists of positions available and of personnel seeking employment. Prospective employees and employers are urged to use these lists to arrange contacts and interviews. Placement information is made available by mail early in each calendar year and at the annual meeting. Applications for membership, payment of dues, and correspondence related to the business operations of NARST should be mailed to the Executive Secretary.

PRESIDENTS OF NARST

1928	W. L. Eikenberry	1946	C. L. Thiele	1964	Cyrus W. Barnes
1929	W. L. Eikenberry	1947	Earl R. Glenn	1965	Frederic B. Dutton
1930	W. L. Eikenberry	1948	Ira C. Davis	1966	Milton O. Pella
1931	Elliot R. Downing	1949	Joe Young West	1967	H. Craig Sipe
1932	Elliot R. Downing	1950	N. Eldred Bingham	1968	John M. Mason
1933	Francis D. Curtis	1951	Betty Lockwood	1969	Joseph D. Novak
1934	Ralph K. Watkins	1952	Betty Lockwood	1970	Willard D. Jacobson
1935	Archer W. Hurd	1953	J. Darrell Barnard	1971	Paul D. Hurd
1936	Gerald S. Craig	1954	George C. Mallinson	1972	Frank X. Sutman
1937	Walter G. Whitman	1955	Kenneth E. Anderson	1973	J. David Lockard
1938	Honor A. Webb	1956	W. C. Van Deventer	1974	Wayne W. Welch
1939	Ralph Powers	1957	Waldo W. Blanchet	1975	Robert E. Yager
1940	Otis W. Caldwell	1958	Nathan S. Washton	1976	Ronald D. Anderson
1941	Harry A. Carpenter	1959	Thomas P. Fraser	1977	O. Roger Anderson
1942	G. P. Cahoon	1960	Vaden W. Miles	1978	Roger G. Olstad
1943	Florence G. Billig	1961	Clarence H. Boeck	1979	James R. Okey
1944	Florence G. Billig	1962	Herbert A. Smith	1980	John W. Renner
1945	Florence G. Billig	1963	Ellsworth S. Obourn	1981	Stanley L. Helgeson

1981 PATRON MEMBERS

H. Craig Sipe

EMERITUS MEMBERS

Kenneth E. Anderson
 N. Eldred Bingham
 Horace H. Bliss
 Clarence H. Boeck
 George T. Davis
 Warren Davis
 T. Handley Diehl
 Frederic B. Dutton
 Thomas P. Fraser
 Ralph P. Frazier
 Paul D. Hurd
 James R. Irving
 Philip G. Johnson
 Ralph W. Lefler
 Ben Levine
 John M. Mason
 Kelso B. Morris
 Clarence H. Nelson
 James S. Perlman
 Ruth L. Roche
 Edward Victor
 Nathan S. Washton
 Fletcher G. Watson
 Helen N. Weekes
 Paul A. Wilkinson

1981 SUSTAINING MEMBERS

Difco Laboratories
 William G. Holliday
 John J. Koran, Jr.
 Carl F. Berger
 Robert E. Yager

LIFE MEMBERS

Clarence E. Baer
 Gerald Craig
 Francis Curtis
 Anita Laton
 Bertha Parker
 Lois M. Shoemaker
 H. Craig Sipe
 W. B. Teeters
 Ralph Watkins

NARST PROGRAM STRUCTURE

This listing of program format and the following definitions are offered to clarify the structure of this program. In addition, all members are invited to make specific suggestions for modification of format or inclusion of topics in future meetings. Letters to the officers are always a welcome means of communicating suggestions.

1. GENERAL SESSIONS--Researchers of national prominence are asked to address the NARST membership concerning topics and issue of general concern. Such analyses of where we have been and where we are going are features of the annual meeting each year.
2. CONTRIBUTED PAPERS--Individual members share results of their research efforts with other members. A series of concurrent sessions where such Contributed Papers are scheduled represent a major part of the NARST meeting. Generally such papers are restricted to a fifteen-to-twenty minute presentation which includes audience questioning as well.
3. PAPER SETS--Several related studies originating from a common research center or line of research can be structured as a set of from three to six separate but related reports. Such a grouping of papers often allows for common elements of design or approach to be presented once instead of several times.
4. SYMPOSIA AND PANELS--Areas of current research or research needs are identified and papers prepared addressing defined issues. Persons with varying backgrounds, positions, and research interests are included. In addition to presentations concerning research in a given area, interaction among the presenters, other discussants, and the audience is anticipated. Varying views, approaches, data reports, and data interpretation are desired features for these sessions.
5. RESEARCH SEMINARS/WORKSHOPS--These sessions are devoted to topics of basic importance for conducting disciplined inquiry of particular types. They are to contain a thorough and sophisticated treatment of a research methodology, including training in the basic procedures to be used.

NARST PROGRAM COMMITTEE

John W. Renner, Co-Chair	University of Oklahoma
Stanley L. Helgeson, Co-Chair	The Ohio State University
Dorothy L. Gabel	Indiana University
Edmund A. Marek	Southwest Texas State University
Victor J. Mayer	The Ohio State University
Gene W. Moser	University of Pittsburgh
Arthur L. White	The Ohio State University

LOCAL ARRANGEMENTS COMMITTEE

Norman Lederman	Kathy Malmgren
Bessie Stanback	Dana Zeidler

Ann C. Howe, Chair
Syracuse University

PLANNING NARST PROGRAMS

According to the NARST By-Laws, The Program Committee is a Standing Committee consisting of the Research Coordinator, the President-Elect (as chair of the Committee), and four members (each with rotating two-year terms). This Program Committee is charged with planning the Program format for the Annual Meeting. This planning includes preparing the Call for Papers, evaluating the contributions suggested by the members for all program elements and preparing the program copy for distribution to members.

The Call for Papers is included in a Newsletter (and, at the option of the Executive Secretary, a special mailing) to all members. The Call for Papers includes a questionnaire which serves as a cover sheet for multiple copies of a summary or other program feature. Such copies are not to include names of the investigator or other means of identification. These copies of the summaries are number-coded with the cover sheets being filed until after all program planning and summary evaluation has occurred.

Members of the Program Committee read and rate each paper submitted for possible use on the program. Following this independent rating, the Committee meets as a group. The separate ratings are summarized and any disagreement among the Committee members making the ratings are then discussed thoroughly. All papers are eventually recommended for inclusion in the program structure or rejected. Sometimes the final decision regarding borderline situations is made based upon the program structure (i.e., number of papers within a particular classification, total number of concurrent sessions planned, needed balance in terms of topics). The names of the contributors remain unknown to all persons making the ratings until all decisions are made. The names of persons submitting Techniques and Procedures of Research sessions, Symposium, and Panel proposals are discussed before final decisions are made.

54th ANNUAL MEETING OF THE
NATIONAL ASSOCIATION FOR RESEARCH
IN SCIENCE TEACHING

April 5-8, 1981

GROSSINGER'S IN THE CATSKILLS

SUNDAY, APRIL 5, 1981

Sunday-April 5, 1981

5:30 p.m. - 7:00 p.m.
8:30 p.m. - 10:00 p.m.

EXECUTIVE BOARD MEETING

Board Room

Presiding: Stanley L. Helgeson, President, NARST
Science and Mathematics Education
Ohio State University
Columbus, OH 43210

Monday - April 6, 1981

CONCURRENT SESSION A

~~9:30~~ a.m. - 10:30

SESSION A-1

Room: A

Title: Paper Set. Learning Science in Informal Settings: Naturalistic and
Experimental Museum Studies

President: George J. Pallrand
Graduate School of Education
Rutgers University
New Brunswick, N.J. 08903

Evaluator: Barbara M. Strawitz
Dept of Curric. & Instr.
Louisiana State University
Baton Rouge, LA 70803

Environmental Problems and Issues in Museum Research

John J. Koran, Jr.
Edward A. Munyer
College of Education & Florida State Museum
University of Florida
Gainesville, FL 32611

Studying Modeling in Museums

Lynn D. Shafer
College of Education & Florida State Museum
University of Florida
Gainesville, FL 32611

Studying Mathemagenic Behavior in Museums

Jeff K. Lehman
College of Education & Florida State Museum
University of Florida
Gainesville, FL 32611

MONDAY, APRIL 6, 1981

Discussants: Mary Lou Koran
College of Education
University of Florida
Gainesville, FL 32611

William. G. Holliday
Education Tower 538
University of Calgary
Calgary, Alberta, Canada T2N 1N4

9:30 a.m. - 10:30 a.m.

SESSION A-2

Room: B

Title: Contributed Papers. Measurement Techniques

2
President: Louis A. Iozzi
Environmental Education Div.
Busch Campus
New Brunswick, NJ 08903

ASB/MS
Evaluator: David L. Dunlop
112 Biddle Hall
University of Pittsburgh-
Johnstown
Johnstown, PA 15905

The Use of the State-Trait Anxiety Inventory in the Measurement of Anxiety
About Teaching Science in Preservice Elementary Teachers

Mary Westerback
C. W. Post Center
Greenvale, N.Y. 11545

A Scalogram Analysis of Two Measures of Concept Generalizability

Walter E. Lowell
Kemal bin Abdullah
Boston University Medical Center, SCF
85 E. Newton Street
Boston, MA. 02118

Preparation and Validation of a Videotaped Test of Conservation Suitable
for Grade 6 Students in Jamaica

Patricia A. Isaacs
School of Education
University of the West Indies
Mona Campus
Kingston 7, Jamaica

MONDAY, APRIL 6, 1981

9:30 a.m. - 10:30 a.m.

SESSION A-3

Room: C

Title: Symposium.

1
President: Delmar Janke
Dept of Curriculum & Instruction
Texas A&M University
College Station, TX 77843

Evaluator: O. Roger Anderson
Science Education
Teachers College
Columbia University
New York, NY 10027

Research Needed to Better Understand Developmental Approaches to Instruction
and Curriculum Development

Michael R. Abraham
Department of Chemistry
University of Oklahoma
Norman, OK 73019

John W. Renner
323 Physical Sciences Center
University of Oklahoma
Norman, OK 73019

9:30 a.m. - 10:30 a.m.

SESSION A-4

Room: D

Title: Contributed Papers. Classroom Behavior Analysis

3
President: Marvin Bratt
Ohio State University
Marion Campus
Marion, Ohio 43302

Evaluator: Richard J. Bady
Mt. Senario College
Ladysmith, WI 54848

Analyzing Arguments in Classroom Discourse: Can Teachers' Questions Distort Scientific Authority?

Thomas L. Russell
Faculty of Education
Queen's University
Kingston, Ontario, Canada K7L 3N6

Behavior Patterns in Desegregated Junior High School Classrooms

Bessie A. Stanback
Syracuse University
101 Heroy Geology Laboratory
Syracuse, NY 13210

The Effects of Behavior Model Analysis on Teachers' Behaviors During Science Activity Lessons

P. Ann Miller
2094 Powell Lane, #3
Decatur, GA 30033

9:30 a.m. - 10:30 a.m.

SESSION A-5

Room: E

Title: Committee Meetings

Rooms will be available for committee meetings. Chairpersons are responsible for arranging meetings.

CONCURRENT SESSION B

10:40 a.m. - 11:40 a.m.

SESSION B-1

Room: A

Title: Paper Set. Patterns of Reasoning

President: Dale G. Merkle
FSC 109
Shippensburg State College
Shippensburg, PA 17257

Evaluator: John E. Lutz
Rochester Institute of Tech
One Lomb Memorial Drive
Rochester, NY 14623

Patterns of Reasoning: Controlling Variables

William Capie
Department of Science Education
University of Georgia
Athens, Georgia 30602

Patterns of Reasoning: Proportional Reasoning

Roger Newton
Department of Science Education
University of Georgia
Athens, GA 30602

MONDAY, APRIL 6, 1981

Patterns of Formal Reasoning: Probabilistic Reasoning.

Kenneth G. Tobin
Mount Lawley College of Advanced Education
Perth, Australia

Patterns of Reasoning: Correlational Thinking

Danny L. McKenzie
Michael J. Padilla
Department of Science Education
University of Georgia
Athens, GA 30602

10:40 a.m. - 11:40

SESSION B-2

Room: B

Title: Contributed Papers. Meta-Analysis

2
Presider: Linda R. DeTure
1049 Tuscanly Pl.
Winter Park, FL 32789

Evaluator: Ramona J. Anshutz
State Dept. of Education
120 East 10th Street
Topeka, KS 66612

The Major Questions Addressed by the Extant Science Education Research:
A Map for Meta-Analysis

Ronald D. Anderson
Stuart R. Kahl
Mary Lee Smith
Gene V Glass
University of Colorado
Boulder, Colorado 80309

Russell H. Yeany
Department of Science Education
University of Georgia
Athens, GA 30602

A Meta-Analysis of the Relationship Between Science Achievement and
Science Attitude: Kindergarten Through College

Victor L. Willson
Dept. of Educational Psychology
Texas A & M University
College Station, TX 77843

Discussant: Carl F. Berger
College of Education
University of Michigan
Ann Arbor, MI 48104

10:40 a.m. - 11:40 a.m.

SESSION B-3

Room: C

Title: Panel

Presider: Ray M. Snider
181 N. Pott Corners Rd.
New Paltz, NY 12561

Evaluator: Fred L. Fifer, Jr.
University of Texas
Box 688
Richardson, TX 75080

SUNDAY, APRIL 6, 1981

Building a Base of Community Support for Science Education

William C. Ritz
Science Education
California State University
Long Beach, CA 90840

Floyd E. Martheis
Science Education
East Carolina University
Greenville, NC 27834

Charles W. Wallace
IDSE
National Science Foundation
Washington, D.C. 20550

Kenneth W. Dowling
State Department of Public Instruction
126 Langdon Street
Madison, WI 53702

Herbert D. Tier
Lawrence Hall of Science
University of California
Berkeley, CA 94720

10:40 a.m. - 11:40 a.m.

SESSION B-4

Room: D

Title: Contributed Papers. Learning and Instruction

President: Gene W. Moser
School of Education
University of Pittsburgh
Pittsburgh, PA 15260

Evaluator: Floyd D. Ploeger
Education Bldg.
University of Texas
Austin, TX 78712

Relationship Between Abstract Reasoning, Instruction, and Achievement
on a Physiology Unit Studied in Tenth Grade Biology

Eguene J. Chiappetta
Cynthia L. Lueckemeyer
Dept of Curriculum & Instruction
University of Houston
Houston, Texas 77004

The Effect of Instruction Using Students' Prior Knowledge on Conceptual Change

M. G. Hewson
Centre for Continuing Education
University of the Witwatersrand
Johannesburg, 2001 SOUTH AFRICA

Discussant: Patricia E. Blosser
Science and Mathematics Education
Ohio State University
Columbus, OH 43210

MONDAY, APRIL 6, 1981

10:40 a.m. - 11:40 a.m.

SESSION B-5

Room: E

Title: Symposium

President: Elizabeth K. Stage
Lawrence Hall of Science
University of California
Berkeley, CA 94720

Evaluator: James D. Ellis
Science Education Center
University of Texas
Austin, TX 78723

Investigation of Male-Female Differences in Science Performance:
Learner Characteristics or Learner Experiences?

Beverly Birns
State University of New York at Stony Brook
Stony Brook, NY 11794

Marcia C. Linn
Steven Pulos
Elizabeth K. Stage
Lawrence Hall of Science
University of California
Berkeley, CA 94720

Wayne W. Welch
204 Burton Hall
University of Minnesota
Minneapolis, MN 55455

~~CONCURRENT SESSION C~~

11:50 a.m. - 12:50 a.m.

SESSION C-1

Room: A

Title: Paper Set. Sex Differences in College Students

President: Edwin A. Arnfield
328 N. Hill Circle
Rochester, MI 48063

Evaluator: Victor J. Mayer
Science and Mathematics Education
Ohio State University
Columbus, OH 43210

The Differences Among Science and Humanities Males and Females

Dale R. Baker
Graduate School of Education
Rutgers University
New Brunswick, NJ 08903

College Physics Achievement: Do Females and Males Differ?

David Van Harlingen
Graduate School of Education
Rutgers University
New Brunswick, NJ 08903

Sex Differences in College Level Biology

Veronica Mondrinos
Graduate School of Education
Rutgers University
New Brunswick, NJ 08903

1:50 a.m. - 12:50 a.m.

SESSION C-2

Room: B

Title: Contributed Papers. Teacher Performance

President: Ronald E. Rowe
C202, Beaver College
Glenside, PA 19038

Evaluator: Joseph P. Riley, II
Dept of Science Education
University of Georgia
Athens, GA 30602

Performance Assessment of Elementary School Science Teachers

Dale G. Merkle
109 Franklin Science Center
Shippensburg State College
Shippensburg, PA 17257

MONDAY, APRIL 6, 1981

The Predictors of Science Teaching Performance in Elementary School Teachers

Mildred R. Green
School of Education
Fordham University
New York, NY 10022

A Factor Analytic Study of Secondary Science Teacher Competencies Within
Which Growth is Perceived as Important by Science Teachers, Supervisors,
and Teacher Educators

H. Craig Sipe
Bruce Tulloch
School of Education
State University of New York at Albany
Albany, NY 12222

11:50 a.m. - 12:50 a.m.

SESSION C-3

Room: C

Title: Research Committee Report

President: Arthur L. White, Research Coordinator, NARST
Science and Mathematics Education
Ohio State University
Columbus, OH 43210

A Discussion of the Activities of the Research Committee

11:50 a.m. - 12:50 a.m.

SESSION C-4

Room: D

Title: Contributed Papers. Science Curriculum Analysis

President: Rodney L. Doran
553 Baldy Hall
SUNY at Buffalo
Amherst, NY 14260

Evaluator: James T. Robinson
Center for Educational
Research & Evaluation
P.O. Box 930
Boulder, CO 80306

Attitude Measurement in an Innovative Curriculum

Peter E. Pezaro
Science and Mathematics Education
Ohio State University
Columbus, OH 43210

The Analysis of Science Curriculum Policies

Graham W. F. Orpwood
Science Council of Canada
100 Metcalfe Street
Ottawa, Ontario, Canada K1P 5M1

An Analysis of Selected National Elementary Science Curriculum Projects
Using Ralph W. Tyler's Basic Principles of Curriculum and Instruction
as a Standard of Comparison

Richard E. Willett
23 Press Building
New York University
Washington Square, NY 10012

11:50 a.m. - 12:50 a.m.

SESSION C-5

Room: E

Title: Symposium. (Continuation of Session B-5)

Investigation of Male-Female Differences in Science Performance:
Learner Characteristics or Learner Experiences?

1:00 p.m. - 2:00 p.m.

LUNCH

BUSINESS MEETING

President: Stanley L. Helgeson, President, NARST
Science and Mathematics Education
Ohio State University
Columbus, OH 43210

2:15 p.m. - 3:15 p.m.

GENERAL SESSION I

Room: G

President: James R. Okey
Department of Science Education
University of Georgia
Athens, GA 30602

The Place of Non-Quantitative Research in Science Education

Douglas Roberts
Ontario Institute for Studies in Education
252 Bloor Street, West
Toronto, Ontario, Canada M5S 1V6

CONCURRENT SESSION D

3:30 p.m. - 4:30 p.m.

SESSION D-1

Room: A

Title: Paper Set. Learning Research

President: Protima Roy
Dept of Education
Drury College
Springfield, MO 65802

Evaluator: Rosalie Grant
586 Vista Ave
Palo Alto, CA 94306

An Investigation of the Role of Piagetian Mental Operations on Earth Science
Concept Attainment in a Differential Instruction Model for Concrete and
Formal Level Subjects

Gabriel M. Zicarelli
Gene W. Moser
School of Education
University of Pittsburgh
Pittsburgh, PA 15260

A Linear Path Model of Delayed Prose Recall of a Lecture on Radiation Effects

Gene W. Moser
Helen M. Loughner
School of Education
University of Pittsburgh
Pittsburgh, PA 15260

The Discriminability of Student Traits and Energy Opinions for Final
Chemistry Course Grades

Helen M. Loughner
Gene W. Moser
School of Education
University of Pittsburgh
Pittsburgh, Pa 15260

The Discriminability of Mathematics and Science Achievement by Music
Interests and Practices of Vocational Education Students

Edward T. Hrabal
Gene W. Moser
School of Education
University of Pittsburgh
Pittsburgh, PA 15260

MONDAY, APRIL 6, 1981

3:30 p.m. - 4:30 p.m.

SESSION D-2

Room: B

Title: Contributed Papers. Information Retrieval

President: Leonard Simons
Elmira College
Elmira, New York 14901

Evaluator: James H. Stewart
226 Teacher Education Bldg.
University of Wisconsin
Madison, WI 53706

Attended

Representing the Substantive Structure of Disciplines

Fred N. Finley
226 Teacher Education Building
University of Wisconsin
Madison, Wisconsin 53706

Young Adults' Trust in Information Sources About Science Policy Issues

Alan M. Voelker
Dept of Curriculum and Instruction
Northern Illinois University
DeKalb, IL 60115

Preparing and Using Data Tapes and Machine Readable User's Guides:
A New Resource for Science Education Research

James T. Robinson
Center for Educational Research & Evaluation
P.O. Box 930
Boulder, CO 80306

3:30 p.m. - 4:30 p.m.

SESSION D-3

Room: C

Title: Review of Research

President: Terry J. Shaw
204 Molton Hall
Kansas State University
Manhattan, KS 66506

The NARST-ERIC/SMEAC Review of Research in Science Education - 1979

David P. Butts
Department of Science Education
University of Georgia
Athens, GA 30602

3:30 p.m. - 4:30 p.m.

SESSION D-4

Room: D

Title: Contributed Papers. Meaningful Learning

President: Vincent N. Lunetta
Science Education Center
The University of Iowa
Iowa City, IA 52242

Evaluator: Fletcher G. Watson
62 Press Building
New York University
New York, NY 10003

The Selective Facilitative Effects of Concrete Organizers and Abstract
Organizers on Targeted Achievement Groups' Learning

Edward E. Jones
McGuffey Lab School
Miami University
Oxford, OH 45056

MONDAY, APRIL 6, 1981

The Effects of Degree of Concept Relatedness of Instruction and Locus of Control Orientation on the Meaningful Learning Achievement of High School Biology Students

Jacqueline D. Sherris
5008 Broadmoor Road
Baltimore, MD 21212

Discussant: David J. Harmon
Kanawha County Schools
200 Elizabeth Street
Charleston, WV 25311

3:30 p.m. - 4:30 p.m.

SESSION D-5

Room: E

Title: Research Methods Seminar/Workshop

Presider: Robert D. Sherwood

Nonparametric Statistical Techniques for Science Educators

Robert D. Sherwood
23 Press Building
New York University
New York, NY 10003

CONCURRENT SESSION E

4:45 p.m. - 5:45 p.m.

SESSION E-1

Room: A

Title: Paper Set. Trends in Science Education

Presider: William Torop
West Chester State College
West Chester, PA 19380

Evaluator: Morris A. Enyeart
Graduate School of Education
Rutgers University
New Brunswick, NJ 08903

Trends with Respect to Science Teacher Education, Faculty and Programs

John E. Penick
Science Education Center
University of Iowa
Iowa City, IA 52242

Rodger Bybee
Dept of Education
Carleton College
Northfield, MN 55057

Ertle Thompson
Science Education Department
University of Virginia
Charlottesville, VA 22903

MONDAY, APRIL 6, 1981

Follow-up of the NSF Status Study of Graduate Centers of
Science Education in the United States, 1960-80.

Edward L. Pizzini
Robert E. Yager
Science Education Center
University of Iowa
Iowa City, IA 52242

Kenneth W. Dowling
Dept of Public Instruction
126 Langdon Street
Madison, WI 53702

Charlotte Purnell
Delaware Technical & Community College
1832 N. Dupont Parkway
Dover, DE 19901

Characteristics of 168 Faculty Members at 35 Major Graduate Centers
for Science Education

Robert E. Yager
Science Education Center
University of Iowa
Iowa City, Iowa 52242

Eric E. Zehr
Kennedy Senior High School
4545 Wenig Rd., NE
Cedar Rapids, IA 52403

Rodger Bybee
Department of Education
Carleton College
Northfield, MN 55057

4:45 p.m. - 5:45 p.m.

SESSION E-2

Room: B

Title: Contributed Papers. Sex Related Differences and Roles

President: Joseph G. Krajcovich
78 Bernard St.
Somerville, NJ 08876

Evaluator: Monroe Cravats
3235 Emmons Ave.
New York, NY 11235

An Analysis of the Relationship of Students' Self Concepts in Science and
Their Science Achievement, Mental Ability and Gender

Burt A. Sellers
Tonawanda Senior High School
Hinds and Fletcher Streets
Tonawanda, NY 14150

Sex Role Stereotypes, Interest in Science and Responses of Sixth Graders to
Scientists/Technologists on T.V.'s "3-2-1 Contact"

Marcia Kaplan Rudy
570 Winthrop Road
Teaneck, NJ 07666

Cognitive Correlates of Sex-Related Differences in
Performance in College Biology

Daniel Doherty
Dept of Science and Math
Mt. St. Mary's College
Emmitsburg, MD 21727

William Doody
Dept of Chemistry
The American University
Washington, D.C. 20016

MONDAY, APRIL 6, 1981

4:45 p.m. - 5:45 p.m.

SESSION E-3

Room: C

Title: An Hour With The Journal Editor

James A. Shymansky, Editor, JRST
Science Education Center
University of Iowa
Iowa City, IA 52242

President: Anne C. Howe
101 Heroy Geology Building
Syracuse University
Syracuse, NY 13210

4:45 p.m.

SESSION E-4

Room: D

Title: Contributed Papers. Cognitive Development

President: F. Gerald Dillashaw
Department of Education
Bethany College
Bethany, WV 26032

Evaluator: Theodore Kellogg
Dept of Education
University of Rhode Island
Kingston, RI 02879

Cognitive Style and the Effects of Two Instructional Treatments on the
Acquisition and Transfer of the Ability to Control Variables:
A Longitudinal Study

Barbara M. Strawitz
Dept of Curriculum & Instruction
Louisiana State University
Baton Rouge, LA 70803

An Analysis of the Range of 2B and 3A Responses to Three Inhelder Tasks

Walter A. Farmer
Margaret A. Farrell
Stephen Rumsey
ED B-15
State University of New York
Albany, NY 12222

Discussant: Anton E. Lawson
Department of Physics
Arizona State University
Tempe, AZ 85281

4:45 p.m. - 5:45 p.m.

SESSION E-5

Room: E

Title: Research Methods Seminar/Workshop (Continuation of Session D-5).

President: Robert D. Sherwood

Nonparametric Statistical Techniques for Science Educators

Robert D. Sherwood
23 Press Building
New York University
New York, NY 10003

7:00 p.m.

DINNER

MONDAY, APRIL 6, 1981

HELP EVALUATE THE 1981 MEETING OF THE NARST

Please comment on each of the sessions you attended. Indicate strengths and weaknesses you observed for each of the sessions. Deposit this form in the box at the information desk before 2:00 p.m. Sunday, April 8, 1981 or mail it to:

Dr. Linda R. DeTure
1049 Tuscany Place
Winter Park, FL 32789

Session A-1 _____

A-2 _____

A-3 _____

B-1 _____

B-2 _____

B-3 _____

B-4 _____

B-5 _____

C-1 _____

C-2 _____

C-3 _____

C-4 _____

Gen. Sess. I _____

D-1 _____

D-2 _____

D-3 _____

D-4 _____

D-5 _____

E-1 _____

E-2 _____

E-3 _____

E-4 _____

Gen Sess II _____

F-1 _____

F-2 _____

F-3 _____

F-4 _____

F-5 _____

G-1 _____

G-2 _____

G-3 _____

G-4 _____

G-5 _____

SCHEDULE PLANNING GUIDE

Sunday April 5		5:30 - 7:00 8:30 -10:00					
		EXECUTIVE BOARD MEETING					
MONDAY, APRIL 6	Sessions	9:30-10:30	A-1	A-2	A-3	A-4	A-5 Committee Mtgs
		10:40-11:40	B-1	B-2	B-3	B-4	B-5
		11:50-12:50	C-1	C-2	C-3	C-4	C-5
			1:00-2:00 LUNCH - BUSINESS MEETING				
			2:15-3:15 GENERAL SESSION I				
	Sessions	3:30-4:30	D-1	D-2	D-3	D-4	D-5
		4:45-5:45	E-1	E-2	E-3	E-5	E-5
			7:00 DINNER				
			8:30 GENERAL SESSION II - PRESIDENT'S ADDRESS				
	TUESDAY, APRIL 7	Sessions	9:30-10:30	F-1	F-2	F-3	F-4
10:40-11:40			G-1	G-2	G-3	G-4	G-5
11:50-12:50			H-1	H-2	H-3	H-4	H-5
		1:00-2:00 LUNCH - JRST AND NARST AWARDS					
		2:15-3:15 GENERAL SESSION III					
Sessions		3:30-4:30	I-1	I-2	I-3	I-4	I-5
		4:45-5:45	J-1	J-2	J-3	J-4	J-5
		6:00-7:00 SOCIAL HOUR					
		7:30-8:30 DINNER					
WEDNESDAY, APRIL 8		Sessions	9:30-10:30	K-1	K-2	K-3	K-4
	10:40-11:40		L-1	L-2	L-3	L-4	L-5
	11:50-12:50		M-1 Committee Mtgs	M-2	M-3	M-4	M-5
			1:00-2:30 LUNCH - GENERAL SESSION III				

Session H-1 _____

H-2 _____

H-3 _____

H-4 _____

H-5 _____

Gen Sess III _____

I-1 _____

I-2 _____

I-3 _____

I-4 _____

I-5 _____

J-1 _____

J-2 _____

J-3 _____

J-4 _____

J-5 _____

K-1 _____

K-2 _____

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K-4 _____

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L-1 _____

L-2 _____

L-3 _____

L-4 _____

L-5 _____

M-1 _____

M-2 _____

M-3 _____

M-4 _____

M-5 _____

Gen Sess IV _____

Comments _____

8:30 p.m.

GENERAL SESSION II

President: Stanley L. Helgeson, President, NARST
Science and Mathematics Education
Ohio State University
Columbus, OH 43210

PRESIDENT'S ADDRESS

The Power of Purpose

John W. Renner, Past President, NARST
323 Physical Sciences Center
University of Oklahoma
Norman, OK 73019

MONDAY, APRIL 6, 1981

Tuesday, April 7, 1981

CONCURRENT SESSION F

9:30 a.m. - 10:30 a.m.

SESSION F-1

Room: A

Title: Paper Set. Logical Reasoning

President: Robert K. James
Holton Hall
Kansas State University
Manhattan, KS 66506

Evaluator: John W. Butzow
206 Shibles Hall
University of Maine
Orono, ME 04469

An Error Analysis of Responses to a Test of Propositional Logic

Michael D. Piburn
Morris A. Enyeart
Graduate School of Education
Rutgers University
New Brunswick, N.J. 08903

The Development of the Ability to Use Propositional Operators

William Martin
Walter Lockwood
Graduate School of Education
Rutgers University
New Brunswick, NJ 08903

Logical Operations and Achievement in Community College Students

Water Rothaug
George J. Pallrand
David Van Harlingen
Graduate School of Education
Rutgers University
New Brunswick, NJ 08903

The Growth of Propositional Logic Ability During the Junior High School Years

Morris A. Enyeart
Michael D. Piburn
Graduate School of Education
Rutgers University
New Brunswick, NJ 08903

TUESDAY, APRIL 7, 1981

9:30 a.m. - 10:30 a.m.

SESSION F-2

Room: B

Title: Contributed Papers. Prose Analysis

President: Michael J. Padilla
Department of Science Education
University of Georgia
Athens, GA 30206

Evaluator: John F. Thompson
Center for the Study of
Higher Education
Memphis State University
Memphis, TN 38152

Using Questions to Focus Students' Attention on Non-Prose Science Materials

William G. Holliday
Garth D. Benson
Education Tower 538
University of Calgary
Calgary, Alberta, Canada T2N1N4

The Relationship of Prose Statements Assessing The Energy Crisis and the
Cognition of Figural Perception Transformations.

David P. Kielbowick
1525 Woodside Drive
Ambridge, PA 15003

Research Approaches for Analyzing Free Prose Data Embedded in Curriculum

David D. Carbonara
Secondary Education
University of Pittsburgh
Pittsburgh, PA 15260

TUESDAY, APRIL 7, 1981

9:30 a.m. - 10:30 a.m.

SESSION F-3

Room: C

Title: Contributed Papers. College Science Students

President: Luis A. Martinez-Perez
13239 S. W. 85 Terrace
Miami, FL 33183

Evaluator: William J. Kermis
University of Texas
at Dallas
Box 688
Richardson, TX 75080

Who Translates Research into Practice? A Look at the Personality Profiles
of Science Education Engineers

John E. Lutz
Rochester Institute of Technology
One Lomb Memorial Drive
Rochester, NY 14623

Projective Spatial Reasoning of Undergraduate College Students

Linda J. Kelsey
Physical Sciences Program
West Virginia University
Morgantown, WV 26506

The Effects of Selected Student Characteristics and College Learning
Environment on Science Process Skills and Information Acquisition

John E. Penick
Gerry Haukoos
Science Education Center
University of Iowa
Iowa City, IA 52242

9:30 a.m. - 10:30 a.m.

SESSION F-4

Room: D

Title: Contributed Papers. Science Teaching Laboratories

President: Nassrine Adibe
43 Mist Lane
Westbury, NY 11590

Evaluator: JoAnn Layne
P.O. Box 562
Warner, OK 74469

Objective and Continuous Assessment of Student Performance in the
Physics Laboratory

Uri Ganiel
Avi Hofstein
Dept of Science Teaching
The Weizmann Institute of Science
Rehovot, ISRAEL

A Descriptive Instrument for Use in Investigating Science Laboratories

Michael R. Abraham
Department of Chemistry
University of Oklahoma
Norman, OK 73019

A Laboratory Study of Physics Teaching in the Egyptian General High School in
Light of Recent International Trends

Ahmed Khalil Mohamed Hassan
Faculty of Education
AL-AZHAR University
Madinet Nasr-Cairo, EGYPT

9:30 a.m. - 10:30 a.m.

SESSION F-5

Room: E

Title: Research Seminar/Workshop

President: Carl F. Berger

Trend Analysis Using Micro Computers

Carl F. Berger
College of Education
University of Michigan
Ann Arbor, MI 48109

TUESDAY, APRIL 7, 1981

~~CONCURRENT SESSION G~~

10:40 a.m. - 11:40 a.m.

SESSION G-1

Room: A

Title: Paper Set. Diagnostic Testing

President: Charles R. Ward
Department of Chemistry
University of North Carolina
Wilmington, NC 28406

Evaluator: David J. Harmon
Kanawha County Schools
200 Elizabeth Street
Charleston, WV 25311

The Influence of Voluntary Diagnostic Testing on the Science Achievement
of University Students

Wenda J. Adams
University of North Carolina
Chapel Hill, NC 27514

The Influence of Voluntary Diagnostic Testing on Science Achievement:
A Replicated Study

Russell H. Yeany
Department of Science Education
University of Georgia
Athens, GA 30602

Predicting Science Achievement of University Students on the Basis of
Selected Entry Characteristics

Edwin A. Helseth
Department of Science Education
University of Georgia
Athens, GA 30602

10:40 a.m. - 11:40 a.m.

SESSION G-2

Room: B

Title: Contributed Papers. Cognitive Development

President: James P. Barufaldi
Science Education Center
University of Texas at Austin
Austin, TX 78712

Evaluator: John A. Novak
Science and Mathematics
Education
Ohio State University
Columbus, OH 43210

The Acquisition of Formal Reasoning Ability Via A Neo-Piagetian Treatment

Marianne Betkouski
University of North Florida
Jacksonville, FL 32216

William Lamb
Frederica Academy
St. Simon's Island, GA 31522

Teaching Formal Reasoning in a College Biology Course for
Pre-Service Teachers

Anton E. Lawson
Department of Physics
Arizona State University
Tempe, AZ 85281

Predicting the Piagetian Cognitive Levels of Teacher Education Students at
The Pennsylvania State University

Hassan H. Zeitoun
H. Seymour Fowler
168 Chambers Bldg.
Pennsylvania State University
University Park, PA 16802

10:40 a.m. - 11:40 a.m.

SESSION G-3

Room: C

Title: Contributed Papers. Science Needs, Interests, and Literary Surveys

President: J. David Lockard
The International Clearinghouse
University of Maryland
College Park, MD 20742

Evaluator: Guilford H. Bartlett, Jr.
106 West 69th Street
New York, NY 10023

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papers*

*Check for good
Engineering Copy Center*

TUESDAY, APRIL 7, 1981

The Determination of the Scientific Literacy of the Students in Twelve Specific Counties in Georgia

Constance T. McNeill
Science Department
East Coweta High School
Senoia, GA 30236

David P. Butts
Department of Science Education
University of Georgia
Athens, GA 30206

Science Interest of Middle and Secondary School Students in Utah

2
J. Hugh Baird
Reuven Lazarowitz
Box 72 McKay Building
Brigham Young University
Provo, UT 84602

Science Needs Assessment: A Statewide Approach

Piyush Swami
Dept of Curriculum and Instruction
University of Cincinnati
Cincinnati, OH 45211

Lawrence L. Gabel
1114 University Hospitals Clinic
The Ohio State University
Columbus, OH 43210

Stanley L. Helgeson
Science and Mathematics Education
The Ohio State University
Columbus, OH 43210

10:40 a.m. - 11:40 a.m.

SESSION G-4

Room: D

Title: Contributed Papers. High School Science Methodology

President: John J. Koran, Jr.
Norman Hall 304
University of Florida
Gainesville, FL 32611

Evaluator: Robert H. Evans
1015 East 5th Avenue
Houghten, MI 49931

Facilitating Problem Solving in High School Chemistry

3
Dorothy L. Gabel
School of Education
Indiana University
Bloomington, IN 47405

Robert D. Sherwood
23 Press Building
New York University
New York, NY 10003

The Effects of the Mastery Paradigm on Summative Performance in a High School Biology Laboratory Course

William S. Kushner
101 Heroy Building
Syracuse University
Syracuse, NY 13210

Discussant: Rodney L. Doran
553 Christopher Baldy Hall
SUNY at Buffalo
Amherst, NY 14260

TUESDAY, APRIL 7, 1981

Title: Research Seminar/Workshop (Continuation of Session F-5)

Trend Analysis Using Micro Computers

Carl F. Berger

CONCURRENT SESSION H

11:50 a.m. - 12:50 p.m.

SESSION H-1

Room: A

Title: Paper Set.

President: Ronald Good
433 Education
Florida State University
Tallahassee, FL 32306

Evaluator: James A. Shymansky
Science Education Center
University of Iowa
Iowa City, IA 52242

A Report on 1977-80 Project LEO Studies of Quantitatively-Defined
Science Teaching Strategies

Charles C. Matthews
Dorothy Schlitt
209 Education Building
Florida State University
Tallahassee, FL 32306

Charlie L. Ray
Marshalltown Community College
Marshalltown, IA 50158

A Comparative Laboratory Study of the Effects of Lower Level and Higher Level
Questions on Students' Abstract Reasoning and Critical Thinking in
Two Non-Directive High School Chemistry Classrooms.

Charlie L. Ray
Marshalltown Community College
Marshalltown, IA 50158

Charles C. Matthews
Dorothy Schlitt
209 Education Building
Florida State University
Tallahassee, FL 32306

TUESDAY, APRIL 7, 1981

11:50 a.m. - 12:50 p.m.

SESSION H-2

Room: B

Title: Round Table Discussion

President: Eugene D. Gennaro
370 Peik Hall
University of Minnesota
Minneapolis, MN 55455

Attended

The Frequencies and Origins of Scientific Misconception

Richard J. Trembath
State College of Victoria At Frankston
Frankston, Victoria, AUSTRALIA 3199

James P. Barufaldi
Science Education Center
University of Texas at Austin
Austin, TX 78712

11:50 a.m. - 12:50 p.m.

SESSION H-3

Room: C

Title: Contributed Papers. Teacher Behavior

President: John E. Penick
Science Education Center
University of Iowa
Iowa City, IA 52242

Evaluator: Edmund A. Marek
Biology Dept
Southwest Texas State Univ.
San Marcos, TX

The Comparative Effects of Congruent and Incongruent Teacher Verbal Behavior
on Higher Level Learning Outcomes of Secondary Biology
Students During Discovery/Inquiry Laboratories

James A. Botti
H. Seymour Fowler
Pennsylvania State University
168 Chambers Bldg.
University Park, PA 16802

3 Effects of Curricula on Search Behaviors Modeled by Science Teachers

John T. Wilson
Science Education Center
University of Iowa
Iowa City, IA 52242

A Case Study Example of Beginning Teacher's Use of Curriculum Materials and the
Potential Outcomes for Students

Brent Kilbourn
The Ontario Institute for Studies in Education
252 Bloor Street West
Toronto, Ontario Canada M5S 1V6

11:50 a.m. - 12:50 p.m.

SESSION H-4

Room: D

Title: Contributed Papers. General Research

President: Marcia C. Linn
Lawrence Hall of Science
University of California
Berkeley, CA 94720

Evaluator: Vince D. Mahoney
Education Department
Iowa Wesleyan College
Mt. Pleasant, IA 52461

The Cognitive Developmental Level of Elementary School Students in Trinidad
and Tobago

Pamela Fraser-Abder
University of the West Indies
St. Augustine, Trinidad W.I.

2 H. Seymour Fowler
168 Chambers Bldg.
Pennsylvania State University
University Park, PA 16802

Using the Intensive Time-Series Design for Assessing Learning
of Crustal Evolution

Victor J. Mayer
Science and Mathematics Education
Ohio State University
Columbus, OH 43210

Carlos A. Rojas
Colciencias
Bogota, Colombia, S.A.

TUESDAY, APRIL 7, 1981

Discussant: Dorothy L. Gabel
School of Education
Indiana University
Bloomington, IN 47401

11:50 a.m. - 12:50 p.m.

SESSION H-5

Room: E

Title: Research Seminar/Workshop

Presider: Rosalie Grant

Determining the Power of Statistical Tests and Sample Sizes for
Research Studies

Rosalie Grant
Mid-Peninsula High School
3530 Ross Road
Palo Alto, CA 94306

1:00 p.m. - 2:00 p.m.

LUNCH - JRST & NARST Awards

2:15 p.m. - 3:15 p.m.

GENERAL SESSION III

Presider: John W. Renner, Past President, NARST
323 Physical Sciences Center
University of Oklahoma
Norman, OK 73019

Naturalistic Inquiry and Conventional Inquiry: An Evaluation

Wayne W. Welch
204 Burton Hall
University of Minnesota
Minneapolis, MN 55455

CONCURRENT SESSION I

3:30 p.m. - 4:30 p.m.

SESSION I-1

Room: A

Title: Outstanding Paper

Presider: Ellen S. Simmons
4315 Martha Ave.
Woodlawn Heights
New York, NY 10470

3:30 p.m. - 4:30 p.m.

SESSION I-2

Room: B

Title: Contributed Papers. Judgement and Decision Analysis

Presider: Alan M. Voelker
Dept of Curriculum and Instruction
Northern Illinois University
DeKalb, IL 60115

Evaluator: Bruce Tulloch
152 East 94th Street
New York, NY 10028

A Model of Class Inclusion Development Based On Subjects'
Verbal Justifications

Jean Sindhikara
Graduate School of Education
Rutgers University
New Brunswick, NJ 08903

TUESDAY, APRIL 7, 1981

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Objective Measures of Cognitive and Moral Judgment Level in Bioethics

John Finley
Cooperative Educational Service Agency
Griffin, GA 30224

Cheri M. Taylor
6031 Queenston Street
Springfield, VA 22152

An Investigation of the Relationships Between Students' Self Concept,
Mental Maturation, Degree of Openmindedness and the Numerical Values
They Assign to Indefinite Quantitative Words and Expressions

Pastor R. Rojas
Ninoska R. Rojas
Michael Duffy
School of Education
University of Pittsburgh
Pittsburgh, PA 15213

3:30 p.m. - 4:30 p.m.

SESSION I-3

Room: C

Title: Symposium

President: Carol Wareing
Department of Education
Tufts University
Medford, MA 02155

Evaluator: John R. Staver
School of Education
DePaul University
Chicago, IL 60614

Formal Operational Reasoning: Format, Content and Intervention

Jane Bowyer, Organizer
Department of Education
Mills College
Oakland, CA 94613

Robert Karplus
Steven Pulos
Elizabeth K. Stage
University of California
Berkeley, CA 94720

Marcia C. Linn
School of Education
Stanford University
Stanford, CA 94305

Discussant: Rodger Bybee
Department of Education
Carleton College
Northfield, MN 55057

3:30 p.m. - 4:30 p.m.

SESSION I-4

Room: D

Title: Contributed Papers. General Research

President: J. Hugh Baird
McKay Bldg. Box 72
Brigham Young University
Provo, Utah 34602

Evaluator: Walter A. Farmer
School of Education
SUNY at Albany
Albany, NY 12222

Applications of Scientific and Mathematical Processes Using Microcomputers:
Part II: Sex and Age Correlates to Estimation

Carl F. Berger
1110 School of Education Bldg.
University of Michigan
Ann Arbor, MI 48109

TUESDAY, APRIL 7, 1981

Thirty Studies Involving the "Scientific Attitude Inventory":
What Confidence Can We Have in this Instrument?

Hugh Munby
Faculty of Education
Queen's University
Kingston, Ontario, Canada K7L 3N6

Discussant: James J. Gallagher
Science and Mathematics Teaching Center
E-37 McDonel Hall
Michigan State University
East Lansing, MI 48824

3:30 p.m. - 4:30 p.m. SESSION I-5 Room: E

Title: Research Seminar/Workshop

Prsided: William H. Leonard

A Quantitative Procedure for Treatment Verification in
Science Teaching Research

William H. Leonard
Manter Hall of Life Sciences
University of Nebraska-Lincoln
Lincoln, NE 68588

CONCURRENT SESSION J

4:45 p.m. - 5:45 p.m. SESSION J-1 Room: A

Title: Contributed Papers. General Research

Prsided: Frank Fazio Evaluator: Victor L. Willson
Chemistry Department Dept of Educational Psychology
Indiana University of Pennsylvania Texas A&M University
Indiana, PA 15701 College Station, TX 77843

An Investigation of Relationships Between Cognitive Preference Orientation
and Jungian (MBTI) Personality Types of Eighth-Grade Science Students

John A. Novak
Science And Mathematics Education
The Ohio State University
Columbus, OH 43210

Burton E. Voss
College of Education
University of Michigan
Ann Arbor, MI 48109

Learning from Science Text Aided by Diagnostic and Prescriptive Instructional
Strategies Derived from Information-Processing Theory

Pierce Farragher
Academy of Natural Science
19th Street and Parkway
Philadelphia, PA 19131

Michael Szabo
202 Chambers Building
Penn State University
University Park, PA 16802

TUESDAY, APRIL 7, 1981

Discussant: Russell H. Yeany, Jr.
Dept of Science Education
University of Georgia
Athens, GA 30602

4:45 p.m. - 5:45 p.m.

SESSION J-2

Room: B

Title: Contributed Papers. Teacher Training

President: Fletcher G. Watson
52 Press Building
New York University
New York, NY 10003

Evaluator: George H. Love
3757 Chambers Hill Road
Harrisburg, PA 17111

A Comparison of Pupil Control Ideology of Science and Non-Science
Secondary Student Teachers.

Dan R. Jones
Dept of Curriculum, Instruction, and Media
Southern Illinois University at Carbondale
Carbondale, IL 62901

The Effects of a One-Day Energy Workshop on Science Teacher's Attitudes
Toward Energy-Related Topics

David L. Dunlop
112 Biddle Hall
University of Pittsburgh at Johnstown
Johnstown, PA 15904

Frank Fazio
Chemistry Department
Indiana University of Pennsylvania
Indiana, PA 15701

The Effect of Reasoning Workshops on the Teaching Strategies of
Secondary Science Teachers

Anne Lombard
School of Education
University of Massachusetts
Amherst, MA 01003

4:45 p.m. - 5:45 p.m.

SESSION J-3

Room: C

Title: An Hour With Past Presidents

President: Ronald D. Anderson
School of Education
University of Colorado
Boulder, CO 80302

An Informal Discussion of Trends in Science Education

4:45 p.m. - 5:45 p.m.

SESSION J-4

Room: D

Title: Contributed Papers. Achievement

President: Mary M. Atwater
2100 Desert Drive Apt. 53
Las Cruces, NM 88001

Evaluator: J. Dudley Herron
Department of Chemistry
Purdue University
West Lafayette, IN 47907

TUESDAY, APRIL 7, 1981

The Effect of an Explaining Module on Preservice Elementary Science Teachers' Knowledge of Explaining Teaching Behavior and Student Achievement

Joseph P. Riley II
Department of Science Education
University of Georgia
Athens, GA 30602

An Empirical Determination of Concepts Contributing to Successful Science Task Performance: A Study of Mineral Classification

William L. Yarroch
Fred N. Finley
226 Teacher Education Building
University of Wisconsin-Madison
Madison, WI 53706

Discussant: Elizabeth K. Stage
Lawrence Hall of Science
University of California
Berkeley, CA 94270

4:45 p.m. - 5:45 p.m. SESSION J-5 Room: E

Title: Research Seminar/Workshop. (Continuation of Session I-5)

President: William H. Leonard

A Quantitative Procedure for Treatment Verification in Science Teaching Research

6:00 p.m. - 7:00 p.m. SOCIAL HOUR

7:30 p.m. DINNER

Wednesday, April 8, 1981

9:30 a.m. - 11:00 a.m. EXECUTIVE BOARD MEETING Board Room

President: Stanley L. Helgeson
Science and Mathematics Education
Ohio State University
Columbus, OH 43210

CONCURRENT SESSION K

9:30 a.m. - 10:30 a.m. SESSION K-1 Room: A

Title: Contributed Papers. Curriculum Analysis

President: Roger G. Olstad
College of Education
University of Washington
Seattle, WA 98195
Evaluator: Dale R. Baker
Graduate School of Ed
Rutgers University
New Brunswick, NJ 08903

Textural Apprehension in Young Children-Development and Implications for Science Curriculum Design

Dennis W. Sunal
Cynthia S. Sunal
College of Human Resources & Education
West Virginia University
Morgantown, WV 26505

Evaluating Science Curricula: Relating Educational Process to Product

James D. Ellis
Science Education Center
University of Texas At Austin
Austin, TX 78712

Patterns in the Use of Elementary School Science Program Materials:
An Observational Study

Charles W. Anderson
Science and Mathematics Teaching Center
Michigan State University
East Lansing, MI 48824

9:30 a.m. - 10:30 a.m.

SESSION K-2

Room: B

Title: Contributed Papers. Visual and Spatial Relationships

President: Anthony Lazzaro
California State College
California, PA 15419

Evaluator: Robert K. James
Holton Hall
Kansas State University
Manhattan, KS 66506

Relationship Between Locus of Control and the Development of
Spatial Conceptual Abilities

Herbert G. Cohen
Department of Elementary Education
Arizona State University
Tempe, AZ 85281

Visual Testing and Visual Instruction in High School Biology

Michael Szabo
Francis Dwyer
202 Chambers Building
Penn State University
University Park, PA 16802

Hermes T. De Melo
Federal University of Bahia
Salvador, Bahia, Brazil

Comparison of High and Low Spatial Males and Females on
Selected Science Concepts

Carole Ann Camp
School of Education
University of Massachusetts
Amherst, MA 01003

9:30 a.m. - 10:30 a.m.

SESSION K-3

Room: C

Title: Contributed Papers. College Level Science

President: Martin D. Stewart
10 Lloyd Rd.
Norwalk, CT 06850

Evaluator: James P. Barufaldi
Education Bldg 340
University of Texas
Austin, TX 78712

College Level Physical Science for Non-Majors

John P. Schellenberg
Paul E. Bell
North Student Center
Kutztown State College
Kutztown, PA 19350

WEDNESDAY, APRIL 8, 1981

Effect of Experience with Investigative Biology on College Student
Views of Scientific Method and Knowledge

Margaret Waterman
Department of Education
Cornell University
Ithaca, NY 14850

Operational Determinants for Academic Promotion in
Undergraduate Science Departments

Gloria J. Dyer
Rutgers University & Fairleigh Dickinson Univ
West Passaic and Montross Avenues
Rutherford, NJ 07070

9:30 a.m. - 10:30 a.m.

SESSION K-4

Room: D

Title: Contributed Papers. Instrument-Development

Presider: Jane Bowyer
Department of Education
Mills College
Oakland, CA 94613

Evaluator: Carol Wareing
Department of Education
Tufts University
Medford, MA 02155

Validation of the Test of Integrated Science Process Skills

James R. Okey
Charles F. Porter
Department of Science Education
University of Georgia
Athens, GA 30602

F. Gerald Dillashaw
Department of Education
Bethany College
Bethany, WV 26032

Designing a Likert-Type Scale to Assess Attitude Toward Energy Conservation

Thomas R. Koballa, Jr.
Chambers Building
Pennsylvania State University
University Park, PA 16802

Discussant: Edward L. Smith
Science and Mathematics Teaching Center
E-37 McDonel Hall
Michigan State University
East Lansing, MI 48824

9:30 a.m. - 10:30 a.m.

SESSION K-5

Room: E

Title: Research Seminar/Workshop

Presider: William Capie

Assessing Pupil Engagement in Learning Activities

William Capie
Kenneth G. Tobin
Department of Science Education
University of Georgia
Athens, GA 30602

WEDNESDAY, APRIL 8, 1981

CONCURRENT SESSION L

10:40 a.m. - 11:40 a.m.

SESSION L-1

Room: A

Title: Contributed Papers. Attitudes and Science

Presider: Lily V. Holloway
3601 Conshohocken Ave. #422
Philadelphia, PA 19131

Evaluator: Ellen S. Simmons
4315 Martha Ave
New York, NY 10470

A Study of the Perceptual Orientation of Community College Students and
Their Attitudes Toward Science As They Relate to Science Achievement

Linda W. Crow
Math/Science Division
Houston Community College
Houston, TX 77007

Martha K. Piper
College of Education
University of Houston
Houston, TX 77004

Developing an Instrument to Measure Scientific Attitudes

Carol Wareing
Department of Education
Tufts University
Medford, MA 02155

Attitudes of Preservice Elementary School Teachers Toward Science Teaching:
Antecedents and Response to Field Experience

Joseph C. Cotham
Department of Science and Environmental Education
Indiana University
Bloomington, IN 47405

10:40 a.m. - 11:40 a.m.

SESSION L-2

Room: B

Title: Contributed Papers. Teaching Strategies

Presider: Susan C. Nurrenbern
University of Wisconsin-Stout
Dept of Chemistry
Menomonie, WI 54751

Evaluator: Vincent N. Lunetta
Science Education Center
University of Iowa
Iowa City, IA 52242

The Effects of a Modified Mastery Learning Strategy on Achievement,
Attitudes, and On-Task Behavior of High School Chemistry Students

F. Gerald Dillashaw
Department of Education
Bethany College
Bethany, WV 26032

James R. Okey
Department of Science Education
University of Georgia
Athens, GA 30602

The Effects of Problem Solving Training in Science Upon Utilization of
Problem Solving Skills in Science And Social Studies

Terry J. Shaw
204 Holton Hall
Kansas State University
Manhattan, KS 66506

Strategies Used by High School Students When Solving Genetics Problems

James H. Stewart
226 Teacher Education Building
University of Wisconsin-Madison
Madison, WI 53706

10:40 a.m. - 11:40 a.m.

SESSION L-3

Room: C

Title: Panel.

President: Robert E. Yager
Science Education Center
University of Iowa
Iowa City, IA 52242

Evaluator: J. Hugh Baird
Box 72, McKay Bldg
Brigham Young University
Provo, UT 84602

Research and the Crisis in Science Education

Joseph Lipson
Robert Watson
Rita Peterson
Kathleen Fisher
Science Education Development and Research Program
National Science Foundation
Washington, DC 20550

10:40 a.m. - 11:40 a.m.

SESSION L-4

Room: D

Title: Contributed Papers. Cognitive Development

President: Brooke M. Pridmore
Div. of Natural Sciences & Mathematics
Clayton Junior College
Morrow, GA 30260

Evaluator: Martin D. Stewart
10 Lloyd Road
Norwalk, CT 06850

The Relationship Between Science Process Skill and Formal Thinking Abilities

Michael J. Padilla
James R. Okey
Department of Science Education
University of Georgia
Athens, GA 30602

F. Gerald Dillashaw
Department of Education
Bethany College
Bethany, WV 26032

The Effect of Science Teaching on the Fourth-Grade Child
Concept of Piagetian Physical Causality

Louise L. Gann
Alcoa Elementary School
Alcoa, TN 37701

H. Seymour Fowler
168 Chambers Building
Pennsylvania State University
University Park, PA 16802

Discussant: James T. Robinson
Center for Educational Research
and Evaluation
P.O. Box 930
Boulder, CO 80306

WEDNESDAY, APRIL 8, 1981

10:40 a.m. - 11:40 a.m. SESSION L-5 Room: E

Title: Research Seminar/Workshop (Continuation of Session K-5)

Presider: William Capie

Assessing Pupil Engagement in Learning Activities

CONCURRENT SESSION M

11:50 a.m. - 12:50 p.m. SESSION M-1 Room: A

Title: Committee Meetings

Rooms will be available for committee meetings. Chairpersons are responsible for arranging meetings.

11:50 a.m. - 12:50 p.m. SESSION M-2 Room: B

Title: Contributed Papers. Test Instruments

Presider: Kathleen M. Fisher Evaluator: Lily V. Holloway
National Science Foundation 3601 Conshohocken Ave
1800 G. Street Philadelphia, PA 19131
Washington, DC 20550

The Development of an Inquiring Practical Examination For
Upper Elementary Children

Edward L. Smith
Science and Mathematics Teaching Center
Michigan State University
East Lansing, MI 48824

The Development of a Test Instrument for Marine Knowledge of Adults
in Northern New England

Wesley H. Medlund
John W. Butzow
206 Shibles Hall
University of Maine at Orono
Orono, ME 04469

An Analysis of Research Studies Utilizing "Home-Made" Achievement Instruments

Jean Hastings
James H. Stewart
226 Teacher Education Building
University of Wisconsin-Madison
Madison, WI 53706

WEDNESDAY, APRIL 8, 1961

11:50 a.m. - 12:50 p.m. SESSION M-3 Room: C

Title: Round Table Discussion

Presider: Patricia E. Blosser
Science and Mathematics Education
Ohio State University
Columbus, OH 43210

Reasoning Patterns of College Level Science Students

George J. Pallrand
Michael D. Piburn
David Van Harlingen
Walter Lockwood
William Martin
Graduate School of Education
Rutgers University
New Brunswick, NJ 08903

11:50 a.m. - 12:50 p.m. SESSION M-4 Room: D

Title: An Hour With The President-Elect

11:50 a.m. - 12:50 p.m. SESSION M-5 Room: E

Title: Round Table Discussion

Prsieder: Ramona J. Anshutz
State Department of Education
120 East 10th Street
Topeka, KS 66612

Science Education: Accomplishments and Needs

Robert E. Yager
Science Education Center
University of Iowa
Iowa City, IA 52242

John W. Renner
323 Physical Science Center
University of Oklahoma
Norman, OK 73109

James J. Gallagher
Science and Mathematics Teaching Center
Michigan State University
East Lansing, MI

Ertle Thompson
Department of Science Education
University of Virginia
Charlottesville, VA 48823

1:00 p.m. - 2:30 p.m. LUNCH

GENERAL SESSION IV Room: G

Prsieder: NARST President-Elect

Consideration of Types of Error in Science Education Research

Arthur L. White
Science and Mathematics Education
Ohio State University
Columbus, OH 43210

WEDNESDAY, APRIL 8, 1981

SCIENCE-MATHEMATICS EDUCATION
283 ARPS HALL
THE OHIO STATE UNIVERSITY
COLUMBUS, OHIO 43210

Misconceptions

How to pattern in how they are.

*Are misconceptions acquired by
experience*