PRESIDENT'S COLUMN
Russell H. Yeany

DISSEMINATION AND IMPLEMENTATION OF RESEARCH FINDINGS: IMPACTING PRACTICE

Research is carried out with two basic goals in mind. The first is to generate knowledge and understanding, the second is to influence practice. Both of these purposes will be rather hollow if effective dissemination of the findings does not occur. In regard to the dissemination of knowledge, the science education research community has made good use of the traditional methods of sharing our findings. We write dissertations, monographs, papers, and articles. We listen to, read, and make reference to these findings. Often, we use the new understanding and knowledge to plan for and modify further research. And thereby, the knowledge is elaborated and expanded until we develop some fairly complex notions about how things, like the teaching and learning of science, work. Dissemination of research findings, within the research community, occurs in a rather systematic and effective fashion.

On the other hand, the implementation of the findings to affect practice is rather hit or miss, mostly miss. We have not been able to develop a systematic, effective approach to implementation. The process is interesting to think about in relation to the methods we rely on to have our research findings reflected in science education practices. I have generated a few metaphors that represent how we attempt to have our second goal of science education research fulfilled.

The first is the Botanical metaphor. Like a fertile plant, we produce an overabundance of seeds knowing that most will not survive; but a few, simply by chance, will fall in an environment that is conducive to their survival. The mechanisms operating here are sheer numbers and chance. Both work to insure the survival of a species. But we can not afford to rely on either of these mechanisms for the implementation of research findings.

A second is the Marketing metaphor. In this case, we develop hype and target a particular audience in the hope that they will “purchase” and make use of the findings. This metaphor is expressed in such efforts as NARST’s “Research Matters” and NSTA’s "What Research Says” columns. The mechanisms operating in this model are the message, the selection of a target audience, and the recognition of a need. This is a significant improvement over the random dispersal described above. However, there is still much to be desired in this approach. There is not a tailored match between a specific need and the hyped findings. And, it is extremely problematic to assume that the targeted audience has the skills or motivation to implement the findings in such a way that results are optimized.

A third metaphor is labeled Engineering. Here the researched based solution is brought to a specific need or problem. In this case, it is assumed that science education research has produced some knowledge and understandings that can be effectively translated into practice. The mechanisms operating in this process are the existence of the critical and specific findings, the articulation of the problem, and the integration of the two. This process demands the involvement of special skills, interests, and aptitudes that neither the researcher nor the practitioner is likely to possess. If we are to rely greatly on this approach, we need to define the role of the educational engineer and begin to develop degree programs for them.

A final thought is represented in the Self Reliance metaphor in which the research is not distinct from the practice. There is a oneness or wholeness present in the form of a team or even a single person with a very broad perspective in which research is carried out in the natural setting, in response to immediate and personal needs. Such needs require specific solutions. In this case, implementation is a mute issue because it occurs simultaneously with and probably is synonymous with the generation of the knowledge and understanding gained from the research. The major mechanism operating here is the wholeness of the model. There is no gap between research and practice. The problem of implementation is nonexistent. Both of the goals set for conducting science education research are met simultaneously. In a sense, the process is self-actualizing, self-fulfilling and self-energizing.

I have presented the above metaphors representing our efforts to implement research findings in what I believe is an ascending order of effectiveness. However, I also believe they are presented in a descending order of usage. If this contrast is valid, we need to develop a more formal agenda regarding the influence of our research on the actual teaching and learning of science. This agenda setting should occur at the individual, the organizational, and funding agent level.
FROM THE JRST EDITOR

NEW MEMBERS ADDED TO THE JRST EDITORIAL BOARD

Nine new members have been added to the JRST Editorial Board:

William Coburn, Arizona State University at Phoenix
Angelo Collins, Florida State University
Jong-Ha Han, Korean Educational Development Institute, Seoul
David Haury, Ohio State University
Nancy Romance, Florida Atlantic University
Wolf-Michael Roth, Appelby College, CAN
Hans-Jurgen Schmidt, University of Dortmund, GER
Joan Solomon, University of Oxford, ENG
Nancy Songer, University of Colorado

They replace the following persons who are retiring from the Board:

Ted Bredderman
Linda Cronin-Jones
Joe Krajcik
Gerald Krockover
Bill Lashier
Mike Smith
David Treagust

Also, Catherine Cummins, Ph.D. candidate and my editorial assistant at LSU for nearly three years, has been replaced by Sherry Demastes. Catherine did an outstanding job and Sherry has quickly adapted to the system.

The special issue of JRST edited by Rodger Bybee, James Ellis, and Michael Matthews, “Teaching the History and Nature of Science and Technology” is scheduled for publication in April or May, 1992. Additional copies of all special issues of JRST are available from John Staver, NARST Executive Secretary.

Jim Wandersee, Associate Editor of JRST is now a tenured Associate Professor at LSU. From Fall 1989 until Spring 1991 Jim was Visiting Scholar and JRST Associate Editor.

All inquiries and comments regarding JRST should be directed to Ron Good, Editor, 223-E Peabody Hall, Louisiana State University, Baton Rouge, LA 70803. (504) 388-2442

SPECIAL ISSUE OF JRST PLANNED

Call for Papers

Editor: Anton E. Lawson

Proposed Focus

Research in the history of science suggests that analogies play a significant role in the process of scientific discovery. In addition to the history of science, the fields of neural modeling, psychology, educational psychology, and science education are actively investigating the role of analogy, analogical reasoning and analogical transfer in concept acquisition, in concept retention (i.e., in long term memory), in concept transfer and in argumentation. The purpose of the proposed special issue is to explore both theory and empirical research in these areas to achieve a better understanding of the role that analogies might play in the improvement of science teaching.

Possible Topics

- The way(s) in which analogies have contributed to scientific discovery
- The role of analogy in learning, in recall, and in transfer of learning
- The role of analogy in reasoning and argumentation
- The development of analogical reasoning across age
- The relationship between analogical reasoning and other patterns of scientific reasoning
- How analogies can be used in science instruction to improve science concept acquisition and the development of scientific thinking skills

Time Line

Papers Due: December 1, 1992
Reviews Returned: March 15, 1993
Revisions Due: June 15, 1993

This special issue will appear in late 1993. All contributed manuscripts should be directed to Ron Good, Editor, 223-E Peabody Hall, Louisiana State University, Baton Rouge, LA 70803. (504) 388-2442

NARST COMMITTEE NEWS

International Issues

The Committee on International Issues is now an official standing committee of NARST and is chaired by a NARST Board member. In the future, NARST will serve international members better, and the excellent research being conducted outside the USA will be disseminated more effectively to the NARST membership.

continued on page 3 - COMMITTEE NEWS
At the 1992 annual meeting of NARST in Boston, the International Committee will have a display of relevant publications produced in other countries. International members are invited to bring along publications and notices to the annual meeting for this purpose.

For further information, please contact the Chair of the Committee on International Issues, Professor Barry Fraser, Science and Mathematics Education Centre, Curtin University, GPO Box U1987, Perth 6001, Western Australia (FAX 61 9 351 2503).

Monographs on Science Education

Curtin University is pleased to announce publication of the following new monographs:

Barriers to Learning Science with Understanding by Ken Tobin, Leonie Rennie, and Barry Fraser

Environments for Learning Science and Mathematics by Barry Fraser and Ken Tobin

Learning in Science Viewed as Personal Construction edited by Jeff Northfield and David Symington

These monographs can be ordered by sending a check payable to “Curtin University” to the Science and Mathematics Educational Centre, Curtin University, GPO Box U1987, Perth 6001, Western Australia. The cost of each monograph is $10.00 US, which includes postage and handling.

NARST Awards

Persons wishing to have their papers considered for the 1992 NARST Outstanding Paper Award must do one of the following:

1. Mail eight copies of the paper, postmarked no later than March 25, 1992, to the Chair of the NARST Awards Committee.

2. Place one copy of the paper in the box marked “1992 NARST Outstanding Paper Award” that will be located near the registration table at the 1992 annual meeting and mail seven additional copies of the same paper to the Chair of the NARST Awards Committee postmarked no later than March 31, 1992.

Tom Koballa is currently serving as Chair of the NARST Awards Committee. Address all correspondence to him at the Department of Science Education, 212 Aderhold Hall, University of Georgia, Athens, Georgia 30602.

The following slate of candidates appears courtesy of the NARST Elections Committee. A formal ballot will be sent to all current NARST members at a subsequent date.

President-Elect: Kenneth Tobin Burton Voss

Executive Board: Richard Duschl Cheryl Mason Carole Mitchener Peter Rubba

Research Coordinator: Audrey Champagne Frank Crawley

CANDIDATE STATEMENTS

Kenneth Tobin (President-Elect)

Kenneth Tobin taught physics, chemistry, biology, mathematics, and general science in high schools in Australia (8 years) and England (1 year) and worked as a curriculum developer (2 years). For the past 17 years he has been a science teacher educator in Australia and the United States. Currently he is professor and program coordinator of science education at Florida State University.

Tobin’s research interests include teacher learning and curriculum change within changing cultures. He has published 3 books, more than 100 papers in refereed journals, and more than 30 chapters in books. He has presented more than 160 papers at international, national, and regional meetings. Tobin was a co-organizer of the first international conference on the History and Philosophy of Science and Science Teaching conference, held in 1989 at Florida State University.

Tobin is the recipient of 16 awards from professional associations including the NARST Outstanding Paper Award (1991, 88), NARST Practical Applications Award (1984, 86), AETS Outstanding Paper Award (1980, 85, 86, 88), AETS Outstanding Teacher Education Program (1991), AERA’s Interpretive Scholarship Award (1988), AERA’s Cattell Early Career Award (1989), a best paper award from AERA’s special interest group on the Study of Learning Environments, the JRST Award (1987/88), a special recognition award from Science Education (1987/88) and a Senior Fulbright Award (1985).

Tobin was a member of the JRST Editorial Board and is completing a term on the NARST Executive Board.

continued on page 4 - CANDIDATES
CANDIDATES (continued)

where he is Chair of the Publications Committee and Co-Chair of the Distinguished Contributions to Research Award Committee. He is presently a member of the Editorial Review Boards of the American Education Research Journal and the Journal of Research in Science and Technological Education, is editor for the North American region of the International Journal of Science Education and series editor for AAAS Press for books on research in science and mathematics education and equity issues.

Tobin's main interest in seeking a term as President of NARST is to assist members to have a voice in establishing a research agenda for science education. NARST can provide a vehicle for collaborative research and networking that can assist the organization to fulfill what has been an elusive vision of improving the quality of learning and teaching science through research.

Burton Voss (President-Elect)

Professor Burton Voss has worked extensively in science assessment and K-12 science curriculum evaluation. He chaired the 1972 science portion of the National Assessment of Educational Progress and has been Project Director of the NSTA Self-Assessment of Elementary, Middle Level and High School Science. Twice he has been selected to update the “Science” section of the Evaluative Criteria, a guide for accrediting secondary schools. During his tenure at the University of Michigan he has chaired over 70 doctoral dissertations. In 1983, his review of Research in Science Education 1981, was published in Science Education.

Voss has served as president of the National Association of Biology Teachers, School Science and Mathematics Association, and Chair of Section Q, Education, of the American Association for the Advancement of Science. NARST activities have included serving on the Outstanding Researcher Award Committee, the Policy Committee, the Program Committee and chairing a special task force to enhance the relationships between NARST and science teacher organizations. He has chaired the Publications Committee of NSTA and chaired a task force of that organization which developed the NSTA lead paper Science and Technology Education for the Twenty-First Century.

Voss has published articles representing a variety of areas—interaction analysis in biology, middle school science and social studies integration, computer assisted instruction and curriculum evaluation. He is co-author of a textbook, Biology as Inquiry, has developed monographs and contributed chapters to books.

Service types of activities include directing NSF Institutes, Energy Institutes and Eisenhower Funded Programs. He also serves as a consultant to local, state, national and international agencies.

Voss is a Fellow of AAAS and has received Distinguished Service to Science Education Citations from the National Science Teachers Association and the Michigan Science Teachers Association.

Richard A. Duschi (Executive Board)

Richard A. Duschi (Ph.D. University of Maryland 1983) is an Associate Professor in the School of Education with a secondary appointment to the Center for Philosophy of Science at the University of Pittsburgh. He has been an active member of NARST for ten years with service on the J_RST Committee twice, membership on the editorial board of the J_RST and service on the advisory board of Investigations in Science Education.


Richard is the Associate Editor of Science Education and the newly appointed Editor for Teachers College Press’ science education series.

In addition to his involvement with NARST, Richard has also been active in the American Educational Research Association as program chair for the Special Interest Groups on Subject Matter Knowledge and Conceptual Change (1989-1991) and The Study of Learning Environments SIG (1987-88). At the local level, he has always been involved with earth science teachers organizations.

Richard maintains that science education research and practice are in the midst of very rapid restructuring brought about by dynamic international research efforts from scholars working in or with science education, educational psychology, anthropology, philosophy of science, feminist theories, artificial intelligence, assessment and cognitive science. It is clear that the issues and participants of science education research are much broader today than just 10 years ago. If continued on page 5 - CANDIDATES
CANDIDATES (continued)

elected to the Board, he plans to initiate and support activities that will facilitate the development of an interdisciplinary dialogue about science teaching, science learning and science curriculum/textbook writing.

Cheryl Mason (Executive Board)

Cheryl Mason is an Associate Professor of Science Education and Adjunct Professor of Biological Sciences at San Diego State University. She received her Ph.D. in Science Education and Educational Computing from Purdue University, and her bachelor and masters degrees in Biological Science from Indiana University. Working mainly with preservice teachers, her research focus is on the relationship of cognitive and attitudinal factors with successful science teaching and learning. She has numerous scholarly publications and papers in these areas in journals such as Journal of Research in Science Teaching, Science Education, School Science and Mathematics, The American Biology Teacher, Tech Trends, Teaching Education, Journal of Science Teacher Education, and Journal of Computing in Childhood Education.

Prior to joining the faculty at SDSU, Mason was an adjunct professor of biological sciences at Purdue University Calumet and a visiting assistant professor in science education at Purdue University, West Lafayette. In addition, she taught middle level and high school science, receiving such honors as the first National Space Educator Award and the first Presidential Award for Excellence in Science and Mathematics Education.

Mason is a member of several professional organizations including NARST, NSTA, NABT, AERA, AETS and PDK. In addition to being a presenter and presider at regional and national professional meetings, she has assumed numerous leadership roles including program chair of the NABT national convention and member of the executive committee for the NSTA board of directors. She is presently a member of the NARST awards and honors committee, has served on a variety of committees for AETS, NABT and NSTA, serves as a consultant to national foundations as well as to local and state organizations, and reviews for a number of professional journals.

Carole Mitchener (Executive Board)

Carole Mitchener offers a broad perspective on science education. Beyond understanding science and science education, she also understands the broader field of curriculum studies. Mitchener's research integrates knowledge of science teaching and learning with curriculum theory in order to enhance practice in schools.

Mitchener's research within curriculum studies has centered primarily on science teachers; their beliefs, values and actions. She has studied the teacher in varied curriculum development efforts, primarily in-service teacher education, from elementary to high school levels. Most recently, her research focuses on pre-service education, the development of the science teacher.

In addition, Mitchener's work examines the way science is portrayed in science education. She has used curriculum models to explore the various faces of science and how they are represented in science education. Her research has examined how science, technology and society goals reflect the liberal arts perspective of science.

Mitchener's professional activities are varied. She has published articles, chapters, science curricula, and abstracts. Her publications have appeared in the Journal of Research in Science Teaching, Interpretive Research in Science Education (NARST monograph), Partnerships in Chemical Research and Education (ACS monograph), as well as national and local curriculum handbooks. In addition, Mitchener has co-authored a series of six children's science books published by Modern Curriculum Press. She has made numerous paper presentations to a variety of professional organizations, including NARST, NSTA, ASCD, AACTE and AERA.

Mitchener has served on science education committees at the national, state and local levels. Within NARST, she has been serving on committees for the past five years. Recently, Mitchener completed a two-year appointment on the Research Committee for the National Science Teachers Association. She is active in the Curriculum Studies division of AERA.

Mitchener has consulted in numerous local school districts in science education and curriculum development.

Peter Rubba (Executive Board)

Peter A. Rubba is an Associate Professor of Science Education, and of Science, Technology and Society, at The Pennsylvania State University. He holds a B.S. in Chemistry/Math from Ashland College (1969), and a M.A. in History and Philosophy of Science (1974) and an Ed.D. in Science Education (1977) from Indiana University-Bloomington. He is a former chemistry, general science, and physics teacher. Rubba joined the faculty at Penn. State in 1984 after eight years on the faculty at Southern Illinois University at Carbondale. At Penn. State, Rubba teaches undergraduate and graduate level science education courses. He has served since 1988 as Professor-in-Charge of Science Education, and formerly served as the first director of the Center for Education in Science, Technology and Society (1985-1988).

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CANDIDATES (continued)

Rubba’s research focuses on the integration of STS and science instruction at the middle/junior high and high school levels, and teacher development in STS education. He has published widely on these and other science education topics in journals, such as, The American Biology Teacher, Bulletin of Science, Technology and Society, International Journal of Science Education, Journal of Chemical Education, Journal of Research in Science Teaching, Science Education, School Science and Mathematics and The Science Teacher, and has written for NSTA and AETS publications. He is co-editor of the recent book, Science Education in the United States: Issues, crises and Priorities, and has been a frequent presenter at AETS, NARST, NSTA, TLC, and state level professional meetings. Rubba’s interest in science teacher education is highlighted by the number of teacher education grants he has received; including seven NSF teacher enhancement projects, six state level teacher training grants (e.g., Dwight D. Eisenhower Mathematics and Science Awards) and awards from ACTION, as well as grants from the GTE Education Foundation to support Minority Doctoral Fellowships in Science and Mathematics Education. He has, in addition, received research grants from the U.S. Department of Education and private foundations, and is presently directing a research grant from the National Science Foundation on teacher development in STS Education.

Rubba’s recent service to science education professional organizations includes: membership on the planning committee for the 1989 NSTA Regional Convention in Atlantic City, the AETS Board of Directors, and membership on the editorial boards of School Science and Mathematics and the Journal of Elementary Science Education. He recently was appointed to the National Board for Professional Teaching Standards, Early Adolescence/Science Standards Committee. His service to NARST includes membership on the NARST Awards Committee (1979-1981, 1984-1987), the JRST Editorial Review Board (1985-1989), and the NARST Program Committee (1987-1990).

Audrey B. Champagne (Research Coordinator)

Audrey B. Champagne is a professor of education and chemistry at the State University of New York at Albany. She has served as Co-Director of the National Center for Improving Science Education where she is currently Senior Scientist. From 1984 to 1990 she directed the AAAS Forum for School Science and the Project on Liberal Education and the Sciences. Champagne was a Senior Scientist and Project Director at the Learning Research and Development Center and Research Professor of Education at the University of Pittsburgh before going to Washington, DC, in 1984.

Champagne conducted psychological research on physics learning and was co-director of an elementary science curriculum development project. Champagne holds a BS and an MS in Chemistry from SUNY Albany, and ED.M. in Science Education from Harvard, and a Ph.D. in Education from the University of Pittsburgh. She has published over 45 papers on the school science curriculum, curriculum development, and the psychology of science learning.

Champagne is a member of the American Chemical Society, National Science Teachers Association, the American Educational Research Association, and is a Fellow of the AAAS. She is on the editorial boards of Science Education, Studies In Science Education and The Journal of College Science Teaching.

Champagne serves on advisory boards for projects at the Educational Testing Service, Rand Corporation, SRI International, and the Biological Sciences Curriculum Study. She regularly serves on review panels for the Department of Education’s Office of Research and Improvement and the NSF’s Directorate for Education and Human Resources.

Frank Crawley (Research Coordinator)

Frank E. Crawley has worked extensively in the preparation of secondary science teachers at The University of Texas at Austin to teach majority and minority students, in rural and urban settings. He has conducted several assessments of the needs of middle and high school science teachers, and has directed and taught in several externally funded, summer and academic year institutes designed to improve the teaching of science by applying research findings and updating science content knowledge. His research has examined the relationship between attitudes and the science-related behaviors of in-service and pre-service science teachers as well as secondary science students in several foreign countries (Korea, Israel, Taiwan) and majority and minority students in Texas. Additional research has included qualitative and quantitative studies of teaching and learning. Most recent research has tested strategies designed to encourage more Hispanic students to pursue advanced science study.

Crawley has been active in the National Association for Research in Science Teaching for nearly two decades. He has presented 19 research papers at annual meetings of the NARST. His paper presented at the 1990 Annual was selected to represent the NARST at the 1991 National Convention of the NSTA in Houston. He has served on the NARST Awards Steering Committee and the JRST Award Committee, and has served on the editorial review boards of the Journal of Research in Science Teaching, Science Education, (AETS Section), and Science Activities. He has written over 60 articles, reports, reviews, and abstracts as well as one book and three book chapters. In addition, he recently served as coauthor (with T. Koballa and R. Shrigley) of A Summary of Research in Science Education: 1988.

If elected, Crawley will strive to improve science education research and expand the participation of NARST members in the ongoing efforts to reform contemporary science education.
Report from the NARST Program Committee

Preliminary Program

for the 1992

NARST Meeting

Hyatt Regency - Cambridge Hotel

Boston, Massachusetts

March 21-25, 1992
Report from the Program Committee
By Emmett L. Wright, President-Elect

The March 1992 NARST annual meeting will be held on March 21-24, 1992, in the Hyatt Regency Cambridge in Boston. A very modern 16-story pyramidal structure, the hotel is located on the north shore of the Charles River, adjacent to MIT and close to Boston University and Harvard, and two miles from downtown Boston and the Hynes Convention Center (where the NSTA convention will take place). Complimentary shuttle service will be provided to Hynes Convention Center, Harvard Square, Kendall Square, Fanevil Hall, and downtown Boston. The hotel will provide, to registered guests, complimentary use of its health club which includes: 75 foot Junior Olympic sized swimming pool, sauna/steam room and whirlpool, universal equipment, aerobic classes, sundeck.

The 1992 national meeting is shaping up well. A record number of proposals have been submitted for consideration. The expanded program committee has now reviewed all proposals, with each member reading at least 20-25 proposals. Based on the blind review process, the papers have been evaluated and placed in appropriate categories.

In preparing the preliminary program we have scheduled the following number of sessions:

- Contributed Papers: 30
- Contributed Paper Sets: 4
- Round Table Discussions: 2
- Research Training Workshops: 2
- Poster Sessions: 7
- Discussion Groups: 15
- Symposia: 10

General Session Speakers
Three general sessions will be scheduled for the meeting:

- Saturday, March 21, 7:00 - 9:00 p.m.
- Sunday, March 22, 1:30 - 3:30 p.m.
- Tuesday, March 24, 1:30 - 3:30 p.m.

Keynote speakers on topics of broad interest to the membership of NARST are being slated for the general session.

On Saturday, March 21, Jill Larkin and Fred Reif, Carnegie-Mellon University, will jointly discuss cognitive science research issues in science education.

On Sunday, March 22, Deborah Ball, Michigan State University, will give the presentation, "Using New Technologies for Research on Teaching and Teacher Education: Implications for Science Education Research."

The Keynote speaker for Tuesday, March 24 has yet to be confirmed. The name of the speaker will be announced in the March issue of the Newsletter.

Receptions
A new members reception will be held from 9:30 p.m. - 11:00 p.m. on Saturday, March 21, 1992. All current members are invited to attend and welcome new members.

A reception for international members will be held from 8:00 p.m. - 9:00 p.m. on Monday, March 23, 1992, by invitation only. International members should contact Dr. Barry Frasier for details. His address is: Barry Fraser, Curtin University of Technology, GPO Box U 1987, Perth 6001, AUSTRALIA.
Special Sessions
A "tea-time" symposium, organized by Gerald Abegg and Pat Freitag, and hosted by Boston University, will be held from 4:15 p.m. - 6:15 p.m. on Monday, March 23. All members are encouraged to attend the session, hosted by the Science and Mathematics Education Center, College of Education. Refreshments will be provided by the Center. The informal symposium will provide a hands-on exploration of the use of technology in science education research. (Participants will move from station to station with drink in hand.) Each presenter will have a complete set of equipment to demonstrate the use of technology to provide instruction, develop curriculum, assess student learning, and collect and analyze data. All participants will have the opportunity to informally discuss technical and research questions related to the use of technologies for educational research. The tentative list of presenters to date includes: Gerald Abegg, Boston University; Pat Freitag, University of Wisconsin-Madison; Robert Sherwood and John Bransford, Vanderbilt University; Carl Berger, University of Michigan; Ron Browne and Charlene Czerniak, University of Toledo; and Gene Stanley, Boston University.

A graduate student/new researcher informal discussion session is planned for 5:00 p.m. - 6:30 p.m., Tuesday March 24, Crispus Attucks Room. Bill Holliday, Jane Butler Kahle, Francis Lawrenz, Kenneth G. Tobin, and Emmett L. Wright will participate in the discussion. Networking ideas will be shared. All graduate students and new researchers are encouraged to attend.

Networking/special interest sessions are being organized for 8:00 p.m. - 10:30 p.m. on Tuesday, March 24. When you arrive, please sign up for the session that is of special interest to you. Sign-up schedules will be on the bulletin board placed near the registration desk.

Annual Review of Research
Fred Finley, Frances Lawrenz, and Pat Heller, University of Minnesota, will share their synthesis of the science education research literature from 1989 (to be published in Science Education), Crispus Attucks Room, Sunday, March 22, 3:30 - 4:30 p.m.

Research Training Workshops
Saturday, March 21, 1:00 - 4:00 p.m. The Research Committee, under the leadership of Frances Lawrenz, has asked Barbara Spector, the Research Director of NSTA, to organize two research training workshops around the title, "The Variety of Qualitative Research Traditions: Implications for Science Education Research." Norman Lederman, Carolyn Carter, Merlen Glass, and Meta VanSickle will work with Barbara in conducting the workshops. One workshop will focus on topics for newcomers to qualitative research. The concurrent workshop will provide a forum for experienced qualitative researchers.

The presenters will emphasize that the forms of qualitative research are as varied as the questions that may be asked about teaching and learning. Participants will examine characteristics, assumptions, and evaluation criteria for a variety of qualitative research traditions and the practical implications of this diversity for evaluating research in science education. Data samples will be used to relate theory to practice. The discussions in each group will emerge from the questions, concerns, and interests expressed by participants. Researchers are invited to share data of their own.

In addition, the presenters will demonstrate how multidimensional images of science teaching (gathered from using a broad range of qualitative traditions in science education research) possess the potential to create more meaningful roles for research in the life of the classroom teacher.
Committee Meetings
To accommodate additional meeting time for standing committees, sessions have been formally scheduled on Sunday, March 22, 7:30 - 8:30 a.m., and Wednesday, March 25, 7:30 - 8:30 a.m. for the Publication Advisory, Election, JRST Award, Distinguished Contributions, and Program Committees; and Monday, March 23, 7:30 - 8:30 a.m. and Wednesday, March 25, 8:30 - 9:30 a.m. for the Policy Advisory, Research, Financial Advisory, NARST Award, Dissertation Award, and International Issues Committees. Also, the lunch hour, 12:00 - 1:30 p.m., on Sunday, March 22, has been set aside for any existing ad hoc committees to hold a meeting or for committees to schedule an additional meeting. All committees are free to meet at other times, if it can be organized by the chair, of course.

NSTA Boston Convention
It is our understanding that the NSTA convention begins on Thursday, March 26, with short courses, special tours, and scheduled meetings of the Board, standing committees and appointed task forces.

NARST Annual Business Meeting
The annual Business meeting has been scheduled purposely early in the program so all members present for the meeting have the opportunity to attend. Several important issues vital to the future of NARST will be addressed. It is important that all members participate in the discussions.

Program and Proceedings
For your reference, a preliminary program for the 1992 Boston meeting is included in this section of the newsletter. The NARST Board, at its October meeting, decided not to mail a copy of the full program to all members prior to the 1992 meeting. Instead, only individuals who pre-register for the meeting by the deadline date will be mailed program. On-site registrants will be provided with a copy. Those not attending the annual meeting may purchase a copy of the program from the NARST executive secretary.

The 1992 annual meeting proceedings will be available only at the Boston meeting, as part of the registration package. The NARST Board also decided at the October meeting that all others desiring a copy of the proceedings should purchase it from the NARST executive secretary.

Details on how to purchase copies of the 1992 NARST annual meeting program and proceedings will appear in the next issue of the NARST Newsletter.
65th Annual Meeting of NARST
March 21-25, 1992
Cambridge Hyatt Regency Hotel
Boston, Massachusetts
Preliminary Program

A1-1
Saturday, March 21, 1992
1:00 pm

NARST Executive Board Meeting
1:00 - 6:00, Room 202

Research Training Workshop
1:00 - 4:00 p.m.

A2-1
Session 1: Haym Saloman
Room (for newcomers to qualitative research)

A2-2
Session 2: Molly Pitcher
Room (for experienced qualitative researchers)

Variety of Qualitative Research Traditions: Implications for Science Education Research
Barbara Spector
University of Southern Florida
College of Education
Tampa, FL 33620

Norman Lederman, Oregon State University
Carolyn Carter, Ohio State University
Merlen Glass, Meta Van Sickle, University of Southern Florida

A3-1
Saturday, March 21, 1992
7:00 pm, JFK Ballroom

General Session I

A4-1
Saturday, March 21, 1992
9:00 pm Thomas Paine A and B Rooms

NARST reception for new members

B1-1
Sunday, March 22, 1992
7:30 am Crispus Attucks Room

JRSA Award Committee, Mary Atwater, Chair

B1-2
Sunday, March 22, 1992
7:30 am William Dawes A Room

NARST Financial Advisory Committee, Dorothy Gabel, Chair

B1-3
Sunday, March 22, 1992
7:30 am Molly Pitcher Room

NARST Publications Advisory Committee, Kenneth G. Tobin, Chair

B1-4
Sunday, March 22, 1992
7:30 am William Dawes B Room

NARST Election Committee, Jane Butler Kahle, Past President

B1-5
Sunday, March 22, 1992
7:30 am Haym Saloman Room

NARST Program Committee, Emmett Wright, President-elect

B2-1
Sunday, March 22, 1992
8:30 Crispus Attucks Room

Symposium: Science Anxiety
Charlene M. Czerniak
University of Toledo
College of Education
Toledo, OH 43606

Mary Westerback, Long Island University
George Davis, Moorhead State University

B2-2
Sunday, March 22, 1992
8:30 William Dawes A Room

Contributed Papers: Science Teaching

Experienced Science Teachers
Teaching Science Outside Their Area of Certification
Linda Sanders
Christopher Newport College
Department of Education
Newport News, VA 23606

Science Laboratory Classroom Environments at Schools and Universities: A Cross-National Study
Barry J. Fraser
Curtin University of Technology
GPO Box U 1987
Perth 6001, AUSTRALIA

Geoffrey J. Giddings, Curtin University of Technology
Campbell J. McRobbie,
Queensland Univ of Tech

Draft 2: December 17, 1991
B2-2 continued
The Effect of Laboratory Versus
Lecture Science Teaching Methods:
A Meta-Analysis
Jacqueline Hykle
University of Cincinnati
Room 608 Teachers College
Cincinnati, OH 45221-0002

B2-3
Sunday, March 22, 1992
8:30 Molly Pitcher Room
Paper Set: Gender Differences
Where are the Gender Differences in
Attitude Toward Science and What
Do They Mean?
Dale Baker
Arizona State University
Div of Curric and Instr
Tempe, AZ 85287-0911
Rosemary Leary, Rick Trammel,
Arizona State University

Reliability and Validity of Two
Measures of Attitude Toward Science
Michael D. Piburn
Arizona State University
Div of Curric and Instr
Tempe, AZ 85287-1011
Lawrence Sidlik, Sean Mulvenon,
Arizona State University

Career Development Strategies for
Science Education
Nancy Moffat
Arizona State University
College of Education
Tempe, AZ 85287-0911

Rick Trammel, Larry Sidlik, Dale
Baker, Arizona State University

B2-4
Sunday, March 22, 1992
8:30 William Dawes B Room
Contributed Papers: Science
Education
Effects of State-mandated Testing on
Local Science Programs: Case Study
of a Suburban Elementary School
Mary Martens
Hofstra University
2104 Potter Ave.
North Merrick, NY 11566
Assessing the State of Science
Education Reform in Florida
Thomas Dana
Florida State University
203 MCH Science Education
Tallahassee, FL 32306
Sharon Nichols, Florida State
University

B2-5
Sunday, March 22, 1992
8:30 Haym Saloman Room
Contributed Papers: Constructivism
Experimenting and Problem Solving
in a Constructivist Science
Laboratory
Wolff-Michael Roth
Appleby College
540 Lakeshore Road West
Oakville, Ontario
CANADA L6K 3P1
Anita Roychoudhury, Miami
University

Interactions in a Constructivist
Classroom
Anita Roychoudhury
Miami University
1601 Peck Blvd.
Hamilton, OH 45011
Wolff-Michael Roth, Appleby
College

B2-5 continued
A Problem with Constructivist
Epistemology
Michael Matthews
Auckland University
Dept of Education
Auckland, NEW ZEALAND
Critical Reform on the Science
Curriculum: A Journey From
Objectivism to Constructivism
Kenneth Tobin
Florida State University
203 Carothers Hall
Tallahassee, FL 32306
Deborah Tippins, University of
Georgia
Karl Hook, Florida State
University

B2-6
Sunday, March 22, 1992
8:30 Thomas Paine A Room
Contributed Papers: Teaching
Biological Concepts
Student Science Knowledge Related
to Oregon's Marine Environment
Michael Brody
Oregon State University
261 Weniger Hall
Corvallis, OR 97331
Language and Children's Conception
of Plants as Living Things
Ruth Stavy
Tel Aviv University
School of Education
Tel Aviv, ISRAEL 69978
Naomi Wax, Tel Aviv University

Children's Understanding of
Scientific Models: Analysis of a
Fifth Grade Life Science Lesson
Sandra Abell
Purdue University
Dept of Curric and Instr
West Lafayette, IN 47907
Marie Roth, Tippecanoe School
Corporation
B2-6 continued
Addressing the Needs of Low Achieving/Special Education Students in High School Biology Classes: Implications of a Conceptual Change Model of Instruction
Marcia Fetter
Michigan State University
301 Erickson Hall
E. Lansing, MI 48824

Brian Templin, Holt High School
Charles Anderson, Michigan State University

B2-7 continued
The Effect of Concept Mapping on Biology Achievement of Field Dependent Students
David Martin
Kennesaw State College
PO Box 444
Marietta, GA 30061

Edward Lucy, Georgia State University

The Effects of Hands-on Science Instruction on Students' Cognitive Structures as Measured by Concept Maps
Donald T. Powers
Western Illinois University
College of Education
Macomb, IL 61455

Emmett L. Wright, Kansas State University

Effects of Concept Mapping as an Instructional Tool: A Meta Analysis
Phillip Horton
Florida Institute of Technology
Science Education Dept
Melbourne, FL 32901

Michael Gallo, Andrew McConney, Gary Senn, Kevin Barry, Amanda Woods, Ann Stocker, Florida Inst of Tech

Concept-Mapping and Chemistry Achievement, Integrated Science Process Skills, Logical Thinking Abilities, and Gender at Teachers Colleges in Taiwan
Wanchu Huang
Taipei Municipal Teachers College
4F #25 LN 65 Lohyeh St
Taipei, TAIWAN 106

Robert Fronk, Florida Inst Tech

B2-7 continued
The Effect of Concept Mapping on Biology Achievement of Field Dependent Students
David Martin
Kennesaw State College
PO Box 444
Marietta, GA 30061

Edward Lucy, Georgia State University

The Effects of Hands-on Science Instruction on Students' Cognitive Structures as Measured by Concept Maps
Donald T. Powers
Western Illinois University
College of Education
Macomb, IL 61455

Emmett L. Wright, Kansas State University

Effects of Concept Mapping as an Instructional Tool: A Meta Analysis
Phillip Horton
Florida Institute of Technology
Science Education Dept
Melbourne, FL 32901

Michael Gallo, Andrew McConney, Gary Senn, Kevin Barry, Amanda Woods, Ann Stocker, Florida Inst of Tech

Concept-Mapping and Chemistry Achievement, Integrated Science Process Skills, Logical Thinking Abilities, and Gender at Teachers Colleges in Taiwan
Wanchu Huang
Taipei Municipal Teachers College
4F #25 LN 65 Lohyeh St
Taipei, TAIWAN 106

Robert Fronk, Florida Inst Tech

B3-1 continued
Attitude-Behavior Change in Science Education: Part I - Models and Methods
Frank Crawley
University of Texas - Austin
Science Educ Cntr, EDB 340
Austin, TX 78712

Thomas Koballa, Jr., University of Georgia

Attitude/Behavior Change in Science Education: Part II - Results of an Ongoing Research Agenda
Thomas Koballa
University of Georgia
212 Aderhold Hall
Athens, GA 30602

Frank Crawley, University of Texas

B3-2
Sunday, March 22, 1992
10:30 William Dawes A Room
Panel: NARST-NET

Developing and Using NARST-NET: A Proposed Telecommunications Network
Derrick R. Lavoie
Montana State University
Dept of Educ, Reid Hall, Rm 213
Bozeman, MT 59717

William S. LaShier, University of Kansas
Norman G. Lederman, Oregon State University
Larry Flick, Washington State University
Steve Oliver, University of Georgia
Jim Ellis, BSCS

B3-3
Sunday, March 22, 1992
10:30 Molly Pitcher Room
Symposium: Using Concept Mapping

Using Concept Mapping as an Analytic Tool for Assessing the Structure of Students' Scientific Knowledge—Multiple Perspectives
Joan Baron
Connecticut State Dept of Educ
PO Box 2219
Hartford, CT 06145

Jeffrey Greig, Michal Lomask, Connecticut State Dept of Educ
Michael Hibbard, Region 15 School District
B3-4
Sunday, March 22, 1992
10:30 William Dawes B Room
Contributed Papers: Life Science

Conceptions of Natural Selection: A Snapshot of the Sense-Making Process
John Settlage
Technical Educ Research Centers
2067 Mass. Ave.
Cambridge, MA 02140

How Does Biological Knowledge Grow?: A Study of Life Scientists' Research Practices Using Laudan's Triadic Network Model
James Wandersee
Louisiana State University
Dept. of Curric and Instr
Baton Rouge, LA 70803

Eleanor Abrams, Louisiana State University

Biology Teachers' Perceptions of Subject Matter Structure and Its Relationship to Classroom Practice
Julie Gess-Newsome
University of Utah
Dept. of Educ Studies
Salt Lake City, UT 84112

B3-5 continued
Sunday, March 22, 1992
10:30 William Dawes B Room
Contributed Papers: Life Science

Student Autonomy and Conceptual Conflict: Using the Laboratory to Promote Conceptual Change
Susan Westbrook
Norman Public Schools
508 Chautauqua
Norman, OK 73069

Laura Rogers, University of Oklahoma

Classroom Conceptual Ecologies: Contrasting Discourse in Conceptual Change Instruction
Richard Thorley
University of Rochester
Grad Schl of Educ & Hmn Dev
Rochester, NY 14627

Using Instructional Strategies for Conceptual Change
Rebecca Pollard
Texas A&M University
COE, Dean's Office
College Station, TX 77843-4222

B3-6
Sunday, March 22, 1992
10:30 Thomas Paine A Room
Contributed Papers: Science Teaching

Hispanic Migrant Students: Discourse and Science Teaching
Alejandro Gallard
Florida State University
203 MCH - Science Education
Tallahassee, FL 32306

Pamela S. Carroll, Florida State University

Teaching Cognitive Strategies to Science Students
William Holliday
University of Maryland
Dept. of Curric and Instr
Benjamin Bldg
College Park, MD 20742

B3-6 continued
Sunday, March 22, 1992
10:30 Thomas Paine A Room
Contributed Papers: Science Teaching

Teaching Reading Through In-Depth Science Instruction: Expansion a Curriculum Integration Model to At-Risk Students in Grades 4 and 5 Nancy Romance
Florida Atlantic University
College of Education
Boca Raton, FL 33431

Michael R. Vitale, East Carolina University

Context-Related Characteristics of Expert Science Teaching
Dennis Sunal
University of Alabama
Box 870231
Tuscaloosa, AL 35487-0231

Judith Burry, Kathleen Boland,
University of Alabama
Mark Jeness, Western Michigan University

B3-7
Sunday, March 22, 1992
10:30 Thomas Paine A Room
Contributed Papers: Assessment

Reliability and Validity of a Self-reporting Tool for Screening Candidates for Science Enrichment Programs
George O'Brien
Florida International University
College of Educ, DM 231
University Park
Miami, FL 33199

Interactive Videodisc as a Tool for Assessing Science Teacher's Knowledge of Safety Regulations in School Labs
Michal Lomask
Connecticut State Dept of Education
165 Capitol Ave
Hartford, CT 06106

Larry Jacobson, Laurin Hafner,
Crystal Ross, Connecticut State Dept. of Education

Draft 2: December 17, 1991
B3-7 continued
Alternative Assessment of High School Laboratory Skills
Rodney Doran
University at Buffalo
593 Baldy Hall
Amherst, NY 14260

Joan Boorman, SAC Oneonta, NY
Fred Chan, Board of Ed, Toronto
Nick Hejaily, Williamsville School, NY

Assessment for Social Constructivist Teaching: A Philosophical Analysis
George Glasson
Virginia Tech University
Div of Curric and Instr
Blacksburg, VA 24061-0313

Rosary V. Lalik, Virginia Tech University

Sunday, March 22, 1992
12:00
Lunch and Ad Hoc Committee Meetings

B 4
Sunday, March 22, 1992
1:30 pm JFK Ballroom
General Session 2

B5-1
Sunday, March 22, 1992
3:30 pm JFK Ballroom
Informal discussion with keynote speaker

B5-2a
Sunday, March 22, 1992
3:30 pm William Dawes A Room
Poster session: Conceptual Change/Understanding

Development and Evaluation of Research-Based Materials for Teaching Photosynthesis to Senior High School Students
Ruth Amir
Hebrew University of Jerusalem
Israel Science Teaching Center
Jerusalem, ISRAEL 91904

Pinchas Tamir, Israel Science Teaching Center

Evaluating Students' Written Laboratory Reports for Evidence of Conceptual and Procedural Understandings in Science
Carolyn Keys
University of Michigan
Room 1228N, School of Educ
Ann Arbor, MI 48109-1259

The Conceptual Knowledge of Beginning Chemistry Graduate Students
George Bodner
Purdue University
Dept of Chemistry
West Lafayette, IN 47907

Nava Ben-Zvi, Hebrew University of Jerusalem

Teaching Electricity with Capacitors and Causal Models: Preliminary Results From Diagnostic and Tutoring Study Data Examining the CASTLE Project
David Brown
University of Illinois at Urbana-Champaign
Dept of C&I, 1310 S. Sixth St.
Champaign, IL 61820

B5-2a continued
Student Conceptions of Natural Selection and Its Role in Evolution:
A Replication Study and More
Sherry Demastes
Louisiana State University
Dept of Curric and Instr
Baton Rouge, LA 70803

Ronald G. Good, Marshall D. Sundberg, Michael Dini,
Louisiana State University

Using Concept Maps to Examine Changes in Ninth-Grade Students' Understanding of Simple Machines
Laura Rogers
University of Oklahoma
PO Box 82
Norman, OK 73019-0260

Susan Westbrook, Norman Public Schools

The Retention of Meaningful Understanding of Meiosis and Genetics
Ann Cavallo
University of Oklahoma
College of Educ
Dept of Instr Leadership
Norman, OK 73019-0260

Pupils' Understandings of Atomic Structure and the Interactive Use of Analogy
Teresa Oliveira
New University of Lisbon
Monte da Caparica - Almada
2825 Monte Da Caparica
PORTUGAL

A. Francisco Cachapuz, Aveiro University

Students' Meaningful Understandings of Science Concepts
Ann Cavallo
University of Oklahoma
College of Education
Norman, OK 73019

Melanie Reap, Univ of Oklahoma

Draft 2: December 17, 1991
**B5-2a continued**

The Validation of a Misconceptions Involving Magnets Survey
Gilbert Twiest
Clarion Univ of Pennsylvania
207 Peirce Hall
Biology Department
Indiana, PA 15705

Meghan Twiest, Indiana University of Pennsylvania

Hands-On Teaching Strategies' Effect on Earth-Sun-Moon Conceptions Held by Preservice Elementary Teachers
Priscilla Callison
University of Missouri-Columbia
Dept of Curric and Instr
Columbia, MO 65211

Emmett Wright, Kansas State University

The Effects of a Role-Playing Game on Students' Conceptual Development of Photosynthesis
Carol Lane
University of Georgia
School of Education
Athens, GA 30602

**B5-2b continued**

A Descriptive Study of Teachers Attaining High Levels of Inquiry Among Students
Karen Lind
University of Louisville
School of Education
Louisville, KY 40292

Kenneth E. Duckworth,
University of Louisville

Student Questioning in a Cognitive Approach to Instruction
Emily Van Zee
University of Washington
Department of Psychology Nl-25
Seattle, WA 98195

James Minstrell, Dorothy Simpson, Virginia Stimpson,
Mercer Island High School

The Role of Reasoning and Culture in Inquiry Science Performance for Young Students
Nancy Murphy
University of Alaska - Fairbanks
Dept of Education
Fairbanks, AK 99775-0600

**B5-3a continued**

Beliefs of K-12 Science Teachers About Science Teaching and the Uses of Computing Technologies
Mary Atwater
University of Georgia
Athens, GA 30602

Patricia Simmons, J. Randy McGinnis, Larry Hatfield, John Olive, Anita Hunt, Univ Georgia Relationships Between Science Museums and Schools. Review of the Literature
Isabel Chagas
Boston Univ, 63 Columbus St
Newton Highlands, MA 02161

Science and Mathematics Curriculum Renewal through Microcomputer Infusion: An Experienced Teacher's Planning Processes in a Novel Situation
David Jackson
University of Georgia
Dept. of Science Ed.
Athens, GA 30606

Lee Meadows, Gwen Scoates,
University of Georgia

Science and Education: A New Journal for Research on the Contribution of the History, Philosophy, and Sociology of Science to Science and Mathematics Education
Michael Matthews
Auckland University
Dept of Education
Auckland, NEW ZEALAND

The Effects of Slide/Sound Computer-Based Instruction on Science Students' Achievement and Retention
Pierce Farragher
University of Victoria
PO Box 3010, Victoria, BC
CANADA V8W 3N4

Ronald Pauline, Gannon University

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**Draft 2: December 17, 1991**
B5-3a continued
Teachers' Perceived Needs for
Implementation of a Computer
Graphics and Networking in Science
and Mathematics Instruction
Preston Prather
University of Virginia
Curry School of Education
Charlottesville, VA 22903-2495
Glen Bull, University of Virginia

B5-3b continued
Effect of Four Instructional
Strategies on Integrated Science
Process Skill Achievement of
Preservice Elementary Teachers
Having Different Cognitive
Development Levels
Joseph Peters
University of West Florida
College of Education
Pensacola, FL 32514
George O'Brien, University of
West Florida
Critical Incidents in the High School
Lab: The Students' Perspective
Jane Larson
Yokota High School
PSC #78 Box 4321
APO, AP 96326-4321
Using Drama as a Medium for
Teaching Science
Jo Beth Gonzales
Texas A&M University
COE, Dean's Office
College Station, TX 77843-4222
Rebecca Pollard, Katherine
Friedrich, Texas A&M University

B5-4 continued
The Perceptions and Special
Considerations of Experienced
Teachers About Management and
Discipline: A Qualitative
Investigation
Mark Latz
Oregon State University
253 Weniger Hall
Corvallis, OR 97331
Science Educators Use of the
Concept of Belief
J. Steve Oliver
University of Georgia
Dept of Sci Ed
Athens, GA 30602
Thomas Koballa, Univ of Georgia
A Study of Teacher Efficacy,
Knowledge of Adolescents' 
Characteristics and Organization of
Schools
Martha Schriver
University of Toledo
2801 West Bancroft St.
Toledo, OH 43606
PSC
Elementary Teachers' Perceptions of
Factors Influencing High Science
Teaching Self-Efficacy
Linda Ramey-Gassert
Chicago Botanic Garden
CORE Program, PO Box 400
Glencoe, IL 60022-0400
The Evolution of Preservice Science
Teachers' Concerns About Teaching
Edward Zielinski
Clarion Univ of Pennsylvania
Center for Sci Educ
Clarion, PA 16214
Denise L. Preston, Clarion
University

B5-3b
Sunday, March 22, 1992
3:30 William Dawes B Room
Poster session: Teaching Strategies
An Experimental Investigation of
Cooperative Learning and Concept
Mapping in the Middle School
Diana Rice
Schl Dist 5 Lexington/Richland
Irmo Middle School
Columbia, SC 29212
Joseph Ryan, University of South
Carolina
An Analysis of Science Methods
Textbooks Designed to Prepare
Secondary School Science Teachers
Philip Pankiewicz
SUNY College at Cortland
Dept of Biological Sciences
Cortland, NY 13045
Why Did We Do All This Writing
and Arguing if You Already Knew
the Answer?: The Role of Talking-
and Writing-To-Learn in
Understanding Science
Kathleen Peasley
Michigan State University
252 Erickson Hall
East Lansing, MI 48824

B5-4
Sunday, March 22, 1992
3:30 Thomas Paine A Room
Poster session: Teacher Perception/Knowledge
A Recursive Dendrographic Method
of Representing Cognitive Structure
Based on Respondent's Narrative
Using Science Content
Olive Demetrius
Columbia Univ Teachers College
525 W. 120th St
New York, NY 10027
O. Roger Anderson, Columbia
University Teachers College

Draft 2: December 17, 1991
B5-4 continued
Design of an Instrument to Assess Science Teachers' Teaching Strategy Choices
Catherine Yeotis
Wichita State University
Curric and Instr, Box 28
Wichita, KS 67208

Linda Bakken, Wichita State University

An Explanatory Model of Student Persistence in a Preservice Science and Mathematics Teacher Education Course
Keith Lucas
Queensland Univ of Technology
Locked Bag No 2
Red Hill, Queensland
AUSTRALIA 4059

David Tulip, Queensland University of Technology

Conceptions of Teaching Science Held by Experienced High School Science Teachers
Peter Hewson
Univ of Wisconsin - Madison
Dept of Curric and Instr
225 N . Mills St
Madison, WI 53706

Perry Cook, Holly Walter Kerby, Univ of Wisconsin - Madison

Teacher Knowledge, Concept Maps, and Vee Diagrams: What Do Science Lessons Really Mean?
Patricia Kerr
University of North Dakota
Box 8158, University Station
Grand Forks, ND 58202

Building a Knowledge/Skill Base by Engaging in the Taking, Critiquing, and Constructing of Assessment Items: A Feasibility Study
Lehman Barnes
Univ of North Florida, Coll of Ed
Jacksonville, FL 32216

Marianne Barnes, University of North Florida

B5-4 continued
A Study of the Science Skill Achievement of Preservice Elementary Teachers
Linda DeTure
Rollins College
Dept of Education
Winter Park, FL 32789

Nicole Escudero, Rollins College

Science Teacher Decision-Making in a Multicultural Classroom
J. Randy McGinnis
University of Georgia
Dept of Sci Educ
Athens, GA 30602

B5-5a
Sunday, March 22, 1992
3:30 Thomas Paine B Room
Poster session: Student Attitude/Knowledge
African Students' Beliefs About Their Pre-College Basic Science Education Program in Africa and the Influence of these Beliefs on Students' Attitudes Toward Science
N. K. Appiah
Science Education Department
University of Georgia
Athens, GA 30602

Gender Differences in Predicting 10th Grade Students' Attitudes Toward Science: Results from the Longitudinal Study of American Youth (LSAY)
Andrew Lumpe
Kansas State University
Center for Science Education
Manhattan, KS 66506

Ronald M. Krestan, Wang Jianjun, Kansas State University

B5-5a continued
CHEMCOM in Sociocultural Context: Interdisciplinary Analysis of a Science-Technology-Society Curriculum
William Carlsen
Cornell University
Dept of Education
Ithaca, NY 14853

Gregory Kelly, Christine Cunningham, Cornell University

Life Science Students' Responses to Questions About Plants: Avoidance Strategies in Children
Delena Tull
Univ of Central Arkansas
105 Lewis Science Cntr
Conway, AR 72032

The Attitudinal and Cognitive Effects of Planetarium Integration in Teaching Fourth, Fifth, and Sixth Grade Students
Mark Twiest
Indiana Univ of Pennsylvania
313 Davis Hall, IUP
Indiana, PA 15705

A Review of Attitude and Behavior Studies in Environmental Education: Implications for Future Research
Barbara Babineaux
University of Texas at Austin
Science Education Center
Austin, TX 78712

Melissa Tothero, Frank E. Crawley, Univ of Texas at Austin

The Focus of Females and Science Research: An Illustration of Blaming the Victim
Sharon Parsons
San Jose State University
College of Education
San Jose, CA 95192-0071
B5-5a continued
Predicting Student Success in Introductory Chemistry: The Roles of Motivation and Past Achievement
Brian Coppola
University of Michigan
Department of Chemistry
Ann Arbor, MI 48187-1686

A Quantitative Description of Elementary Students' Activities During Physical Science Laboratory Lessons
Bambi Bailey
Miami University
403a McGuffey Hall
Oxford, OH 45056

Jane Kahle, Miami University

Stress on the Role of Evidence as a Basis of Knowledge Claims in Science and Control Belief in Elementary School Children
John Butler
Anchorage School District
1521 "N" St.
Anchorage, AK 99507

B5-5b
Sunday, March 22, 1992
3:30 Thomas Paine B Room
Poster session: Inservice Program Evaluation
Action Planning for Earth Science Field Trips: Reducing the Barriers
Larry Enochs
Kansas State University
Center for Science Education
Manhattan, KS 66506

Peggy Daisey, Thomas McCaughon, Ronald West, Kansas State University

B5-5b continued
A National Science Foundation Pre-College Teacher Enhancement Program for Middle/Junior High School Life Science Teachers
Melissa A. Warden
Ball State University
Dept of Biology
Muncie, IN 47306

Thomas R. Koballa, Jr., University of Georgia
Lowell Bethel, Univ Texas-Austin

A Statewide Model for Middle School Science Improvement
Burton Voss
University of Michigan
School of Education, Room 1323
Ann Arbor, MI 48109-1259

David Kazen, Ingham Schl Dist

Intermediate School District
The Effects of an STS Issue Investigation and Action Training
Summer Institute on Middle School Science Teachers
Patricia Simpson
St. Cloud State University
Dept of Biological Sci
St. Cloud, MN 56301-4498

William Pankratius
University of Nevada, Las Vegas
College of Education (ICS)
Las Vegas, NV 89154

Richard Powell, University of Nevada, Las Vegas
Michael Robinson, University of Nevada, Reno

Long-Term Effects of NSF-Sponsored Summer Institutes
Lisa McWhirter
University of Oklahoma
Physical Sciences Bldg Rm 323
Norman, OK 73019-0260

Edmund Marek, Ann Cavallo, University of Oklahoma

B5-5b continued
Evaluation of a University/School-Based, Sustained Contact Inservice for Elementary Science Teachers
Joseph Riley
University of Georgia
212 Aderhold Hall
Athens, GA 30602

Mark Guy, Darwin Smith, University of Georgia
Barbara Cornelius, Clarke Co Schl Dist

B4-3
Sunday, March 22, 1992
3:30 Crispus Attucks

Annual Review of Research
Fred Finley, Frances Lawrenz, and Pat Heller
University of Minnesota
Minneapolis, MN

Sunday, March 22, 1992
6:00 pm
Dinner (on your own)

B6
Sunday, March 22, 1992
7:30 pm Haym Salomon Room

JRST Editorial Board Meeting
Ronald G. Good, Editor

C1-1
Monday, March 23, 1992
7:30 am Crispus Attucks Room

NARST Policy Advisory Committee
Jane Butler Kahle, Past-President

C1-2
Monday, March 23, 1992
7:30 am William Dawes A Room

NARST Research Committee
Frances Lawrenz, Research Coordinator

Draft 2: December 17, 1991
C1-3
Monday, March 23, 1992
7:30 am William Dawes B Room

NARST Distinguished Contributions Award Committee, Donald W. McCurdy, and Kenneth G. Tobin, Co-chairs

C1-4
Monday, March 23, 1992
7:30 am Haym Salomon Room

NARST International Committee Barry J. Fraser, Chair

C1-5
Monday, March 23, 1992
7:30 am Thomas Paine A Room

NARST Award Committee Thomas R. Koballa, Jr., Chair

C1-6
Monday, March 23, 1992
7:30 am Thomas Paine B Room

NARST Dissertation Award Committee, Linda R. DeTure, Chair

C2-1
Monday, March 23, 1992
8:30 Crispus Attucks Room Round Table: Science Education Research

Report of NSTA/AAAS/NARST Task Force for Defining A Research Agenda in Science Education Emmett Wright Kansas State University Manhattan, KS 66506-5310

C2-2
Monday, March 23, 1992
8:30 William Dawes A Room Contributed Papers: Student Knowledge

Massed Versus Distributed Practice in High School Physics
Michael Grote
University of Cincinnati ML #0002
Cincinnati, OH 45221-0002

Knowledge is Not Always What We Take it to Be: Issues in the Assessment of Students' Understanding of Motion
Dori Ridgeway
Columbus Public Schools
208 East Maynard Ave.
Columbus, OH 43202

C2-3
Monday, March 23, 1992
8:30 Crispus Attucks Room Symposium: Epistemology

Teacher and Student Epistemologies in Science Classrooms: Past Research and Future Prospects
Wolff-Michael Roth
Appleby College
540 Lakeshore Road West
Oakville, Ontario
CANADA L6K 3P1

K.G. Tobin, Florida State University
J.J. Gallagher, Michigan State University
W.W. Cobern, Arizona State University-West Campus
A. Roychoudhury, Miami University

C2-4
Monday, March 23, 1992
8:30 William Dawes A Room Contributed Papers: Cooperative Learning

Cooperative Incentives and Heterogenous Arrangement of Cooperative Learning Groups: Effects on Achievement of Elementary Education Majors in an Introductory Life Science Course
Scott B. Watson
East Carolina University Dept of Science Education
Greenville, NC 27858-4353

James E. Marshall, California State University, Fresno

The Characterization of Small Instructional Work Groups in 9th Grade Biology
Steven Rogg
University of Maine College of Education
Orono, ME 04469-0121

Jane Butler Kahle, Miami University

Teaching Physics Problem Solving Through Cooperative Grouping: Do Men Perform Better Than Women?
Patricia Heller
University of Minnesota Dept of Curric and Instr
159 Pillsbury Dr. SE
Minneapolis, MN 55455-0208

C2-5
Monday, March 23, 1992
8:30 Haym Salomon Room Contributed Papers: Scientific Knowledge

Ethical Dilemmas in Science Teaching
Deborah Tippins
University of Georgia
212 Aderhold Hall
Athens, GA 30602

Ken Tobin, Karl Hook, Florida State University

Draft 2: December 17, 1991
C2-5 continued
An Analysis of the Conceptions
About the Nature of Scientific
Knowledge of Portuguese Secondary
Science Teaching
Francisco Cachapuz
Aveiro University
3800 AVEIRO, PORTUGAL
J. Felix Praia, Porto University

Increasing Elementary Teachers’
Ability to Explain Events in Science
by Making Causal Relationships
More Explicit in Science Text
Rosalyn Gates
Indiana University of
Pennsylvania
412 Davis Hall
Indiana, PA 15705

Constructing Explanatory Models for
Anomalous Genetic Phenomena:
Problem Solving in the ‘Context of
Discovery’
Robert Hafner
Western Michigan University
Dept of Educ and Prof Dev
2423 Sangren Hall
Kalamazoo, MI 49008

C2-6 continued
Preservice Elementary Teachers’
Beliefs About Science Teaching and
Learning and Perceived Sources of
Their Beliefs Prior to Their First
Formal Science Teaching Experience
Sheila Jasalavich
Syracuse University
Dept of Sci Teach
Syracuse, NY 13244-1070

Gender Comparisons: Attitudes of
Preservice Elementary Science
Methods Teachers Toward Science
and Science Teaching
Betty Bitner
SW Missouri State University
901 South National Ave
Springfield, MO 65804

Learning to Teach Elementary
Science: Changing Images,
Metaphors, and Beliefs
Sharon Nichols
Florida State University
Science Education, 203 MCH
Tallahassee, FL 32306

Thomas Dana, Florida State Univ
Carol Briscoe, Univ of W Florida

C2-6
Monday, March 23, 1992
8:30 Thomas Paine A Room
Contributed Papers:
Elementary Teachers

The Effect of Astronomy Teaching
Experience on the Astronomy
Interest and Conceptions of
Elementary School Teachers
Linda Shore
Boston University
Polymer Center
590 Commonwealth Ave.
Boston, MA 02215

Robert Kilburn, Boston University

C2-7 continued
Teacher Empowerment and
Curriculum Reform in Secondary
Science and Mathematics Classes: A
Model of Change
Sheryl McGlamery
Florida State University
Science Education
Tallahassee, FL 32306

Monday, March 23, 1992
10:00

Coffee Break (served in hallway of
Patriot’s Hall Complex)

C3-1
Monday, March 23, 1992
10:30 Crispus Attucks Room
Paper set: Conceptual Change

Learning About Light and Shadows:
A Tale of Three Children
Elizabeth Wier
University of Delaware
College of Education
Newark, DE 19716

Conditional Knowledge in an
Experienced Teacher’s Construction
and Implementation of a Third Grade
Conceptual Change Science Room
Julie Schmidt
University of Delaware
College of Education
Newark, DE 19716

Jean Leach, West Park Place
Elementary

The Role of Theory in Making Sense
of Evidence and Arguments in
Primary Science Classrooms
Nancy Brickhouse
University of Delaware
College of Education
Newark, DE 19716

Draft 2: December 17, 1991
C3-1 continued
The Curriculum Development Lab:
A Vehicle for Staff Development in
Primary Science
Deborah Smith
University of Delaware
College of Education
Newark, DE 19716

C3-2
Monday, March 23, 1992
10:30 William Dawes A
Room
Contributed Papers:
Preservice/Inservice

Teaching Evolution: The Influence of Peer Instructional Modeling
Lawrence Scharmann
247 Bluemont Hall
Kansas State University
Manhattan, KS 66506

Evaluating An Inservice Model That Impacts Science Classroom Practice
David Butts
University of Georgia
Dept. of Science Education
Athens, GA 30602

Wyatt Anderson, Mary Atwater, Thomas Koballa, Patricia Simmons, University of Georgia Rosalina Hairston, University of South Mississippi

Presidential Awardees as Instructional Mentors for Middle Level Science Teachers: A Summer Institute and Beyond
Thomas Greenbowe
Iowa State University
Dept of Chem
Gilman Hall A110
Ames, IA 50011-3110

Cheryl L. Mason, San Diego State University Barbara Saigo, Southeastern Louisiana University

C3-2 continued
Teacher and Researcher Development in a Professional Development School: Learning About Science Teaching From Multiple Perspectives
Kathleen Roth
Michigan State University
116 Erickson Hall
East Lansing, MI 48824

C3-3
Monday, March 23, 1992
10:30 Molly Pitcher Room
Symposium: Science Reform Project

The Reality of a Science Reform Project: Structure, Design, and Preliminary Findings
Linda Crow
Baylor College of Medicine
1709 Dryden, Suite 709
Houston, TX 77030

Ronald J. Bonnstetter, University of Nebraska

C3-4
Monday, March 23, 1992
10:30 William Dawes B
Room
Contributed Papers: Problem Solving/Teacher

A Qualitative and Quantitative Analysis of Earth and Space Science Teacher's Declarative, Procedural, and Structural Knowledge
Robertta Barba
San Diego State University
San Diego, CA 92182

Critical Features of an Advanced Earth Science Seminar Series for Middle School Teachers: An Evaluation
Joseph Ryan
University of South Carolina
Dept of Educ Psychology
Columbia, SC 29208

Laurie Martin, John Carpenter,
University of South Carolina

C3-4 continued
The Effects of Repeated Intensive Instruction in Cue Attendance Upon Cue Attendance Behavior and Interactive Thoughts of Elementary Science Methods Students
Ronald Hughes
California State University, Bakersfield
School of Educ
9001 Stockdale Hgwy
Bakersfield, CA 93311-1099

Emmett L. Wright, Kansas State University

Influencing Teacher Thinking and Teacher Behavior Through Analysis, Feedback, and Reflection
Teresa Kokoski
University of New Mexico
CIMTE Department
Albuquerque, NM 87131

C3-5
Monday, March 23, 1992
10:30 Haym Saloman Room
Contributed Papers:
Chemistry Education

Belief and Attitude Differences of Preregistered and Nonpreregistered Hispanic Students Relative to Enrollment in High School Chemistry
Carolyn B. Black
Incarnate Word College/San Antonio
3803 Barrington, 13C
San Antonio, TX 78217-4105

Frank E. Crawley, University of Texas at Austin

Stoichiometric Problem-Solving in High School Chemistry
Hans- Jürgen Schmidt
University of Dortmund
Dept of Chemistry
Otto-Hahn-Straße, D-4600 Dortmund 50, GERMANY

Draft 2: December 17, 1991
C3-5 continued
From "Algorithmic Mode" to "Conceptual Gestalt" in Understanding the Behavior of Gases: An Epistemological Perspective
William Robinson
Universidad de Oriente
Apartado Postal 90, Cumaná
Estado Sucre, Venezuela
SOUTH AMERICA 6101A
Mansoor Niaz, Purdue University

A Qualitative Study of the Effects of STS Issues on High School Chemistry Students
Jon Pedersen
University of Arkansas
300 Graduate Education Bldg
Fayetteville, AR 72701

C3-6
Monday, March 23, 1992
10:30 Thomas Paine A Room
Contributed Papers: Teaching Strategies

Everything Depends on the Teacher: Multiple Perspectives on Classroom Control as a Constraint to Effective Change in Science Teaching
Carol Briscoe
University of West Florida
Dept of Elem & Sec Educ
Pensacola, FL 32514

Comparing Algorithmic and Heuristic Instructional Approaches in Teaching Problem-Solving in High School Chemistry
Obed Norman
Univ of California - Berkeley
Lawrence Hall of Science
Berkeley, CA 94720

Students' Understanding in Elementary Thermodynamics: A Comparison of Two Teaching Approaches
Sophia Kesidou
University of Pittsburgh
704 LRDC, 3939 O'Hara St
Pittsburgh, PA 15260

C3-6 continued
Problem Solving and its Social Context in Secondary School
Armando Contreras
Univ De Los Andes, Apartado Postal #143, Trujillo
Estado Trujillo, VENEZUELA

C3-7
Monday, March 23, 1992
10:30 Thomas Paine B Room
Contributed Papers: Sex Differences

School Effectiveness and Science Achievement: Are There Any Sex Differences?
Deidra Young
Curtin University of Technology
Science and Math Ed Centre
GPO Box U1987
Perth, AUSTRALIA 6001

Barry J. Fraser, Curtin University of Technology

Constructivism and Gender-Inclusiveness: Has Assessment Kept Pace?
Lesley Parker
Curtin University of Technology
Sci and Math Educ Cntr
Perth, AUSTRALIA 6002

Leonie Rennie, Curtin University

Sex Differences on the Maine Educational Assessment Science Test
Kate Scantlebury
University of Maine
College of Education
Orono, ME 04469

Scott F. Marion, Univ of Maine

C4
Monday, March 23, 1992
12:00 Adams Room

Awards Luncheon

C5-1
Monday, March 23, 1992
3:00 Crispus Attucks Room
Symposium: Teacher Enhancement Projects

Mixing Paradigms in Evaluating Teacher Enhancement Projects
James Ellis
BSCS; The Colorado College
830 North Tejon St, Suite 405
Colorado Springs, CO 80903

Paul J. Kuerbis, Colorado College
Larry G. Enocks, Kansas State University
Philip G. Goulding, BSCS

C5-2
Monday, March 23, 1992
3:00 William Dawes A Room
Symposium: Cooperative Inquiry

Doing Cooperative Inquiry: The Challenge of Undertaking a New Research Methodology
Karen Sullenger
University of New Brunswick
Fac of Educ, Bag Service #45333
Fredericton, NB
CANADA E3B 6E3

Mariona Espinet, Universitat Autonoma de Barcelona, Spain
William Kyle, Purdue University
Ken Tobin, Carl Hooper,
University of Florida

Draft 2: December 17, 1991
C5-3
Monday, March 23, 1992
3:00 Molly Pitcher Room
Symposium: Assimilation Theory

The Current Status of Ausubel's Assimilation Theory in Science Education
Joseph Novak
Cornell University
421 Kennedy Hall
Ithaca, NY 14853

C5-4
Monday, March 23, 1992
3:00 William Dawes B Room
Contributed paper: Development of Reasoning

The Effects of Adding a Prediction/Discussion Phase to a Science Learning Cycle
Derrick Lavoie
Montana State University
Dept of Educ, Reid Hall, Rm 213
Bozeman, MT 59717

C5-5
Monday, March 23, 1992
3:00 Haym Salomon Room
Contributed Papers: Science Attitudes

C5-4 continued

Conceptual and Reasoning Patterns on Motion Tasks Among Malaysian Students and Across Piagetian Cognitive Reasoning Levels
Yap Kueh Chin
Universiti Teknologi
Dept of Sci and Technical Ed
Johor Bahru, MALAYSIA 80990

C5-6
Monday, March 23, 1992
3:00 Thomas Paine A Room
Contributed Papers: Environmental Education

The Outcomes of A Summer Institute in Environmental Education for Elementary Teachers From Four States
Katherine Norman
University of Kansas
Dept of Curric and Instr
Lawrence, KS 66045

Environmental Content, Belief and Affective Structures with Their Generation of Solutions to Environmental Problems
Ann Novak
1312 Colgate Circ.
Ann Arbor, MI 48103

The Effects of Issue Investigation and Action Training on Characteristics Associated with Environmental Behavior in Seventh and Eighth Grade Students
John Ramsey
University of Huston - University Park
Dept of Curric and Instr
Houston, TX 77204-5872

Constructivism in Outdoor Based Science: A Case Study of the Teton Science School
Michael Hayes
University of Utah
Dept of Educational Studies
307 MBH
Salt Lake City, UT 84105

Draft 2: December 17, 1991
C5-7
Monday, March 23, 1992
3:00 Thomas Paine B Room
Contributed Papers: Learning Preferences

Teaching Strategies in Science That Address the Learning Preferences of Male and Female Middle Level Students
Gail Shroyer
Kansas State University
229 Bluemont Hall
Manhattan, KS 66506

Kathy Backe, Janet Carlson
Powell, BSCS

An Investigation of the Effect of a Scientific Research Experience on Teachers' Attitudes Toward Inquiry-Based Instruction
Douglas Huffman
University of Minnesota
159 Pillsbury Dr. SE
370 Peik Hall
Minneapolis, MN 55455

Affective Characteristics of Urban African American Middle School Students with High Positive Attitudes Toward Science
Catherine Gardner
Mercer University
Tift College Dr.
Forsythe, GA 31029

Mary Atwater, John Wiggins,
University of Georgia

C 6
Monday, March 23, 1992
4:45 Boston University Symposium:"Tea-Time"
Reception: Uses of Technology in Science Education Research (Hands-on Demonstrations)

Ron Browne and Charlene Czerniak,
University of Toledo
Gerald Abegg and Gene Stanley,
Boston University
Pat Freitag, University of Wisconsin
Carl Berger, University of Michigan
Robert Sherwood and John Bransford,
Vanderbilt University

Monday, March 23, 1992
6:15
Dinner (on your own)

C 7
Monday, March 23, 1992
8:00 pm Haym Saloman Room

International Members Reception (by invitation only)

D 1-1
Tuesday, March 24, 1992
7:30 Crispus Attucks Room
Symposium: Science Teacher Education

Research on Science Teacher Education
Ronald Anderson
University of Colorado
Campus Box 249
Boulder, CO 80026

Carole P. Mitchener, De Paul University
Susan Loucks-Horsley, Network, Inc.
Michael Padilla, University of Georgia

D 1-2
Tuesday, March 24, 1992
7:30 William Dawes A Room
Paper Set: Metacognition in Science
Reading Comprehension and Metacognition in Science
Larry Yore
University of Victoria
Box 3010, Faculty of Education
Victoria, BC
CANADA V8W 3N4

Madge Craig, Univ of N. Texas
Leonard Rivard, College Universitaire De Saint-Boniface
Lori DiGisi, Harvard University

D 1-3
Tuesday, March 24, 1992
7:30 Molly Pitcher Room
Contributed paper:
Reasoning/Inquiry Learning

Reasoning Using Biological Content: Relationships Among Evidence, Theory, and Interpretation
Catherine Cummins
Louisiana State University
Dept of Curric and Instr
Baton Rouge, LA 70803

Ronald Good, Sherry Demastes,
Patsye Peebles, Louisiana State University

The Relationship Between Anthropophoric/Teleological Reasoning Age and the Study of Biology
Anat Zohar
Hebrew University - Jerusalem
Ontario Institute for Studies
252 Bloor St West
Toronto, Ontario
CANADA M5S 1V5

Yael Friedler, Pinchas Tamir,
Hebrew University - Jerusalem

Draft 2: December 17, 1991
D1-3 continued
The Development of Thinking in Early Adolescents
Richard Williams
University of Victoria
PO Box 3010
Victoria, BC
CANADA V8W 3N4

Betty Bitner, SW Missouri Univ
A Teacher's Perspective of the Implementation of Problem-Centered Learning in Chemistry
Nancy Davis
Florida State University, Panama City Campus
4750 Collegiate Dr
Panama City, FL 32405-1020

Maggie Helly, Mosley High

D1-4
Tuesday, March 24, 1992
7:30 William Dawes B Room
Contributed Papers: Qualitative Research

Microcomputer Applications for Data Gathering and Data Analysis in Qualitative Research
Patricia Simmons
University of Georgia
212 Aderhold
Athens, GA 30602

Quality of Qualitative Research: Rigor in Case Study
Deborah Trumbull
Cornell University
Dept of Education
Ithaca, NY 14853

Debra Tomanek, North Dakota State University
A Case Study of Peer Review at the Tertiary Level
Campbell McRobbie
Queensland Univ of Technology
Locked Bag 2
Red Hill, QLD 4059
AUSTRALIA

D1-4 continued
Assessment of Children's Experimental Work: A Descriptive Approach
Anthony Bartley
University of British Columbia
2125 Main Mall
Vancouver, B.C.
CANADA V6T 1Z4

Robert Carlisle, Univ of B.C.
Ruth Stavy, Tel Aviv University, Israel

D1-5
Tuesday, March 24, 1992
7:30 Haym Saloman Room
Contributed Papers: Instructional Media/Technology

A Protocol Analysis of the Effect of Technology on Students' Actions, Verbal Commentary, and Thought Processes During the Performance of Acid-Base Titrations
Mary Nakhleh
Purdue University
Department of Chemistry
W. Lafayette, IN 47907-1393

Joseph S. Krajcik, University of Michigan

The Effects of Questions Embedded in Science Videotapes on High School Students' Attention
Laura M. Barden
Univ of Tennessee, Knoxville
311 Claxton Education Addition
Knoxville, TN 37996-3400

William G. Holliiday, University of Maryland
James Carffio, University of Mass-Lowell
Wm. J. Kermis, Southwestern Oklahoma State University

D1-6
Tuesday, March 24, 1992
7:30 Thomas Paine A Room
Contributed Papers: Student Conceptions/Learning

Facilitating Success in Attaining Science Student Outcomes: Constructivist Constructs and Inventions Applied to Science Curriculum and Instruction
Robert J. Stahl
Arizona State University
Secondary Education
Tempe, AZ 85287-1911

Michael P. Verdi, Arizona State University
A Study of Thinking and Learning in Electric Circuits
Hans Niedderer
University of Bremen, NW1
D 2800 Bremen
D 2800 Bremen, GERMANY

Fred Goldberg, CRMSE
D1-6 continued
An Analysis of the Development of Students' Conceptions on Shadow Formation
Hsiang-Wu Huang
National Taiwan Normal University
Dept of Physics, 88, Sec 5, Roosevelt Rd.
Taipei, TAIWAN, ROC 11718
Bao-Tyan Hwang, National Taiwan Normal University

D1-7 continued
The Learning Environment as a Focus for the Evaluation of Inquiry-Based Computer Classrooms
Dorit Maor
Curtin University of Technology Science and Math Educ
GPO Box U 1987
Perth, AUSTRALIA 6001
Barry Fraser, Curtin University of Technology

D2-1 continued
Teachers Perception of Concept Mapping as a Metacognitive Tool in Science: A Cross-National Study
Peter Okebukola
Lagos State University
Dept of Curric Studies, PMB 1087
Apapa, Lagos NIGERIA

Tuesday, March 24, 1992
7:30 Thomas Paine B Room
Contributed Papers: Computer Education

The Effects of Computer Animation Emphasizing the Particulate Nature of Matter on the Understanding and Misconceptions of College Chemistry Students
Daniel P. Shepardson
Purdue University
School Mathematics and Science Center, ENAD 414
West Lafayette, IN 47907-1442

Tuesday, March 24, 1992
9:00 am
Coffee Break (served in the hallway of the Patriot's Hall Complex)

D2-1 Tuesday, March 24, 1992
9:30 Crispus Attucks Room
Discussion Group: Teacher Beliefs/Knowledge, Secondary
Preservice Science Teachers' Conceptions of Subject Matter and Pedagogy: A Longitudinal Study of Professional Development
Norman Lederman
Oregon State University
Science and Mathematics Education, Weniger Hall
Corvallis, OR 97331

Juli- Gess-Newsome, University of Utah
Mark Latz, Oregon State University

Use and Effectiveness of Daily Journal Writing with Pre-service Teachers
Patricia Hauslein
St. Cloud State University
Dept of Biological Sciences
St. Cloud, MN 56301-4498
Patricia Simpson, St. Cloud State University

Changes in Science Teachers' Perceptions of Specific Teaching Skills and Strategies: A Longitudinal Study
Roger Norris
University of Idaho
Education 412
Moscow, ID 83843

The Roles of Three Types of Teacher Knowledge—Content Knowledge, Pedagogical Knowledge, and Pedagogical Content Knowledge—in the Teaching of High School Mendelian Genetics
Mary Louise Bellamy
National Assn Biology Teachers
11250 Roger Bacon Dr #19
Reston, VA 22090
Hilda Borko, University of Colorado
J. David Lockard, University of Maryland

Draft 2: December 17, 1991
Interactions
Teaching:
On
in
New
Educating
in
the
Triads:
Illinois,
Science
Results
Teacher
Discussion
9:30
Tuesday,
Draft
D2-2
Mathematics
the
Jehuda
Rochester,
Elizabeth
Chapel
CB
University
Gail
V.
G.
239
New
Pamela
University-Oranim,
San
CRMSE,
San
Cheryl
514
Oakland
Diego,
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UNC-Ch
3500,
Carolina,
Carolina,
Vesilind,
University
Vesilind,
of
NY
10003
218
New
239
Greene
St.,
218
East
Bldg
New
NY
10003
New
York
University

G. Orpwood, The Impact Group
V. Svolopoulos, New York
University

On the Road to Expert Science
Teaching: Student Teacher-Pupil
Interactions
Gail Jones
University of North Carolina
CB # 3500, UNC-Ch
Chapel Hill, NC 27599-3500

Elizabeth Vesilind, University of
North Carolina, Chapel Hill

D2-2 continued
A Program to Improve Elementary
Teachers' Preparation in Science,
Phase II
Eileen Gregory
Rollins College
1000 Holt Ave
Winter Park, FL 32789-4499

Linda DeTure, Rollins College

Computer Uses in Secondary Science
Laboratory: Project Design,
Implementation and Evaluation
Deborah Trumbull
Cornell University
426 Kennedy Hall
Ithaca, NY 14853

John Schwartz, Ithaca College
Nancy Ridenour, Ithaca High

A Preliminary Study of the
Educational Outcomes of Teacher
Summer Internships
Teri Metcalf
Texas A&M University
College of Education
College Station, TX 77843-4232

Robert James, Texas A&M
University

Effective Measurement of Affective
Outcomes in Curriculum Evaluation
Leonic Rennie
Curtin University of Technology
Sci and Math Educ Cntr
GPO Box U 1987
Perth, AUSTRALIA 6001

D2-3A
Tuesday, March 24, 1992
9:30 Molly Pitcher Room
Discussion Group:
Conceptual Change

The Effectiveness of Different
Teaching Models for Science
Conceptual Change
Meme Dai
Taipei Municipal Teachers
College
1, Aih-Kuo W. Rd.
Taipei, TAIWAN 10000

Joseph Riley, Univ of Georgia

The Origin of Alternative
Conceptions: Some Thoughts From
Cross-Cultural Research
Ed van den Berg
Free University, Netherlands
Physics Lab, De Boelelaan 1081
1081 HV Amsterdam
NETHERLANDS

Alternative Conceptions as Catalyst
for Conceptual Change
J. Randy McGinnis
University of Georgia
212 Aderhold Hall
Athens, GA 30602

Joseph Riley, Univ of Georgia

The Relationship Between Mental
Models Related to the Particulate
Nature of Matter and the Infinite
Nature of Geometrical Figures
Dina Tirosh
Tel Aviv University
School of Education
Tel Aviv 69978
ISRAEL

Ruth Stavy, Tel Aviv University
D2-3b
Tuesday, March 24, 1992
9:30 Molly Pitcher Room
Discussion Group:
Textbook/Program Evaluation

From Concrete to Theoretical: An
Analysis of Twentieth Century High
School Chemistry Textbooks
Lee Meadows
University of Georgia
212 Aderhold Hall, Science Edu.
Athens, GA 30602

Teaching SciencePlus: An
Observational Survey of Science
Teaching in New Brunswick and
Nova Scotia Grades 7, 8, and 9.
Charles McFadden
University of New Brunswick
Faculty of Education
Fredericton, NB
CANADA E3B 6E3

D2-4a
Tuesday, March 24, 1992
9:30 William Dawes B Room
Discussion Group: Instructional
Media/Technology

Evaluation and Its Role in Materials
Development: Preliminary Results of
Evaluation of Interactive Media
Science Materials
Craig Bowen
Florida State University
Room 203 Carothers Hall
Tallahassee, FL 32306

George Dawson, Florida State
University

Computer Inclination of Students and
Teachers in Relation to Their STS
Views
Uri Zoller
Haifa University, Oranim
Dept of Science Educ
PO Kiryat Tivon, ISRAEL 36910

Stuart Donn, University of B.C.

D2-4a continued
Software Tools to Assist the
Learning of Science Among Hispanic
Students
Jaime Sanchez
University of Antofagasta
Educational Computing Center
Casilla 170, Antofagasta
CHILE

D2-4b
Tuesday, March 24, 1992
9:30 William Dawes B Room
Discussion Group: School-
Business Partnerships

A Comparison of Educational
Perspectives of Science Teachers,
Industry Personnel Involved in a
Business/Education Partnership, and
Industry Personnel Not Involved in a
Partnership
Glenda Carter
North Carolina State University
Center for Research in Math/Sci
Raleigh, NC 27695-7801

John Park, North Carolina State
University

Validation of a School-Business
Partnership Program
Suzanne Weber
SUNY Oswego Education Dept.
Poucher Hall
Oswego, NY 13126

C. Thomas Gooding, J. Nathan
Swift, Barbara Beyerbach, SUNY
at Oswego

D2-5a
Tuesday, March 24, 1992
9:30 Haym Salomon Room
Discussion Group:
Grouping/Instructional
Settings

The Effect of Levels of Group
Cooperation on Students'
Achievement in Physical Science
Laboratory
Huey-Por Chang
National Changhua Univ of Educ
Dept of Physics
Paisa Village, Changhua
TAIWAN, CHINA 50058

Norman G. Lederman, Oregon
State University

Schoolyards as Classrooms: A Study
of Their Effectiveness
Linda Cronin-Jones
University of Florida
258 Norman Hall
Gainesville, FL 32611

What is Happening Inside
Unstructured Groups? Pattern and
Type of Verbal Interactions of
Intermediate Students
Catherine Conwell-Nesbit
University of North Carolina,
Charlotte
Dept of Curric and Instr
Charlotte, NC 28223

Faye G. Humphrey, Jack
Fleming, University of North
Carolina, Charlotte

Creative Drama and the Enhancement
of Elementary School Students'
Understanding of Science Concepts
Michael Kamen
Auburn University
Curric and Teach Educ
Auburn, AL 36849

Children Attending Science Camp:
Their Home Environment
Christa Winter
Lewis & Clark College
Teacher Education Program
Portland, OR 97219

Draft 2: December 17, 1991
D2-5b
Tuesday, March 24, 1992
9:30 Haym Salomon Room
Discussion Group: Teacher Beliefs/Knowledge, Elementary - Jr. High

Preservice Elementary and Secondary Science Methods Teachers:
Comparison of Formal Reasoning, Act Science, Process Skills, and Physical Science Misconception Scores
Betty Bitner
Southwest Missouri State University
901 South National Ave. Springfield, MO 65804

The Relationship Between Teacher Content and Pedagogical Content Knowledge and Student Knowledge of Heat Energy and Temperature
Shirley Magnusson
University of Michigan Educational Studies
Ann Arbor, MI 48109-1259

Hilda Borko, University of Colorado
Joseph S. Krajcik, University of Michigan
John W. Layman, University of Maryland

Acceptance And Resistance As Forms Of Teachers' Participation In Change
Roberto Monteiro
University of Juiz de Fora (Brazil)
Juiz de Fora #36 100
Minas Gerais, BRAZIL

James J. Gallagher, Michigan State University

The Preservice Elementary School Teachers' Attitude Toward Science Teaching and Its Correlations with Selected Variables
Tien- Ying Lee
National Taiwan Normal University
88, Section 5, Roosevelt Rd. Taipei, TAIWAN, ROC

D2-5b continued
A Preliminary Assessment of Science Process Skills Achievement of Preservice Elementary Teacher
David Radford
Louisiana Tech
Box 3019 TS
Ruston, LA 71272

Linda DeTure, Rollins Coll.
Joyce Swartney, Buffalo State
Rod Doran, SUNY at Buffalo

D2-6
Tuesday, March 24, 1992
9:30 Thomas Paine A Room
Discussion Group: Problem Solving/Use of Analogies

Gifted Seventh Grade Girls' Strategies on a Mechanical Design Task
Marilyn Fowler
Austin Independent School District, 305 North Bluff
Austin, TX 78745

A Meaningless But Nonalgorithmic Solving Course: Solving a Graphing Problem About Osmosis by Analogy
June Zuckerman
Queens College of the City University of New York
Flushing, NY 11367-0904

An Exploratory Study: The Recognition of Prose Structures and the Construction of Graphic Postorganizers are More Useful in Combination Than in Isolation
George Spiegel, Jr.
University of Texas at Austin Education Bldg 340
Austin, TX 78712

Performance Assessment: Implementing the Task Model for Sequencing Instruction in Science Problem Solving
Carol Stuessy
Texas A & M University
Dept of Edu Curric and Instr College Station, TX 77843

Gil Naizer, Texas A & M

D2-6 continued
Analysis and Synthesis of Studies Related to the Effectiveness of Analogies in Science Learning
Zoubeida Dagher
University of Delaware Educational Development Newark, DE 19716

D2-7
Tuesday, March 24, 1992
9:30 Thomas Paine B Room
Discussion Group: Conceptualization/Proportion Reasoning

An Analysis of Think-Aloud Protocols of Students' Understanding of the Mole Concept and Its Use in Problem Solving
John Slaver
Kansas State University Center for Science Education
Manhattan, KS 66506

Andrew T. Lumpe, Kansas State University

A Study on Students' Conceptions of Vaporization and Boiling
Bao-yan Hwang
Dept of Chemistry National Taiwan Normal Univ.
88m Sec 5, Roosevelt Rd. Taipei, TAIWAN 11718

Hsiang-Wu Huang, National Taiwan Normal University

The Development of Conceptions in Basic Electricity: An Application of Teaching Experiment Methodology
Nggandi Katu
The Pennsylvania State University
241 Chambers Bldg.
University Park, PA16802-3206

Vincent N. Lunetta, The Pennsylvania State University
Euwé van den Berg, Vrije Universiteit, Amsterdam, Netherlands

Draft 2: December 17, 1991
**D2-7 continued**
Proportional Reasoning and Field Dependence: Variations on the Cylinder Problem
Carol Lawton
Indiana-Purdue University at Fort Wayne
Dep of Psycy Sci, IPFW
Fort Wayne, IN 46805

Progressive "Problemshifts" Between Different Research Programs in Science Education: A Lakatosian Perspective
Mansoor Niaz
Universidad de Oriente, Venequeula
Apartado Postal 90, Cumana
Estado Sucre,
VENEZUELA 6101A

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**D3**
Tuesday, March 24, 1992
11:00 JFK Ballroom
NARST Business Meeting

**Tuesday, March 24, 1992**
12:00

Lunch (on your own)

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**D4**
Tuesday, March 24, 1992
1:30pm JFK Ballroom
General Session 3

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**D5-1**
Tuesday, March 24, 1992
3:30 Crispus Attucks Room Symposium: Self Efficacy
Self-efficacy Research in Science Education
Charlene Czerniak
University of Toledo
College of Education
Toledo, OH 43606
Larry Enochs, Kansas State University
Catherine Yeotis, Linda Bakken, Wichita State University
David Haury, Ohio State University

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**D5-2**
Tuesday, March 24, 1992
3:30 William Dawes A
Contributed Papers: External Influence on Student Learning
The Mediating Effects of Teacher-Student Relationship on Academic Risk Taking
Mark Templin
University of Michigan
School of Education
Ann Arbor, MI 48109

Katherine Ebbs, University of Michigan
A Descriptive Study of Urban Middle School Students' Relationships to Science and Family
John Wiggins
University of Georgia
Science Education
212 Aderhold Hall
Athens, GA 30602

Mary Atwater, Catherine Gardner, University of Georgia
Third and Fourth Grade Parents' Ideas About and Involvement in Children's Science Education
Elisabeth Charron
Montana State University
Dept of Education
Bozeman, MT 59717

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**D5-3**
Tuesday, March 24, 1992
3:30 Molly Pitcher Discussion Group: Predictors of Science Success/Choice
The Relationship Among Students' Attitudes Toward Science, Math, English, and Social Studies
Jianjun Wang
Kansas State University
Center for Science Education
Manhattan, KS 66506

J. Steve Oliver, University of Georgia
Andrew Lumpe, Kansas State University

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**D5-3a continued**
The Relationship Between Students' Formal Reasoning Ability, Prior Knowledge, Approaches to Studying, and Their Performance in Chemistry
Frank Giuliano
Syracuse University
101 Heroy Geology Bldg
Syracuse, NY 13244

Modifiable Predictors of Students' Academic Success in College Chemistry Courses
Jeffrey Pribyl
Mankato State University
Dept of Chemistry, Box 40
Mankato, MN 56002

Elaine Hogan-Miller, Marcia Stevens, Daryl Adams, Mankato State University
Paul Germann
University of Missouri-Columbia
108 Townsend Hall
Columbia, MO 65201

An Analysis of Myers-Briggs Type Indicator Scores: Florida Women Scientists in Academia
Carolyn Dickman
University of South Florida
4202 E. Fowler Ave.
Tampa, FL 33620

Women Scientists in Academia:
Factors Effecting Career Choice
Carolyn Dickman
University of South Florida
4202 E. Fowler Ave.
Tampa, FL 33620

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Draft 2: December 17, 1991
D5-3a continued
A Study of the Relationships
Between C-Base Composite and
Science Scores, ACT Scores,
Preservice Elementary Students
Process Skills
John Settlage
Technical Ed Research Center
2067 Mass. Ave.
Cambridge, MA 02140
Lloyd Barrow, Julie Cook,
Candace She, University of
Missouri

D5-3b
Tuesday, March 24, 1992
3:30 Molly Pitcher Room
Discussion Group: Teacher
Induction
Induction: Developing a Support
Model to Aid Beginning Middle
School Science Teachers: A Case
Study of a Third Year Teacher
John Wiggins
University of Georgia
Science Education Dept
Athens, GA 30602
Michael Padilla, Lewis Maxwell
Monroem, Bethany Kim Nichols,
University of Georgia

Induction: Developing a Support
Model to Aid Beginning Middle
School Science Teachers: A Case
Study of a Second Year Teacher
Lewis Maxwell
Monroe
University of Georgia
Science Education Dept
Athens, GA 30602
Michael Padilla, John R.
Wiggins, B. Kim Nichols,
University of Georgia

D5-3b continued
Induction: Developing a Support
Model to Aid Beginning Middle
School Science Teachers: A Case
Study of a First Year Teacher
B. Kim Nichols
University of Georgia
Science Education Dept
Athens, GA 30602
Michael Padilla, John R.
Wiggins, Lewis Maxwell
Monroe, University of Georgia

D5-4
Tuesday, March 24, 1992
3:30 William Dawes B Room
Contributed Papers: Nature of
Science/Curriculum Reform
Student Understanding About the
Nature of Science: Data From a Case
of Curriculum Development
Yvonne Meichtry
University of Wisconsin-Stevens
Point
College of Natural Resources
Stevens Point, WI 54481
Project 2061, Phase II: The Culture
of the Georgia Team
Mary Jo Brown
University of Georgia
Educational Psychology
Aderhold Hall
Athens, GA 30602
Politics, Programs, and Pedagogy:
Private Sector Influence on Science
Education Policy Reform in
Michigan
Stacey Marlow
University of Michigan
1228 P SEB
Ann Arbor, MI 48109-1259
Michael Marlow, Jackson Co.
Intermediate School Dist.
An Interpretive Study of Prospective
Teachers' Beliefs About the Nature of
Science
Anthony Lorsbach
Bradley University
Peoria, IL 61625

D5-5a
Tuesday, March 24, 1992
3:30 Haym Salomon Room
Discussion Group: Secondary
School Science
High School Students' Concepts
Regarding Food Chains and Food
Webs: A Multinational Study
Charles Barman
Indiana University School of
Education
902 W. New York St.
Indianapolis, IN 46202-5155
Alan K. Griffiths, Memorial
University of Newfoundland
Peter A. O. Okebukola, Lagos
State University
Continuous Integrated Curriculum
Evaluation: The Case of the Israel
High School Biology Program
Pinchas Tamir
Hebrew University
Israel Science Teaching Center
Jerusalem, ISRAEL 91904
Surveying the Knowledge of Basic
Biology in British and American
Teenagers
Thomas Lord
Indiana University of
Pennsylvania
Weyandt Hall - Biology
Indiana, PA 15705
The Drama of the Hawking-Gould
Dichotomy and Other Everyday
Scientific Happenings: Applying the
Scientific Theory Profile
Cathleen Loving
California State University,
Fresno
Dept of Biology
Fresno, CA 93740
Missing the Mark in Interpreting and
Predicting Outcomes of Diffusion
and Osmosis by First Year College
Students
Rosie Allen-Noble
Montclair State College
Richardson Hall
Upper Montclair, NJ 07043

Draft 2: December 17, 1991
D5-5b
Tuesday, March 24, 1992
3:30 Haym Salomon Room
Discussion Group: Student Attitudes/Beliefs

Students' Attitudes Toward School and Classroom Science: Are They Related?
Patricia Morrell
Oregon State University
Dept of Science Education
Corvallis, OR 97331

Teaching "Nuclear Radiation" in an Integrative Approach to 10th Grade Biology Students: Academic Achievement and Attitudes
Reuven Lazarowitz
Dept of Educ in Tech & Science
Technion - IIT
HAIFA, ISRAEL 32000

Michal Nachshon, Michal Shemesh, Dept. of Education in Technology & Science

The Effects of Live- and Stuffed-Animal Displays on the Attitudes and Behavior of Kindergarten Students
Barry Brucklacher
Mansfield University
Education Dept, 115 Retan
Mansfield, PA 16933

Case Study of a Sixth Grade Class: Attitudes and Conceptions of the Marine Environment
Tom Howick
University of Southern Maine
504 Bailey Hall
Gorham, ME 04038

Michael Padilla, Univ of Georgia

Epistemological Beliefs of Students in High School Physics
Hans Niedderer
University of Bremen, NW1
D 2800 Bremen, GERMANY

Heinz Meyling, Thomas Bethge, Horst Schecker, University of Bremen, NW1

D5-6
Tuesday, March 24, 1992
3:30 Thomas Paine A Room
Symposium: Intuitive Investigation

Student as Intuitive Investigator of the Natural World
Nancy Songer
University of Colorado
School of Education, Box 249
Boulder, CO 80309

Marcia Linn, Univ of California
Robert Tinker, Andee Rubin,
Technical Education Research Centers

D5-7
Tuesday, March 24, 1992
3:30 Thomas Paine B Room
Round Table Group: Responsive Interaction

Responsive Interaction: Pedagogy of Complexity and Uncertainty of Scientific Thought
Joan Russow
University of Victoria
Faculty of Education
Victoria BC
CANADA V8W 3N4

Erich Schwartz

D 6
Tuesday, March 24, 1992
5:00 - 6:30 Crispus Attucks Room

Informal Discussion Group:
Networking with New Researchers

Bill Holliday, Univ of Maryland
Jane Butler Kahle, Miami University
Emmett Wright, Kansas State University
Francis Lawrenz, Univ of Minnesota

Tuesday, March 24, 1992
6:30 - 8:00
Dinner (on your own)

D 7
Tuesday, March 24, 1992
8:00 pm

Networking/Special Interest Groups.
Sign up on bulletin board placed near the reception desk. Room designated (in the Patriot Hall Complex) will be on the sign-up sheet.

Wednesday, March 25, 1992
7:30 am Molly Pitcher Room

NARST Publications Advisory Committee, Chair to be appointed

E1-1
Wednesday, March 25, 1992
7:30 am Crispus Attucks Room

JRST Award Committee, Mary Atwater, Chair

E1-2
Wednesday, March 25, 1992
7:30 am William Dawes A Room

NARST Distinguished Contributions Award Committee, Donald W. McCurdy and Kenneth G. Tobin, Co-chairs

E1-3
Wednesday, March 25, 1992
7:30 am Molly Pitcher Room

NARST Publications Advisory Committee

E1-4
Wednesday, March 25, 1992
7:30 am William Dawes B Room

NARST Election Committee, Russell Yeany, Past President
E1-5
Wednesday, March 25, 1992
7:30 am Haym Saloman Room
NARST Program Committee, Chair to be elected

E2-1
Wednesday, March 25, 1992
8:30 am Crispus Attucks Room
NARST Policy Advisory Committee, Russell Yeany, Past President

E2-2
Wednesday, March 25, 1992
8:30 am William Dawes A Room
NARST Research Committee, Chair to be elected

E2-3
Wednesday, March 25, 1992
8:30 am Molly Pitcher Room
NARST Award Committee, Thomas R. Koballa, Jr.

E2-4
Wednesday, March 25, 1992
8:30 am William Dawes B Room
NARST Financial Advisory Committee, Dorothy Gabel, Chair

E2-5
Wednesday, March 25, 1992
8:30 am Haym Saloman Room
NARST International Issues Committee, Barry Fraser, Chair

E2-6
Wednesday, March 25, 1992
8:30 am Thomas Paine B Room
NARST Dissertation Award Committee, Linda DeTure, Chair

E3
Wednesday, March 25, 1992
10:00 am - 6:00 p.m.
Room 203
NARST Executive Board Meeting and Lunch

Draft 2: December 17, 1991
The preliminary program is being issued at this time to facilitate individuals who are planning to attend the annual meeting. The mailing address of the senior author or organizer of each presentation is included so individuals not attending the annual meeting can write for papers. Caution: Because of possible circumstances beyond the control of the program committee, modifications may be required. For example, changes may occur because we will not have confirmed most presentations by the deadline for publishing this issue of the NARST newsletter. Names of presiders and discussants (where appropriate) will appear in the final version of the program. The final program will be mailed to all individuals who preregister for the annual meeting.

Draft 2: December 17, 1991
ANNOUNCEMENTS

International Conference on Technology. Concepts and Trends in Technology Education, an International Conference on Technology Education, will be held in Weimar, Germany, April 26-May 1, 1992. The aims of the conference are for education and industry working in partnership to:

- consider the goals, methods and organization of technology education around the world and identify common interests, concepts and trends, including the relationship to the environment,
- share practice aimed at developing technological literacy enabling all people to contribute to a modern society,
- discuss the value of technological approaches for delivering other learning and enhancing human capabilities,
- gain a wider appreciation of resources (materials and practice) available for technology education for all ages,
- establish an international council for technology education—to provide an umbrella for networking information and contacts.

For further information concerning the conference, please contact: Dawn Robertson, Janet Jones Associates Ltd., Westerfield College, Queens Building, Kidderport Avenue, London NW3 7ST (United Kingdom).

Second International History, Philosophy & Science Teaching Conference. The second conference of the International History, Philosophy and Science Teaching Group will be held at Queen's University, Kingston, Ontario, CANADA, from May 11-15, 1992.

Kingston is a very attractive small city located midway between Toronto and Montreal. The campus is situated on the edge of Lake Ontario. Accommodations will be provided on campus in a well appointed residential complex.

The same pattern as the first conference will be followed. It will be a working conference with many papers published in advance — in the first two issue numbers of Science & Education and The Journal of Educational Thought. School teachers are especially encouraged to attend.

Papers for the conference should be a maximum of 5,000 words, they should be submitted on disc along with three copies by January 12, 1992.

David Hawkins, distinguished Professor of Philosophy Emeritus, University of Colorado, has agreed to be ‘Honorary Chairman’ for the conference. David’s contributions to the history of science, philosophy of science, philosophy of education and science education (especially with young children and teachers of young children) have been substantial.

Registration costs are CAN $250 if paid before February 15, 1992; and CAN $300 if paid after that date. Registration includes the Conference Proceedings, a special issue of The Journal of Educational Thought, two year’s subscription to Science & Education, and the conference dinner. There is a special student registration rate of CAN $150.

Full accommodation and meals will be provided on the attractive lake-side campus of Queen’s University. The cost will be in the order of CAN $75 per day.

Further details from the Conference Secretary:

Professor Skip Hills
Faculty of Education
Queen’s University
Kingston
Ontario

Call for Manuscripts. (Journal of Elementary Science Education). The Journal of Elementary Science Education invites submissions of manuscripts written in accord with its purposes that have not been previously published and are not under review by any other publication. The JESE, published biannually by the Curry School of Education, University of Virginia, is a national, refereed journal devoted exclusively to the issues of elementary science education. The purpose of the journal is to communicate ideas, theoretical formulations, research findings, and practical field-oriented information related to supervision, curriculum, and instruction. Lesson activities alone are generally not accepted. The audience of the JESE includes colleges and universities with teacher education preparation programs, State Departments of Education, local education agencies, science educators, and science teachers.

For a sample copy, guidelines for submission of articles, or additional information, contact: J. Preston Prather, Editor, Journal of Elementary Science Education, Curry School of Education, CISE - 250 Ruffner Hall, University of Virginia, Charlottesville, VA 22903-2495.


continued on page 8 -ANNOUNCEMENTS
ANNOUNCEMENTS (continued)

January 1992. The editor is Dr. Michael R. Matthews, School of Education, UNSW, Kensington, NSW, Australia.

The journal is affiliated with the International History, Philosophy, and Science Teaching Group which held a very successful first conference at Tallahassee, USA, in 1989, and which is holding its second conference at Kingston, Canada, in May 1992.

Science & Education hopes to contribute to the improvement of science and mathematics teacher education programmes by publishing accounts of successful courses which have included history, philosophy and sociology, and by other means.

Straight historical, philosophical and sociological studies will be published, but only if they bear upon recognizable pedagogical concerns and subject matter.

One major development of the past 25 years in science education has been the introduction of Science-Technology Society (STS) courses. Most of these raise questions about the history, philosophy and sociology of science. Science & Education will provide a forum in which these topics can be explored.

Among the contributors to the early issues are: Paul Ernest, Alberto Cordero, Derek Hodson, Gerd Buchdahl, John Heilbron, Harry Collins, Harvey Siegel, and Walter Jung.


Contributions: Papers, reports, letters are welcome. Clear and lucid writing which is intelligible across a number of disciplines is encouraged. The standard Kluwer format for presentation and referencing - as found in journals such as Synthese, Biology & Philosophy and Educational Studies in Mathematics - is to be used. Full style guidelines are available from Kluwer. Three copies of a double-spaced manuscript are required. Additionally, submission on IBM compatible disc is encouraged. Send to The Editor, Science & Education, c/o Kluwer Academic Publishers, P. O. Box 322, 3300 AH Dordrecht, THE NETHERLANDS.

National Study of Curricular Reform in Science and Mathematics The U. S. Department of Education has just awarded a $690,000 contract to the University of Colorado for a three year study of curricular reform in science, mathematics and higher order thinking skills. Directed by Professor Ronald D. Anderson of the School of Education, this national research study is intended to provide information for practitioners and policymakers about the character of such reforms, barriers to their initiation, and means of putting the reforms into practice at the state and local level. The first year of the project will include the preparation of reviews of existing research, commissioning of papers by leading scholars and development of a national conference on the topic to be held in mid-1992. The second year will focus on conducting case studies of nine sites in the U. S. where successful reforms of this nature have become established. In year three, information from the case studies will be analyzed, documents for practitioners and policymakers will be prepared, and relevant information will be disseminated through a variety of publications, conferences and communication networks established through various state groups and agencies across the U. S.

MU Science Education Center helps Prepare Future Educators Amid reports that U. S. students lag behind children from other countries in basic science skills, the University of Missouri-Columbia, College of Education, is changing the way it prepares tomorrow's science teachers.

The College dedicated its new Southwestern Bell Foundation Science Education Center Nov. 2. The center was made possible through a $1 million gift from the Southwestern Bell Foundation, which is the College's largest gift.

"This new facility will benefit MU and the larger community. With the Southwestern Bell Foundation's support, we have the tools necessary to improve science education throughout Missouri as highly trained teachers help our children understand science and learn how to think," MU Chancellor Haskell Monroe said.

"The Southwestern Bell Foundation is very pleased to have had a part in making this innovative facility a reality," said Edward E. Whitacre, Jr., chairman and chief executive officer of Southwestern Bell Corporation. "It underscores our commitment to improving the quality of science instruction at every level in our educational system."

"We need to help future teachers learn how to solve problems, not just how to memorize," said Dr. Lloyd Barrow, director of the Southwestern Bell Foundation Science Education Center and professor of science education. "There are two major roadblocks in science education today — a lack of classroom materials and limited staff development and support to answer classroom teachers' questions."

Many science educators are unable to use technological advances to their best advantage, according to Barrow. "The traditional way to teach science is to have the students read and answer questions. They need to do more hands-on work, to try different things and see that there are many ways to approach one problem."

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ANNOUNCEMENTS (continued)

Before students can do this, teachers must be able to use new equipment and resources in a variety of ways. "We are trying to expose future teachers to technology and equipment that is brand new at this point, but will be necessary to understand in five years," he said.

The center includes an IBM networked computer laboratory and library of instructional science and math software. In addition, the laboratory will house both IBM and Macintosh computer networks that will access national science databases.

A telephone hotline is planned for teachers statewide to use to call for advice on science curriculum and other resources. An electronic mail network also will be installed to allow convenient communication with science educators around the state.

"The laboratory has three arrangements that simulate different types of classrooms," Barrow said. "When our graduates enter a classroom situation, they will know how to use the type of classroom available in the best way."

"The center provides an opportunity for the College to assume a leadership role and address the critical needs of this state and nation for improving student interest and success in science," said Dr. Robert J. Dollar, interim dean of the College of Education. "It certainly would not have been possible to strengthen significantly our science education program without the generous gift of the Southwestern Bell Foundation."

University of Missouri-Columbia is offering graduate assistantships ($8,000 plus free tuition) for doctoral students beginning in Fall 1992 with an emphasis in science education. Recipients will be assisting first year K-8 science teachers via a toll-free phone assistance program. Applicants must have a master's degree, K-8 science teaching experience (minimum of three years), GRE scores, three letters of recommendation. Applications are due February 1, 1992. For information and application, contact Lloyd H. Barrow, Southwestern Bell Education Center, 108 Townsend Hall, University of Missouri, Columbia, MO 65211; (314) 882-7457.

Obituary - Joseph Isaac Lipson. Joseph Isaac Lipson, who has been an active member of the science education community for nearly 30 years, died of cancer at his home in Chico, California, on July 17, 1991. He had been Professor of Communication Design at California State University-Chico, since 1985.

Joe was a self-made think tank with a goal of understanding nothing less than the human mind. He read widely and synthesized across many fields, generating innumerable insights which he freely shared. He was happiest when he could give someone new perspectives in their own area of expertise.

Born on April 19, 1927, Joe earned his B.S. from Yale University (1950) and his Ph.D. in physics from the University of California-Berkeley (1956). As a graduate student, he is credited with making many contributions to the development of the first all-glass mass spectrometer and the potassium-argon method of age-determination of rocks. Joe held positions in physics and geology at the University of Alberta in Edmonton (57-60) and University of Pittsburgh (61-64). During this time he grew increasingly interested in science education.

In 1964, Joe moved to the Learning Research and Development Center at the University of Pittsburgh, where he was one of the principal developers of IPI (Individually Prescribed Instruction). Subsequent university positions included Nova University (professor of science education, 67-69); the University of Illinois at Chicago Circle where he was instrumental in creating the Doctor of Arts program, working as associate dean of the graduate college and associate academic vice chancellor (71-75); and University of Mid-America (academic vice president, 1975-77). Joe was also active in the public sector, including positions such as: member of the U.S. Commission on Education Planning Unit for the proposed National Institute of Education (1971), Director of Science Education Development and Research at the National Science Foundation (1978-1981), and most recently, Special Advisor to the California Mathematics Assessment Advisory Committee. Dr. Lipson periodically worked in private industry as well. He created elementary science materials with Learning Research Associates (69-71); helped produce the first instructional videodisc in biology at the World Institute for Computer Aided Teaching (WICAT) in Provo, Utah (77-78, 81-84); and helped develop assessment strategies for teachers and learners at the Educational Testing Service in Princeton (88-89). From 1985 until the day he died, Dr. Lipson was an active and valued member of the SemNet Research Group, which is engaged in the design, development and testing of a computer-based learning and knowledge organization tool.

Joe is survived by his friend, Loretta Jones (who is in chemistry education at the University of Illinois, Urbana-Champaign); four children, Christopher, Mark, Elaine, and Roger; three grandchildren; a sister, Myra; a brother, Eugene; and a former wife, Laurette Lipson of Dallas. He is missed by many. Memorial donations may be made to the Joe Lipson Scholarship Fund, Project 7186, California State University, Chico, CA 95929-0145.
FROM THE EXECUTIVE SECRETARY

In his text entitled the Complete Problem Solver (2nd edition), John Hayes (1989) defined a problem as, "Whenever there is a gap between where you are now and where you want to be, and you don't know how to find a way to cross that gap, you have a problem." (p. xii). Grayson Wheatley utilized Hayes' definition of a problem to define problem solving as what you do when you don't know what to do. Colleagues, I have a problem. I have considered all sorts of ways to ignore my problem, such as: 1) reading scholarly journals and books; 2) preparing a manuscript for possible publication; 3) playing 18 holes of golf; 4) jogging four miles; or 5) taking the family on a vacation. Moreover, I have contemplated several possible courses of action that I could take after sharing my problem, such as: 1) changing my address; 2) changing my FAX number; 3) changing my office phone number; or 4) obtaining an unpublished home telephone number. But, none of these will bring a resolution to the problem; thus, I have decided to take the direct approach and leap straight into the gap. Colleagues, the time has come to increase the NARST membership dues.

The Executive Board met in October and spent an entire weekend discussing issues central to the continuing growth and vitality of NARST. Among the issues discussed was an increase in the annual membership dues. The current annual dues structure has been in place for at least five years. Regular members pay $54, student and emeritus members receiving JRST pay $30; student members not receiving JRST pay $14; emeritus members not receiving JRST pay nothing. Under a proposal approved unanimously by the Executive Board, the annual dues structure would become:

Regular member $90.00
Student member with JRST $46.00
Student member without JRST $14.00
Emeritus member with JRST $46.00
Emeritus member without JRST $46.00

An analysis of three factors provided the impetus for the Executive Board's action. The first factor relates to the 1992 budget and cash reserves. The Executive Board approved an operating budget for 1992 that contains a projected $7,000 deficit. I anticipate closing out the 1991 budget with approximately $15,000 cash in reserve, but this cushion will quickly disappear without increased revenues. A combination of higher sales of NARST monographs and books, an increase in membership, and greater participation in the 1992 Annual Meeting could shrink but not totally remove the deficit.

The second factor centers on our contract with John Wiley & Sons, publishers of the Journal of Research in Science Teaching. The publishing agreement expires at the end of 1992; thus, it must be renegotiated in the coming year. The publisher has demonstrated a commitment to NARST by not increasing the charge to NARST members when it could have done so at certain points under the present contract. However, the Executive Board expects that Wiley and Sons will have to increase charges to NARST members by a substantial amount under a new contract. Moreover, the Executive Board could not delay its action, as a dues increase must be voted on and approved by the membership. Assuming that members vote to increase dues, the earliest that a new dues structure can be implemented is fiscal 1993, which begins January 1, 1993. Thus, the Executive Board had to act in advance of a new contract for publishing JRST. It is likely that the NARST membership will also vote on a dues increase in advance of a new JRST contract.

The third factor focuses on the sources of revenue and the costs of operating NARST in the 1990s. NARST has three principal sources of revenue: membership dues; sales of books and monographs; and its Annual Meeting. In preparing the budget for 1992, I adhered to the philosophy that normal operating expenses should come from dues and sales; the Annual Meeting should, in a worst case scenario, pay for itself. According to 1992 budget projections, receipts for the Annual Meeting should exceed expenses by about $3,700. Thus, the Annual Meeting, should pay its own way. Further, the actual deficit is centered in the area of normal operating expenses.

As I stated earlier, the Executive Board examined the present financial situation at length during its recent meeting and unanimously approved the new membership dues structure. The Board further recommended that NARST members be informed early on through NARST News, thereby allowing members to reply with suggestions, comments, and concerns. I suggest that members do this in two ways. First, take the time to call, write, or FAX your reply to me using the information at the close of this message. Second, come to the Annual Meeting, discuss the issues with your colleagues, and attend the NARST business meeting, which is scheduled for 11:00 a.m. - 12 noon, Tuesday, March 24, 1992. Please note that this time slot lies in the middle of the Annual Meeting, not at the end, thereby providing ample time for discussion. After the close of the Annual Meeting, I will mail ballots to all NARST members who have paid their 1992 dues. Please use the information provided below to reply regarding an increase in dues:

Dr. John R. Staver
NARST Executive Secretary
Center for Science Education
219 Bluemont Hall
Kansas State University
Manhattan, KS 66506
PHONE: (913) 532-6294
FAX: (913) 532-7304
NARST MONOGRAPHS & PUBLICATIONS

Monographs


4. *Interpretive Research in Science Education*. J. Gallagher (editor).

Publications


NARST MONOGRAPH ORDER FORM

Please send me the following:

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Send orders with check payable to NARST to:

Dr. John Staver  
NARST Executive Secretary  
Center for Science Education  
219 Bluemont Hall  
Kansas State University  
Manhattan, KS 66506
NARST News

NARST News is the quarterly newsletter of the National Association for Research in Science Teaching, produced as a means for the NARST leadership team to communicate with members. Moreover, individual members, special interest groups and regional, national and international associations, can announce items of interest. First priority will be afforded to regular NARST News features; other items will be published as space permits and on a first-received basis. Copy submitted in other than printed form should be through one of the following alternatives: 1) as a Wordperfect text file on a five inch floppy MS-DOS computer disk; 2) as a Wordperfect text file on a 3 1/2 inch Macintosh disk; 3) FAX copy to (913) 532-7304; or 4) through BITNET (LSCHARM@KSUVM). News and/or other contributions will be accepted up to 3 weeks prior to the first day of the month of quarterly publication. Late items will be considered for publication in subsequent newsletters.

Send contributions to the return address below.

NARST Membership Information

I am interested in becoming a member of the National Association for Research in Science Teaching (NARST).

_____ Please send me information about NARST.

_____ Please enroll me as a member of NARST for the 1992 calendar year.

NOTE: If enrolling as a member, please check the appropriate category and enclose a check payable to NARST (in U.S. funds).

_____ Regular membership @ $54.00

_____ Student membership w/JRST @$30.00

_____ Student membership w/o JRST @$14.00

I attest that .

is eligible for student membership in NARST.

(Signature, NARST sponsoring member)

NAME: ____________________________

ADDRESS: ___________________________

City ____________________________ ST _______ ZIP _______

Country ___________________________

PLEASE SEND MEMBERSHIP/INFORMATION REQUESTS TO:

DR. JOHN STAVER, EXECUTIVE SECRETARY

NARST, BLUEMONT HALL

KANSAS STATE UNIVERSITY

MANHATTAN, KS 66506-5334.

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Center for Science Education
Kansas State University
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