NARST ANNUAL BOARD OF DIRECTORS MEETING
October 19 – 20, 2001

Table of Contents

Agenda Approval

Introductions

Minutes, Spring 2001 Board Meeting .....Section 1

President's Report .....Section 2
Norman G. Lederman

Past President's Report .....Section 3
Sandra K. Abell

President-Elect's Report .....Section 4
Standing Committees – 2002-2005
Cheryl L. Mason

Program Committee .....Section 5
Cheryl L. Mason & David B. Zandvliet

Executive Secretary's Report .....Section 6
John Tillotson

JRST Editor's Report .....Section 7
Dale R. Baker & Michael D. Piburn

Research Coordinator's Report .....Section 8
Frank E. Crawley

Standing Committee Reports

Financial Advisory Committee .....Section 9
Diane Ebert-May

Policy Advisory Committee .....Section 10
Sandra K. Abell

Publications Advisory Committee .....Section 11
Charlene M. Czerniak

Election Committee .....Section 12
Sandra K. Abell

International Committee ..... Section 13
Sharon J. Lynch

JRST Award Committee .....Section 14
Jonathan F. Osborne

NARST Outstanding Paper Award Committee .....Section 15
Kathryn Scantlebury

Distinguished Contributions Through Research Award Committees ....Section 16
William W. Cobern

Early Career Research Award Committee .....Section 17
J. Randy McGinnis

Outstanding Doctoral Dissertation Award Committee .....Section 18
Leonie J. Rennie

Outstanding Master's Research Award Committee .....Section 19
Diane Ebert-May

Equity Committee .....Section 20
Alberto J. Rodriguez

Membership Committee .....Section 21
J. Randy McGinnis

Special Committee Reports

National Science Teachers Association Representation .....Section 22
Maureen M. McMahon

American Assoc. for the Advancement of Science Representation.....Section 23
Marcia C. Linn & Kathryn Scantlebury

International Council of Association for Science Ed. Representation ...Section 24
Sharon J. Lynch

Environmental Education Ad Hoc Committee .....Section 25
Michaela Zint

Informal Science Education Ad Hoc Committee .....Section 26
Lynn Dierking & John Falk

Practitioner Research and Ad Hoc Committee .....Section 27
Emily Van Zee & Deborah Roberts

NARST Policy Manual .....Section 28

Other Old Business

New Business

Time and Location of Spring and Fall 2002 Board Meetings

Adjournment

Past President's Report
October, 2001
Sandra K. Abell, Past President

1. NARST Management. As charged at the March 2001 Board meeting, a subcommittee of the board met in DC on June 12 with Gerry Wheeler, Executive Director of NSTA, and members of his staff to explore issues surrounding NARST Management. Subsequently the subcommittee met in private and drafted an action plan for NARST management, reported to the board electronically June 18 (see attached). The following actions have since been taken:

- John Tillotson was approved as Interim Executive Secretary
- Marilyn Estes was hired at the University of Missouri, Columbia (UMC) as NARST Administrative Assistant.
- A set of NARST Management Responsibilities (see attached) has been developed and shared with John and Marilyn. They continue to work out the details.
- David Haury has forwarded all files and records to John and Marilyn. David visited UMC in September to provide Marilyn with hands-on training on the database and other NARST business procedures.
- The NSTA Board, at its July meeting, gave Gerry Wheeler the green light to pursue continuing conversations with NARST concerning management ideas. No further action with NSTA has been taken.
- David Zandvliet has taken over management of the NARST web site and listservs from the Kleins.

2. Policy Advisory Committee: (Members: Ann Cavallo, John Staver, Kathleen Hogan, Thomas Koballa, Jeff Bloom, William Sumrall)

Because of my work with NARST Management and recruiting/hiring/start up of the new administrative assistant, President Norm Lederman asked other board members to oversee the development of several policies: policy on electronic board communications; policy on affiliation with other organizations; policy on removal of non-participating committee members; and policy on creating new strands. I assume we will receive updates on the status of these policies in other reports during this board meeting.

The other task of the Policy Advisory Committee (PAC) is to update the NARST Procedures Manual. I asked award committee chairs to examine their procedures in light of current practice and equity issues. The Manual contained in Section 28 of this Board Book represents the most current version of NARST procedures as submitted. Once approved, it will be forwarded to David Zandvliet to post to the NARST web site. It is important that each committee chair examine the section of the manual pertaining to his/her committee and send updates regularly to the chair of the PAC.

3. Election Committee: The report of the Election Committee is available in Section 12 of this Board book.

Election Committee Report
October, 2001
Sandra K. Abell, Chair

Committee Members: Lloyd Barrow, Saouma Boujaoude, Angelo Collins, Cathy Loving

1. Given the Presidential charge at the March, 2001 Board meeting, the Election Committee worked to find nominees for the position of NSTA Research Director, given the important role this person serves as liaison to the NARST Board and spokesperson for science education research interests in NSTA. The following individuals agreed to be nominated for the position and their names were forwarded to the NSTA Nominations Committee:

   Patricia Simmons, University of Missouri, St. Louis
   John Staver, Kansas State University

2. **The Election Committee recommends that the following individuals be placed on the NARST ballot for President-elect**:

   Andy Anderson, Michigan State University
   M. Gail Jones, University of North Carolina—Chapel Hill

3. **The Election Committee recommends that the following individuals be placed on the NARST ballot for Board members at large**:

   Zoubeida Dagher, University of Delaware
   David Jackson, University of Georgia
   Gregory Kelly, University of California-Santa Barbara
   Gail Richmond, Michigan State University
   Mike U. Smith, Mercer University
   Deborah Smith, Woodcreek Elementary Magnet School for Math, Science and Technology, Lansing, MI

4. The procedures for the Election Committee have been modified to include information about qualifications of candidates. Many details about elections procedures were removed from the bylaws during the last update. I have tried to account for them in the procedures. Some questions arose while I was updating these procedures:
   a. What is the procedure in case of a tie? The old bylaws indicated that a tie would be established by a voted of the members present at the Annual Meeting, which seems cumbersome and inefficient. Other ideas?
   b. The old bylaws indicated that the Election Committee Chair prepares and counts the ballots. Our practice for many years is that the Executive Secretary does so. Is there any reason to change this practice?
   c. The old bylaws/procedures allow for petitions to add names to the ballot, but this has not been part of recent practice. What is your pleasure?

4. NSTA Liaison: In my role as NSTA liaison, I have served in the following ways:
    - Attended the meeting of the NSTA Research Committee at the national convention. The main topic of discussion is the NARST/NSTA joint publication effort spearheaded by Maureen McMahon.
    - I was asked by NSTA President, Harold Pratt, to appoint a NARST member to the NSTA Research Committee. I asked NARST Research Coordinator Frank Crawley to fill this role through 2004. **The board should consider providing travel support for this member to attend the NSTA national convention where the Research Committee meeting takes place so that NARST can have a continuing presence at NSTA.**
    - Attended the NSTA Summer Council Meeting in Colorado Springs.
    - Worked with NARST Subcommittee and NSTA Executive Director and staff on plans for NARST management (see #1).

   I will attend the Winter NSTA Council meeting. After that time, President-elect Cheryl Mason will take over the NSTA liaison role.

5. Pathways Conference. NARST agreed to endorse/co-sponsor the Pathways to Change Conference, an international conference meeting in April in DC that focuses on transforming college math and science teaching for all students, and especially for the future K12 teachers who will prepare the next generations of college students. President Norm Lederman appointed me to represent NARST at the conference. I have organized a panel about research and practice in assessing student science learning, and have asked Bill Boone and Kate Scantlebury to be part of the panel. For more information see: http://k12s.phast.umass.edu/stemtec/pathways/path2.html

6. Unresolved Issues. I know of several tasks that remain not completed. My hope is that as our new NARST management structure, including new web site management, will provide a more efficient and effective means of accomplishing tasks such as these.
    - Electronic member directory posted to the web.
    - Posting of minutes and procedures manual to the web.

June 18, 2001

Dear NARST Board Members,

At the Spring Board Meeting in St. Louis, a subcommittee (i.e., Sandi Abell, Norman Lederman, Cheryl Mason, Sharon Lynch, Randy McGinnis, and Kate Scantlebury) was charged with developing and implementing an action plan related to the overall management of NARST. This was a direct result of the recommendations derived from the Fall 2000 Retreat. This letter serves as a summary of the action plan decided upon by the subcommittee.

On June 11, our subcommittee met with representatives from NSTA to hear their proposal of how NSTA may be able to assist NARST with the performance of some of the administrative and clerical aspects of NARST management. Our subcommittee considered NSTA's capabilities, along with the proposal received from David Haury at the Spring Board meeting with respect to management activities and associated costs.

Following a close inspection of the current NARST budget and NSTA's current time-line constraints (i.e., they can't do all that we want until at least spring 2002), our subcommittee decided upon an interim plan for the next year:

1. NARST will advertise for an Interim Executive Secretary whose responsibilities will begin August 1, 2001 and end July 31, 2002. The Interim Executive Secretary would serve NARST in a significant role as the Association moves forward in a restructuring effort of its Association management. The goal is to make member services more efficient so that the Board can concentrate more on the research agenda of the Association. An interim position is necessary as the Board and Interim Executive Secretary explore different management models. If the position is not filled by the August 1 deadline, we will continue to advertise until an acceptable candidate is found.

   The Interim Executive Secretary's responsibilities include, but are not limited to: (1) recording, maintaining and distributing reports and minutes for executive board meetings; (2) coordinating communications among the board, the administrative staff, and NARST members; and, (3) serving as ex-officio member on numerous NARST committees.

   The individual will be paid $15,000 to be used for expenses incurred while fulfilling the responsibilities of the Interim Executive Secretary (including supplies, printing, postage, and telephone expenses) as well as for release time and/or summer salary. The Executive Secretary's travel expenses to the NARST annual meeting and the October board meeting are paid for by NARST.

2. An half-time Administrative Assistant will be hired at the University of Missouri to handle all clerical activities that NSTA is unable to perform at the current time. These responsibilities will include managing the financial aspects of NARST (e.g., member

registration, disbursements, budget preparation, conference registration, management of the NARST databases, mailings, and inventory and control of monographs). This individual will be paid $16,000 for the year with an additional $25,000 provided for supplies and equipment. Sandi will monitor this person's performance.

3. NSTA will assume some of the basic clerical activities formally performed by the Executive Secretary. These services include coordination of the Board meetings, assembling the Board book, maintaining Board intranet communications, archiving of NARST documents in a central location, and other organizational communication activities (e.g., e-mail and FAX central location, U.S. mail, etc.). NSTA will be offered $5,000 for these services. At this time, because of software changes and other infrastructure changes NARST is not capable of performing the responsibilities assigned to the aforementioned Administrative Assistant. It is hoped that NSTA can assume these additional responsibilities next Spring. NSTA will need to present our proposal to its Board next month. If NSTA finds the NARST offer unacceptable, the responsibilities mentioned will temporarily be handled at University of Missouri (hence the reason for the Administrative Assistant being located at University of Missouri).

4. David Zandvliet will be asked to perform an upgrade of the NARST website for a one-time block grant of $10,000, after which maintenance support of $3500 will provided each year to whoever is serving as webmaster.

The subcommittee arrived at this interim plan as a one year "stop gap" because NSTA was not ready to perform responsibilities previously anticipated. In addition, the NARST budget could not afford the David Haury/Ohio State proposal. Finally, the short time-line of August 1 for the expiration of David Haury's term as Interim Executive Secretary necessitated that we act quickly, but provide ourselves additional time to fully develop a more permanent organizational structure.

After considerable discussions, the entire subcommittee reached unanimity in support of the described action plan. We feel the plan represents the most practical and affordable option available to NARST at this time. We strongly believe that this action plan will allow NARST a one-year time frame during which NSTA will be able to gear-up their capabilities or another affordable proposal can be developed by another "agency" or university. Thank you for taking the time to carefully read this action. Subcommittee members will be happy to respond to any questions or requests for further information that you may have.

NARST Management Functions and Responsibilities

Function	Responsibility
• Database services o Member data base o Correspond with techies about online member data base o Data bases of committee and board service o Member lists to Wiley (our journal publisher) and other clients	UMC
• Financial services o Member registration o Conference registration o Disbursements o Reimbursements (e.g., to board members for travel) o Sales and distribution (NARST monographs, exhibit space, ads in program) o Taxes and auditing	UMC
• Financial services o Budget preparation	Executive Secretary
• Communications o Receptionist for phone calls (this person would need to answer questions, not just route calls) o Email and fax o Sending listserv messages and web forms o US mail o Outreach beyond NARST	UMC and Executive Secretary
• Technology services o Listserv management o Web site management o Electronic member directory o Board intra-net management o Electronic program proposal submission and review o Electronic newsletter distribution	David Zandfliet and crew Randy Yerrick and Helen Parke

○ Publications ○ Printing and mailing of newsletter (although this may become purely electronic) ○ Board book assembly and reproduction ○ Inventory control (monographs) ○ Marketing and mailing (other potential pubs)	UMC
• Coordination ○ Arrange lodging and meeting rooms for Board Meetings ○ Arrange accommodations for executive group and staff at Annual Meetings ○ Arrange meals for Board Meetings	Executive Secretary
• Coordination ○ Arrange production of plaques and awards	UMC
• Arrange staffing of registration table at annual meeting	??? (maybe UMC and Exec. Sec)
• Liaison with board ○ Take minutes ○ Distribute minutes in a timely fashion ○ Post approved minutes on web site ○ Serve as ex-officio on standing committees ○ Maintaining archives; policy documents, etc.	Executive Secretary
• Coordination of Elections ○ Candidate statements and ballot ○ Mailing ballots ○ Counting ballots ○ Communicating with Past President (Chair of Election Committee)	Executive Secretary (to put together candidate statements) UMC (to mail and count ballots)

President-elect's Report
October, 2001
New Orleans, LA

1. David Zandvliet, the new AMC, Kim Nichols and I met at the 2001 NARST Annual Meeting. We discussed what the procedures were for developing the annual program and meeting. Over the next few months the transition was made from Kim's campus to David's.
2. In meeting with my program committee, we refined the theme for the 2002 meeting. The decided upon theme is Research, Policy, Practice: Creating a Voice for the Profession.
3. Over the past several months, I have been in steady communication with Norm and Sandi concerning issues revolving around a myriad of details.
4. I served on the subcommittee to develop a working relationship with NSTA as part of restructuring the leadership team and individual responsibilities.
5. David Zandvliet, Carson Au and I have worked intensely on transferring the website from the Kleins to Simon Fraser University. I have been extremely impressed with David, Carson and their colleagues.
6. There were numerous email messages with questions and concerns about proposal submission and hotel registration, among other things, to which I responded.
7. Kluwer was invited to continue its sponsorship of the Past-Presidents' Reception at the annual meeting in New Orleans at a level of $500. Michel Lockhorst of Kluwer quickly agreed to continue sponsorship of the event.
8. Several invitations were sent to potential plenary speakers. The idea was to invite three speakers each addressing the concepts of research, policy or practice. As it turns out, Marilyn Cochran-Smith will be addressing practice on April 8th at 10:30A. David Berliner will be addressing policy on April 9th at 10:30A. We could discuss a third speaker for the research arena.
9. Concerning the Mission Statement, I suggest that we add "funding agencies" to the third goal.
10. In going through the Bylaws, I think that we need to discuss Article V, Section I "The Board of Directors approves membership in the organization."
11. In conjunction with the Policy Committee, I am working to develop policy concerning measures to be taken when Board Members, Committee Chairs and Members are negligent in their duties. This may take longer than some of the other policy issues due to its sensitivity.
12. email, email, email

Respectfully submitted,

Cheryl L. Mason
NARST, President-elect

Program Committee Report
October, 2001
New Orleans, LA

1. Two plenary speakers have been confirmed. Marilyn Cochran-Smith from Boston College will be the speaker at 10:30A on Monday, April 8, 2002. Her emphasis will be on practice. David Berliner from Arizona State University will be the speaker at 10:30A on Tuesday, April 8, 2002. His emphasis will be on policy. Despite several efforts, I have not identifed a third speaker. As it stands, unless someone has an individual in mind, we are going with just the two speakers.

2. Michel Lokhorst from Kluwer has agreed to sponsor ($500) the reception honoring Past Presidents, Distinguished Awardees, Executive Secretaries, and Past and Present Journal Editors.

3. Ron Good is working at having last year's band, Boomers, play for us on Tuesday, April 9, 2002. It will follow the FARSE presentation.

4. Carson Au (cau@sfu.ca) and Athena Roussinos (athenar@sfu.ca), under the direction of David Zanvliet, have been developing the NARST website (http://www.educ.sfu.ca/narstsite/) and listserv connection (http://www.educ.sfu.ca/narstsite/listserv.html), in addition to the site for proposal submission.

5. The following is a rough estimate of the number of completed proposal submission for the 2002 meeting.

Proposals	Status
156	complete proposals
617	unchecked or incomplete (including 478 rec. during the last 7 days)
102	duplicates - voided
875 (hits)	total (attempts)
15	received in paper format

6. Tasks the Simon Fraser University group are completing:

- Corresponding with authors
- Checking database records for completeness and accuracy
- Checking proposal-upload, readable file format
- Insuring ID author name, absent for blind review
- Assigning to strands
- Converting to PDF documents
- Summarizing review process and distribution to strand coordinators

7. Other ideas for the Board to consider:

- Use of color in the NARST program or at least on the front cover
- Preparation of a refereed proceedings

Respectfully submitted,

Cheryl L. Mason
NARST, President-elect

David B. Zandvliet
NARST, Annual Meeting Coordinator

Executive Secretary's Report
NARST Fall Board Meeting
October 19-20, 2001
New Orleans, LA

John W. Tillotson

The following is a brief report of the activities of the NARST Interim Executive Secretary from the period beginning August 15, 2001. It is my understanding that the outgoing Executive Secretary, David Haury, will also be submitting a report on his activities this year prior to my appointment to the position.

1. Following my appointment as the new NARST Interim Executive Secretary, I contacted both Norm Lederman and Sandi Abell in August to discuss the responsibilities of the position in light of the reorganization of the NARST administrative structure. Sandi provided me with an outline of the suggested division of duties between the Executive Secretary and the newly created NARST Administrative Assistant position (filled by Marilyn Estes, University of Missouri). This outline of NARST management functions is included in Appendix 1.

2. During August and September 2001, I had numerous conversations with outgoing Executive Secretary David Haury about the transition of materials and responsibilities to my office at Syracuse University. In particular, I asked David to provide me with copies of the minutes of the Fall 2000 and Spring 2001 NARST Board meetings as well as the minutes of the Fall Strategic Planning Retreat. Norm Lederman informed me that the minutes of these three meetings had not yet been shared with the Board. David stated that he had some minor work left on these documents and that he would send them to me as soon as possible, but I have not received them as of today's date. David is also in the process of packing up the various NARST materials from his office and shipping them to Syracuse and/or Missouri as appropriate.

3. Copies of the latest NARST membership database were e-mailed by David Haury to Marilyn Estes and me. Marilyn will be meeting with David in person to learn the process for navigating the database.

4. According to David Haury, he has the current budget for the upcoming NARST Fall Board meeting. I have not yet received this document, but have asked him again for the information so that Board members can view the budget in preparation for the October 19-20 meeting. Sandi Abell forwarded me a copy of the last budget for information purposes in order to help me get familiarized with the typical receipts and disbursements that the NARST organization handles in a given year. At this point, the $15,000 budget allocated for the Interim Executive Secretary's office has not been transferred to Syracuse University from The Ohio State University. This will need to

be done soon in order for the expenses related to mailing out the minutes of the NARST Fall Board meeting minutes, etc. to be properly paid. Until then, the Department of Science Teaching at Syracuse University will cover these costs and get reimbursed from the NARST account once it is established.

5. The NARST web site has been updated to include the current addresses for all of the NARST Executive Board, including the contact information for the new Executive Secretary and Administrative Assistant. Since the update, a number of informational request from NARST members have been sent to my office so the update has been timely.

6. Working in cooperation with David Haury, I finalized the hotel arrangements for the NARST Fall Board meeting in New Orleans. Each Board Member received an e-mail with his or her room confirmation number. International travelers were provided with an additional night's stay prior to the start of the meeting to allow for the extended travel times and time zone changes. Selby Tardo, Associate Director of Catering/Convention Services at the Hyatt Regency New Orleans, is serving as the liaison between NARST and the hotel for both the Fall Board Meeting and the 2002 Annual Meeting. In addition to assisting with the arrangements for the October meeting, she has been in contact with Cheryl Mason to make sure that the web site reservation service is available to NARST members booking rooms for the Annual Meeting.

Appendix 1

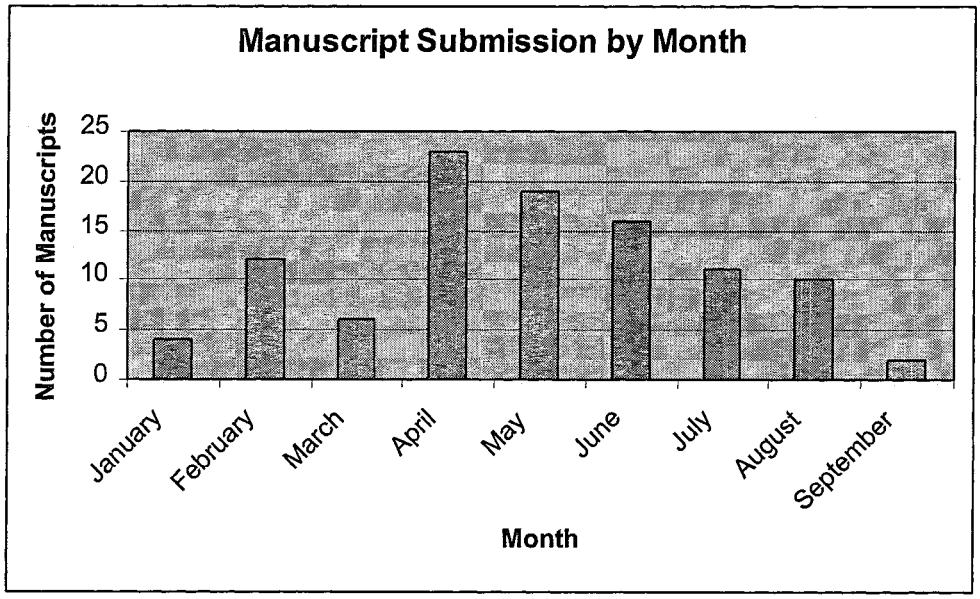
NARST Management Functions and Responsibilities

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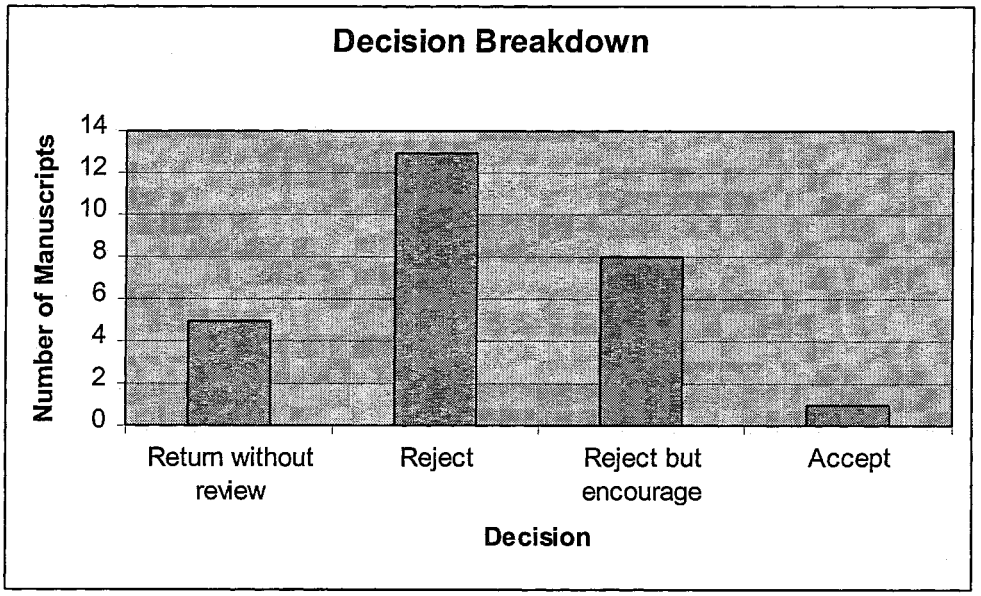
The following is a summary of the JRST manuscript submissions and tracking of the time spent at each step in the review process:

Total Number of Manuscripts received through 9/10/01: 102
Total Number of Resubmissions (ASU Only): 1



Distribution of manuscript submissions by month

Decision Analysis



Number of Manuscripts that have entered the review process: 97
Number of Manuscripts that have finished the review process: 22

Associate Editors:
The following table shows the average amount of time in days a manuscript spends with the Associate Editor.

	Time with AE (days)
Mean	17.07692
Median	14
Mode	7
Standard Deviation	14.09943
Minimum	2
Maximum	63
Count	26

The Count shows the number of manuscripts that have been returned by the Associate Editors.

Editorial Board Members:
The following table shows the average amount of time in days a manuscript spends waiting for an Editorial Board Member to agree to review it.

Time To find EB (days)	
Mean	46
Standard Error	3.530868
Median	37
Mode	79
Standard Deviation	31.97337
Minimum	0
Maximum	144
Count	82

Count Shows the Number of Manuscripts that have an Editorial Board Member that has agreed to review it.

The Number of Editorial Board Reviewers that accepted is 82.
The Number of Editorial Board Reviewers that rejected is 42.
The Number of Editorial Board Reviewers that were asked to review was 124.
The percentage of the time that an Editorial Board Reviewer accepted was 66%.

The following table shows the average amount of time in days a manuscript spends with the Editorial Board Member.

Time with EB (days)	
Mean	38.64286
Median	39.5
Mode	41
Standard Deviation	20.16246
Minimum	0
Maximum	97
Count	56

Count shows the number of manuscripts that have been returned by Editorial Board Members.

Reviewers:
The reviewers have been split into reviewer 1 and reviewer 2, this is an artifact of the way the database is set up and is not easily recombined. This division is purely artificial, there is no hierarchy amongst reviewers.

The following tables show the average amount of time in days spent trying to find a reviewer.

Time to find Rev 1 (days)	
Mean	44.55814
Median	36
Mode	35
Standard Deviation	34.05587
Minimum	0
Maximum	142
Count	86

Time to find Rev 2 (days)	
Mean	45.98701
Median	40
Mode	59
Standard Deviation	31.67869
Minimum	4
Maximum	151
Count	77

The sum of the counts (N = 163) gives the total number of accepted reviewers.

The total number of reviewers asked is: 275
The total number of reviewers that accepted is: 163
The total number of reviewers that rejected is: 99
The average reviewer acceptance rate is: 59%

The following table shows the average time in days a manuscript spends with the reviewers:

Time with Reviewers (days)	
Mean	37.00926
Median	35
Mode	38
Standard Deviation	18.25801
Minimum	7
Maximum	90
Count	108

Count shows the number of reviews returned by the reviewers.

RESEARCH COORDINATOR'S REPORT
FRANK E. CRAWLEY
SEPTEMBER 24, 2001

Research Committee Activities for Calendar Year 2001

Committee Membership

The membership of the Research Committee currently includes: Crawley (chair), Carlone, Rogg, Tippins, VanDriel, Wallace, Whitworth, and Lederman (ex-officio).

Scope of Work

Over the past year the Research Committee's tasks have expanded. Tasks this year included: the evaluation of proposals for the NSTA Annual Meeting, development of a policy statement for the creation and dissolution of strands, evaluation of NARST Pre-Conference Workshop proposals, co-development (with NSTA) of a NSTA-NARST publication, evaluation of the research areas on the NARST membership application, and brainstorming new ideas for increasing the visibility of NARST research work.

Research Presentations at NSTA Annual Meeting 2002 in San Diego

A call went out in April, 2001, for proposals to present NARST-endorsed sessions at the 2002 NSTA Annual Meeting in San Diego. NARST members submitted fifteen proposals for 13 presentation slots totaling 10 hours (6, 30-minute and 7, 60-minute presentations) at the NSTA Annual Meeting in San Diego. Research Committee members reviewed the proposals, and 13 presentations were selected, which represented a broad range of classroom-focused research. Proposals selected for presentation at NSTA 2002 will include sessions by NARST members: 1) Dianne Anderson & Kathleen Fisher, 2) Susan Barkdoll, 3) Jeanelle Bland, 4) Leah Bricker and Kathleen Morris, 5) Kathleen Fisher, 6) Nikki Hanegan, Riley Nelson, and Steve Getty, 7) Sharon Lynch and Ann Harmon, 8) Jon Pedersen and Frank Crawley, 9) Judy Ridgway and Kim Roempler, 10) Ann Rivet and Ann Novak, 11) Misty Sato, Irene Hirota, Anthony Cody, and Jen Morrow, 12) Deborah Roberts and Emily van Zee, and 13) Sandra West and Julie Westerlund. (See Attachment A)

Policy Statement for the Creation and Dissolution of Strands

In June NARST President, Norm Lederman, requested that the Research Coordinator and members of the Research Committee draft a policy statement on the "creation and dissolution of strands." Two key questions emerged among committee members during preliminary discussions, namely,

- What is a strand and what purpose does a strand serve? and
- How does a strand differ from a Special Interest Group (SIG)?

During the summer months committee members proceeded through numerous develop-critique-revise iterations, before coming to agreement on a final draft. The final draft was submitted to members of the Policy Advisory Board for their comments and critique and their input was incorporated into the draft document, a copy of which is attached to this report (see Attachment B).

NARST 2001 Annual Meeting Pre-Conference Workshops

A call went out in August for proposals for the NARST 2002 Pre-Conference Workshops, followed by a second call in early September. To date, five proposals have been received and one additional proposal is anticipated before the deadline. After formal proposals are received by the end of the day on September 24, 2001, they will be sent by electronic mail to members of the Research Committee for their review and ranking. Reviews will be returned to the Research Coordinator by October 13, 2000, and results of the review will be announced shortly thereafter. Two workshops will be selected for inclusion on the 2002 Program of the Annual Meeting.

NSTA-NARST JOINT PUBLICATION

Discussion of a NSTA-NARST joint publication was a key topic discussed at the meeting of the Research Committee, held at the Annual Meeting in St. Louis, April, 2001. At that time Maureen McMahon (NARST member and Director of the Committee on Research in Science Education, NSTA) reported to committee members on NSTA Board members interest and discussions regarding a joint publication and the form(s) it might take (see Research Committee's report of Spring, 2001). During the summer, Maureen and Frank drafted an announcement, which would be published in the NSTA Reports, and they arrived at a title for the publication, *PEERs Matter* (Practical Experience and Educational Research). After discussions with members of the NSTA and NARST research committees, it was decided that the publication would be co-edited by Maureen McMahon and Frank Crawley and that manuscripts would be reviewed by members of the NSTA and NARST research committees. In addition, the goal was set for two issues of *PEERs Matter* each year, available in print and electronic formats. The topic selected for the first issue was "student assessment" (see Attachment C).

Research Areas on the Membership Application

Members of the Research Committee continue to discuss and to review the *Research Categories* listed on the membership application. In particular, considerable interest exists among committee members to clarify the purpose and function of research categories in view of the Association's use of *Strands* and *SIGs*.

ATTACHMENT A

NARST-MEMBER PRESENTATIONS AT NSTA 2002

Prepared by
Frank E. Crawley
Research Coordinator
National Association for Research in Science Teaching

Title	Presenter(s)	Day and Date	Session Type and Time
#1: Biology concept cartoons: A constructivist tool for dealing with common alternative conceptions	Anderson, D. & Fisher, K	WEDNESDAY March 27, 2002	30-minute presentation Morning, 9:30-10:00 AM
#2: You've Got Mail! Outcomes for Students Using a Multidisciplinary Approach in Science Education	Barkdoll, S	WEDNESDAY, March 27, 2002	30-minute presentation Morning, 10:00-10:30 AM
#3: Biology Lessons Web Site and Internet-based Biology Course for Elementary and Middle-School Teachers	Fisher, K.	WEDNESDAY, March 27, 2002	60-minute presentation Afternoon, 12:30-1:30 PM
#4: Building Partnerships Through A National Network: Year One Lessons	Pedersen, J. & Crawley, F	WEDNESDAY, March 27, 2002	60-minute presentation Afternoon, 2:00-3:00 PM
#5: Critical Science Issues to Improve Teacher Content Knowledge	Hanegan, N., Nelson, C., & Getty, S	THURSDAY, March 28, 2002	60-minute presentation Morning, 9:30-10:30 AM
#6: Session Title: Seeking NBPTS Certification? Learn about Research on Science Teacher Support Groups"	Lynch, S., Pyke, C., & Harmon, A.	THURSDAY, March 28, 2002	60-minute workshop Afternoon, 12:30-1:30 PM
#7: Teaching to the Test? Assessing What We Expect Students to Learn	Bricker, L. & Morris, K	THURSDAY, March 28, 2002	60-minute presentation Afternoon, 2:00-3:00 PM
#8: Aerospace Engineering for Preservice Educators? Addressing Content Needs through Aerospace Concepts.	Bland, J	THURSDAY, March 28, 2002	30-minute presentation Afternoon, 3:30-4:00 PM
#9: A Safety Profile of Secondary Science Teachers in Texas	West, S. & Westerlund, J.	FRIDAY, March 29, 2002	30-minute presentation Morning, 9:30-10:00 AM
#10: Making Research Meaningful: Peer Reviewed Online Learning Environments	Ridgway, J. & Roempler, K.	FRIDAY, March 29, 2002	30-minute presentation Morning, 10:00-10:30 AM
#11: Using Digital Cameras to Support Student Inquiry	Rivet, A., Schneider, R., Novak, A., & Gleason, C.	FRIDAY, March 29, 2002	30-minute presentation Morning, 11:00-11:30 AM
#12: Improving Classroom Assessment: Perspectives from Teachers	Sato, M., Hirota, I., Cody, A., & Morrow, J.	FRIDAY, March 29, 2002	60-minute presentation Afternoon, 2:00-3:00 PM
#13: Poster Session for Teachers Inquiring into Science Learning and Teaching	Roberts, D. & van Zee, E.	SATURDAY March 30, 2002	60-minute presentation Morning, 9:30-10:30 AM

ATTACHMENT B

NATIONAL ASSOCIATION FOR RESEARCH IN SCIENCE TEACHING

DRAFT

CREATION, DISSOLUTION, AND RENAMING OF STRANDS

The Association encourages its members to engage in research that is consistent with and advances its mission. Members' research topics are grouped into broad, general categories of similar interest called Strands. Each year the Association announces a "call for proposals" and groups reports of its members' research by strand for presentation on the program of the annual meeting. The Association also provides an informal forum for the interaction of its members who are drawn together by a common interest in a unique field of study, teaching, or research, called a Special Interest Group (SIG), when the existing strand structure may not facilitate such activity. It also allocates time on the program of the annual meeting for SIG members to meet. Each Strand represents a common category of research interest of its members, and each SIG reflects a unique research interest. The number of SIGs is independent of the number of Strands.

Strand Creation, Dissolution, and Renaming

1. The Board creates, dissolves, or renames a strand by majority vote of its members.

2. The Research Coordinator recommends to the Board that a strand be created, dissolved, or renamed by majority vote of members of the Research Committee.

3. Members of the Research Committee are charged with responsibility for reviewing and recommending that a strand be created, dissolved, or renamed. NARST members may petition the Research Committee to create, dissolve, or rename a strand.

4. Members of the Association may petition the Research Committee to create, dissolve, or rename a strand.

   Strand Creation:
   - The Research Coordinator recommends to the Board that a strand be created following a majority vote by members of the Research Committee present for the vote.
   - A sponsoring member of the Association recommends that a strand be created through petition to the members of the Research Committee.
   - A sponsor who submits a petition to the Research Committee for its consideration must demonstrate that the proposed strand contributes to and advances the Association's mission and must document sustained interest for a minimum of two years by at least 5% of the Association's members.
   - Examples of sustained interest may included but are not limited to research publications, presentations, and meetings in SIGs by the Association's members.
   - On approval of the Board, the President-Elect appoints the Strand Coordinator(s).

   Strand Dissolution:
   - The Research Coordinator recommends to the Board that a strand be dissolved following a majority vote by members of the Research Committee present for the vote.
   - Members of the Research Committee will review periodically the activity level to determine that existing strands reflect the research interests of the Association's members and advance the Association's mission.
   - A strand may be recommended for dissolution by majority vote of the Research Committee when members of the Association fail to support it, as reflected by lack of sustained interest for at least two years, and/or the interests of its members no longer advance the Association's mission. A majority of members actively involved in a strand also may recommend to the Research Committee that the strand be dissolved
   - A strand may be recommended for dissolution by a majority vote of its active members.
   - Lack of sustained interest as reflected by participation on the program of the annual meeting and contribution to the Association's mission is established in consultation with the Strand Coordinator(s) and/or member(s).

Strand Renaming:

- The Research Coordinator recommends to the Board that a strand be renamed following a majority vote by members of the Research Committee present for the vote.
- A Strand Coordinator or member petitions the Research Committee that a strand be renamed.
- A Strand Coordinator or member who submits a petition to the Research Committee must demonstrate support for renaming the strand by a majority vote of the Association's members who are active in the existing strand.
- A count of the presentations and publications of strand members that advance the Association's mission is a measure of member activity in an existing strand.

****

NARST Mission Statement

The National Association for Research in Science Teaching (NARST) is a worldwide organization of professionals committed to the improvement of science teaching and learning through research. Since its inception in 1928, NARST has promoted research in science education and the communication of knowledge generated by the research. The ultimate goal of NARST is to help all learners achieve science literacy. NARST promotes this goal by: 1) encouraging and supporting the application of diverse research methods and theoretical perspectives from multiple disciplines to the investigation of teaching and learning in science; 2) communicating science education research findings to researchers, practitioners, and policy makers; and 3) cooperating with other educational and scientific societies to influence educational policies.

Criteria for Advancing the Mission of the NARST

To advance the mission of the Association, strand members engage in and report on professional activities that contribute (but are not limited) to the following outcomes:

1. Improvement of science teaching and learning through research;
2. Communication of research to researchers, practitioners, and policy makers pertaining to the improvement of science teaching and learning;
3. Promotion of universal scientific literacy; and/or
4. Cooperation with other educational and scientific societies to influence educational policies.

ATTACHMENT C

NSTA REPORTS: NSTA-NARST JOINT PUBLICATION ANNOUNCEMENT

PEERs (Practical Experience and Educational Research) Matter

NSTA Press and NARST are teaming up this fall to create an ongoing publication series called *PEERs Matter*. This new series will be a print and online resource for teachers of science, teacher-researchers, and science education researchers to share methods, stories, and findings about the hottest issues in today's preK-16 science classrooms. *PEERs Matter* will link "best-practice" ideas to sound science education research. Overwhelming demand from the members of both NSTA and NARST determines that our first *PEERs'* topic will be student assessment. Together we can build a strong *science assessment* knowledge base from which to construct sound classroom practices. Planning appropriate evaluation is challenging—and even more difficult in the current climate of high-stakes testing. Consider:

- Has your analysis of your students' work generated new strategies for your teaching?
- What are the toughest challenges in student assessment, and what are your best solutions?
- Has your research led to insights for identifying evidence of student understanding?
- What practical implications do research findings have for classroom and district science assessment?

Share your classroom testing stories, standards-based assessment techniques, teaching-testing dilemmas, portfolio struggles and triumphs, and knowledge of the research on assessment. Please visit (*The website address will go here.*) to email us a 250-word abstract of your assessment-related research or classroom assessment tale; plus a 100-word paragraph indicating your science education teaching or research experience. The deadline for these initial submissions is December 15th, 2001. An electronic receipt confirming your submission will be sent to you immediately. You will hear from editors Maureen McMahon or Frank Crawley in January 2002. Final manuscripts (500 to 5000 words) will be due in March 2002, and will be peer reviewed by an editorial panel composed of members from both NSTA and NARST. Planned release of this first issue of *PEERs Matter* is Fall 2002.

DRAFT

ON STRANDS, RESEARCH CATEGORIES AND SIGs WITHIN NARST

In the process of writing a draft on creation, dissolution, and renaming of strands, NARST's Research Committee explored the different ways that are used within NARST to distinguish between areas of research interest. Currently, three different ways seem to be in use:

1. Strands
   Strands are used to structure the program of the Annual Meeting. When a proposal is submitted for this meeting it should be addressed to a specific Strand coordinator. In the program of the Annual Meeting, every session is related to a Strand. Currently, there are 10 Strands within NARST (See appendix).
2. Research Categories
   Research categories are featured on the Membership Application Form. Members are asked to select those categories, from a list of 22, that fit best with their research interests. Moreover, they may add a different category to the list (See appendix).
3. Special Interest Groups (SIGs)
   Informal meetings of SIGs are listed on the programs of the Annual Meeting. However, these SIGs seem to correspond to the Strands. Apparently, meetings of the SIGs are actually meetings of persons who are interested in, or feel associated with, particular Strands.

From this exploration, the Research Committee recommends the following:

1. Given the obvious function of Strands within NARST, we suggest to substitute Research Categories on the NARST Membership Application Form with a list of the Strands.
2. Given the size of NARST, we don't think it is necessary to have Special Interest Groups, in *addition* to Strands. If more, or different, Strands are needed, Strands can be created, or renamed according to the procedure proposed by the Research Committee (See DRAFT Creation, dissolution, and renaming of strands).
3. However, we think it is desirable to change the nature of Strands from themes of the Annual Meeting into groups, to which NARST-members can subscribe in addition to their NARST membership.

Ad.1
The list of Research Categories overlaps with the list of Strands. At the same time, there are differences. As the Strands reflect the most important areas of research interests within NARST, it is useful to ask (new) members to indicate which Strands fit best with their own interest. Obviously, members may select more than one Strand. If it is desirable to know the disciplinary background or interest of members, a special question about disciplines (inlcuding biology, chemistry, geology, physics, environment, technology, or STS) may be added to the membership form.

Ad.2
We think that SIGs may be functional for organisations, such as AERA, where Strands or Divisions are very large groups. In those cases, SIGs may have the additional value of bringing together smaller groups of people with specific interests, within or across Strands or Divisions. Given the size of NARST, however, plus the flexible policy with respect to creating and renaming strands, proposed by the Research Committee, we don't think SIGs are needed within NARST in addition to Strands.

Ad.3
At present, NARST does not have a place in its organisation for (formal) subgroups of people with similar research interests. Strands are used merely to structure the organisation and the program of the Annual Meeting. We suggest to form such groups, however, using the current listing of strands as a basis. These groups may have meetings, during or between the Annual Meetings, they may organise an email-list, issue news letters, and have their own pages on the NARST website. On the membership application form, members could be asked to indicate which group(s) they wish to join. Maybe a small additional membership fee would be necessary to cover costs of the organisation of the subgroups.
[I doubt about the name of these groups: 'Strand groups' does not seem to make much sense. 'Special interest group', of course, would be a better name, but then we need to be very clear that Strands during the Annual meeting correspond on a one-to-one basis with SIGs. However, I would prefer to have one name for both functions.]

Draft version #4

Policy and Procedures for Removal of Board Members, and Committee Chairs and Members

Although we rely totally on volunteers to conduct the business of NARST, there must be a level of commitment on the part of the members to fulfill their obligations. For the most part, members are very dedicated with many devoting numerous hours to assigned tasks. The policy and procedures outlined here are designed for the small number of individuals who interfere with Committee or Board functions, provide insufficient efforts or are nonparticipatory. In all cases, the first step should be for the Chair, Annual Meeting Coordinator or a member of the Presidential Team to conference with the individual and determine what is creating the situation. Every effort should be made to maintain open communication among involved parties.

Behaviors Defining Negligence of Duty

These behaviors include, but are not exclusive to:

- missing meetings without a valid excuse;
- not responding to a written, voicemail and/or email request made by a Committee Chair, Annual Meeting Coordinator, Strand Coordinator and/or a Presidential Team Member; and
- failing to complete an assigned task in a timely manner.

Procedures for Action

Board Members

- If a Board Member is negligent in fulfilling assigned tasks, the Presidential Team, led by the President, will discuss the matter with her/him.
- If the situation does not improve, the individual will be asked to resign. This request for the individual's resignation would be determined by a two-thirds majority vote of the Board.
- His/her replacement could be the individual who would have been the next person to be elected by the membership. Regardless, with the approval of the Board, an individual would be appointed to the vacant post by the President. In certain circumstances, the Board may determine that a replacement is not necessary.
-

Strand Coordinators

- The Annual Meeting Coordinator reports the problem to the Presidential Team.
- The President-elect asks the strand coordinator to stand down, and then she/he replaces this individual with another.

Committee Chairs

- One or more members of the committee, and Board Members report the problem to the Presidential Team.
- If a Committee Chair is found to be negligent in fulfilling assigned tasks, the Presidential Team, led by the President, will discuss the matter with her/him.

- If, in the President's judgment, the problem cannot be resolved, then the President will ask the Committee Chair to stand down as Chair. The President will then appoint another Chair from the membership of the committee. The President may also appoint an additional committee member from the membership if the former Chair declines to continue to participate as a member of the committee.

Committee Members

- The Committee Chair reports the problem to the Presidential Team.
- The Chair is asked what steps should be taken, e.g., work with the person, replace the person.
- The President or President-elect, depending on the timing, writes a letter of thanks to the individual and then replaces him/her on the committee.

Draft Policy for NARST Board Discussions and Votes

Rationale

- Electronic voting is essential for the National Association for Research in Science Teaching (NARST) to conduct its business in a timely manner. Lacking electronic communication for the purpose of conducting business and voting, the NARST Board is forced to conduct most, if not all of its business, at the fall and annual meeting times. In an any time, any place, electronic age, it is unnecessary to wait 6 months to have a discussion and conduct a vote. Therefore, in the spirit of efficiency and timeliness, electronic discussions and votes will be conducted. Caution should be given, however, that last minute electronic voting should not be used to compensate for lack of planning or organization by members of the Board. The Board should be looking ahead to maximize the time used during our regular face-to-face Board meetings.

Draft Policy

- Roberts Rules are used in board meetings. Electronic votes will follow similar procedures. The NARST President will serve as the parliamentarian for business conducted electronically.

- The President has the right to decide which items of business can be conducted electronically and which should be held for regular face-to-face Board meetings. Therefore, the President can "table" electronic business and bring it to the regular Board meeting.

- When a Board Member wants to make a motion, it should be sent to the President. The President will organize all electronic discussions and votes.

- The President will send the motion to the Board members, identifying the person who made the motion.

- It is the responsibility of each Board member to acknowledge receipt of the motion and indicate availability to engage in an electronic discussion over the next 10 business days.

- It is the responsibility of the President and the Board member making the motion to supply to the Board at the time the motion is made all relevant information needed to make informed decisions. For example, motions with financial implication need to have accompanying NARST financial status information. Motions to vote on individuals for positions need to include resumes.

- The President will confirm an "electronic presence" of the majority of the board via these acknowledgements. When this has been established, the President will call for a

second to the motion, giving a specific timeline to respond. It is suggested that a second be received no later than 3 days after the motion has been sent to the Board.

- Once a second has been made, the President will identify the person making the second and will call for a discussion. The President will specify a time frame for holding the discussion, but it is recommended that no more than 3 days be taken for a discussion.

- When board members discuss a motion, they should reply to all – not solely the President.

- After the discussion has occurred, the President will call for the vote. It is recommended that 3 days be given to cast votes.

- When board members vote, they should reply to all – not solely the President.

- The President will provide to the Board the final tally of votes showing the names of those Board members who are in favor, opposed, or abstained. The names of members who did not vote should also be shown.

- A section will be included in the regular Board meeting packets that includes a record of all the electronic votes taken during the year. These should be part of the minutes, and the Board should all vote on whether they are accurate at our regular Board meetings. These minutes should then become official part of the institutional history of NARST and posted on the NARST web site.

Publications Advisory Committee
October, 2001
New Orleans, LA

Committee Members:
Charlene M. Czerniak, Chair
Larry Flick
Julie Luft
Roger Johnson
Dale Baker, JRST Editor
Mike Piburn, JRST Editor
Helen Parke, NARST NEWS Editor
Randy Yerrick, NARST NEWS Editor
Beth Klein, Director of Electronic Services; David B. Zandvliet
Ex-officio: Maureen McMahon

1. NARST Monographs:
The Committee has not received any monograph proposals during the year. However, there was one inquiry, and a proposal may be submitted in the upcoming months.

David Haury did not submit a report regarding Monograph sales.

2. NARST-NET and Listserv Report:
No report was submitted by Beth Kline. David B. Zandvliet reported that the NARST web site is in major need of updating and this initiative must be closely aligned with the budget allocated for this service. I would like to begin a consultative process whereby NARST members could give input about what features of the current site are most valued and which areas are not used. Other suggestions about new areas to include in the association's website can be considered where there are adequate resources to design these new features and where they can be properly maintained and updated. I recommend that the board give consideration to a special budget that would allow for the re-design of the site. And a yearly line item that would accommodate its day-to-day management and minor revisions to the site.

The NARST Listserve is also in major need of revisions and this has created a large management issue for our centre. Most of the current addresses are no longer current or have been forwarded to inactive accounts so that they are bounced back to our server. The only solution would seem to be to start the list over again asking people to re-subscribe using their current e-mail addresses. As an association we may also need to make some deliberations about what is an appropriate (or inappropriate) use of the association's listserve and what types of communication would more appropriately reside on the web site.

NOTE: Members of the NARST Publication Committee expressed the desire for a *searchable* web site...much like those on many university web sites.

3. NARST NEWS:
The NARST News continues to be hosted by East Carolina University where the final photo ready copy is produced. We are now on a publishing schedule of two issues annually (January 1st and June 1st) as decided by the Board last Spring. We are currently working out a schedule of publication contents for each issue that is best suited for the membership that considers important dates of the organization (e.g.; elections, annual meetings, call for papers) and is also sensitive to

various members and contributors (e.g.; presidential address). The most pressing of the contributions seem to be the call for papers, elections, presidential addresses, pre-program, and NARST annual awards.

We encountered a significant delay in the NARST news last Spring as the publication was behind schedule by approximately 6 weeks. The mailing was so delayed that the proposal reviews were moved back by the President, Cheryl Mason, for an additional month. The delay raised important issues surrounding:

- the deadlines for contributors,
- the "readiness" of the call for papers and pre-program upon its arrival to the editors,
- the awareness of committee chairs of their responsibilities to compose reports and announcements, and
- the printing turnaround time at the office of the Executive Secretary.

The general preference of the editors' time would be to have all contributions no later than three weeks prior to publication dates. At this time Randy and Helen divide up contributions, prioritize, organize and format and recombine the sections, and edit the final issue. This process has never taken less than two weeks (often up to five weeks) and the final printing and fine formatting an additional week. At this time, it is forwarded to OSU (or other executive secretary site) where the printing and mailing process takes an additional two weeks after its arrival.

Working backwards this would mean the deadlines for the two issues would mean:

- Photo ready Pre-program (Due November, 15th)
- First Presidential Address (Due December 1st)
- General Membership Announcements (Due December 1st)
- Board and Committee announcements/Link to Minutes (html version) (Due December 1st)
- Annual meetings and conferences (Due December 1st)
- Jobs/positions (Due December 1st)
- New committee chair announcements (Due April 15th)
- Awards committee chair call for nominations (Due April 15th)
- Awards given at the Annual Meeting (Due April 15th)
- Second Presidential Address (Due April 15th)
- General Membership Announcements (Due April 15th)
- Board and Committee announcements/Link to Minutes (html version) (Due April 15th)
- Jobs/positions (Due April 15th)

We have been publishing an html version of the NARST news since June 1999 and this issue is always available prior to the hard copy mailing. It has been useful to publish these html versions early as it has sped up the review process and provided a new venue for the President to confirm the accuracy of all contributions. We have had troubles with past NARST.org webmasters pointing to the current issues housed at San Diego State University. It is an uncomplicated task to change the change the URL address that is hotlinked on the front page of NARST.org page but it will require a contentious effort to keep this NARST.org link updated. We are working hard to be sure that the current leadership team and webmaster are aware of the location of the html versions and the timeline of publications.

The issues we receive from the membership most often include:

- trouble with the website,
- current names and institutions of the committee chairs and responsibilities,
- access to the website, phone or fax, or other more personal contact with the NARST leadership,
- receiving hard copies of NARST News as well as changing their address,
- member contacts and information about becoming a member, and
- general questions about committees, responsibilities, and how do members know whom to contact with their questions.

We would appreciate any and all feedback the Board would like to supply to the NARST News editors regarding how to respond formally to these membership concerns either on the NARST web site or more directly in the NARST News itself.

As editors we continue to invite not only suggestions from the Board to improve NARST News service to its membership but we also encourage all members of the Board to consider contributing perspectives, editorials, and issues to the NARST News itself. At this time, relatively few Board members outside of the President use the NARST News as a venue to discuss issues, events, or trends though this has been our hope as editors to convey the diversity of perspectives of the current leadership.

As always, it is an honor and pleasure to serve the NARST organization.

Sincerely,

Helen and Randy

4. JRST Editorial Board

Dale Baker would like the following individuals considered for the JRST Editorial Board. Dale Baker and Mike Piburn are attempting to add younger NARST members to the Editorial Board.

- Molly Hand Weinburgh
- Tina Jarvis
- Daniel P. Shepardson
- Andrew T. Lumpe
- Douglas W. Huffman
- Anthonius Johannes Maria (Ton) de Jong

5. Plan for Publishing and Distributing Joint NARST/NSTA Publication

The NSTA collaborative work report will come out in Maureen McMahon's report and in Frank Crawley's Research Committee report. As was suggested by the publications committee at the last NARST meeting, Maureen McMahon attended the research committee where the NARST-NSTA publication collaboration seemed a good fit. Frank Crawley and Maureen McMahon have been working with NSTA over the past several months and there will be a joint call go out in NSTA Reports and over the NARST listserv/website in October for the first issue of PEERs Matter (Practical Experience and Educational Research Matter). The important area of interest for the publications committee will probably be in negotiating the royalties/publication specifics with NSTA. In the next few weeks Maureen McMahon should have information from NSTA

regarding our options with the NSTA Press that could be offered the publications committee for consideration.

CV A.J.M. de Jong

Surname:	de Jong
First names:	Anthonius Johannes Maria (Ton)
Place of birth:	Amsterdam
Date of birth:	May 08, 1956
Address:	Godfried Bomansstraat 116, 7552 NV Hengelo
Telephone:	++ 31 74 2504194
Email:	jong@edte.utwente.nl
Graduations:	Gymnasium ß, 1974 Masters in Educational/Cognitive Psychology University of Amsterdam, January 1981 (cum laude) PhD in Technology, Eindhoven University of Technology, May 1986
Career:	Assistant professor: Educational Service, Delft University of Technology. 01-02-1981 - 01-01-1982 Section Educational Research, Faculty of Philosophy and Social Sciences, Eindhoven University of Technology 01-01-1982 - 01-02-1992 Department Social Science Informatics, Faculty of Psychology, University of Amsterdam. 01-05-1986 - 01-01-1992 Associate professor: Department of Instructional Technology, Faculty of Educational Science and Technology, University of Twente. 01-01-1992 - 01-06-1998 Full professor Instructional Technology Department of Instructional Technology, Faculty of Educational Science and Technology, University of Twente. 01-06-1998 - (01-07-2001) Full professor Educational Psychology (van der Leeuw chair) Department of Instructional Technology, Faculty of Educational Science and Technology, University of Twente. 01-03-2000 – now Temporary full (C4) professor Educational Science Universität Tübingen (Germany), Institut für Wissensmedien 01-04-2001 – 01-04-2000

Publications::

DISSERTATION

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12. van Berkum, J.J.A., & de Jong, T. (1991). Instructional environments for simulations. *Education & Computing, 6*, 305-358.
13. de Hoog, R., de Jong, T., & de Vries, F. (1991). Interfaces for instructional use of simulations. *Education & Computing, 6*, 359-385.
14. van Joolingen, W.R., & de Jong, T. (1991). Supporting hypothesis generation by learners exploring an interactive computer simulation. *Instructional Science, 20*, 389-404.
15. de Jong, T., & Ferguson-Hessler, M.G.M. (1991). Knowledge of problem situations in physics: a comparison of good and poor performers. *Learning and Instruction*, 1, 289-302.
16. van Joolingen, W.R., & de Jong, T. (1992). Modeling domain knowledge for Intelligent Simulation Learning Environments. *Computers & Education, 19*, 29-38.
17. de Jong, T., van Andel, J., Leiblum, M., & Mirande, M. (1992). Computer assisted learning in higher education in the Netherlands, a review of findings. *Computers & Education, 19*, 381-386.
18. Njoo, M., & de Jong, T. (1993). Exploratory learning with a computer simulation for control theory: Learning processes and instructional support. *Journal of Research in Science Teaching, 30*, 821-844.
19. Ferguson-Hessler, M.G.M., & de Jong, T. (1993). Does physics instruction foster students' cognitive processes? A descriptive study of teacher activities. *Journal of Research in Science Teaching, 30*, 681-697.
20. de Jong, T., de Hoog, R., & de Vries, F. (1993). Coping with complex environments: The effects of overviews and a transparent interface on learning with a computer simulation. *International Journal of Man-Machine Studies, 39*, 621-639.
21. de Jong, T., & Ferguson-Hessler, M.G.M. (1993). Probleemoplossen, leren en onderwijzen in exacte vakken: een voorbeeld uit de Natuurkunde. (Problem solving,

learning and teaching in science: An example from physics). *Tijdschrift voor Onderwijsresearch, 18*, 149-162.
22. de Hoog, R., de Jong, T., & de Vries, F. (1994). Constraint driven software design: An escape from the waterfall model. *Performance Improvement Quarterly, 7*, 48-63.
23. de Jong, T., & Ferguson-Hessler, M.G.M. (1996). Types and qualities of knowledge. *Educational Psychologist, 31*, 105-113.
24. Swaak, J., & de Jong, T. de (1996). Measuring intuitive knowledge in science: the development of the what-if test. *Studies in Educational Evaluation*, 22, 341-362.
25. van Joolingen, W.R., & de Jong, T. (1996). Design and implementation of simulation-based discovery environments: the SMISLE solution. *Journal of Artificial Intelligence and Education, 7*, 253-277.
26. de Vries, E., & de Jong, T. (1997). Using information systems while performing complex tasks an example from architectural design. *International Journal of Human-Computer Studies, 46*, 31-54.
27. van Joolingen, W.R., & de Jong, T. (1997). An extended dual search space model of learning with computer simulations. *Instructional Science, 25*, 307-346.
28. Swaak, J., van Joolingen, W.R., & de Jong, T. (1998). Supporting simulation-based learning; the effects of model progression and assignments on definitional and intuitive knowledge. *Learning and Instruction, 8*, 235-253.
29. de Jong, T., & van Joolingen, W.R. (1998). Scientific discovery learning with computer simulations of conceptual domains. *Review of Educational Research, 68*, 179-202.
30. de Jong, T., van Joolingen, W.R., Swaak, J., Veermans, K., Limbach, R., King, S., & Gureghian, D. (1998). Self-directed learning in simulation-based discovery environments. *Journal of Computer Assisted Learning, 14,* 235-246.
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32. de Vries, E., & de Jong, T. (1999). Task dependent design and evaluation of information systems; a study into structuring hypertext information for design problem solving, *Instructional Science, 27*, 285-302.
33. Gellevij, M., van der Meij, H., de Jong, T., & Pieters, J. (1999). The effects of screen captures in manuals: A textual and two visual manuals compared. *IEEE Transactions on Professional Communication, 42*, 77-92.
34. Savelsbergh, E., de Jong, T., & Ferguson-Hessler, M.G.M. (2000). Physics learning with a computer algebra system: Towards a learning environment to promote elaborate problem representations. *Journal of Computer Assisted Learning, 16*, 229-243.
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36. Swaak, J., & de Jong, T. (2001). Discovery simulations and the assessment of intuitive knowledge. *Journal of Computer Assisted Learning, 17*, 284-295.
37. Swaak, J., & de Jong, T., (in press). System vs. learner control in using on-line support for simulation-based discovery learning; effects on knowledge tests, interaction measures, and a subjective measure of cognitive load. *Learning Environments Research*
38. Kuyper, M., de Hoog, R., & de Jong, T. (in press). Modeling and supporting the authoring process of multimedia simulation based educational software: a knowledge engineering approach. Instructional Science
39. Haldane, A., van Heijst, G., Shalgi, N., de Hoog, R., de Jong, T. (2001). Is KM just a game? The knowledge management interactive training system. *Knowledge Management, 4*, 14-17.

40. Gellevij, M., van der Meij, H., de Jong, T., & Pieters, J. (submitted). Roles of screen captures in software manuals and their influence on cognitive load. *Journal of Experimental Education*
41. Savelsbergh, E., de Jong, T., & Ferguson-Hessler, M.G.M. (submitted). Situational knowledge in physics: the case of electrodynamics. *Journal of Research in Science Teaching*
42. Swaak, J., de Jong, T., & van Joolingen, W.R. (submitted). Do different learning environments make a difference? The effects of discovery learning and expository instruction on the acquisition of intuitive and explicit knowledge.
43. Savelsbergh, E., de Jong, T., & Ferguson-Hessler, M.G.M. (in preparation). Novices' knowledge of physics problem categories and their ability to categorize specific problems.
44. de Jong, T, & van der Hulst, A. (in preparation). The effects of graphical overviews on exploratory behaviour and knowledge acquisition in hypertext environments.
45. van Emmerik, M, & de Jong, T. (in preparation). Automating instruction in a driving simulator
46. Alessi, S.A., & de Jong, T. (in preparation). Learning with augmented reality in computer simulations.

(CONTRIBUTIONS TO) BOOKS

1. de Jong, T., & Ferguson-Hessler, M.G.M. (1983). Het effect van een instructie van een strategie voor het oplossen van natuurkundige problemen door eerstejaarsstudenten (The effect of strategy instruction on the solving of physics problems by first year university students). In J.J. Beishuizen, C. Hamaker, B. van Hout-Wolters & K.B. Koster (Eds.), *Onderwijsleerprocessen: tekstverwerking, probleemoplossen en leermoeilijkheden* (pp. 93-103). Lisse: Swets en Zeitlinger.
2. Ferguson-Hessler, M.G.M., & de Jong, T. (1983). On success and failure in the solving of problems in electricity and magnetism. In: *Research on physics education* (pp. 271-279). Paris: Centre National de la Recherche Scientifique.
3. de Jong. T., & Ferguson-Hessler, M.G.M. (1985). De cognitieve structuur van wel en niet succesvolle beginnende probleemoplossers in de natuurkunde (the cognitive structure of successful and unsuccessful problem solvers in physics). In P.R.J. Simons & G.C.L. Lodewijks (Eds.), *Zelfstandig leren* (pp. 183-193). Lisse: Swets en Zeitlinger.
4. Ferguson-Hessler, M.G.M., & de Jong, T. (1986). On the role of knowledge structures in the field of electricity and magnetism. In: A. Art. H. Eisendrath, & F. Greandjean (Eds.) *Proceedings of the International Symposium on Physics Teaching (pp. 183-186).* Brussels, november 11-13, 1985.
5. de Jong, T., & Ferguson-Hessler, M.G.M. (1987). Student note-taking behavior when preparing for an examination in science. In P.R.J. Simons & G. Beukhof (Eds.), *Regulation of learning* (pp. 107-119). The Hague: SVO-Selecta.
6. de Jong, T., Pilot, A., & van Andel, J. (1988). *Computer ondersteund onderwijs in het Nederlands Hoger Onderwijs (Computer supported instruction in Dutch higher education)*
7. de Jong, T., & Ferguson-Hessler, M.G.M. (1989). The role of exercises in knowledge acquisition in a physics domain. In P. Span, E. De Corte & B. van Hout-Wolters, (Eds.). *Onderwijsleerprocessen: Strategieën bij het verwerken van informatie* (pp. 57-67). Lisse: Swets & Zeitlinger.
8. Njoo, M., & de Jong, T. (1991). Learning processes of students working with a computer simulation in mechanical engineering. In M. Carretero, M. Pope, R. Simons, & J.I. Pozo (Eds.) *Learning and Instruction: European research in an international context: Volume III* (pp. 483-499). Oxford: Pergamon press.

9. de Jong, T., van Andel, J., Mirande, M., & Leiblum, M. (1991). *Coursewaregids voor het Nederlands Hoger Onderwijs (Courseware guide for Dutch higher education).* Utrecht: SUNCOO (VSNU).
10. van der Hulst A., & de Jong, T. (1991). Een reconstructie van instructie: ontwikkeling van prototypische modellen van onderwijsacties (A reconstruction of instruction: development of prototypical models of instructional acts). In J.J. Beishuizen (Ed.) *Technologie* (pp. 17-27). Amsterdam: SCO.
11. de Jong, T., Tait, K., & van Joolingen, W.R. (1992). Authoring for intelligent simulation based instruction: a model based approach. In S.A. Cerri & J. Whiting (Eds.) *Learning Technology in the European Communities* (pp. 619-637). Dordrecht: Kluwer Academic Publishers.
12. de Jong, T., & Njoo, M. (1992). Learning and instruction with computer simulations: learning processes involved. In E. de Corte, M. Linn, H. Mandl, & L. Verschaffel (Eds.) *Computer-based learning environments and problem solving* (NATO ASI series F: Computer and Systems Series) (pp. 411-429). Berlin: Springer.
13. de Jong, T. (1992). Computer simulations in an instructional context: interface aspects. In F.L. Engel, D.G. Bouwhuis, T. Bösser & G. d'Ydewalle (Eds.), *Cognitive modelling and interactive environments in language learning* (pp. 239-247). Berlin: Springer Verlag.
14. Ferguson-Hessler, M.G.M., & de Jong, T. (1993). Het leren van exacte vakken (learning in science). In: W. Tomic & P. Span (Eds.), *Onderwijspsychologie. Beïnvloeding, verloop en resultaten van leerprocessen* (pp. 331-353). Utrecht: Lemma.
15. Towne, D., de Jong, T., & Spada, H. (Eds.) (1993). *Simulation-based Experiential Learning.* Berlin: Springer.
16. Njoo, M. & de Jong, T. (1993). Supporting exploratory learning by offering structured overviews of hypotheses. In D. Towne, T. de Jong & H. Spada (Eds.). *Simulation-based Experiential Learning* (pp. 207-225). Berlin: Springer.
17. van Joolingen, W.R., & de Jong, T. (1993). Exploring a domain through a computer simulation: traversing variable and relation space with the help of a hypothesis scratch-pad. In D. Towne, T. de Jong, & H. Spada (Eds.) *Simulation-based Experiential Learning* (pp. 191-206). Berlin: Springer.
18. de Jong, T., van Joolingen, W., Scott, D., de Hoog, R. , Lapied, L., & Valent, R. (1994). SMISLE: System for Multimedia Integrated Simulation Learning Environments. In: T. de Jong & L. Sarti (Eds.) *Design and production of multimedia and simulation based learning material* (pp. 133-167). Dordrecht: Kluwer Academic Publishers.
19. de Jong T., & Sarti, L. (Eds.) (1994). *Design and production of multimedia and simulation based learning material.* Dordrecht: Kluwer Academic Publishers.
20. de Jong, T. de, & Sarti, L. (1994). Introduction: Trends in the design and production of computer based learning material. In T. de Jong & L. Sarti (Eds.) *Design and production of multimedia and simulation based learning material* (pp. IX-XVI). Dordrecht: Kluwer Academic Publishers.
21. de Jong, T., & van Joolingen, W..R. (1994). Instructional use of simulations: a learner's and author's perspective. In P. Brusilovsly, S. Dikareva, J. Greer, V. Petrushin (Eds.) *Proceedings of the East-West conference on computer technologies in education.* Simferopol, Ukraine, September 1994, pp. 119-124.
22. van Berkum, J.J.A., Hijne, H., de Jong, T., van Joolingen, W., & Njoo, M. (1995). Characterising the application of computer simulations in education: instructional criteria. In A. Ram & D. Leake (Eds.) *Goal-Driven Learning* (pp. 381-391). The MIT press.
23. de Jong, T., & van Joolingen, W.R. (1995). The SMISLE environment: Learning with and design of integrated simulation learning environments. In P. Held & W.F. Kugemann (Eds.) *Telematics for education and training* (pp. 173-187). Amsterdam: IOS Press.

24. de Jong, T., Härtel, H., Swaak. J., & van Joolingen, W. (1996). Support for simulation-based learning; the effects of assignments in learning about transmission lines. In A. Díaz de Ilarazza Sánchez & I. Fernández de Castro (Eds.), *Computer aided learning and instruction in science and engineering* (pp. 9-27). Berlin: Springer Verlag.
25. Van Joolingen, W.R., & de Jong, T. (1996). Supporting the authoring process for simulation-based discovery learning. In P. Brna, A. Paiva & J. Self (Eds.), *Proceedings of the European conference on Artificial Intelligence and Education* (pp. 66-73). Lisbon, Portugal: Edições Colibri.
26. Swaak, J., & de Jong, T. (1996). The assessment of intuitive knowledge acquired in simulation-based discovery environments. In P. Brna, A. Paiva & J. Self (Eds.), *Proceedings of the European conference on Artificial Intelligence and Education* (pp. 31-38). Lisbon, Portugal: Edições Colibri.
27. Van Joolingen, W.R., King, S., & de Jong, T. (1997). The SIMQUEST authoring system for simulation-base discovery environments. In B. du Boulay & R. Mizoguchi (Eds.), *Knowledge and media in learning systems* (pp. 79-87). Amsterdam: IOS.
28. de Jong, T., & van Joolingen, W.R. (1988). El entorno SMISLE: diseño y aprendizaje con enternons integrados de simulación. In C. Vizcarro & J. León (Eds.), *Nuevas tecnologías para aprendizaje* (pp. 53-64). Madrid: Ediciones Pirámidee.
29. de Jong, T., & Ferguson-Hessler, M.G.M. (1998). Leren probleemoplossen (Learning how to solve problems). In L. Verschaffel & J. Vermunt (Eds.), Het leren van leerlingen (pp. 65-81). *Onderwijskundig Lexicon*. Alphen a.d. Rijn: Samson/Tjeenk Willink.
30. Van Someren, M., Reimann, P., Boshuizen, H., & de Jong, T (Eds.) (1998). *Learning with multiple representations.* Elsevier Science
31. de Jong, T., Ainsworth, S., Dobson, M., van der Hulst, A., Levonen,. J., Reimann, P., Sime, J-A., van Someren, M., Spada, H., & Swaak, J. (1998). Acquiring knowledge in science and mathematics: the use of multiple representations in technology based learning environments. In M. van Someren, P. Reimann, H. Boshuizen & T. de Jong (Eds.), *Learning with multiple representations* (pp. 9-41). Oxford: Elsevier Science.
32. Savelsbergh, E., de Jong, T., & Ferguson-Hessler, M.G.M. (1998). Competence related differences in problem representations. A study in physics problem solving. In M. van Someren, P. Reimann, H. Boshuizen & T. de Jong (Eds.), *Learning with multiple representations* (pp.263-283). Oxford: Elsevier Science.
33. de Jong, T., Limbach, R., Gellevij, M., Kuyper, M., Pieters, J., & van Joolingen, W.R. (1999). Cognitive tools to support the instructional design of simulation-based discovery learning environments: The SimQuest authoring system. In J. van den Akker, R.M. Branch, K. Gustafson N. Nieveen & T. Plomp (Eds.), *Design approaches and tools in education and training* (pp. 215-225). Dordrecht: Kluwer Academic Publishers.
34. Limbach, R., de Jong, T., Pieters, J., & Rowland, G. (1999). Supporting instructional design with an information system. In J. van den Akker, R.M. Branch, K. Gustafson N. Nieveen & T. Plomp (Eds.), *Design approaches and tools in education and training* (pp. 113-125). Dordrecht: Kluwer Academic Publishers.
35. Kanselaar, G., de Jong, T., Andriessen, J., & Goodyear, P. (2000). New technologies. In P.R.J. Simons, J. van der Linden & T. Duffy (Eds.), *New learning* (pp. 55-83). Dordrecht: Kluwer Academic Publishers.
36. de Jong, T., & van Joolingen, W.R. (2000). Cognitieve psychologie en communicatiekundig ontwerpen (cognitive psychology and design in communication science). In P.J. Schellens, R. Klaassen & S. de Vries (Eds.) *Communicatiekundig ontwerpen* (pp. 163-180). Assen: Van Gorcum.
37. de Jong, T. (in press). Cognitive psychology of explanation-based learning. In W. Kintsch (Ed.) *International Encyclopedia of Behavioral and Social Sciences*. Oxford: Elsevier.

38. de Jong, T., Beishuizen, J., van Someren, M., Veenman, M., Hulshof, C., Wilhelm, P., Prins, F., van Rijn, H. (in press). Determinants of discovery learning. In P. Gärdenfors, U. Riis & P. Johansson (Eds.) *Cognition, Education and Communication Technology*, Lawrence Erlbaum Ass.

LECTURES

- Course "Design of study material" for lecturers. (Eindhoven University of Technology).
- Course "Educational psychology for lecturers". (Eindhoven University of Technology).
- Course "Computer Supported Instruction" (Eindhoven University of Technology).
- Lecture series "Protocol analysis" (University of Amsterdam).
- Lecture series "Man-Machine Interaction" (Eindhoven University of Technology).
- Lecture series "Problem solving and Instruction" (University of Twente).
- Lecture series "OKT 2" (Educational design) (University of Twente).
- Lecture series "Information Technology in Society and Schools" (University of Twente).
- Lecture series "Research theory" (University of Twente, Teacher Training Department).
- Lecture series "Design of constructivistic learning environments" (University of Twente)
- Lecture series "Information design" (University of Twente)
- Lecture series "General Psychology" (University of Twente)
- Lecture series "Cognitive psychology" (University of Twente/Information Science)
- Lecture series "Cognitive Science" (University of Twente/Educational Science)
- Minor psychology (section knowledge psychology) (University of Twente)
- Lecture series "Technology, Training, and Education: Complex systems" (University of Twente)

MANAGEMENT

- Member Scientific Research Committee, Faculty of Philosophy and Social Sciences, Eindhoven University of Technology (1984-1990).
- Member Faculty Council, Faculty of Philosophy and Social Sciences, Eindhoven University of Technology.
- Head of the research programme section "Transfer of Technical Knowledge" (Eindhoven University of Technology).
- Member Management Committee of the department of Social Science Informatics (University of Amsterdam).
- Member research committee of the Institute for Perception Research (Eindhoven)
- Member Scientific Research Committee, Faculty of Educational Science and Technology, University of Twente (1993-1995)
- Member Management Committee, Department of Instructional Technology, Faculty of Educational Science and Technology, University of Twente (1993-1995; 1997)
- Executive secretary of the NWO (the Dutch NSF) research group "Teaching and learning" (1992 - 1998)
- Executive secretary of the Dutch National research school ICO (1996 - 2000).
- Manager EC projects SIMULATE en SMISLE
- Project manager EC project **SERVIVE**
- Coordinator NWO research programme 'Inductive learning'
- Department head Department of Instructional Technology, University of Twente (01-07-1998 – now)
- Project manager EC KITS project (2000-2003)
- Project manager EC Co-Lab project (2001-2004)

GRANTS:

- Computer Integrated Learning SVO (1 FTE, 1 year)
- DELTA project SIMULATE, *SIMULation Authoring Tools Environment*. Eindhoven University of Technology, 129 person months. With H. Hijne (Courseware Europe).
- DELTA project SMART, *Subject Matter Analysis and Representation Tools*. University of Amsterdam, 8 personmonths (with prof. dr. B. Wielinga).
- MIOS, *Methodology for Intelligent Tutoring Systems*. Research fund, University of Amsterdam. 200.000 Euro (4 years) (samen met drs. P. de Greef).
- GRIOTTO, *Graphical repesentations for architecural design*, Research fund, Eindhoven University of Technology), 1 PhD position (with dr. J. van Andel).
- CHEMCAD, *Chemical Computer Aided Design*. Research fund, Eindhoven University of Technology), 1 PhD position (with dr.ir. J. Coumans).
- SMISLE, *System for Multimedia Integrated Simulation Learning Environments*. DELTA main phase, EC. 270 person months, budget 2.9 Million Euro. (with Dr. W.R. van Joolingen).
- SMISLE extension, DELTA main phase: 209.000 Euro.
- SETCOM, learning with simulations on harmonic oscillators. SVO, 20.000 Euro, 1995 (with Dr. W.R. van Joolingen).
- SERVIVE, SERVice for Integrated Virtual Environments. 4th Framework, EG DG XIII, budget 3.2 Million Euro.
- Inductive learning. (3 PhD's; 1 Post-doc), NWO/SGW. 1996-200.
- **SERVIVE**-demo. EG DG XIII, 200.000 Euro
- NWO (PROO) PhD-project "Learning by design in SimQuest", 1999-2004
- NWO (PROO) PhD-project "Collaborative discovery learning", 2000-2004
- KITS project, EC Fifth framework (with R. de Hoog). Budget 2 million Euro.
- Co-Lab, EC Fifth framework (together with W. van Joolingen), budget 2.1 million Euro
- ZAP, Zeer Actieve Psychologie (Very Active Psychology). SURF. 1 million Euro.

PHD SUPERVISION (co-promotor/promotor)

Dr. H. de Bruijn (University of Twente, April 1993)
Dr. W.R. van Joolingen (Eindhoven University of Technology, June 1993)
Dr. M.K.H. Njoo (Eindhoven University of Technology, March 1994)
Dr. E. de Vries (Eindhoven University of Technology, September 1994)
Dr. A. van der Hulst (University of Amsterdam, October 1996)
Dr. E. Savelsbergh (University of Twente/Eindhoven University of Technology, September 1998)
Dr. J. Swaak (University of Twente, November 1998)
Dr. R. Limbach (University of Twente, March 2001)
Dr. C. Hulshof (University of Twente, June 2001)
Dr. M. Gellevij (University of Twente)
Dr. K. Veermans (University of Twente)
Dr. M. van Emmerik (University of Twente/TNO)
Ir. C. Vreeman (University of Twente)
R. Purbojo (M.Sc)
I. Shostak (M.Sc)
Drs. H. Gijlers
Drs. J. van der Meij

MEMBER DISSERTATION COMMITTEE

Dr. Ir. W. Schaefer (Eindhoven University of Technology, September 1991)
Dr. R. Winkels (University of Amsterdam, October 1992)
Dr. F. Paas (University of Twente, March 1993)
Dr. M. Veenman (University of Amsterdam, November 1993)
Dr. P. Kamsteeg (University of Amsterdam, March 1994)
Dr. S. Goei (University of Twente, September 1994)
Dr. R. Taconis (Eindhoven University of Technology, June 1995)
Dr. B. van Dijk (University of Twente, August 1996)
Dr. E. Krabbe (University of Twente, October 1998)
Dr. M. Kuyper (University of Amsterdam, December 1998)
Dr. M. van de Ven (Delft University of Technology, December 1998)
Dr. I. Karassividis (University of Twente, January 1999)
Dr. M. de Croock (University of Twente, June 1999)
Dr. C. van Boxtel (Utrecht University, May, 2000)
Dr. R. Maslowski (University of Twente, June 2001)
Dr. E. Hassan (University of Twente, September 2001)

EDITORIALS

- Associate editor *Instructional Science*
- International Advisory Board *Journal of Computer Assisted Learning*
- Editorial board *Contemporary Educational Psychology*
- Editorial board *International Journal of Educational Research*

INTERNATIONAL ACTIVITIES

- Coordinator 'European Simulation Working Group' (for the European Commission, DG XIII, Brussels)
- Co-organizer NATO Advanced Research Workshop "The use of computer models for explication, analysis and experiential learning". October 12-14, 1992, Bonas, France (with Dr. D. Towne (University of Southern California) and Prof. Dr. H. Spada (Universität Freiburg).
- Project manager EU projects (SMISLE, **SERVIVE,** KITS) and collaborator on other EC projects (PIMS, KADS, SAFE).
- "Invited expert" for assessment Swiss research in the field of instruction and information technology (April, 1995, Geneva).
- Senior researcher in the programme "Learning in Humans and Machines" sponsored by the European Science
- Invited keynote speaker conference "Automated Instructional Design and Authoring Systems". Utah State University. (Augustus 1995)
- Invited opening address AEPIA conference (Spanish Association for Artificial Intelligence), Alicante, Spain. (October, 1995).
- Invited speaker seminar "Multimediales Lernen". DIFF, Tübingen, March 1996
- Invited keynote speaker seminar "Computer supported learning environments" UIMP Cuenca (organized by Universidad Autónoma de Madrid) (June, 1996)
- Invited speaker workshop "New technologies for instruction in the sciences". Lisbon, Portugal. (October, 1996)
- Invited keynote speaker CALISCE conference. San Sebastian, Spain (August, 1996).
- Invited speaker EARLI conference, Athens, August, 1997.
- Invited speaker conference on ICT and education. Odense, Denmark, November, 1997.
- Invited keynote speaker, EC Da Vinci conference, Lisbon, February, 1998.

- Invited speaker and invited expert for research on ICT and education, University of Santiago de Chile, October 1998
- Invited speaker, IST conference, Vienna, October, 1998
- Invited speaker, conference on "Multimedia in initial and continuing vocational training", München, June, 1999, organized by Bundesminusterium für Bilding und Forschung.
- Invited keynote speaker, Fourth International Conference on Computer Based learning in Science. Twente, June, 1999
- Invited expert Wissenschaftsrat (advice body for the German government) (October 1999).
- Organizer of symposia and presenter at many conferences including AERA, EARLI etc. symposia op AERA, EARLI etc.
- Member program committee AIED, 1999, Le Mans, France
- Invited keynote speaker. The Bank of Sweden Tercentenary Foundation symposium on Education, Cognition and Communication Technology. Stockholm, March 30 -April 1, 2000.
- Invited speaker conference on learning in physics ("Nuevas Tendencias en la Enseñanza de Física"). Puebla, Mexico, May, 2000.
- Visiting professor, Syracuse University, June 2000 (course on New Designs for Instruction: Integrating Constructive, Situated and Collaborative Learning and Multimedia Technology)
- Invited speaker, Universität Heidelberg, July 2000
- Invited speaker, Universität Freiburg, July 2000
- Member programme committee and invited speaker "V IberoAmerican Conference on Informatics in Education", Santiago de Chile, December 2000.
- Member of the evaluation board for a research programme of The German Research Council (Deutsche Forschungsgemeinschaft (DFG)) on "net-based knowledge communication in groups" (2000-2006).
- Member of the Problem Solving Steering Group (OECD)
- Member Programme Committee of the first European CSCL Conference. Maastricht, March 2001.
- Invited workshop on "ICT based training of knowledge management". Bilbao, January 18-19, 2001 (organized by Deusto Universidad and Socintec).
- Invited speaker EARLI conference, Fribourg, Switzerland, September 2001.

NATIONAL ACTVITIES

- Invited speaker, I&I conference, November 1997.
- Invited lectures, University of Maastricht, 1998, 1999
- Lecturer course CRWO. October 1999
- Lecturer ICO-courses
- Member editorial board ICO books (with J. Scheerens and B. Creemers). Kluwer
- Presentations at Dutch conferences, e.g., ORD (many times).
- Invited plenary, SURF conference on simulations and education. Eindhoven, June, 2001

AWARDS

- EARLI "Outstanding Publication Award" 1999 for article with van Joolingen in RER 1998.
- European Academic Software Award 2000 for SimQuest.

CURRICULUM VITA

DOUGLAS W. HUFFMAN, Ph.D.

University of Minnesota
College of Education & Human Development
Department of Curriculum & Instruction
358 Peik Hall, 159 Pillsbury Drive SE
Minneapolis, Minnesota 55455
Work (612) 625-5337
Huffman@umn.edu

PERSONAL INFORMATION

EDUCATION

Ph.D. 1994 **University of Minnesota,** Minneapolis, MN.
Major: Curriculum & Instruction - Science Education
Minor: Educational Psychology – Evaluation & Measurement

M.Ed. 1987 **Harvard University,** Cambridge, MA.
Major: Teaching Science & Mathematics

B.S. 1985 **Stanford University,** Palo Alto, CA.
Major: Civil Engineering with Distinction

EMPLOYMENT HISTORY

University of Minnesota, College of Education, Minneapolis, MN.

1999-present **Assistant Professor of Science Education**
Dept. of Curriculum & Instruction
Taught science methods courses for both pre-service and in-service middle school and high school science teachers. Also advised M.Ed., M.A and Ph.D. students, and served on Ph.D. examining committees. PI or Co-PI on the following science education grants:

- Impact of State Systemic Initiatives on Student Achievement
- Collaborative for Excellence in Teacher Preparation (CETP)
- Long-Term Effects of Science Teacher Enhancement
- Science & Mathematics Evaluation Fellowship Program

1994-1999 **Research Associate,**
Center for Applied Research & Educational Improvement.
Conducted research and evaluation in science and mathematics education using both quantitative and qualitative methodologies. Co-principal investigator on the following projects:

- Impact of State Systemic Initiatives on Student Achievement
- Statistical Analysis of Minnesota TIMSS DATA
- Long-Term Effects of Teacher Enhancement
- Evaluating a Computer-Supported Learning Environment
- Field Initiated Research for Science Teachers
- Science & Mathematics Evaluation Fellowship Program

Lecturer, Dept. of Curriculum & Instruction.
Taught both graduate and undergraduate courses in education for secondary and elementary teachers. Also advised M.Ed., M.A and Ph.D. students, and served on Ph.D. examining committees.

1991-1994 **Graduate Teaching Assistant**, Dept. of Curriculum & Instruction.
Assisted with instruction of education courses, supervised student teachers in school-based practicums, and evaluated student teaching performance.

1990-1991 **Evaluation Fellow**, Dept. of Educational Psychology.
Designed and implemented evaluations of educational and social service programs funded by The Saint Paul Foundation. Also provided evaluation consultation for grant recipients.

1989-1990 **Research Assistant**, National Center for Youth with Disabilities.
Reviewed, abstracted and coded published materials on youth with disabilities. Maintained database and performed database searches for information on youth with disabilities.

Wooddale Academy, Minneapolis, MN.

1988-1989 **Science Department Chair & Mathematics Teacher**
Taught 4-10th grade science and mathematics, and led the review, evaluation and revision of an activity-based K-10 science and mathematics curriculum scope and sequence.

1987-1989 **Elementary & Middle School Teacher**
Taught 4-9th grade science and mathematics with emphasis on student-centered, inquiry-based instruction.

Newton North High School, Boston, MA.

1986-1987 **Mathematics Student Teacher**
Taught Algebra, Geometry, and Basic Mathematics in a large 9-12th grade public high school.

Nicolet High School, Milwaukee, WI.

1985-1986 **Resource Teacher**
Taught study skills to 9-12th grade students who were in a special program for students at risk of dropping out of school.

DISCIPLINED INQUIRY

BOOK CHAPTERS

Lawrenz, F. & Huffman, D. (in review). *Evaluating Science Education Reform: Lessons Learned on Teacher Enhancement and Curriculum Implementation.* Washington, DC: National Science Foundation.

Huffman, D. (in press). Evaluating science inquiry: A mixed-method approach. In J. Altschuld & D. Kumar (Eds.) *Evaluation in Science Education in the 21st Century.* New York: Kluwer.

Lawrenz, F. & Huffman, D. (in press). *Best Practices in Training Evaluators in Science and Mathematics Education.* Washington, DC: National Science Foundation.

REFEREED JOURNAL ARTICLES

Huffman, D., Goldberg, F. & Michlin, M. (in review). A Large-Scale Materials Development and Teacher Enhancement Project: The Impact on Pedagogy and Student Achievement. *American Journal of Physics – Supplement on Physics Education Research.*

Lawrenz, F. & Huffman, D. (in review). Relationships Among Student, Teacher and Observer Perceptions of Science Classrooms and Student Achievement. *International Journal of Science Education.*

Huffman, D., & Lawrenz, F. (in review). A cross case analysis of science education in two schools. *Journal of Research in Science Teaching.*

Lawrenz, F., Lavoie, B., & Huffman, D. (in review). A model for sustainable reform in science and mathematics. *School Science and Mathematics.*

Huffman, D. (in review). Explore, experiment and explain: Collaborating with science museums to assess elementary school students' inquiry skills. *Science & Children.*

Lin, H., Lawrenz, F. & Huffman, D. (in review). The Assessment of Students' Inquiry Ability. *Journal of Chemistry Education.*

Huffman, D., & Lawrenz, F. (2001). TIMSS and relationships between instruction and achievement in Minnesota science and mathematics classes. *Proceedings of the National Science Council (Part D): Mathematics, Science and Technology Education.* Vol. 11, No. 3. (note: this is an international peer reviewed journal, not conference proceedings)

Huffman, D., Sinclair, M. & Lawrenz, F. (2001). The impact of the science learning environment on middle school students with disabilities. *Journal for Elementary/Middle Level Science Teachers*. June, 2001.

Lawrenz, F., Huffman, D. & Welch, W. (in press). The science achievement of various sub-groups on alternative assessment. *Science Education.*

Lawrenz, F., Huffman, D. & Welch, W. (2000). Policy considerations based on a cost analysis of alternative test formats in large scale science assessments. *Journal of Research in Science Teaching, 37(6)*, 615-626.

Welch, W., Lawrenz, F. & Huffman, D. (1998). The precision of data obtained in large scale science assessments: An investigation of bootstrapping and half-sample replication methods. *Journal of Research in Science Teaching.* 35(6), 697-704.

Huffman, D., Lawrenz, F. & Minger, M. (1997). Within-class analysis of ninth-grade science students' perceptions of the learning environment. *Journal of Research in Science Teaching*, 34(8), 791-804.

Huffman, D. (1997). The effect of explicit problem solving instruction on high school students' problem solving performance and conceptual understanding of physics. *Journal of Research in Science Teaching*, 34(6), 551-570.

OTHER JOURNAL ARTICLES (editor reviewed)

Finnerty, K., Ingram, D. & Huffman, D. (1999). Finding a common language for museum process. *The Journal of Museum Education, 23(2), 3-5.*

Aldridge, B., Lawrenz, F. & Huffman, D. (1997). Scope, Sequence & Coordination: Tracking the success of an innovative reform project. *The Science Teacher*, 64(1), 21-25.

Lawrenz, F. & Huffman, D. (1996). Considerations in structural modeling research. *Journal of Research in Science Teaching,* 33(3), 339-341.

Heller, P. & Huffman, D. (1995). Interpreting the force concept inventory. *The Physics Teacher*, 33(8), 503-511.

Huffman, D. & Heller, P. (1995). What does the force concept inventory actually measure? *The Physics Teacher,* 33(3), 138-143.

CONFERENCE PROCEEDINGS

Lawrenz, F. & Huffman, D. (August, 2000). Overview of Evaluation Training Programs, in Proceedings from the NSF Workshop on Training Mathematics and Science Evaluators. National Science Foundation.

Lawrenz, F. & Huffman, D. (1995). The SS&C project: Project evaluation and national science education standards. In D. Tulip & D. Smith (Eds.), Conference Proceedings of the Australian Science Teachers Association Queensland, Australia: Queensland University of Technology.

NEWSLETTERS

Huffman, D., Lawrenz, L. & Palmer, L. (Fall, 1999). TIMSS and Relationships Between Instruction and Achievement in Minnesota Science and Mathematics Classes. In D. Huffman (Ed.), Research Practice (pp. 2-6). Center for Applied Research & Educational Improvement, University of Minnesota.

Huffman, D. & Lawrenz, F. (Fall, 1999). Achieving the Science Standards: A National Study of Inquiry-based Instruction in High School Science. In D. Huffman (Ed.), Research Practice (pp. 17-24). Center for Applied Research & Educational Improvement, University of Minnesota.

Huffman, D. (Editor). Research Practice: Standards-Based Education in Minnesota. Center for Applied Research and Educational Improvement, Spring, 1999.

Huffman, D. (Editor). Research Practice: Standards-Based Education in Minnesota. Center for Applied Research and Educational Improvement, Fall, 1999.

Lawrenz, F. & Huffman, D. (1997). Scope, Sequence & Coordination: 9th and 10th Grade Science. Evaluation Report. December, 1997. ERIC/CSMEE Ed 419 682.

CYDLINE Review: Substance Use by Youth with Disabilities and Chronic Illnesses (Second Edition). National Center for Youth with Disabilities, Minneapolis, MN, August, 1990.

CYDLINE Review: Promoting Decision-Making Skills by Youth with Disabilities - Health, Education, and Vocational Choices. National Center for Youth with Disabilities, Minneapolis, MN, December, 1989.

EVALUATION REPORTS

Huffman, D. & Michlin, M. (2001). Using Computers to Construct Physics Understanding: The Impact of CPU on High School Physics. National Science Foundation, Arlington, VA.

Lawrenz, F., Huffman, D., & Lavoie, B. (2001). Evaluating the Long Term Effects of Teacher Enhancement. National Science Foundation, Arlington, VA.

Lawrenz, F. & Huffman, D. (2000). Evaluating the Long Term Effects of Teacher Enhancement: 9th and 12th Grade Comparisons. National Science Foundation, Arlington, VA.

Lawrenz, F., Huffman, D. & Palmer, E. (1999). Supporting Standards-Based Teaching and Learning in Mathematics and Science: Lessons from the Minnesota TIMSS Data. Department of Children, Families and Learning, St. Paul, MN.

Huffman, D. (1999). Using Computers to Construct Physics Understanding: Motion and Force Workshops, San Diego State University.

Lawrenz, F. & Huffman, D. (1999). Evaluating the Long Term Effects of Teacher Enhancement, National Science Foundation, Arlington, VA.

Lawrenz, F. & Huffman, D. (1998). Minnesota TIMSS Report: 12th Grade Mathematics and Science, Minnesota Department of Children, Families and Learning, St. Paul, MN.

Lawrenz, F. & Huffman, D. (1998). Minnesota TIMSS Report: 3rd & 4th Grade Mathematics and Science, Minnesota Department of Children, Families and Learning, St. Paul, MN.

Huffman, D. (1998). Using Computers to Construct Physics Understanding: Evaluation of Current Electricity Workshops, San Diego State University Foundation.

Lawrenz, F., Huffman, D. & Palmer, E. (1997). Minnesota TIMSS Report: 7th and 8th Grade Mathematics and Science, Minnesota Department of Children, Families and Learning, St. Paul, MN.

Lawrenz, F. & Huffman, D. (1997). Scope, Sequence & Coordination: 9th & 10th Grade Science. Supplemental Evaluation Report. National Science Teacher's Association, Arlington, VA.

Lawrenz, F. & Huffman, D. (1997). Scope, Sequence & Coordination: 10th Grade Science. Evaluation Report. National Science Teacher's Association, Arlington, VA.

Huffman, D. & Ingram, D. (1997). Evaluation of the Exhibit Development Learning Model: Science Museum Magnet School, Saint Paul Public Schools, St. Paul, MN.

Lawrenz, F. & Huffman, D. (1997). Evaluation of Elementary Science Kit Centers: Minneapolis Public Schools, Minneapolis, MN.

Lawrenz, F. & Huffman, D. (1996). Scope, Sequence & Coordination: 9th Grade Science. Evaluation Report. National Science Teacher's Association, Arlington, VA.

Huffman, D. (1996). Teaching Apprenticeship Program for Physics Graduate Students: Final Evaluation Report. University of Minnesota, Department of Physics & Astronomy.

Huffman, D. (1995). Field Involvement: Research by Science Teachers II. Pigeon Lake Institute Evaluation Report. Wisconsin Academy of Sciences, Arts and Letters, Madison, WI.

Huffman, D. (1995). Field Involvement: Research by Science Teachers II. Retrospective Evaluation Report. Wisconsin Academy of Sciences, Arts and Letters, Madison, WI.

Huffman, D. (1992). Evaluation of the Research Exploration for Elementary Teachers in the Sciences and Social Sciences. U.S. Department of Education Grant Report, University of Minnesota, Minneapolis, MN.

Huffman, D. (1992). Evaluation of the Research Exploration for Secondary Teachers in the Sciences and Social Sciences. NSF Grant Report, University of Minnesota, Minneapolis, MN.

Huffman, D. (1991). Evaluation of the Management Improvement Fund. The Saint Paul Foundation, Saint Paul, MN.

Huffman, D. (1991). Prepare Saint Paul, Workforce Readiness Program, Interim Evaluation Report. The Saint Paul Foundation, Saint Paul, MN.

Huffman, D. (1991). Evaluation Report, Joseph C. Duke Employees' Assistance Fund. The Saint Paul Foundation, Saint Paul, MN.

REFEREED PRESENTATIONS AT PROFESSIONAL MEETINGS

Huffman, D. (April, 2001). Using Computers to Create Constructivist Learning Environments: The Relationship Between Instruction and Achievement in Science. Paper presented at the annual meeting of the American Educational Research Association, Seattle, WA.

Lawrenz, F. & Huffman, D. (April, 2001). The Long Term, School-based Effects of Teacher Enhancement. Paper presented at the annual meeting of the American Educational Research Association, Seattle, WA.

Huffman, D. & Palmer, E. (November, 2000). Using Computers to Construct Physics Understanding. Poster presented at the annual meeting of the American Evaluation Association, Honolulu, HI.

Lawrenz, F. & Huffman, D. (November, 2000). SSI Impact Study: Merged Research Model of Systemic Change. Paper presentation at the annual meeting of the American Evaluation Association, Honolulu, HI.

Huffman, D. (April, 2000). Longitudinal Study of Science Teacher Enhancement: Implications for Policy and Practice. Paper presented at the annual meeting of the National Association for Research in Science Teaching, New Orleans, LA.

Butterbaugh, D. & Huffman, D. (November, 1999). The Use of a Mixed-Method Design for a Computer-Supported Learning Environment. Poster presented at the annual meeting of the American Evaluation Association, Orlando, FL.

Huffman, D. & Lawrenz, F. (April, 1999). The Relationship Between Standards-based Instruction and Achievement in the Minnesota TIMSS Data. Poster presented at the annual meeting of the American Educational Research Association, Montreal, Canada.

Huffman, D. (November, 1998). The Role of Evaluation in Student Achievement of the National Science Education Standards: Policy & Practice. Paper presented at the annual meeting of the American Evaluation Association, Chicago, IL.

Ingram, D., Huffman, D. & Colby, J. (November, 1998). Assessing Student Learning in the Exhibit Development Learning Model. Paper presented at the annual meeting of the American Evaluation Association, Chicago, IL.

Huffman, D. & Lawrenz, F. (April, 1998). Two Year Longitudinal Evaluation of a Teacher Enhancement Project on Student Achievement of the Standards. Paper presented at the annual meeting of the National Association for Research in Science Teaching, San Diego, CA.

Huffman, D. & Lawrenz, F. (March, 1997). The Relationship Between Different Assessment Formats in Ninth Grade Science. Poster presented at the meeting of the American Educational Research Association, Chicago, IL.

Lawrenz, F. & Huffman, D. (March, 1997). Evaluating the Effects of the SS&C Curriculum on Ninth Grade Science Students. Paper presented at the National Association for Research in Science Teaching, Chicago, IL.

Minger, M., Lawrenz, F. & Huffman, D. (April, 1996). Students' Perceptions of the Learning Environment in ninth Grade Science. Paper presented at the National Association for Research in Science Teaching, St. Louis, MO.

Huffman, D. (April, 1995). The Effect of Explicit Problem Solving Instruction on High School Students' Problem Solving Performance and Conceptual Understanding of Physics. Paper presented at the annual meeting of the National Association for Research in Science Teaching, San Francisco, CA.

Huffman, D. (Jan., 1995). The Physics Teaching Assistant Experience: Views on Learning. Paper presented at the annual meeting of the American Association of Physics Teachers, Orlando, FL.

Huffman, D., & Heller, P. (Jan., 1994). Explicit Problem Solving in High School Physics. Paper presented at the annual meeting of the American Association of Physics Teachers, San Diego, CA.

Visavateeranon, S., Finley, F., & Huffman, D. (April, 1993). Effect of Research Experiences on Teachers' Perceptions of the Nature of Science. Paper presented at the National Association for Research in Science Teaching, Atlanta, GA.

Huffman, D. (May, 1992). An Investigation of the Effect of a Scientific Research Experience on Teachers' Attitudes Toward Inquiry-based Instruction. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Boston, MA.

STATE AND LOCAL PRESENTATIONS

Huffman, D. (November, 2000). Shaping the Future of Science and Mathematics Education. Panel presentation at the Minnesota Education Policy Seminar. University of Minnesota, College of Education and Human Development, St. Paul, MN.

AWARDS & DISTINCTIONS

Nominated for the McKnight Land-Grant Professorship Award by the Department of Curriculum and Instruction, 2000.

GRANTS & CONTRACTS

Co-principal investigator, The Impact of State Systemic Initiatives on Student Achievement, National Science Foundation, Washington, DC, 1999-2001, $759,000.

Co-principal investigator, Collaborative for Excellence in Teacher Preparation: Core Evaluation, National Science Foundation, Washington, DC, 1999-2002, $999,975.

Principal investigator, Evaluating a Computer Supported Learning Environment (CPU), National Science Foundation (indirect), San Diego State University, San Diego, CA, 1995-00, $108,000.

Co-principal investigator, The Long-Term Effects of Teacher Enhancement, National Science Foundation, Washington, DC, 1997-2000, $500,000.

Co-principal investigator, Statistical Analysis of Minnesota TIMSS Data, SciMathMN, 1997-1998, $25,000.

Co-principal investigator, Science and Mathematics Evaluation Fellowship Program, American Educational Research Association, Santa Barbara, CA, 1997-2000, $325,000.

Co-principal investigator, Assessing the Exhibit Development Learning Model at the Museum Magnet School, Science Museum of Minnesota, St. Paul, MN, 1996-97, $25,000.

Co-principal investigator, Evaluation of Minneapolis Public Schools Systemic Change Initiative in Science, SciMath MN, MN Dept. of Education, St. Paul, MN, 1996-97, $10,000.

Principal investigator, Evaluation of the Field Involvement Research by Science Teachers Project, Wisconsin Academy of Arts, Sciences and Letter, 1995-99, $10,850.

Co-principal investigator, Evaluation of the 9th Grade Scope, Sequence and Coordination in Secondary Science: A National Curriculum Development Project, National Science Teachers Association, Washington, DC, 1994-96, $600,000.

ADVISING

Current Ph.D. Advisees

Leslie Gehlsen, Science Education (engaged in coursework)
Bethann Lavoie, Science Education (beginning dissertation)
Natalie Rasmussen, Science Education (engaged in coursework)
Elisabeth Robelia, Sience Education (engaged in coursework)
Jonathan Kaiser (engaged in coursework)
Nathan Wood, Science Education (engaged in coursework)

Committee Member on Completed Dissertations

Laura McCullough, Science Education (Reader, Graduated Summer 2000)

Committee Member for Ph.D. Students

Tricia Dieck, Science Education (completed preliminary writtens and orals)
Todd Frauenholts, Mathematics Education (completed preliminary writtens and orals)
Bethann Lavoie, Science Education (completed preliminary writtens and orals)
Denise Woodward, Science Education (completed preliminary writtens and orals)
Donna Butterbaugh, Science Education (engaged in coursework)
Esther Dale, Science Education (engaged in coursework)
Aaron Doering, Instructional Systems and Technology (engaged in coursework)
Mathew Schultz, Kinesiology (engaged in coursework)

Committee Member for M.A. Students

Anne Christensen, Entomology
Katrina Meehand, Mathematics Education

Advisor for M.Ed. Students

Serve as advisor for approximately 70 M.Ed. students in the science education initial license program.

Serve as advisor for 20 M.Ed. students in the science education in-service professional studies program.

Also, serve as advisor for 4 M.Ed. students in the Teacher Leadership program which is jointly administered between C&I and the Dept. of Educational Policy & Administration.

SERVICE

REVIEWING

Senior Reviewer for JRST - Journal of Research in Science Teaching (1999- Present)

Ad Hoc Reviewer for JRST – Journal of Research in Science Teaching (1994-1998)

National Science Foundation – Chair of the Site Review Team to evaluate the New Jersey State Systemic Initiative in Science and Mathematics Education. March 28-30th, 2000.

National Science Foundation – Grant proposal reviewer. Research on Systemic Initiatives. August, 1999.

OFFICES IN PROFESSIONAL ORGANIZATIONS

National Association for Research in Science Teaching (NARST)
Member of the Journal of Research in Science Teaching Award Committee (2001-2003)

National Association for Research in Science Teaching (NARST)
Member of the Outstanding Paper Awards Committee (1998-2000)

UNIVERSITY, COLLEGE AND DEPARTMENT COMMITTEES

CAUT: Committee on the Academic Use of Technology (2000-present)
Attended monthly meetings on college-wide issues of technology. Member of the facilities sub-committee responsible for making decisions regarding the use of CAUT funds for college technology equipment.

CTE: Council of Teacher Education (2001)
Representative for the science education program area.

Chair of the Curriculum & Instruction Technology Committee (2000-present)
Led the planning and implementation of a department-wide technology upgrade that included the purchasing of equipment for instructional uses, the development of a technical and academic support plan, and the supervision of technology fellows to support faculty as they increase the use of technology in instruction.

Curriculum & Instruction Communications Committee (2000-present)
Developed communication plan for the department.

Science Education Initial Licensure Program Area Head (1999-present)
Led the science education initial licensure program. Efforts included review of applicants and admission decisions for M.Ed. initial licensure program, development of secondary school placements for student teachers, creation of a handbook for cooperating teachers, and development of evaluation forms to evaluate student teachers.

OTHER SERVICE ACTIVITIES

Edina Public Schools – Conducted needs assessment and review of K-12 science programs. Included focus groups with parents, student and teachers to develop a vision for science education in the district. April, 2000.

SciMathMN workshops. "Global Perspectives for Local Action: Using TIMSS to Improve Minnesota Mathematics and Science Education" Led a year-long sequence of four day-long workshops to help teams of science and mathematics teachers throughout the State of Minnesota use the TIMSS data to make data-based decisions about improving curriculum and instruction in their schools.

Science Centrum Advisory Council. University of Minnesota. Member of the advisory council that provides input on the consortium designed to connect K-12 educators with University of Minnesota scientists. The consortium is an inter-college organization with representation from the College of Education, Biological Sciences, Natural Resources, Institute of Technology, General College, and Continuing Education and Extension.

Minnesota State Fair, College of Education & Human Development Booth. Developed and implemented interactive, computer-based display to promote science and math education at the Minnesota State Fair. August, 2000.

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

National Science Teachers Association (NSTA)
National Association for Research in Science Teaching (NARST)
The Association for the Education of Teachers in Science (AETS)
American Educational Research Association (AERA)
American Evaluation Association (AEA)

CURRICULUM VITA

ANDREW T. LUMPE

CONTACT INFORMATION

Department of Curriculum and Instruction
Southern Illinois University Carbondale
Carbondale, IL 62901-4610
Phone: 618-453-4215
Fax: 618-453-8093
Email: alumpe@siu.edu
Web: http://ttech.siu.edu/lumpe/

Home Address
152 Spring Arbor Drive
Carbondale, Illinois 62901
Phone: 618-351-9428

EDUCATION

Degree Institution Major Date Awarded
Ph.D. Kansas State University Curriculum & Instruction 1992
Manhattan, Kansas
M.S. Kansas State University Secondary Education 1990
Manhattan, Kansas
B.A. Washburn University Biology 1983
Topeka, Kansas

PROFESSIONAL EXPERIENCES

Administrative Experiences

- Director, Teaching Excellence in Mathematics and Science Initiative (TEMS), Southern Illinois University Carbondale, 1999-present
- President, Giant City Consolidated School Board, Carbondale, Illinois, 1997 – present
- Assistant State Director, Kansas Junior Academy of Science, Manhattan, Kansas, 1989 – 1991

DANIEL P. SHEPARDSON
CURRICULUM VITA
(1/31/2001)

A. GENERAL INFORMATION

1. Personal Data

Daniel Philip Shepardson
32 Scarborough Ct.
Lafayette, IN 47905
(765) 448-1685

Personal web site: http://www.soe.purdue.edu/shepard/

Birth date and Place: May 26, 1957, Dekalb, IL 60115

2. Academic Record

a. Institutions Attended

Doctor of Philosophy in Science Education (1990)
The University of Iowa, Iowa City, IA 52242
(Science Education, Environmental Studies)

Masters of Education in Secondary Education (1984)
Utah State University, Logan, UT 84322
(Secondary Education, Biology)

Bachelors of Science in Wildlife Science (1980)
Utah State University, Logan, UT 84322
(Wildlife Science)

b. Academic Appointments

Associate Professor of Science Education (7/95-Present)
Courtesy Appointment in the Department of Earth and Atmospheric Sciences (1999-Present)
Assistant Professor of Science Education (8/90-6/95)
Department of Curriculum and Instruction,
Purdue University, West Lafayette, IN 47907

Graduate Research Assistant, Science Education (8/87-8/90)
Graduate Teaching Assistant, Elementary Science Methods (8/89-5/90)
The University of Iowa, Iowa City, IA 52242

Adjunct Instructor, Elementary Science Methods (9/84-6/85)
Utah State University, Logan, UT 84322

Middle School Science Teacher (9/81-6/83)
Grand County School District, Moab, UT 85432

Wildlife Technician (3/80-10/80)
Utah State University-U.S. Fish & Wildlife Service-Utah Division of Natural Resources
Intermountain Mountain Lion Study
Utah State University, Logan, UT 84322

c. Industrial and Business Positions

Director of Curriculum (1/84-8/87)
The National Energy Foundation, Salt Lake City, UT 84116

3. Licenses, Registrations, and Certifications

Secondary Education Certificate, State of Utah

4. Citations in Biographical Works

Who's Who in the Midwest (1995-96, 1996-97, 1997-98)
Who's Who in American Education (1992-93, 1993-94, 1994-95, 1995-96, 1996-97, 1997-98)
Men of Achievement, International Biographical Center (1995)
Who's Who in Science Education Around the World (1992)

5. Awards and Honors

Gustav Ohaus Program for Innovations in College Science Teaching (1988)
U.S. Department of Energy Award for Energy Innovation (1984)
Utah Governor's Award for Excellence in Energy Innovation (1984)
NEA/Kodak Implementation winner, Cameras in the Curriculum (1984)
NEA/Kodak National Award winner, Cameras in the Curriculum (1983)

6. Memberships in Academic and Professional Societies

National Association for Research in Science Teaching (NARST)
American Educational Research Association (AERA)
The Association for The Education of Teachers in Science (AETS)
School Science and Mathematics Association (SSMA)
National Science Teachers Association (NSTA)
North American Association for Environmental Education (NAAEE)
Hoosier Association of Science Teachers, Inc. (HASTI)
Environmental Education Association of Indiana, Inc. (EEAI)

B. EXCELLENCE IN TEACHING

Excellence in teaching is demonstrated through: effective course instruction; participation in course and program development; collaboration with K-12 classroom teachers through inservice programs; scholarly publications and presentations that support teaching; and through the integration of my research into both my preservice and inservice instruction. Thus, my scholarship contributes directly to the improvement of course instruction, providing undergraduate students, graduate students, and practitioners with current knowledge and understandings about teaching, assessing and learning. Both my preservice and inservice courses actively involve participants/students in constructing their own understanding of teaching, learning, and assessing through engaging them in action research, reflection upon practice, and as professionals.

1. Courses Taught, Last Three Years

   The science education courses taught in the last three years have involved undergraduates (EDCI 317), graduates (EDCI 506, 517, 591), and practitioners (EDCI 590) in the Department of Curriculum & Instruction, while EDCI 506/FOR 564 and EDCI 591 involved undergraduates and graduates from the Departments of Agricultural Economics, Entomology, Forestry and Natural Resources, and Natural Resources and Environmental Science. I have also taught numerous EDCI 590 (individual projects) and 695 (internship) courses for individual graduate students. I also co-taught the graduate course, "Advanced Geoscience Seminar: Applied Geoenvironmental Science" (G690), at IUPUI during the summer 1999 semester.

   EDCI 317, Elementary Science Methods (spring, fall)
   EDCI 506/FOR 564, Environmental Education
   EDCI 517, Survey of Science Education
   EDCI 590/GEOS 591 Ed. Applications of Env. Sci. & Investigations in Env. Sci. (summer)
   EDCI 591 Ed. Applications of Env. Sci. (spring)
   G690, Advanced Geoscience Seminar: Applied Geoenvironmental Science (IUPUI)

2. Courses with Administrative Responsibility

   EDCI 317, Elementary Science Methods Coordinator
   (Sp 1990; Fa 1992, 1993; Sp 1995, 1996, 1997, 1998; Fa 1998, 1999)

3. Contributions to Course and Curriculum Development

   Established EDCI 317 field experience with Cumberland and Happy Hollow elementary schools. The field experience provided EDCI 317 students opportunities to develop, implement, and reflect upon conceptual change teaching.

   Developed first 16 week EDCI 317 course, and the curriculum for integrating the National Geographic Kids Network. The NG Kids Network was integrated into the EDCI 317 curriculum from the perspective of how children learn and do science.

   Chair, Ad hoc Committee to Establish a New Elementary Teacher Education Program (1994-1995).

   Participant in the Teacher Education Equity Project at CUNY (1994-1996). The goals of the project are to develop awareness of gender equity issues and research in mathematics and science education and to promote the development and implementation of gender equitable curriculum for the preparation of mathematics and science teachers. Through

participation in the project, I have developed curriculum and instructional activities for integrating gender equity issues into the elementary science methods (EDCI 317) course. The resource materials provided by the project also included a copy of my article *Gender Bias in the Classroom - - A Self-Evaluation* as an exemplary instructional activity for promoting gender equitable classroom interactions.

I have been Collaborating with teachers at Murdock Elementary School to establish a science-literacy PDS site. This process has resulted in: 1) the establishment of a more extensive field experience for EDCI 317 students, initiated during the Spring 1995 semester; 2) the implementation of a gender equity staff-development program, Spring and Fall 1995 semesters; and the establishment of an environmental education experience for students enrolled in EDCI 506/FOR564, Fall 1995 semester. This experience involved teaching children about environmental concepts and issues and designing an environmental compass course and interpretive nature trail for use by teachers at Murdock Elementary School.

I have developed the instructional materials, activities, and school-based field experience to prepare EDCI 317 students to utilize inquiry-based teaching in science. These materials and activities stem from my collaborative research with elementary and middle school teachers, and require EDCI 317 students to reflect on science teaching in light of the state science proficiencies and the NRC Science Education Standards, and to analyze children's work. The experience also requires EDCI 317 students to develop alternative forms of assessment that are embedded in instruction.

I have developed the plant investigation lab to model the teaching of elementary science as inquiry and as a model for incorporating children's self-produced journals as a teaching and assessment tool. EDCI 317 students design and conduct a plant investigation, using their self-produced journals as a tool for data collection and reflection. At the completion of the plant lab, students develop alternative assessment techniques and reflect on the experience in terms of the state science proficiencies and national standards (see publication #28).

I have developed three new teaching modules for EDCI 506/FNR 564 that engage students in learning about doing environmental education. The three modules: Celery Bog, Yellowstone, and Designing Effective Workshops in Environmental Education are "real world" based modules designed to engage students as professional environmental educators. The Celery Bog module emphasizes curriculum development in environmental education and inquriy-based teaching. The Yellowstone module exposes students to pedagogical techniques for teaching about environmental issues, requiring students to develop an issues-based lesson for teaching about an environmental issue facing Yellowstone National Park. The Designing Effective Workshops in Environmental Education prepares students for planning and developing effective environmental education programs for adults and children, requiring students to design an environmental education workshop.

I have been collaborating with Professors Jon Harbor (EAS) and Kerry Rabenold (Bio) on the development of the new Environmental Science Capstone Course for Elementary Teachers. This course has been approved by the Science Education faculty and the School of Science as a required course for elementary education majors in the new reformed program for elementary education.

Developed the web site for the EDCI 506/FNR 564 course. The web site provides an overview of the course, course assignments, grading policy, and examples of student

projects. The site is designed to be a resource for other environmental educators and teachers.

I have been collaborating with Jon Harbor and Barb Cooper in the development of the IUPUI Geoenvironmental science application course, that is designed around the environmental monitoring of the Crooked Creek Watershed and is for teachers.

Developed curriculum for the new course titled Educational Applications of Environmental Science (EDCI 591). Educational Applications of Environmental Science integrates environmental science content with pedagogy to enhance students' pedagogical-content knowledge of environmental issues. The course is designed to facilitate understanding of current environmental issues and pedagogy for teaching adults and children. The course is designed for educators, environmental professionals, and others interested in learning about environmental science, environmental curriculum, and pedagogy for teaching about environmental issues. The course leads to certification in several nationally sponsored environmental education programs (at cost to students). The course compliments Environmental Education (EDCI 506/FNR 564) by specifically investigating current environmental issues and curricular programs and pedagogy for teaching about environmental topics. Inquiry, issues, and computer-based pedagogy will be used to investigate and explore environmental issues and educational programs. Guest speakers and case studies will also be utilized.

Collaborated with Murdock Elementary teachers during the 1999 fall semester on the development of an experimental section of EDCI 317 and its implementation spring semester 2000. The section was taught on-site at Murdock Elementary School and emphasizes the integration of theory and practice by providing an extensive field experience component. A major requirement of the pilot section is the development of a case study report by students that explores and investigates science teaching, learning, and assessment in the context of the NRSC's STC curriculum.

4. Preparation of Instructional Materials

a. Test Books

Prepared EDCI 317 midterm packet that required students to: 1) analyze and synthesize research on children's conceptions of solids and liquids and the presentation of the scientific conception of solids and liquids in elementary science textbooks, 2) evaluate the textbooks from the perspective of children's conceptions of solids and liquids, and 3) apply the research findings and class experiences towards teaching the concepts of solids and liquids to children.

Prepared EDCI 517 midterm packet, which required graduate students to analyze a teacher-student interaction transcript and then utilize their analysis as evidence to support a learning theory perspective. Students also had to utilize the transcript as evidence for not supporting other theories of learning.

Developed two new Assessments (Fall 1998), revised Fall 1999, for use in EDCI 317. The assessments are in an alternative format and present students with science teaching, learning, and assessment scenarios that they analyze in response to guiding questions (prompts). The scenarios and guiding questions require students to apply their understandings about science teaching, learning, and assessment.

b. Laboratory Manuals

Prepared the following laboratory materials for EDCI 317:

Designing Investigative Centers using Productive Questions
Strategies for Analyzing SCIS, SAPA, ESS, FOSS, NCR and Delta Modules
Problem Solving in the Elementary Grades: Paper Airplanes and the Principles of Flight
Water quality and Solar Energy Lab to coordinate with National Geographic Kids Network
Developed the Science Curricular Framework Lab and materials packet
Developed the Alternative Assessment laboratory activity and materials
Developed the Science Curriculum Adoption laboratory and materials

c. Statement of Course Objectives

Prepared course syllabus for EDCI 317, as well as syllabus packet
Prepared course syllabus for EDCI 506/FOR 564
Prepared course syllabus for EDCI 517
Prepared course syllabus for EDCI 605
Prepared course syllabus for EDCI 591
Prepared course syllabus for G 690

d. Course Packets

Assisted in preparation of EDCI 317 reading packet. Updated reading packet for Spring 1998
Prepared EDCI 317 packet on strategies for implementing problem solving based instruction at the elementary level
Prepared reading packet for EDCI 506/FOR 564. Updated reading packet for Fall 1997
Prepared EDCI 517 reading packet. Updated reading packet for Fall 1997
Prepared EDCI 605 reading packet

e. Visual Aids

Developed the following visual aids for EDCI 317:

Goals of Elementary Science
The Role of Prior Knowledge and Experience in Influencing Observations
Asking the Right Question: Productive Questions
Graphing: Types, Techniques, Student Difficulties, and Teaching Strategies
Alternative Curriculum Frameworks for the Elementary School
A Comparison of Elementary Science Teaching Models
How Children Learn Science: Generating Meaning
Children's' Ideas of Science Concepts
Disparities in Science Teaching: The Mismatch between Curriculum, Instruction, and Children's' Ideas
Planning for Conceptual Change Teaching
Techniques for Cooperative Group Learning
Assessment: The Great Mismatch between assessment methods and science goals and teaching

f. Other Materials

Developed situation cards for EDCI 317 on teacher behaviors, teacher-student interactions, classroom management strategies, and student ideas to facilitate student discussion and preparation for the field experience.

Developed environmental scenario cards for EDCI 506/FOR 546 designed to create discussion concerning the social, technological, and scientific aspects of environmental issues; emphasizing that environmental trade-offs are required.

Developed handouts for EDCI 317 titled: "The Inquiry Training Model of Teaching" (3 pages), "Structuring Small Groups in Science for Effective Learning" (5 pages), and "A Problem Solving Model of Teaching" (5 pages).

Developed demonstration video and guides for discussing children's observations and the role of prior knowledge in the construction of meaning, and to exemplify conceptual teaching using demonstrations. The video and guides are based on my 5th grade classroom research on children's construction of meaning from demonstrations (see publication #19). Materials are used in EDCI 317, 517, and 605.

Developed materials on children's (4th grade) conceptual understanding of electric circuits, to use as examples for developing conceptual based instruction and alternative assessment techniques. The materials were developed from my classroom research on children's construction of meaning and social interactions (see publication #20). Materials are used in EDCI 317 and 605.

Developed EDCI 506/FOR 564 instructional activities and assignment materials. These activities focused on the development of an environmental compass course and an interpretive nature trail. Teachers at Murdock Elementary School will utilize the compass course and nature trail to teach children about environmental concepts.

Developed the reflection assignments and videotape activities on laboratory teaching, teacher questioning in the context of Vee Diagrams, using collaborative groups more effectively, and developing and analyzing alternative assessment for INLAB participants (EDCI 590). See NSTA presentation: An in-service model for improving laboratory instruction and assessment. NSTA National Convention, Anaheim, CA.

Developed the "Science Teachers and Science Classrooms" and "Teacher-Child and Child-Child Interactions During a Science Lesson" instructional activities and assignments to facilitate EDCI 317 students' field observations and reflective inquiry. The first activity/assignment is designed to expose EDCI 317 students to science classroom structure and environment and science teaching in an elementary school, as well as, the perspectives elementary teachers have about science teaching. The second assignment is designed to facilitate EDCI 317 students' observations of social interactions during science lessons and gender equity issues.

Developed and revised the course handouts, resources, and instructional activities for the inquiry and alternative assessment topics covered in EDCI 317.

Developed instructional module for EDCI 506/FNR 564 (Fall 1999) that engaged students in writing an Environmental Protection Agency (EPA) environmental education proposal. The EPA proposal served as the context for which students learned about developing needs assessments and program evaluation tools, utilized the environmental education

research literature to support the need for and develop an environmental education program. In addition, students also learned about writing proposals, preparing budgets and reviewing proposals.

5. Experimentation in Teaching Methods and Techniques

Implemented the National Geographic Kids Network program in EDCI 317, 1991-92. The program required students to conduct inquiry investigations in water quality and solar energy and to telecomunicate with elementary schools and the NG Kids Network. The activities were designed to exemplify inquiry as a teaching model, the nature of science, the relationship between process skills and science content, and the use of computer technology in science teaching.

Developed collaborative group simulation activity where students performed the roles of members of an elementary science curriculum committee charged with the task of re-designing the schools science curriculum. The goal for each group was to design a conceptually based and sequenced science curriculum. I provided each group with a resource packet, which contained readings on curricular and science education reform, and examples of innovative conceptual frameworks. Students were also exposed to "new" conceptually based and innovative elementary science curricula. Students then utilized these resources to construct their conceptual frameworks. Materials used in EDCI 317.

Developed curriculum adoption simulation activity for EDCI 317. Students performed the roles of members of an elementary curriculum adoption committee charged with the task of reviewing, evaluating, recommending an innovative curriculum program for adoption by the elementary school. Each adoption team was provided a resource packet, which contained readings on curricular and science education reform initiatives and state of Indiana curriculum and proficiency guidelines. Each team then evaluated the innovative elementary science curricula, such as: Delta Modules, FOSS, NCSR, ESS, SCIS3. The adoption committees were charged with the preparation of constructing an adoption document that outlined the philosophy, rationale, and goals of their science education program; the curriculum recommended for adoption and the criteria and reasons for adoption; and the reasons why other curricular programs were not recommended for adoption.

6. Special Activities which Contribute to Teaching Effectiveness

I Have collaborated with fifth grade teachers at Hershey Elementary School on the development of conceptual change teaching. This collaboration has provided me with knowledge about conceptual change teaching that I would not have constructed had I not interacted and observed these teachers in a collaborative manner. That is, I have learned from these teachers as they have learned from me. This collaboration has contributed to my elementary methods teaching effectiveness in two ways: 1) it has helped me better understand the techniques needed to be successful at conceptual change teaching, which I integrate into my elementary methods curriculum and instruction; and 2) it provides me with a better understanding of the conceptual ideas children have and how these ideas can "interfere" with learning, which I utilize as examples, with methods students, for designing conceptually based science teaching (see publication numbers 19 and 20).

I have collaborated with a fourth-grade teacher at Happy Hollow elementary school on the use of journals in science teaching. This collaboration has provided me with knowledge about how to effectively incorporate the use of journals into science teaching. I could not have constructed this understanding had I not interacted and

observed the use of journals in this classroom. This collaboration has contributed to my elementary methods teaching effectiveness in two ways: 1) it has helped me better understand how to effectively use journals in science teaching, which I have integrated into my elementary methods curriculum and instruction; and 2) it has provided me with an understanding of how children learn science and use journals as a medium to organize and communicate their understandings of science. (See 1994 and 1995 AERA presentation handout for additional information)

I have developed all of the instructional activities and teacher (participant) self-reflection assignments for project INLAB. The self-reflection assignments are designed to engage participants in reflecting upon laboratory instruction and assessment within the culture of their classroom. Further, the assignments engage participants in collaborative dialogue about their reflections and laboratory teaching and assessing practice (see paper presented at the 1994 annual AETS meeting: A Framework and Strategies for Improving Laboratory Instruction and Assessment at the Middle School Level, and the 1995 AERA paper).

I co-developed (with Gerald Krockover and Marie Roth--5th grade elementary teacher) an instructional unit on fruit flies, whereby multimedia and computer technology were integrated into a constructivist based, inquiry teaching unit. I was specifically responsible for developing strategies for assessing students based upon their journal entries (see paper presented at the 1995 NSTA regional conference).

In collaboration with Professor Britsch and a Doctoral Student, I developed a teaching/research project that was implemented at Linnwood Elementary School. The project focused on testing models of inquiry-based science instruction, instructional techniques for using children's self-produced science journals, and investigating the role of small-group social interactions in science learning. This experience contributes to my EDCI 317 teaching effectiveness by providing me first-hand experiences in an elementary classroom using these pedagogical techniques.

7. Institutes and Programs Attended

a. Purdue University Student Retention Workshop (1992)
b. Association for the Education of Teachers in Science (AETS) 1993 annual conference.
c. Cultural Diversity (March 1993). A Faculty Development Workshop Department of C & I
d. Teacher Education Equity Project (1994-96). Center for Advanced Study in Education, City University of New York Graduate Center, New York.
e. National Science Teachers Association (NSTA) 1994 regional conference.
f. Revitalizing Undergraduate Science and Mathematics Education, Michigan State University (May 8-10, 1997), East Lansing, MI.
g. International Congress of Technology Educators (March 9-12, 1998), Santa Fe, NM.
h. National Association of Research in Science Teaching (April 19-23, 1998), San Diego, CA.
i. ArcView Geographic Information System Short-Course (May 14, 1998), Purdue University, West Lafayette, IN.
j. Association of American Geographers annual meeting (1999), Honolulu, HI
k. National Association of Research in Science Teaching annual meeting (1999), Boston, MA
l. The Indiana Adopt-A-Wetland Program, sponsored by the Sierra Club and the Indiana Department of Environmental Management (May 14, 1999), Okland, IN.
m. Project Wet (6/23/99). Certified to utilize project wet materials with students and teachers.
n. Hoosier Riverwatch (7/29/99). Certified Level 1 stream quality monitoring sponsor. Indiana Department of Natural Resources.

o. Indiana Post-Secondary Science Educators Meeting (11/17/00). Ball State University, Muncie, IN.
p. Indiana Environmental Education Roundtable (11/20/00). Natural Resources Education Center, Department of Natural Resources, Indianapolis, IN.
q. P3T3 (1/3-4/01). SOE technology integration training workshop. Purdue University, Wet Lafayette, IN.

9. Other Evidence of Teaching Excellence

With the initiation of the 1998-99 academic year (Fall Semester), I discontinued the use of the CIS Instructor and Course Appraisal system in leu of an alternative form of course evaluation. The decision to discontinue the CIS system was a result of long-term dissatisfaction with the process. First, the CIS system does not provide significant and substant course and instruction feedback that informed practice, that is, the CIS feedback fails to provide sufficient guidance for improving course instruction. Second, the experience that written student feedback does not correlate to student ratings, suggesting that the CIS system is neither valid or reliable at evaluating course instruction (e.g., in EDCI 506/FOR 564 one student indicated that the course and instruction was the best they had experienced at Purdue University, yet the CIS ratings were all 3s.). Therefore, I have developed and implemented an alternative evaluation form and process.

The alternative course and instruction form request anonymous student feedback through specific questions for evaluating specific course activities and experiences or content modules. This feedback then is received at least 3 times per semester and provides specific information about the course, indicating: (1) what students think they have learned, (2) what activities/experiences students felt assisted them in learning, (3) what modifications students would suggest for improving the module, (4) what students could personally do to better prepare themselves for learning, and (5) how students see the module contributing to their professional growth or the practical application of the module content. The actual student responses are located in my C&I personnel file, and a summary of my interpretation of student feedback is presented below for each course.

a. CIS Instructor and Course Appraisal Core Items, EDCI 517, Survey of Science Education

Semester/Year	N	CO1	CO2	CO3	CO4	CO5
Fall 1992	11	4.3	4.4	4.3	4.1	4.2
Fall 1994	09	4.0	4.1	4.0	4.0	4.0
Fall 1995	10	4.3	4.9	4.7	4.3	4.9
Fall 1997	12	3.9	4.4	4.2	3.9	4.1

b. CIS Instructor and Course Appraisal Other Items, EDCI 517, Survey of Science Education

Item	Fa92	Fa94	Fa95	Fa97
#2 ...inst. underst. course topics	4.8	4.6	4.8	4.8
#24 ...course intell. fulfilling	4.6	4.0	4.5	4.0
#38 ...emphasizes concept. under.	4.9	4.4	4.9	4.4
#67 ...sts encouraged to contr.	4.7	4.6	4.9	4.6
#91 ...course cont. to prof. growth	4.7	4.0	4.8	4.2
#99 ...course gives excellent bkgr. for further study	4.8	4.0	4.5	4.1

c. Summary of anonymous student feedback for EDCI 517, Module Feedback Form Fall

2000. The matrix below summarizes the Module Feedback Forms for the fall 2000 Semester. A summary of student ratings on the Module Feedback forms and the actual student completed forms may be found in my personal file. The Cumulative Module Feedback matrix below is a sum of all Module Feedback forms.

Cumulative Module Ratings/Feedback (Totals/percentages of all module feedback forms)

Question Item	Rating 1 (Low)	Rating 2	Rating 3 (High)
1. Course readings introduced different ideas about and assisted me in understanding science teaching.	Not helpful 0	Helped some 23 (66%)	Very helpful 11 (32%)
2. Course discussion assisted me in understanding science teaching.	Not helpful 1 (3%)	Helped some 12 (35%)	Very helpful 21 (62%)
3. The student synthesis papers and discussions provided me with insight into science teaching.	Not at all 0	Somewhat 13 (38%)	Yes, good overview 21 (62%)
4. The instructor provided the appropriate assistance in helping me and the class understand science teaching.	Not at all 0	Somewhat 12 (35%)	Just right, good job 22 (65%)
5. Overall I would rate the readings and discussions as:	Not helpful 0	Helpful 20 (59%)	Informative/interesting 14 (41%)

d. Anonymous Graduate Student Comments, EDCI 517

"I have seen Dr. Shepardson's teaching style and ability change so much in the past 2-3 years. His teaching abilities and ability to motivate has clearly put him among the best instructors I've had at Purdue."

"I really enjoyed the format of the course. The course was really good. Thank you very much."

"I found this to be just the kind of course I needed to start my studies in chem ed."

"The course seemed to require more time than my other courses. Because I learned so much I have to believe the time was necessary."

e. CIS Instructor and Course Appraisal Core Items, EDCI 317, Elementary Science Methods

Semester/Year	N	CO1	CO2	CO3	CO4	CO5
Fall 1990	13	2.0	1.8	2.1	1.4	1.4
Spring 1991	22	4.0	3.8	3.9	3.9	3.8
Fall 1991	10	2.3	4.0	3.3	2.8	3.1
Fall 1992	27	3.9	4.0	3.9	3.9	4.0
Fall 1993	27	3.9	4.1	4.1	3.7	3.8
Spring 1995	21	3.1	3.9	3.8	3.5	3.3
Spring 1996	23	3.9	3.9	4.2	3.8	3.6
Spring 1997	15	4.0	4.0	4.0	3.6	3.4

Spring 1998	23	3.9	3.9	3.8	3.4	3.6

f. CIS Instructor and Course Appraisal Other Items, EDCI 317, Elementary Science Methods

Item	Sp91	Fa91	Fa92	Fa93	Sp95	Sp96	Sp97	Sp98
#2 ...inst. underst. course topics	4.7	4.1	4.5	4.5	4.5	4.5	4.4	4.7
#19 ...many methods in learning	4.6	3.9	4.1	4.2	3.8	4.0	4.2	4.0
#38 ...emphasizes concept. under.	4.6	3.9	4.3	4.5	4.0	4.4	4.1	4.3
#67 ...sts encouraged to contr.	4.5	3.9	4.5	4.1	3.9	4.0	4.4	4.0
#90 ...pertinent to profession	4.6	4.3	4.5	4.2	4.3	4.2	4.2	4.3
#92 ...apply skills learned	4.6	4.5	4.6	4.3	4.0	4.4	4.3	4.2
#98 ...practical app. apparent	4.5	4.4	4.4	4.4	4.1	4.2	4.2	4.2
#140...group work cont. to class	4.5	4.0	4.3	4.2	3.4	4.1	4.4	4.1

g. Anonymous Undergraduate Student Comments, EDCI 317

"I liked the fact that not only did I learn many methods about how to teach scientific concepts, but I also learned about these concepts. I learned a more clearly defined scientific view of several concepts. I also got the opportunity to apply these methods through completing several activities/lessons, which was helpful."

"I appreciate the way that what was preached was practiced, in the way activities were done in cooperative groups etc."

"I really liked that the instructor modeled the type of instruction (GLM, problem-centered, etc.) for elementary science in this class."

"I liked the active approach to learning instead of the passive lecture/take notes approach."

"This course gives a nice basis to begin teaching science in the elementary school."

h. Summary of anonymous student feedback for EDCI 317, Module Feedback Form Spring 1999

Based on the three module feedback forms, the following conclusions may be drawn about the course and course instruction. First, students felt they learned the importance and aspects of inquiry-based teaching, about productive questions and the importance of using questions to guide student activity, how to developing science lessons that build on children's ideas and understandings, and that children learn science best when they are involved in "doing" science. Second, students felt that modeling the science teaching process in class, the use of journals and other tools to assist children's science learning, working with others in planning/developing lessons, interviewing children, and teaching science at Murdock were the strengths of the course. Third, students felt the course could be improved by providing more: class time for working on lesson plans, practice with and examples of lesson plans, and time teaching. Fourth, students felt they could better prepare themselves for the class by doing more research on the topic/content of the lessons they were to teach, practice with the science materials ahead of time, and spend more time preparing their teaching lessons. Fifth, students indicated that the course contributed toward their professional development by developing their abilities to develop a variety of science teaching models, learning about children's ideas and the importance of children's

ideas to teaching and learning, and learning about productive questions as a questioning strategy.

i. Summary of anonymous student feedback for EDCI 317, Module Feedback Form Fall 1999

Based on the three module feedback forms, the following conclusions may be drawn about the course and course instruction. First, students felt they learned what inquiry-based teaching is, about productive questions and the importance of using questions to guide student activity, how to developing science lessons that build on children's ideas and understandings, and that children learn science best when they are involved in "doing" science. Second, students felt that modeling the science teaching process in class (wood car rally, electric circuits, and learning cycle lesson), working with others in planning/developing lessons, interviewing children, and teaching science at Murdock were the strengths of the course. Third, students felt the course could be improved by providing more: class time for working on lesson plans, practice with and examples of lesson plans, sharing time about and debriefing of the teaching experience. Fourth, students felt they could better prepare themselves for the class by doing the class readings, doing more research on the topic/content of the lessons they were to teach, practice with the science materials ahead of time, and spend more time preparing their teaching lessons. Fifth, students indicated that the course contributed toward their professional development by developing their abilities to develop a variety of science teaching models (inquiry as fair testing, guided inquiry through productive questions, learning cycle), learning about children's ideas and the importance of children's ideas to teaching and learning, and learning about productive questions as a questioning strategy. The course also provided students an opportunity to work with children. Alternative assessment was a major theme throughout the course; however, students rarely mentioned this on the Module Feedback Forms.

j. Summary of anonymous student feedback for EDCI 317, Module Feedback Form Fall 2000. The matrix below summarizes the Module Feedback Forms for the fall 2000 Semester. A summary of student ratings on the four Module Feedback forms and the actual student completed forms may be found in my personal file. The Cumulative Module Feedback matrix below is a sum of all Module Feedback forms.

Cumulative Module Ratings/Feedback (Totals/percentages of all module feedback forms)

Question Item	Rating 1 (Low)	Rating 2	Rating 3 (High)
1. Rate and describe three things that you learned about teaching science.	Learned very little: 0	Learned something: 50 (54%)	Learned a lot: 42 (46%)
2. Rate and list two activities that assisted you in learning about teaching science	Didn't help: 0	Helped some: 47 (52%)	Helped a lot: 44 (48%)
4. Rate and identify two things you could do to better prepare for class.	I did little: 0	I did some: 42 (47%)	I did a lot: 47 (53%)
5. Rate and describe how you see this module contributing to	Contributed little:	Contributed some:	Contributed a lot:

your professional growth.	5 (5%)	39 (42%)	48 (52%)
6. Rate and describe the overall quality of this module in learning to teach science.	Poor: 1 (1%)	Okay: 24 (26%)	Good: 67 (73%)

Note: Item 3 does not require students to rate the module, but only to identify ways of improving the module.

k. CIS Instructor and Course Appraisal Core Items, EDCI 506/FOR 564, Environmental Education

Semester/Year	N	CO1	CO2	CO3	CO4	CO5
Fall 1991	14	4.1	3.8	4.3	3.9	3.9
Fall 1993	17	3.9	3.9	4.0	3.9	3.8
Fall 1995	28	3.6	4.1	4.2	3.8	3.8
Fall 1997	24	4.1	4.0	4.1	3.8	4.0

l. CIS Instructor and Course Appraisal Other Items, EDCI 506/FOR 564, Environmental Education

Item	Fa91	Fa93	Fa95	Fa97
#2 ...inst. underst. course topics	NA	4.7	4.2	4.6
#19 ...many methods in learning	4.4	4.4	4.3	4.0
#67 ...sts encouraged to contribute	4.8	4.7	4.5	4.5
#90 ...pertinent to profession	4.7	4.0	4.3	4.2
#92 ...apply skills learned	4.7	4.6	4.2	4.3
#98 ...practical app. apparent	4.8	4.4	4.3	4.3
#140...group work cont. to class	4.0	4.1	4.3	4.2

m. Anonymous Undergraduate/Graduate Student Comments, EDCI 506/FOR 564

"I found this course to be very relevant to my professional training. The professor was flexible with assignments and allowed everyone the opportunity to contribute to their own learning. The practical applications in class were very helpful."

"I felt that the class was valuable, but those of us w/out education background did not really understand some of what went into curriculum development. Although, I thought this class was excellent."

"Curriculum project was the best assignment--applicable and usable."

"This is the kind of class that one complains about during the semester, but when it is all over a real sense of accomplishment and fulfillment is felt."

n. Summary of anonymous student feedback for EDCI 506/FNR 564, Module Feedback Form, Fall 1998

Based on the three module feedback forms, the following conclusions may be drawn about the course and course instruction. First, students indicated that the course assisted them in learning about designing environmental education (EE) programs and materials based on EE literacy strands and objectives. In addition, the course successfully prepared students for teaching about environmental issues, exposing them to multiple teaching methods, and the need for balance in teaching about environmental issues. The course also successfully

prepared students for designing effective EE workshops. Second, the course instruction that was best received by students included the use of guest speakers, field trips, certification in EE programs, using the world wide web, and the instruction on developing curricular frameworks. Third, students felt the course could be improved by providing more: examples of EE lessons and activities, structure in designing web pages/sites, detail on assignments, and modeling effective teaching methods. Fourth, students felt they could improve their contributions to the course by reading and reading course materials more carefully, conducting more library research on their own, and seeking out existing EE materials. Fifth, students felt the course contributed to their professional development by: requiring them to use and construct web sites, experience developing EE lessons and curriculum, plan effective EE workshops, learn new methods for teaching about the environment and environmental issues, learn about environmental issues, and be able to use the products they created.

o. Summary of anonymous student feedback for EDCI 506/FNR 564, Module Feedback Form, Fall 1999

Based on the three module feedback forms, the following conclusions may be drawn about the course and course instruction. First, students indicated that the course assisted them in learning about designing environmental education (EE) programs and materials based on EE literacy strands, goals, and objectives. In addition, the course successfully prepared students for teaching about environmental issues, exposing them to multiple teaching methods, and the need for balance in teaching about environmental issues. The course also successfully prepared students for designing effective EE workshops and provided them with an experience in developing an EE proposal for EPA. Second, the course instruction that was best received by students included the use of guest speakers, field trips, certification in EE programs, and the instruction on developing curricular frameworks. Experiencing and see examples of lessons and materials was also helpful. Third, students felt the course could be improved by providing more: examples of EE lessons, activities, EPA proposal and workshop plans (examples of past student projects). Because a session on web page development was incorporated (based on last year's feedback) that was not an issue this year. Fourth, students felt they could improve their contributions to the course by reading course materials more carefully, conducting more library research on their own, seek out existing EE materials, and meet more often with me as they worked on their projects. Fifth, students' felt the course contributed to their professional development by: providing an opportunity to learn about proposal development and developing an EE issues-lesson and an EE workshop. Learning about environmental issues and the various perspective stakeholder have about such issues was also identified as a strength. Overall it is difficult to draw detailed implications of the course to the professional development of the students based on their Module Feedback. This may be reflective of the fact that only about 4 of the students had an interest in EE as a career goal, the others registered for the course because of interest in the environment, but not in education.

p. CIS Instructor and Course Appraisal Core Items, EDCI 605, Science in the Elementary School

Semester/Year	N	CO1	CO2	CO3	CO4	CO5
Summer 1995	05	4.9	4.9	4.9	4.7	4.7

q. CIS Instructor and Course Appraisal Other Items, EDCI 605, Science in the Elementary School

Item	Su95

#2 ...inst. underst. course topics	4.9
#24 ...intellectually fulfilling	4.7
#38 ...emphasizes conceptual understand.	4.7
#67 ...sts encouraged to contribute	4.7
#91 ...contributes to prof. growth	4.3
#140...group work cont. to class	4.9

r. INLAB Participant Evaluation Survey Results, Average Rate for the Project's (1993-96) Academic year workshops (n=28) and Summer Institutes (n=31); 5 Strongly Agree, 1 Strongly Disagree*

Question	Academic Year	Summer Institutes
1. The instruction was clear and appropriate.	4.4	4.1
2. The instruction and activities have effectively challenged me to think.	4.8	4.7
3. Each participant is encouraged to contribute to the learning process.	4.6	4.7
4. I can apply the practices/ideas learned in the project to my teaching.	4.7	4.8
5. The group sharing sessions contribute ... to learning and practice	4.7	4.4
6. The assignments and activities motivate me to do my best work.	4.6	4.4
7. Project assignments are interesting and stimulating.	4.3	4.2
8. Overall, this inservice project is among the best I have participated in.	4.6	4.6
9. Overall, the instruction has been among the best inservice instruction	4.5	4.5
10. Overall, the project has improved the quality of my laboratory teaching and assessment practice.	4.8	4.9

*rating scale reversed from original survey to reflect CIS rating scale. The ratings are based upon the mean number of participants in attendance at the time the surveys were distributed; therefore, the results do not reflect the total number of participants in the project.

s. Anonymous INLAB Participant Evaluation Comments

Initially, participants looked to INLAB staff to provide the "answers"--prescriptions for successful laboratory teaching and assessing. As a result, the constructive approach of INLAB at first left participants frustrated, anguished, and dissatisfied with their involvement in the project. However, by summer (1993), the self-reflection assignments and collaborative dialogue fostered personal constructions of laboratory teaching and assessing, leading to confidence and ownership in INLAB; providing the impetus to change. This initial frustration leading to understanding is illustrated in the following quotes from participants (see paper presented at the 1994 annual AETS meeting: "A Framework and Strategies for Improving Laboratory Instruction and Assessment at the Middle School Level" for additional project evaluation data):

> "Frustrations surfaced in some participants because this procedure--lack of definite direction--appeared to be a weakness of the program. Frustration subsided when usefulness of the concept maps and Vee diagrams were demonstrated and the information became assimilated by the participants. . . . The learning became more meaningful when it had been broken down and reorganized in the mind of the learner. This occurred in different ways and at different times for the participants. . . . What appeared to be weakness during the quarterly assignments changed into successes as the restructuring of the participant's thinking occurred."

> "I was accustomed to being educated in this fashion [rote memorization] so I proceeded to try to learn in the traditional method. But for the first time, I had difficulty with the

process. So I had to examine how I learn. . . . I could not learn the process until it made sense to me. I had to fit it into my frame of reference."

"The processes that the INLAB participants went through during the 1992-1993 school year were well organized and with hindsight I can say worthwhile. . . . In order to make any changes, one has to know where they are and what they are presently doing. The evaluation process was an eye opener for me because it made me step back and think about what, how, and why I was teaching the material and to think about what could be done differently."

"INLAB has successfully prompted, encouraged, and demanded at times much more discussion between my colleagues and me. The discussions have been very thought provoking and we have struggled, agreed, and disagreed (sometimes vehemently) over implementation of some new ideas."

t. The web site for the Environmental Science Institute for Indiana Teachers, funded by the Commission for Higher Education (http://uval.eas.purdue.edu/geoed.html), illustrates the nature, quality, and effectiveness of my instruction and collaboration with practicing professionals. The web site provides an overview of the program, including agendas, instructional activities, teacher research projects, and teacher evaluations. I am directing the development of the web site as a case study in professional development. At the completion of the project, the web site will not only document the effectiveness of the institute, but serve as a case study for use in the Environmental Education (EDCI 506/FNR 564) course, providing students an opportunity to study the development and implementation of a professional development program in environmental science.

C. EXCELLENCE IN RESEARCH, SCHOLARSHIP, AND CREATIVE ENDEAVOR

My primary area of scholarship focuses upon children's understanding/learning and ways of thinking/reasoning about science phenomena, while my secondary area emphasizes instruction that challenges children's understandings and ways of thinking about science phenomena. Although the primary area of my research has remained consistent, my methods of study have changed to reflect the kinds of questions I now ask about teaching and learning. My research method has evolved from a quantitative approach to a qualitative approach. My research is unique in that it not only investigates children's conceptual understandings and ways of thinking about science phenomena, but looks at the role social interactions play in the understandings children construct and how they think about science phenomena as they solve problems. The research also looks at children's conceptual frameworks and how their frameworks are challenged and restructured by encounters with anomalous data derived from science investigations. My research has recently expanded to explicitly incorporate the role of science journals in children's developing understandings of science phenomena, and the impact of alternative assessment techniques on both teacher practice and children's learning of science.

1. Published Papers

   a. Refereed Papers

      1. Radcliffe, R.* and Shepardson, D.P* (1983). Photographic geology: A multimedia module for individualized field trips. In S. Nixon (Ed.), Cameras in the Curriculum: A Challenge to Teacher Creativity, vol.1. NEA/Kodak.

      2. Shepardson, D.P.* (1984). Snapshot curriculum. Science Scope, 8, 14-15.

      3. Shepardson, D.P.* (1985). Teaching teachers how to utilize photography in their curriculum. In S. McMillan and F. Quinto (Eds.), Cameras in the Curriculum: A Challenge to Teacher Creativity, vol.2. NEA/Kodak.

      4. Saunders, W.L.* and Shepardson, D.P.* (1987). A comparison of concrete and formal science instruction upon science achievement and reasoning ability of sixth grade students. Journal of Research in Science Teaching, 24, 39-51.

      5. Pizzini, E.L.*, Abell, S.K., and Shepardson, D.P. (1988). Rethinking thinking in the science classroom. The Science Teacher, 55, 22-25.

      6. Pizzini, E.L., Shepardson, D.P.*, and Abell, S.K. (1989). A rationale for and the development of a problem solving model of instruction in science education. Science Education, 73, 523-534.

      7. Abell, S.K.*, Pizzini, E.L., and Shepardson, D.P. (1989). The textbook scan. Science and Children, 27, 36-37.

      8. Pizzini, E.L., Shepardson, D.P.*, and Abell, S.K. (1991). The inquiry level of junior high activities: Implications to science teaching. Journal of Research in Science Teaching, 28, 111-121.

      9. Pizzini, E.L.* and Shepardson, D.P.* (1991). SSCS problem solving and effective inservice education. Iowa Educational Leadership, 7, 19-26.

10. Shepardson, D.P.* and Pizzini, E.L. (1991). Teaching teachers: Gender bias in the classroom--A Self-Evaluation. Science and Children, 29, 38-41.

11. Shepardson, D.P.* and Pizzini, E.L. (1991). The questioning level of junior high school science textbooks and the implication to the learning of textual information. Science Education, 75, 673-682.

12. Pizzini, E.L. and Shepardson, D.P.* (1991). Student questioning interactions in the presence of the teacher during problem solving in science. School Science and Mathematics, 91, 348-352.

13. Pizzini, E.L., Shepardson, D.P.*, and Abell, S.K. (1992). The questioning level of select middle school science textbooks. School Science and Mathematics, 92, 74-79.

14. Pizzini, E.L. and Shepardson, D.P.* (1992). A comparison of the classroom dynamics of a problem solving and traditional laboratory model of instruction using path analysis. Journal of Research in Science Teaching, 29, 243-258.

15. Shepardson, D.P* and Pizzini, E.L (1992). Gender bias in female elementary teachers' perceptions of the scientific ability of students. Science Education, 76,147 -153.

16. Shepardson, D.P.* and Pizzini, E.L. (1993). A comparison of student perceptions of science activities within three instructional approaches. School Science and Mathematics, 93, 127-131.

17. Shepardson, D.P. (1993). Publisher based science activities of the 1980's and thinking skills. School Science and Mathematics, 93, 264-268.

18. Shepardson, D.P.* and Pizzini, E.L. (1994). Gender, achievement, and perception toward science activities. School Science and Mathematics, 94, 188-193.

19. Shepardson, D.P.*, Moje, E.*, and Kennard, A. (1994). The impact of a science demonstration on children's construction of meaning. Journal of Research in Science Teaching, 31, 243-258.

20. Shepardson, D.P.* & Moje, E*. (1994). The nature of fourth graders' understandings of electric circuits. Science Education, 78, 489-514.

21. Shepardson, D.P. (1995). Mathematics and science teaching and learning on the information superhighway. Journal of Computers in Mathematics and Science Teaching, 14, 9-26.

22. Kyle, W.C.*, Abell, S.*, Shepardson, D.P.*, Seals, M.*, & Ruth, D. (1995). Using NGS kids network as an instructional tool in science methods courses. Journal of Computers in Mathematics and Science Teaching, 14, 169-186.

23. Hendricks, R.*, Krockover, G.H.*, & Shepardson, D.P.* (1996). A gender equity study of differences among instructors in a multi-age classroom. New England Mathematics Journal, 28, 41-51.

24. Shepardson, D.P. (1996). Social interactions and the mediation of science learning in two small groups of first-graders. Journal of Research in Science Teaching, 33,159-178.

25. Shepardson, D.P.* & Britsch, S.J.* (1996). When dinosaurs roamed: Hypermedia and the learning of mathematics and science. Journal of Computers in Mathematics and Science, 1/2, 7-18.

26. Shepardson, D.P.* & Adams, P.E. (1996). Coming to know and understand alternative assessment in science. Journal of Science Teacher Education 7, 267-282. **[Note: Article is recognized by AETS as a model program for teacher inservice.]**

27. Shepardson, D.P. (1997). The nature of student thinking in life science laboratories. School Science and Mathematics, 97, 37-44.

28. Shepardson, D.P.* & Britsch, S.J.* (1997). Children's science journals: Tools for teaching, learning, and assessing. Science and Children, 34, 13-17 & 46-47.

29. Shepardson, D.P.* & Jackson, V. (1997). Developing alternative assessments using the Benchmarks. Science and Children, 35, 34-40.

30. Shepardson, D.P (1997). Of butterflies and beetles: First graders' ways of seeing and talking about insect life cycles. Journal of Research in Science Teaching, 34, 873-889.

31. Stahly, L*, Krockover, G*, & Shepardson, D* (1999). Third grade students' ideas about the lunar phases. Journal of Research in Science Teaching, 36, 159-177.

32. Shepardson, D.P.* & Moje, E.B.* (1999). The role of anomalous data in restructuring fourth graders' frameworks for understanding electric circuits. International Journal of Science Education, 21, 77-94.

33. Shepardson, D.P. (1999). Learning science in a first grade science activity: A Vygotskian perspective. Science Education, 83(5), 621-638.

34. Krockover, G.H.*, Pekarek, R.M.*, Rigss, C.G.*, & Shepardson, D.P.* (1999). How well do multiage intermediate classrooms foster successful learning for children? The Educational Forum, 64(1), 67-74.

35. Shepardson, D.P.* & Britsch, S.J.* (2000). Analyzing children's science journals. Science and Children, 38(3), 29-33.

36. Shepardson, D.P.* & Britsch, SJ.* (2001). The role of children's journals in elementary school science activities. Journal of Research in Science Teaching, 38(1), 43-69.

37. Krockover, G.,* Adams, P.,* Eichinger, D.,* Nakhleh, M.,* & Shepardson, D.P.* (2001). Action-based research teams: Collaborating to improve science instruction. Journal of College Science Teaching, 30(5), 313-317.

2. Other Publications

   a. Monographs/Special Issues/Proceedings

      1. Pizzini, E.L.*, Abell, S.K*, & Shepardson, D.P* (1992). Problem solving: An effective practice. In W.J. McIntosh and M. Caprio (Eds.), Successful approaches to teaching introductory science courses. Cedar City, UT: Society for College Science Teachers.

2. Kyle, W.C.*, Abell, S.K.*, Shepardson, D.P.*, & Seals, M.* (1994). The National Geographic kids network elementary science methods course implementation at Purdue University. In C.L. Julyan, and M.S. Wiske (Eds.), Learning along electronic paths: Journeys with the NGS Kids Network. Cambridge, MA: TERC.

3. Editor (1995), Telecommunications special issue of Journal of Computers in Mathematics and Science Teaching. As Editor of the special issue I was involved in soliciting manuscripts from professionals in the field to provide a diverse collection of articles on the use of telecommunications in the teaching and learning of mathematics and science, reviewing and editing manuscripts for publication, and organizing the manuscripts in the special issue. I also served as ghostwriter for several articles.

4. Editor (1996), Use of Multimedia and Hypermedia special issue of Journal of Computers in Mathematics and Science Teaching. As Editor of the special issue I was involved in soliciting manuscripts from professionals in the field to provide a diverse collection of articles on the use of multimedia and hypermedia in the teaching and learning of mathematics and science, reviewing and editing manuscripts for publication, and organizing the manuscripts in the special issue.

5. Krockover, G.H.*, Roth, M.C.*, Shepardson, D.P.*, & Webb, M.* (1997). Using technology in a constructivist manner to enhance the science education curriculum. In K. Calhoun, R. Panwar, & S. Shrum (eds.), International Organization for Science and Technology Education, 8th Symposium Proceedings, Volume 3: Practice. Edmonton, Canada: University of Alberta.

6. Krockover, G.H* and Shepardson D.P.* (2000). Improving undergraduate geoscience instruction through action based research teams. Third International Conference on Geoscience Education: Conference Proceedings. Sydney, Australia: University of New South Wales.

b. Books/book chapters

1. Moje, E.B.* & Shepardson, D.P.* (1998). Social interactions and children's changing understanding of electric circuits, in B. Guzzetti & C. Hyndy (Eds.), Studies in conceptual change: Theoretical perspectives. Lawrence Erlbaum Associates, Inc.

2. Moje, E.B.* & Shepardson, D.P.* (1998). Social interactions and children's changing understanding of electric circuits: Exploring unequal power relations in "peer" learning groups, in B. Guzzetti & C. Hyndy (Eds.), Studies in conceptual change: Theoretical perspectives. Lawrence Erlbaum Associates, Inc.

e. Other publications

1. Shepardson, D.P (1984). The effects of Concrete and Formal Instruction on Adolescents. Unpublished masters report, Department of Secondary Education, Utah State University, Logan, UT.

2. Editor, The Energist, The National Energy Foundation, Salt Lake City, UT, 1984-87.

3. Editor, Top Hit Energy Lesson Plans, The National Energy Foundation, Salt Lake City, UT, 1987.

4. Energy in Science Series, The National Energy Foundation, Salt Lake City, UT, 1988.

5. Shepardson, D.P. (1988). Useful Problem Solving: SSCS Activity Guide. Science Education Center, The University of Iowa, Iowa City, IA.

6. Shepardson, D.P. (1990). The relationships between problem solving phase, student interactions, and thinking skills among middle school students taught within the SSCS problem solving instructional model. Dissertation, The University of Iowa, Iowa City, IA.

7. Shepardson, D.P.* & Pizzini, E.L. (1991). Evaluation of SSCS: Summary of research findings. In E.L. Pizzini (Ed.), SSCS Assessment Information and Research Findings. Science Education Center, The University of Iowa, Iowa City, IA.

8. Stensvold, M.* & Shepardson, D.P.* (1994). Reflections of central Indiana science teachers on laboratory instruction and assessment strategies. The Hoosier Science Teacher, 20, 56-63.

9. Krockover, G.H.* & Shepardson, D.P.* (1995). The missing links in gender equity research. Journal of Research in Science Teaching, 32, 223-224.

10. Pekarek, R.*, Krockover, G.H.*, & Shepardson, D.P.* (1996). The research-practice gap in science education. Journal of Research in Science Teaching, 33, 111-113.

11. Krockover, G.H* & Shepardson, D.P.* (1996). Educators perspective: National science education standards. Bulletin of the American Meteorological Society, 77, 1293-1294.

12. Shepardson, D.P. (1996). Evaluation report of the Florida International University Summer Camp.

13. Krockover, G.H.*, Pekarek, R.M.*, Riggs, C.G.*, & Shepardson, D.P.* (1997). Identifying characteristics of the multi-age intermediate classroom that foster successful learning for children.

14. Shepardson, D.P.* & Klich, D.* (1998). Evaluation report on the pilot program: Collaborative action based research science and mathematics partnerships for excellence in K-12 Teacher preparation.

3. Work in Process of Being Published

1. Shepardson, D.P. (in final editing stage). Assessment in Science: A guide to professional development and classroom practice. (Book contract with Kluwer Academic Publishers). Reviews of the book indicate the quality and importance of the book: "This is a very practical book on innovative science assessment for teacher development and classroom practice. . . . One important strength of the book is the option to use cases written by single teachers on how they felt, understood and developed innovations in the classroom" (reviewer). Book is currently undergoing final editeding and formating for publication. It is anticipated that the book will be published spring 2001.

2. Shepardson, D.P. (in review). Bugs, butterflies, and spiders: Children's understandings about insects. International Journal of Science Education.

3. Shepardson, D.P.* & Britsch, S.J.* (in review). Pebbles and sand the rocks grave: Children's representations of earth materials. Science Education.

4. Shepardson, D.P.* & Britsch, S.J.* (accepted). The role of children's journals in elementary school science activities. Journal of Research in Science Teaching.

5. Shepardson, D.P.* & Britsch, S.J.* (in progress). Interacting in the zones of privilege.

5. Invited Lectures Presented

a. International Meetings

1. Shepardson, D.P. (1991). SSCS Problem Solving: An Effective Classroom Practice. Soviet/American Convention, Moscow State University, Moscow, Soviet Union.

2. Krockover, G.H. & Shepardson, D.P. (1996). Using technology to enhance the science education curriculum. International Organization of Science and Technology Education, Edmonton, Alberta, Canada.

3. Shepardson, D.P. (1996). A vygotskian perspective on learning science: Vignettes and interviews from a first grade science activity. King's College, The University of London, England.

4. Krockover, G.H. & Shepardson, D.P. (2000). Improving undergraduate geoscience instruction through action based research teams. International Conference on Geoscience Education, Sydney, Australia.

b. National Meetings

1. Saunders, W.L. and Shepardson, D.P. (1984). The effects of concrete and formal instruction on reasoning and science achievement. NARST National Convention, New Orleans, LA.

2. Shepardson, D.P., Pizzini, E.L., and Abell, S.K. (1989). An analysis of the questioning level of junior high school science textbooks: Implications for science teaching and learning. NARST National Convention, San Francisco, CA.

3. Pizzini, E.L., Shepardson, D.P., and Abell, S.K. (1989). Making textbook science come alive. NSTA National Convention, Seattle, WA.

4. Shepardson, D.P., Abell, S.K., and Pizzini, E.L. (1989). Strategies for improving student thinking utilizing science textbooks. NSTA National Convention, Seattle, WA.

5. Carber, M., Miller, D., Brown, K., Pizzini, E., and Shepardson, D.P. (1989). Gender differences in the science classroom. SSMA National Convention, Des Moines, IA.

6. Pizzini, E.L. and Shepardson, D.P. (1990). Extending science textbooks through problem solving. NSTA National Convention, Atlanta, GA.

7. Kotar, M., Abell, S., Barrow, L.H., Daugs, D.R., O'Brien, G.E., Pizzini, E.L., Shepardson, D.P., Voyles, M., and Yupp-Edwards, R. (1990). Teaching teachers' elementary methods share-a-thon. NSTA National Convention, Atlanta, GA.

8. Shepardson, D.P. and Pizzini, E.L. (1990). Analysis of student interactions and behaviors during problem solving within the SSCS instructional model utilizing path analysis. NARST National Convention, Atlanta, GA.

9. Abell, S.K. and Shepardson, D.P. (1990). Promoting meaningful learning from science books. SSMA National Convention, Cincinnati, OH.

10. Shepardson, D.P. and Abell, S.K. (1991). Improving student learning from science textbooks. NSTA National Convention, Houston, TX.

11. Shepardson, D.P. (1991). Relationships among problem solving, student interactions, and thinking skills. NARST National Convention, Lake Geneva, WI.

12. Abell, S.K., Shepardson, D.P., and Campbell, L. (1992). Productive questions = productive investigations. NSTA National Convention, Boston, MA.

13. Shepardson, D.P. and Abell, S.K. (1992). Graphic representations. NSTA National Convention, Boston, MA.

14. Shepardson, D.P. (1992). The development of first graders' ideas about metamorphosis: The role of formal and informal learning. NARST National Convention, Boston, MA.

15. James, R.K, Shepardson, D.P., Skoog, G., Andrews, D., Druger, M, Atwater, M., Gilbert, S.W, Griffin, J., Germann, P., and Yeotis, C. (1993). NSTA's new standards for science teacher preparation. NSTA National Convention, Kansas City, MO.

16. Shepardson, D.P., Moje, E., Abell, S. (1993). Fourth graders' change in conceptual understandings of electric circuits. NARST National Convention, Atlanta, GA.

17. Shepardson, D.P. (1994). A framework and strategies for improving laboratory instruction and assessment at the middle school level. AETS Annual Meeting, El Paso, TX.

18. Shepardson, D.P. & Moje, E. (1994). The nature of fourth graders' understanding of electric circuits and the role of anomalous data. NARST National Convention, Anaheim, CA.

19. Shepardson, D.P., Krockover, G., & Kyle, W.C. (1994). Strategies for integrating computer technology into science classrooms. NSTA National Convention, Anaheim, CA.

20. Shepardson, D.P. (1994). An in-service model for improving laboratory instruction and assessment. NSTA National Convention, Anaheim, CA.

21. Britsch, S.J. & Shepardson, D.P. (1994). The role of literacy in the construction of scientific understandings: The use of journals in elementary classrooms. AERA Annual Meeting, New Orleans, LA.

22. Shepardson, D.P. (1995). An in-service model for changing teachers assessment practice. AETS Annual Meeting, Charleston, WV.

23. Shepardson, D.P & Adams, P. (1995). Strategies for improving laboratory instruction and assessment. NSTA Annual Meeting, Philadelphia, PA.

24. Shepardson, D.P. (1995). Coming to know and understand alternative assessment. NSTA Annual Meeting, Philadelphia, PA.

25. Britsch, S.J. & Shepardson, D.P. (1995). The role of journals in children's construction of scientific understanding in elementary school classrooms. AERA Annual Meeting, San Francisco, CA.
26. Shepardson, D.P. (1995). Twenty-four out of thirty = change. AERA Annual Meeting, San Francisco, CA.
27. Shepardson, D.P. & Moje, E. (1995). Fourth graders' interpretive frameworks for understanding electric circuits. NARST Annual Meeting, San Francisco, CA.
28. Shepardson, D.P., Adams, P., & Hendricks, R. (1996). Alternative assessment in science. NSTA Annual Meeting, St. Louis, MO.
29. Shepardson, D.P., Adams, P., & Hendricks, R. (1996). Making laboratory instruction and assessment meaningful. NSTA Annual Meeting, St. Louis, MO.
30. Shepardson, D.P. & Adams, P. (1996). Perspectives on assessment in science: Voices from the field. NARST Annual Meeting, St. Louis, MO.
31. Shepardson, D.P. (1996). Teacher voices: Perspectives on assessment in science. AERA Annual Meeting, New York City, NY.
32. Britsch, S.J. & Shepardson, D.P. (1996). Science journals: Tools for the construction of understanding. AERA Annual Meeting, New York City, NY.
33. Shepardson, D.P. & Britsch, S.J. (1997). Using journals to teach science. NSTA Annual Meeting, New Orleans, LA.
34. Shepardson, D.P., Kyle, W.G., & Adams, P.E. (1997). Theoretical perspectives for science education. NARST Annual Meeting, Chicago, IL.
35. Britsch, S.J. & Shepardson, D.P. (1997). Children's uses of science journals in the context of classroom social interactions. AERA Annual Meeting, Chicago, IL.
36. Krockover, G., Ridgeway, K., Eichinger, D., Nakhleh, M., Francisco, J., Shepardson, D., & Adams, P. (1998). Improving the preparation of k-12 teachers through reform of the undergraduate science content experience. NSTA Annual Meeting, Las Vegas, NV.
37. Shepardson, D.P. (1999). Who I am. The University of Iowa, Iowa City, IA
38. Shepardson, D.P., Bell, C., and others (2000). Share the wealth in environmental education. NSTA Annual Meeting, Orlando, FL.
39. Shepardson, D.P. and Britsch, S.J. (2000). Young children's representations of earth materials on the science journal page. NARST Annual Meeting, New Orleans, LA.
40. Cooper, B., Harbor, J., & Shepardson, D. (2000). Inquiry-based research as a science teaching model for grades 6-12. National Association of Geoscience Teachers Annual Meeting, Denver, CO.
41. Krockover, G.H. and Shepardson, D.P. (2001). Using action-based research teams to reform the college science curriculum. Association for the Education of Teachers of Science Annual Meeting, Costa Mesa, CA.

c. Regional Meetings

1. Shepardson, D.P. and Brown, D. (1987). Infusing hydrocarbon concepts into the science curricula. NSTA Area Convention, Salt Lake City, UT.

2. Shepardson, D.P. and Brown, D. (1987). Teaching children about heat and temperature. NSTA Area Convention, Salt Lake City, UT.

3. Shepardson, D.P. and Dalton, E. (1987). Teaching energy in the classroom. NSTA Area Convention, Salt Lake City, UT.

4. Shepardson, D.P. and Dalton, E. (1987). Infusing technological and societal issues into the science curricula. NSTA Area Convention, Salt Lake City, UT.

5. Shepardson, D.P., Abell, S.K., and Pizzini, E.L. (1989). Strategies for improving student thinking utilizing science textbooks. NSTA Area Convention, Milwaukee, WI.

6. Pizzini, E.L. and Shepardson, D.P. (1989). Making textbook science come alive through problem solving. NSTA Area Convention, Milwaukee, WI.

7. Pizzini, E.L. and Shepardson, D.P. (1989). Making textbook science come alive through problem solving. NSTA Area Convention, Phoenix, AZ.

8. Pizzini, E.L. and Shepardson, D.P. (1990). SSCS problem solving. NSTA Area Convention, Long Beach, CA.

9. Krockover, G.H., Shepardson, D.P., Moje, E., Reid, P., & Roth, M. (1995). Developing content for science and literacy assessment: The genetics of fruit flies. NSTA Area Convention, Salt Lake City, UT.

10. Shepardson, D.P. (1995). Teacher perspectives on alternative assessment. NSTA Area Convention, San Antonio, TX.

d. Other Presentations

1. Moore, J., Pizzini, E.L., and Shepardson, D.P. (1988). Project Sci-Tag: Science curricula for TAG students. Iowa Talented and Gifted Associations State Conference, Iowa City, IA.

2. Shepardson, D.P. (1990). Problem solving and science education. Integrating thinking skills into the science classroom, science supervisors leadership conference. Science Education Center, The University of Iowa, Iowa City, IA.

3. Shepardson, D.P. (1991). Asking the right question. Hoosier Association of Science Teachers, Inc. State Conference, Indianapolis, IN.

4. Shepardson, D.P. and Mary Schwartz (1991). Teaching for Conceptual Understanding in Science. Presentation to the State Budget Committee, Purdue University, West Lafayette, In.

5. Shepardson, D.P. (1991). The Relationship Among Problem Solving, Student Interactions, and Thinking Skills. Research Seminar Series, Division of Vocational Education, Dept. of Curriculum & Instruction, Purdue University, West Lafayette, IN.

6. Abell, S. and Shepardson, D.P. (1991). Enhancing Elementary Science through Peer Instruction. Reform in Science, Mathematics, and Technology Education. School Mathematics and Science Center, Purdue University, West Lafayette, IN.

7. Shepardson, D.P. and Stensvold, M. (1992). Re-structuring laboratory instruction. HASTI Annual Convention, Indianapolis, IN.

8. Celichowski, M., Gladysmae, G., Hilton, B., Kobe, M., Krockover, G., Shepardson, D., and Vavrek, J. (1992). The Moscow experience. HASTI Annual Convention, Indianapolis, IN.

9. Abell, S.K., Shepardson, D.P., Bruns, M., Dietrich, M., Dodds, L., Sharp, K. (1992). Enhancing elementary science through peer leadership teams. HASTI Annual Convention, Indianapolis, IN.

10. Shepardson, D.P. (1992). Elementary students' conception of scientific concepts. Science and Mathematics Education Colloquia, Purdue University, West Lafayette, IN.

11. Shepardson, D.P. (1993). Children's ideas about insect life cycles. Research Seminar Series, Division of Vocational Education, Department of Curriculum & Instruction, Purdue University, West Lafayette, IN.

12. Shepardson, D.P. (1993). Project wild and other environmental education curriculum projects. Indiana Association of Colleges for Teacher Education, 46th Annual Conference, Turkey Run, IN.

13. Shepardson, D.P. & Moje, E. (1994). Children's conception of electric circuits. Research Seminar Series, Division of Vocational Education, Department of Curriculum & Instruction, Purdue University, West Lafayette, IN.

14. Shepardson, D.P., Stensvold, M., Emery, D., Jackson, V., Linton, E., Ruckman, C., Mitchell, R, & Scherer, R. (1994). INLAB--integrating laboratory instruction and assessment. HASTI Annual Convention, Indianapolis, IN.

15. Shepardson, D.P., Adams, P., Kasarjian, B., Jackson, V., & Ruckman, C. (1994). A framework for improving laboratory instruction and assessment. Indiana Department of Education, Mathematics/Science/Technology Conference, Indianapolis, IN.

16. Britsch, S.J. & Shepardson, D.P. (1994). The use of science journals by elementary children. Literacy and Language Seminar, Department of Curriculum and Instruction, Purdue University.

17. Shepardson, D.P. & Adams, P. (1994). An overview of project INLAB. Research Seminar Series, Division of Vocational Education, Department of Curriculum & Instruction, Purdue University, West Lafayette, IN.

18. Shepardson, D.P. & Britsch, S.J. (1995). Journal writing to learn science: How and why. HASTI Annual Convention, Indianapolis, IN.

19. Shepardson, D.P., Adams, P., Jackson, V., Linton, E., Ruckman, C., Mitchell, R., & Scherer, R. (1995). Integrating laboratory instruction and alternative assessment. HASTI Annual Convention, Indianapolis, IN.

19. Shepardson, D.P., Brewer, M., Edwards, M., Gropp, R., Hamilton, J., Jackson, V., Main, B., Naftzger, L., Shartrina, R., & Werner, K. (1996). Will rub ric sink or float? HASTI Annual Convention, Indianapolis, IN.

21. Beardmore, K. & Shepardson D.P. (1996) Constructivism: What is it and what does it mean for the science classroom? HASTI Annual Convention, Indianapolis, IN.

22. Gummer, E. & Shepardson, D.P. (1997). Teacher enhancement through alternative assessment task development. School Mathematics and Science Spring Conference, Purdue University, West Lafayette, IN.

23. Gummer, E. & Shepardson, D.P. (1998). Teacher enhancement through alternative assessment task development. HASTI Annual Convention, Indianapolis, IN.

24. Gummer, E. & Shepardson, D.P. (1998). Standards-based alternative assessment tasks: Examples from the classroom. HASTI Annual Convention, Indianapolis, IN.

25. Gummer, E. & Shepardson, D.P. (1998). Standards-based assessment task development inservice program. School Mathematics and Science Center Spring Conference, Purdue University, West Lafayette, IN.

26. Shepardson, D.P. (1999). Study in a second discipline: An update. Division of Vocational Education, Department of Curriculum & Instruction, Purdue University, West Lafayette, IN.

27. McDonald, J., Shepardson, D., & Harbor, J. (2000). Environmental science institute for Indiana teachers. HASTI Annual Convention, Indianapolis, IN.

28. Shepardson, D., Harbor, J., & McDonald, J (2000). Teacher understandings and beliefs about water quality and watersheds. HASTI Annual Convention, Indianapolis, IN.

29. Cooper, B., Harbor, J., & Shepardson, D. (2000). Environmental research in the classroom. HASTI Annual Convention, Indianapolis, IN.

30. Krockover, G., & Shepardson, D. (2000). Developing action based research teams to reform your science program. HASTI Annual Convention, Indianapolis, IN.

31. Shepardson, D.P., Bell, C., Leuenberger, T., Harbor, J., Meyer, J., & Klaggs, H. (2001). ENVISION. HASTI Annual Convention, Indianapolis, IN.

6. Evidence of Involvement in Graduate Research Program

   a. Chairperson, Current Ph.D.

      1. Edith Gummer, Ph.D. Science Education (2000)
      2. Cheryl Bell, Ph.D. Elementary Science Education

   b. Chairperson Ed.S, MS., MS Ed.

      1. Rick Mitchell (1996). MS Science Education, Purdue University
      2. Rebecca Pekarek (1997). MS Science Education, Purdue University **(MS paper received the 1997 Ann Patterson Award)**
      3. Amy Wachnicki, MS Elementary Education
      4. Amy Mugg (1999). MS Science Education, Purdue University

5. Frank Drumwright, MS Science Education, Purdue University

c. Ph.D. and MS Committee Member:

1. Ketterling, Gary (1992). Instruction in a problem solving model: Behavioral effects on middle school science teachers after three years. The University of Iowa, Ph.D. Dissertation.
2. Yang, Ma Tzu-Lin (1992). An investigation of cultural variations in Chinese and American arithmetic learning contexts. Purdue University, Ph.D. Dissertation.
3. Brenda Kasarjian (1993), MS Elementary Science Education, Purdue University
4. Deborah S. Teuscher (1994), MS Earth Space Science Teaching, Purdue University
5. Steve Hawkins (1994), MS Elementary Science Education, Purdue University
6. Maria Anderson (1996), MS Elementary Science Education, Purdue University
7. Rachel Hendrixs (1995), MS Science Education, Purdue University
8. William S. Walker (1995), MS Mathematics Education, Purdue University
9. Kelly Lockard (1995), MAT Elementary Education, Purdue University
10. Paul Adams, (1996), Beginning teacher cognition: A case study of four secondary science teachers, Purdue University, PhD Dissertation. **(Note: Dissertation received the Department of Curriculum and Instruction Outstanding Dissertation Award)**
11. Marie Roth (1996), MS Science Education, Purdue University
12. Kathleen Falconer (1996), MS Science Education, Purdue University
13. Laura Staly (1996), MS Science Education, Purdue University
14. David Kellum, MS Extension Education, Purdue University
15. Melissa George (1998), MS Science Education, Purdue University
16. Bill Crum, MS Science Education, Purdue University
17. Debra Klich (1999), MS Science Education, Purdue University

d. Collaborative Work with Graduate Students

1. Elizabeth J. Moje collaborated with me on research on children's understanding and construction of meaning within small groups (See publications: The impact of a science demonstration on children's construction of meaning. Journal of Research in Science Teaching, 31, 243-258 & The nature of fourth graders' understandings of electric circuits. Science Education).

2. Amy Kennard collaborated with me on research on children's construction of meaning from science demonstrations (See publication: The impact of a science demonstration on children's construction of meaning. Journal of Research in Science Teaching, 31, 243-258).

3. Paul Adams collaborated with me on research and development of alternative assessment tools, as well as with the research on teachers' perspectives and utilization of alternative assessment. (See publication: Shepardson, D.P.* & Adams, P.E. (1996). Coming to know and understand alternative assessment in science. Journal of Science Teacher Education 7, 267-282. **Note: Article is recognized by AETS as a model program for teacher inservice.)**

4. Rachel Hendricks has published her masters project, "A gender equity study of differences among instructors in a multi-age classroom." New England Mathematics Journal, 28, 41-51.

5. Stahly, L*, Krockover, G*, & Shepardson, D* (1999). Third grade

students' ideas about the lunar phases. Journal of Research in Science Teaching, 36, 159-177. Publication based on Laura's masters theses.

6. Collaborated with Edith Gummer in the development of the chapters titled "The NRC Standards as a Tool in the Professional Development of Science Teacher Assessment Practice" and "Facilitating Change in Classroom Assessment Practice: Issues for Professional Development" (In review).

7. Mitchell, R. (1999). Real testing, real learning. Science Scope, 22(4), 4-5. Publication based on Rick's masters work and participation in INLAB.

7. Research and Training Grants Received

Awarded 12 externally funded grants, as PI, Co-PI, Director, or Co-Director, from state Eisenhower programs and NSF, totaling $2,826,940. In addition, I have submitted an Indiana Commission for Higher Education proposal ($60,000+) and have co-developed the IERI proposal titled, "Researching Effective Inquiry Teaching in Grades 7 and 9 for Complex Geoenvironmental Science Understanding" ($3,771,738) and the Toyota Foundation proposal titled, "Children's Literacy and Science Learning Project" (500,000+)

1. Project SCI-TAG, Science for the Talented and Gifted, $51,550. State Board of Regents EESA Title II program, 1987-88.

2. Project WISE, Women in Science and Education, $33,670. State Board of Regents EESA Title II program, 1988-89.

3. Project UPSSTAT, Using Problem Solving in Science Teaching and Training, $52,653. State Board of Regents EESA Title II program, 1989-90.

4. Enhancing Elementary Science Through Peer Leadership Teams. A Cooperative Project of Purdue University and Tippecanoe School Corporation, $59,552. Indiana Commission for Higher Education, Eisenhower program, 1991-92.

5. Establishing a National Clearing house for Science, Mathematics, and Technology Education, $3,150. Purdue University Incentive Grant, 1991.

6. The Impact of Cooperative Small Group Instruction in Science on Children's Scientific Understanding and Thinking. Purdue University, Undergraduate Research Trainee Award, 1991.

7. Facilitating an Agenda for Reform in Science Education, $50,000. Indiana Commission for Higher Education, Eisenhower program, 1992-93.

8. Promoting the Effective Use of Computers in Science Teaching, $3,250. Purdue University Proposal Development Incentive Grant, School of Education, 1992.

9. Purdue Research Foundation Summer Faculty Grant, 1992, $5,000. Science Instruction and its Potential impact on Student Thinking.

10. Establishing a reform agenda in science, mathematics, and technology education through a state-wide conference, 1992-93, $15,000. Indiana Department of Education.

11. INtegrating LABoratory instruction and assessment (INLAB), 1992-1995, $628,821.

National Science Foundation.

12. Systemic Reform in Science Education, 1993-94, $50,000. Indiana Commission for Higher Education.

13. The Role of Literacy in the Construction of Scientific Understanding: The Use of Journals in Elementary Classrooms. Purdue University, Undergraduate Research Trainee Award, 1993, in collaboration with Professor Susan Britsch.

14. Teacher Education Equity Project ($750). Teacher Education Equity Project, CUNY Graduate Center.

15. The Role of Journals in the Construction of Scientific Understandings in Elementary Classrooms. Purdue University, Undergraduate Research Trainee Award, 1994, in collaboration with Professor Susan Britsch.

16. The Role of Journals in the Construction of Scientific Understandings in Elementary Classrooms. Purdue University, Undergraduate Research Trainee Award, 1995, in collaboration with Professor Susan Britsch.

17. Identifying Characteristics of the Multi-age Intermediate Classroom that Foster Successful Learning for Children, 1996, $1,000. School of Education, Purdue University, PDS Minigrant. Co-PI.

18. Teacher Enhancement Through Alternative Assessment Task Development, 1997-98, $70,493.00. Indiana Commission for Higher Education. See web site for examples of teacher developed assessment tasks: http://omni.cc.purdue.edu/~shepardd/science_assessment/welcome.htm

19. Faculty Program of Study in a Second Discipline ($3,500). Proposal for collaborating with Professor Jon Harbor in Earth and Atmospheric Sciences in the study of wetlands environments, EVPAA Ringle (Spring Semester, 1999).

20. Multimedia Instructional Development Grant ($18,238). Proposal for instructional development of a multimedia tool for campus-wide teaching of geographic information systems (GIS) in collaboration with W.L. Mills, Shao Guofan, Bernie Engel, Jon Harbor, and Jane Frankenberger. Multimedia Instructional Development Center, Purdue University.

21. Using Local Geoenvironmental Research Projects to Achieve National Science Education Standards: A Pilot Summer Course for In-Service Teachers, 8/1/98-5/31/2000 ($88,369). With Barb Cooper (IUPUI) and Jon Harbor. The project improves the quality of science teaching and achieves the National Science Education Standards by exposing science teachers to inquiry and research-based education and pedagogy. National Science Foundation.

22. Environmental Science Institute for Indiana Teachers ($80,645). With Jon Harbor. The project improves the quality of science teaching by developing high school science teachers' content, pedagogy, and assessment knowledge through the investigation of environmental issues. Indiana Commission for Higher Education, 1/1/99-5/31/2000. See web site for case study of project: http://uval.eas.purdue.edu/geoed.html

23. ENVISION, 5/31/99-6/1/2003 ($1,580,783). With Jon Harbor. ENVISION is a regional environmental science institute for teachers, developing teachers content, pedagogy, and

assessment knowledge in the areas of watershed science, waste management, and urban and built environments. NSF Teacher Enhancement. See web site for information on project: http://uval.eas.purdue.edu/geoed.html

24. PRF International Travel Grant ($1,190) for presenting at the third International Conference on Geoscience Education, Sydney, Australia.

25. Environmental Science Institute for Indiana Teachers ($66,484). The project improves the quality of science teaching by developing high school science teachers' content, pedagogy, and assessment knowledge through the investigation of environmental issues. Indiana Commission for Higher Education, 1/1/01-5/31/02.

8. Current Research Interests and Projects in Process

Student thinking and understandings. This area of research deals with students' thinking and understandings within small-group, laboratory situated activities. Specifically, the effect of social interactions and group collaboration on students' ways of thinking, problem solving, and construction of meaning. Further, investigating the nature of students' understandings and how these understandings influence students' frameworks for thinking and interpreting data, especially data that is anomalous to their interpretive framework.

Journals as a medium for thinking and understanding. This is a collaborative research activity with professor Britsch, Literacy Education, designed to investigate children's use of journals as a medium for integrating their emerging literacy skills with their understandings of science phenomena and concepts as constructed in the classroom. Specifically: How does the teachers' structure of science activities influence children's strategies of journal use in their construction of science understandings? How does the nature of the children's social interactions in small-group science activities influence the content of their journals and, in turn, their scientific understandings and literacy development?

Alternative assessment. The focus of this area of research is on investigating the learning potential of alternative assessment techniques, the validity and reliability of alternative assessment techniques to reflect student understandings of science, and the difference in student understandings as reflected in various assessment techniques. Related to this area, I am investigating science teachers' construction of understanding of the relationships among laboratory pedagogy, science content knowledge, and assessment knowledge, what I call pedagogical content assessment knowledge.

9. Evidence of Interdisciplinary Activity

I am collaborating with faculty from the Schools of Science and Agriculture on the development of a web site-based, GIS instructional tool. The development of the site is supported by an University MID grant.

Faculty Program of Study in a Second Discipline (1998-99). Proposal for collaborating with Professor Jon Harbor in Earth and Atmospheric Sciences in the study of wetlands environments was approved by EVPAA Ringle (11/4/97). The plan of study will develop my research and teaching expertise in wetlands science. This area of study is essential to enhancing both my science content knowledge and pedagogy, enabling me to remain competitive in seeking external funding. The program of study will have direct impact on my undergraduate teaching of EDCI 506/FOR 564 by allowing me to integrate the study of wetlands and pedagogical models for teaching about wetlands into this course. This experience will also lead to collaboration in the development of an undergraduate

environmental science and education course, and the development of collaborative proposals for external funding. Thus, the study in a second discipline will allow me to extend my scholarship through interdisciplinary collaborations in teaching, research, and proposal development in an area related to my professional efforts.

Prairie Curriculum Project (1997-2000). I am collaborating with the U.S. Fish & Wildlife Service in the development of a prairie curriculum. Responsibilities include: directing the curriculum writing, field testing and revising process; collaborating in the writing of the curriculum; advising Barb Hossler, USF&W project director; and assisting in developing the conceptual framework and curricular matrix for guiding the curriculum development process.

Consultant to the School of Agriculture's elementary school agriculture proposal (1990)

Member, Environmental Education Group, provided input on the development of an EPA environmental education proposal which involved faculty from School of Agriculture, Natural Resources Research Institute, Dept. of Agricultural Engineering, and Water Resources Research Center (1992)

Collaborated with faculty from the Department of Earth and Atmospheric Science in the development of an Earth Science education proposal for American Indians (1992)

Have collaborated with professors Neie, Krockover, Nakhleh, and Eichinger in the Systemic Reform in Science Education project (1993-94).

Have involved faculty from Biology (Professor Eichinger), Physics (Professor Neie), Chemistry (Professor Nakhleh), and Earth and Atmospheric Science (Professor Krockover) in NSF funded project INLAB (1992-95)
Collaborating with professor Britsch, Literacy Education, on research on children's strategies for using journals in the construction of understandings of science phenomena and emerging literacy skills (1993-Present).

Assessment/Evaluator (1997-98) for the NSF project "Collaborative Action Based Research Science and Mathematics Partnerships for Excellence in k-12 Teacher Preparation: A Pilot Program" (Gerald Krockover, Louis Sherman, & Kenneth Ridgeway, PIs).

10. Other Evidence of National or International Activity

Editor, Journal of Computers in Mathematics and Science Teaching, 1992-1996
Associate Editor, Journal of Research in Science Teaching, 1993-1998; JRST Awards Committee, 1994-95.
Editorial Board, Journal of Science Teacher Education, 1992-1997; reviewer 1990-1992
Reviewer, School Science and Mathematics, 1990-Present
Reviewer, Science Education, 1991-1993
National Science Teachers Association, Science Teacher Education Committee, 1991-1993
Association for the Education of Teachers in Science, Membership Committee, 1991-1992; Publications Committee (1997-2000).
Advisory Board, ED Tech Review, 1993-1995
AERA program proposal reviewer, 1995, 1996, 1997
NARST program proposal reviewer, 1995, 1996
School Science and Mathematics Association, Nominations and Elections Committee, 1999-2002

D. EXCELLENCE IN CONTINUING EDUCATION AND SERVICE

1. Description of Major Programs Associated with

Co-Director (1990-1992), Enhancing Elementary Science Through Peer Leadership Teams. A Cooperative Project of Purdue University and Tippecanoe School Corporation

Co-Director (1992-1993), Facilitating an Agenda for Reform in Science Education.

Co-Director (1992-93), Establishing a Reform Agenda in Science, Mathematics, and Technology Education Through a State-Wide Conference

Co-Director (1993-1994), Systemic Reform in Science Education. The project is working with elementary teachers from the Crawfordsville, Brownsburg, and Franklin school district and involves both assisting teachers in conceptualizing science content and developing conceptually based instruction.

Director (1992-1996), project INLAB. NSF Teacher Enhancement project for improving the quality and integrating laboratory instruction and assessment at the middle grades (4-9) (see file for description of project and current progress). The project includes 6 academic year workshops and a 3-week summer institute for each year of the 4 years of operation.

Director (1997-1998), Teacher Enhancement Through Alternative Assessment Task Development. The project involved middle level and high school science teachers in the development of alternative assessment task development, incorporating 1 spring (1997) workshop, a 2 week June 1997 workshop, 2 fall (1997) and spring (1998) workshops, and a 1 week June 1998 workshop.

Co-Director (1999-2000), Environmental Science Institute for Indiana Teachers. The institute involved middle and high school teachers and pre-service teachers in learning about watersheds and water ecosystems as well as learning the skills and techniques for conducting environmental field studies. Pedagogical and assessment strategies were also address during the Institute's workshops to facilitate classroom implementation.

Co-Director (1999-2000), IUPUI Geoenvironmental Education program. The program involved middle and high school teachers in learning about watersheds and water ecosystems as well as learning the skills and techniques for conducting environmental field studies through investigating the Crooked Creek watershed. Pedagogical and assessment strategies were also address during the program's workshops to facilitate classroom implementation.

Co-Directors (1999-2004), ENVISION project. The project involves middle school teachers from across the Midwest in learning about environmental science concepts and issues related to watersheds, rural environments, and urban and built environments. Teachers design and conduct research projects investigating a local environment. Teachers also design inquiry-based lessons and activities for use in their classroom.

2. Evidence of Teaching Excellence

Hershey teachers involved in the Cooperative Project of Purdue University and Tippecanoe School Corporation have transferred pedagogical strategies to other disciplines: mathematics and social studies.

Lebanon School Corporation has revised their science curriculum based on their participation in the Eisenhower project: Facilitating an Agenda for Reform in Science Education (see file for letter from Mary Jane Cragion, Assistant Sup. of Curriculum and Instruction).

Six middle school teachers from the INLAB project have been appointed to the Indiana Department of Education, Indiana Science Assessment Advisory Committee (1994-Present). Thus, the entire middle school subcommittee consists of INLAB participants. The committee

has been charged with the responsibility of establishing policy and preparing an alternative assessment document to foster the integration of alternative assessment techniques into Indiana classrooms. Further, the committee will be responsible for developing and conducting state-wide inservice on integrating alternative assessment into the science curriculum. The invitation to serve on the committee was a result of my direction of the INLAB project, which is on the cutting edge of alternative assessment within the state of Indiana.

Mark Brewer (1996), INLAB participant, published article on assessment based upon his participation in the INLAB project: Tools for Alternative Assessment, The Hoosier Science Teacher, 21, 91-95.

Mitchell, R. (1999). Real testing, real learning. Science Scope, 22(4), 4-5. Publication based on Rick's masters work and participation in INLAB.

3. Principal Conferences and Workshops Organized

Coordinator and instructor Project Wild workshops (1990-Present). Over 500 participants have been involved in the six hour workshops.
Coordinator and instructor, Project Learning Tree workshops (1990-Present). Over 300 participants have been involved in the eight-hour workshops.
Coordinator and instructor, Project Wet workshops (2000-Present). Over 5 participants have been involved in the eight-hour workshops.
Co-Director (1991), School Mathematics and Science Center, Conference on Reform in Science, Mathematics, and Technology Education.
Co-Director and co-instructor (1992) Enhancing Elementary Science A Workshop for Teachers, K-6.
Co-Director and co-instructor (1992) Summer Workshop on Reforming Science Education.
Director Project INLAB workshops (1992-96). Project includes 6 academic year workshops and a 3 week summer institute for each of the 4 years of operation.
Co-Director and co-instructor (1992) Science Reform Conference (Nov. 12-14), Airport Hilton, Indianapolis. (see file for SMSC brochure describing conference)
Co-Director (1993-94) Systemic Reform in Science Education, involving teachers from Crawfordsville, Franklin, and Brownsburg school corporation.
Director (Oct. 21 & Nov. 18, 1994) Science Laboratory Instruction Workshop, Purdue University, involving science teachers from across the state of Indiana.
Director (Oct 13 & Nov 10, 1995) Alternative Assessment in Science Workshop, Purdue University, involving science teachers from across the state of Indiana.
Director (May 3-4, 1996) INLAB Turkey Run Conference, involving science teachers from across the state of Indiana.
Co-Director (1997). SMSC conference, Implementing Mathematics, Science, and Technology Standards into K-12 Schools, Purdue University.
Co-Director (1998). SMSC conference, Implementing Mathematics, Science, and Technology Assessment Standards into K-12 Schools, Purdue University.

4. Conducting Studies and Investigations to Support Educational Programs

External Evaluator (1999-2000) for Project Learning Tree (PLT), Indiana Department of Natural Resources. Responsible for planning, developing, and implement the evaluation of PLT.

External Evaluator (1996-98) for the NSF funded CTEP project (PIs: Professors Krockover, Ridgeway, & Sherman). Responsible for planning, developing, and implementing the evaluation component of the CTEP project for improving undergraduate science teaching.

Conducted and submitted an evaluation report on the Florida International University Summer Camp program for minority and at risk students (summer 1996).

5. Translating Research Information into Practice

Directed and edited the development and production of the Integrating Laboratory Instruction and Assessment (INLAB) staff-development handbook. The handbook translates research on laboratory teaching and learning, as well as alternative assessment into a useable form by practitioners. The handbook enables teachers to apply scientific and pedagogical information to classroom practice and teacher inservice (1998).

Developed the science assessment web site, that contains example alternative assessment tasks developed by teacher-participants in the Eisenhower funded assessment project. The web site serves as a resource for teachers and educators interested in professional development in science assessment (1998-1999). The web site is located at: http://omni.cc.purdue.edu/~shepardd/science_assessment/welcome.htm

Prepared the document titled, "Identifying characteristics of the multi-age intermediate classroom that foster successful learning for children," with Krockover, Pekarek, and Riggs (1998). The document translates classroom-based research into recommendations for practice.

Developed "A Field Guide Primer for Macroinvertebrate Monitoring of Wetland Environments" document that provides science educators and others with information about establishing and implementing a field study for monitoring and learning about wetland environments (1999). The field guide was developed as part of my study in a second discipline.

8. University, School, and Departmental Service

a. University Service

Purdue University Task Force on Recycling and Waste Management (1991-present)

b. School of Education Service

Faculty Affairs Committee (1997-2000)
Technology Task Force, Infusion Group Subtask Force (1992-1995)
School of Education Curriculum Committee (1992-1995)
Reviewer, School of Education monograph The scientist-practitioner model and practice
Ad hoc Publications Committee, School of Education (1994). The committee revised the School of Education "You Can" brochure, which is distributed to students.
Teacher Education Council (1994-1997)
SOE R&D Advisory Committee (1995-96)
Reviewer, Sigma Xi High School Teacher Award committee (1996).

c. Department of C & I Service

School Mathematics and Science Center (1990-1998)
Chair, Ad Hoc Committee on Admissions to Elementary Education (1991-93)
Teacher Education Certificate Council, Jr High/Middle School Education (1991-1999)
Chair, Teacher Education Certificate Council, Elementary Education (1991-96)
Faculty Affairs Committee (2001-03; 1991-93)
Social Studies Education Search Committee (1991-92)

Reviewer, PRF David Ross Research Grant proposals (1991-93)
Chair, Ad hoc Committee to Establish a New Elementary Teacher Education Program, Department of Curriculum and Instruction (1994-96)
Graduate Committee, Department of Curriculum and Instruction (1994-97; 1997-2000)
Chair, Subcommittee on Graduate Student Awards (1997-2000)
Chair, Science Education Program Area (1994-97)
Member Block IV Elementary Education Reform Group (1998-1999)
Member Environmental Science Capstone Course for Elementary Teachers, School of Science Working Group (1998-1999)
Convener, Elementary Education Graduate Review Panel (1999-2000)

11. Community Service Activities

Chamber of Commerce "Golden Apple Awards" Committee (1990-1993; Interview Committee Chair, 1993)

12. Consulting Activities

The National Energy Foundation, Salt Lake City, UT (1990-Present). Energy and environment curriculum developer and reviewer.

Project STEPS, Science Education Center, The University of Iowa, Iowa City, IA (1990-Present). Research and evaluation consultant.

The Upjohn Company, Science Grasp program, Kalamazoo, MI (1990-1994)

Indianapolis Children's Museum, Indianapolis, IN (1993). Provided expertise on children's understandings and ways of thinking about science concepts, guiding the museums development of exhibits.

U.S. Department of Education, Fund for the Improvement and Reform of Schools and Teaching (1993). Review Panel member for the Secretary of Education's discretionary funds for innovative programs in education.

Indiana Department of Education, Indiana Science Assessment Advisory Committee (1994-1996). The committee has been charged with the responsibility of establishing policy and preparing an alternative assessment document to foster the integration of alternative assessment techniques into Indiana classrooms. The invitation to serve on the committee was a result of my direction of the INLAB project, which is on the cutting edge of alternative assessment within the state of Indiana.

U.S. Department of Education, Dwight D. Eisenhower National Program for Mathematics and Science Education (1994 & 1995). Review Panel member for priority three, innovative environmental education teacher development projects and discretionary funds.

Indiana Department of Education, Science Proficiency Guide Assessment Team (1998-99). The committee is charged with the responsibility of reviewing and selecting existing assessment items that may be reflective of items utilized on ISTEP+ and that align with the state science proficiency guide.

National Science Foundation, Division of Elementary, Secondary, and Informal Education (1998). National Review Panel member for the Presidential Awards for Excellence in Mathematics and Science Teaching. Panel responsible for reviewing and recommending the Presidential Award winners to the White House.

Indiana Department of Education, Science Proficiency Guide Team (1999-present). The committee is charged with the responsibility of revising the existing proficiency guide and implementing staff development for schools and teachers. The committee will also be developing the Project 2061 Institute for the state of Indiana.

Tippecanoe Soil & Water Conservation District (1999-2000). This committee is responsible for developing the Water Education Vehicle that will be used to deliver teacher professional development and instructional support to local school in terms of teaching about water and watersheds. The development process included the construction of the water and watershed curriculum, development of instructional activities and educational displays, and the design of the vehicle layout and appearance.

13. Other evidence of national recognition

a. Received over 90 national and international requests for published and presented work. My publications and work are cited in the work of other professionals that publish in the major science education research journals.

b. Recognition of work in other published textbooks.

The SSCS problem solving instructional model, that I have developed and evaluated in collaboration with Edward Pizzini, was recognized in Wakefiled (1996), Educational psychology: Learning to be a problem solver, Boston, MA: Houghton Mifflin. The SSCS model is recognized in Chapter 10 (pp. 445-448), "Cognitive learning theories, part 2: Achieving the goal of higher-order thinking," as an effective instructional model for teaching problem solving and higher-order thinking.

The SSCS problem solving instructional model, that I have developed and evaluated in collaboration with Edward Pizzini, is described in the elementary science methods textbook titled, "Learning to Teach Science: A Model for the 21St Century" by Ebenezer and Connor (1998). The instructional model is described in chapter 6, "Constructing and Negotiating" (pp. 140-141). The narrative describes the instructional model and references the articles by Pizzini, Shepardson, and Abell (1988) and Pizzini, Abell, and Shepardson (1988).

My collaborative work on children's self-produced journals as a tool for science teaching, learning, and assessing (Shepardson, D.P.* & Britsch, S.J.* 1997. Children's science journals: Tools for teaching, learning, and assessing. Science and Children, 34, 13-17 & 46-47) was identified in NSTA's publication, "Pathways to the Science Standards, Elementary School Edition" (Lowery, 1997), as a resource for implementing the NRC standards.

My article titled, "Teaching teachers: Gender bias in the classroom--A Self-Evaluation" published in Science and Children, was utilized by Sanders, Koch, and Urso (1997) in their book, "Gender Equity Sources and Resources for Education students," published by Lawrence Erlbaum.

My collaborative work on science assessment (see Shepardson, D.P.* & Jackson, V. 1997. Developing alternative assessments using the Benchmarks. Science and Children, 35, 34-40.) is utilized in the NSTA publication titled, "Science Educator's Guide to Assessment", by Doran, Chan, and Tamir (1998).

My collaborative work on science journals and assessment (see Shepardson, D.P.* & Britsch, S.J.* 1997. Children's science journals: Tools for teaching, learning, and

assessing. Science and Children, 34, 13-17 & 46-47.) is utilized in the elementary science methods book titled, "Science Stories: Teachers and Children as Science Learners", by Janice Koch (1999). Koch both refers to the article as a resource for teaching science as inquiry and bases her examples of journal assessment on the assessment framework presented in the *Science and Children* article.

My collaborative work on science assessment (see Shepardson, D.P.* & Jackson, V. 1997. Developing alternative assessments using the Benchmarks. Science and Children, 35, 34-40.) is utilized in the elementary science methods book, "Essentials of Elementary Science" (2nd edition) by Dobey, Beichner, and Raimondi (1999).

My collaborative work on gender bias (see Shepardson, D.P.* & Pizzini, E.L. 1991. Gender bias in the classroom: A self-evaluation, Science and Children, 29, 38-39) is incorporated into the elementary science methods book, "Discovering elementary science: Method, content, and problem-solving activities" (2nd edition) by Tolman and Hardy (1999).

My article titled, "Teaching teachers: Gender bias in the classroom--A Self-Evaluation" published in Science and Children, was utilized by Sanders (2000) in her book titled, "Fairness at the Source: Assessing Gender Equity in Teacher Education for Colleges and Universities," published by the Washington Research Institute, Seattle, WA.

My work on the social construction of knowledge (Shepardson, D.P., 1997. Of butterflies and beetles: First graders' ways of seeing and talking about insect life cycles. Journal of Research in Science Teaching, 34, 873-898.) and alternative assessment (Shepardson, D.O. & Jackson, V., 1997. Developing alternative assessments using the Benchmarks. Science and Children, 35, 34-40.) is used by David Martin (2000) in his elementary science methods book, "Elementary Science Methods: A Constructivist Approach" published by Wadsworth.

My collaborative work on science journals and assessment (see Shepardson, D.P.* & Britsch, S.J.* 1997. Children's science journals: Tools for teaching, learning, and assessing. Science and Children, 34, 13-17 & 46-47.) is utilized in the elementary science methods book titled, "Science and Science Teaching: Science is something You Can Do", by Sharon Sherman (2000). New York: Houghton Mifflin Co.

CURRICULUM VITAE: TINA JARVIS

Work Address
School of Education Leicester University
21, University Road, Leicester LE1 7RF
0116 2523661

Home Address
Flat 9, 20 Knighton Drive
Leicester LE2 3HB
0116 2707485

Date of Birth 24.12.46 Divorced

Education

Schools:
Trowbridge Girls High School, Wiltshire 1957-1965

Universities:
University of Birmingham, Dept of Geography 1965-1968
University of Birmingham, Faculty of Commerce and Social Science 1968-1969
Birmingham Polytechnic, Faculty of Education 1981-1982

Degree	University	Subject	Class	Year
BSc Hons	University of Birmingham	Geography (Subsidiaries - Geology & Biology)	2(i)	1968
DipSocSci	University of Birmingham	British Admin., British Politics, Social Statistics and Research methods		1969
PGCE	Birmingham Polytechnic	Mathematics & Geography (Middle years)	Distinction	1982
PhD	University of Leicester			2000

Posts held (in chronological order)

City of Birmingham Education Department	Administrative posts 1969-1974
Dudley College of Education Geography Department	Part-time tutor 1970-1972 Part-time lecturer 1974-1977
George Dixon Junior School Birmingham	Teacher Scale 1 1983
City Road Junior and Infant School Birmingham	Coordinator Maths and Science Scales 1 and 2 1983-1985
Jervoise Junior and Infant School Birmingham	Coordinator Scale 3 Maths and Science: Acting Deputy Head 1985-1987
Nelson Mandela Community Primary School Birmingham	Deputy Head and Science Coordinator 1987-1989
Leicester University School of Education	1989 - 1995 Lecturer in Primary Education (Science and Technology)
Leicester University School of Education	1995 - date Head of Primary PGCE 1996 - date Senior Lecturer 1996 - date Director SCIcentre

Summary statement of research interests

o Models of primary children's and their teachers' developing perceptions of science and technology, and factors that influence rate of development

o Stereotypical views of scientists held by young children

o Evaluation of strategies for widening young children's views of science and technology

o Monitoring attitudinal and conceptual change through in-service programmes

o Factors influencing effective learning and dissemination in primary science and technology INSET

o Subject mentoring of initial teacher trainees and experienced teachers in primary science

o Effect of informal learning through the 'Challenger Centre' experience on children's attitudes

Research and other grants

£400,000	1996	Society of Chemical Industry
£5,000	1998	ESSO
£5,000	1998	ICI
£3,000	1998	TTA Teacher Researcher Grant Scheme
£90,000	1999	AstraZeneca Science Teaching Trust
£78,740	2000	AstraZeneca Science Teaching Trust
£39,504	2001	TTA Supplementary Support Training: Primary English, Mathematics & Science

Director SCIcentre: National Centre for Initial Teacher Training in Primary Science £400,000 grant

The SCIcentre is a millennium project of the Society of Chemical Industry (SCI). The Centre is run by Leicester University and Homerton College Cambridge, with its offices located at Leicester. SCIcentre was established in September 96. Other funds have been obtained from ICI and ESSO.

Liaison and collaboration

SCIcentre promotes liaison and collaboration between initial teacher training institutions by promoting joint projects, making visits to individual science tutors, arranging conferences, publishing newsletters and provision of jointly developed work on the SCIcentre website.

SCIcentre also liaises between OFSTED and the primary science departments in initial teacher training institutions.

SCIcentre conferences for initial teacher trainers

o Developing Student Teachers' Knowledge and Understanding Manchester April 1999
o SCIcentre 2000 Leicester August 2000 (A very successful 3 day conference with over 100 delegates from most UK ITT institutions.)

SCIcentre publications

Annual reports 1997-1999 on practice in initial teacher training in UK
Report into Course Design in Primary Science Initial Teacher Training
Place of Literacy and Numeracy in Primary Science and Science in the Early Years
Changes in Primary Science Initial Teacher Training
Self Study Materials
Audit of Student Science Knowledge
Developing Student Teachers' Subject Knowledge and Understanding (Booklet and web based)

Videos
Organising Primary Science
Data Logging in the Primary School (and booklet)
Mentors to Support Students in Science Lessons (and booklet)
Broadsheet
Citizenship and Primary Science
Booklets
Using CDRoms in Primary Science
Improving Experience in Science during Cross-Phase Transfer
Science PAL Resource Pack
Helping Primary Children Understand Science and Technology
Science and Literacy

Director Leicester City Project: AstraZeneca Science Teaching Trust £168,740

This is an innovative 2 year project designed to improve the teaching of science in City of Leicester. Sixteen primary schools received intensive support in 1999. An additional 15 have joined the programme in 2000. The programme is being evaluated. This has involved:
o Developing 4 new instruments to monitor children's and teachers' attitudes and cognitive development
o Pre and post testing of 2000 children and their teachers each year
o Evaluation of the use of the Challenger Space centre by 25 Year 6 classes

Senior Lecturer in Primary Science

Coordinator and lecturer for Primary Science Courses
o PGCE Primary Science Course o PGCE Primary Technology Course
o In-service Primary Science and Technology Courses
o Development of new short courses for primary science & technology

Supervision of PhDs, MAs, Diplomas, and Cert. in Primary Science and Primary Technology

Head of Primary PGCE Course

The Primary PGCE Course currently has 134 students specialising as Early Years (3-8) or Juniors (7-11). Some of the junior specialists take an additional specialism in educational psychology. This administrative job involves
o Staffing for course: 7 full time, 9 contracted part-time plus casually employed headteachers/ teachers and other educators
o Control of Primary Course budgets
o Overview of timetabling & organisation of different subjects, specialisms & professional courses
o Recruitment & interviewing
o Appraisal
o Liaison with government and other official bodies re primary ITT such TTA, DFEE, OFSTED & UCET
o Liaison with schools with regard to Partnership and Teaching Practice placements & training of teacher mentors
o Arrangements for and liaison with external examiners

Awards

University of Leicester: Achievement Bonus Award June 1991

Association of Commonwealth Universities: ACU Development Fellowship for 3 month visit to Curtin University Australia for research and to provide lectures and consultancies. (Awarded November 1991 for June-September 1992)

British Council: Award for travel to Perth, Western Australia in July/August 1994 to facilitate academic collaboration with Dr Rennie at Curtin University.

University of Leicester: Achievement Bonus Awards April 1998 & April 1999

Examining and Editorial Responsibilities

o External Examiner
University of Central England: MA Modular Science Courses: 1994 - 1998
University of Leeds: Primary PGCE: 1993 - 1997
University of Exeter: Primary Education for Advanced Course Students: 1994 -1998

University of Strathclyde PGCE 1998-2002

o Member of Editorial Board for
International Journal of Science Education
Research in Science Education

o Referee for Research in Science & Technological Education

Significant International, National and Regional Conferences

I have given innumerable invited courses, lectures, seminars and consultancies in Great Britain, Australia, Singapore and USA since 1990. Some of the more significant conferences are listed below.

Great Britain

o Association of Science Education Tutors Annual Conference, Bangor Sept 1993 *The merits and limitations of involving PGCE students in research projects relating to issues of gender and race in primary science*

o Science Education Research in Europe, Leeds, April 1995
T. Jarvis *The development of directed school based tasks related to issues of gender and race in science for primary postgraduate initial teacher trainees*
L. Rennie and T Jarvis *Perceptions about technology held by primary children and their teachers*

o Association for Science Education
1995 *Measuring children's understanding of technology*
1997 *Development of directed tasks and specialist course in higher education primary courses.*
1998 *Developing citizenship in primary science*
1999 T. Jarvis & D, Dickinson *Developing sensing through the primary school*
T. Jarvis, F. McKeon & P. Stephenson *Practice in teacher training*
T.Jarvis *Widening primary children's perceptions of science and technology*
2000 T. Jarvis & F. McKeon *Responding to changes in teacher training requirements*
T. Jarvis *Investigating Industry in the Primary Classroom*
T. Jarvis & D. Dickinson *Sensing through the primary school*
T. Jarvis *Widening primary children's perceptions of science*
2001 T. Jarvis & F. McKeon *The Challenger Experience: How does it Influence Children's Attitudes*
T. Jarvis F. McKeon *Science and Literacy for Bilingual Children*
T. Jarvis *Using Primary Teachers' Industrial Visits to Enhance Classroom Science*
T. Jarvis and F. McKeon *Planning for Science in the Foundation Years*
T. Jarvis *Is Deign Technology the 'Application of Science'*
T. Jarvis *Citizenship and Primary Science*

- University of Durham 3rd Summer Conference for Teacher Education in Primary Science July 1997
P. Stephenson, T. Jarvis and F. McKeon *Developments in Teacher Training Primary Science Programmes in UK*

- University of Durham 4th Summer Conference for Teacher Education in Primary Science July 1999
T. Jarvis, F. McKeon and P. Stephenson Course *Design in Primary Science Initial Teacher Training*

- SCIcentre 2000 and ASET Conference August 2000
D Coates. T Jarvis, F McKeon *Planning for Science in the Foundation Years*

- BERA 2000 Sept
Tina Jarvis and Tony Pell *Development of a Pupil Attitude Test to Monitor Change and Effectiveness of Science Inservice Programmes*

Singapore 1992

Ministry of Education (September 1992): Invited lectures for the Ministry of Education to teachers on
o Developing effective groupwork and children's independence in science and mathematics.
o Providing opportunities for children to understand and question local and world environmental issues through science.

Nanyang Technological University: National Institute of Education: (September 1992) Invited lecture on
o Developing effective groupwork and children's independence in science and mathematics.

USA 1993, 1994, 1995, 1996, 1997, 1999 & 2001

American Education Research Association: Atlanta, April 1993
T. Jarvis and P. Jarvis *Promoting environmental awareness through school nature areas in the primary grades in England*

National Association for Research in Science Teaching: Atlanta, April 1993
T. Jarvis *An evaluation of three approaches for widening elementary children's views of science and scientists*
L. Rennie and T. Jarvis *Measuring children's perceptions of technology*

National Association for Research in Science Teaching: LA, March 1994
T. Jarvis and L. Rennie *A comparison of primary children's ideas of technology in England and Australia*

North American Research in Science Teaching: San Francisco, April 1995
T. Jarvis and L. Rennie *Using drawings to investigate children's understanding of concepts*
Part of symposium on *Gender, science and mathematics: Shortening the shadow*

North American Research in Science Teaching: St Louis, April 1996
T. Jarvis and L. Rennie *Testing a model of children's conceptions of technology*

American Education Research Association: Chicago April 1997
T. Jarvis and L. Rennie *Factors that influence children's developing perceptions of technology*

North American Research in Science Teaching: Boston March 1999
T. Jarvis, F. Mckeon, D. Coates & J. Vause *Beyond generic mentoring: Teaching pre-service teachers to teach elementary science*

North American Research in Science Teaching: St Louis April 2001
T Jarvis & T Pell *The Effect of the Challenger experience on elementary children's attitudes to science*

American Education Research Association: Seattle May 2001
T Jarvis and T Pell *Changes in elementary boys' and girls' attitudes to school and science during a two year science inservice programme*

Finland 1996

First Science Centre World Congress: Finland June 96 Symposium
L. Rennie, T. Jarvis, T. McClafferty and D. Johnston *Learning in Science Centres: International research perspectives*

Australia 1992, 1994 & 1996

Perth 1992, 1994 & 1996

Science and Mathematics Centre, Curtin University, Perth

Invited to design and present accredited part-time courses for primary teachers on
- o Content and Strategies for Teaching Primary Science (August 1992)
- o Science and Technology for Primary School Teachers' (August 1994)
- o Developing Primary Science (July 1996)

CONASTA 41- PERTH Annual Conference of the Australian Science Teachers' Association (July 1992)
Science for All (Catering for SEN children in science, especially bilingual children)
Developing awareness of environmental issues in English primary schools.

CONASTA 43- TASMANIA Annual Conference of the Australian Science Teachers' Association (July 1994)
T. Jarvis *Approaches for widening primary children's views of science and scientists*
L. Rennie & T. Jarvis *Measuring understanding of technology*

Annual Conference of the Australian Association for Research in Education Fremantle, Western Australia November 93
L. Rennie and T. Jarvis *Technology education in the primary school: Where do we start?*

Australasian Science Education Research Association July 1994 Tasmania
T. Jarvis & S Cavendish *An investigation into subject competency of teachers and level of dependency on resource packs to teach levers, gears and pulleys*
T. Jarvis & L Rennie *Children's developing perceptions of technology*

PUBLICATIONS SINCE 1990

BOOKS

T. Jarvis (1991)*Children and Primary Science* Cassell 141 pages
T. Jarvis (1993) *Teaching Design and Technology in the Primary School* Routledge 166 pages

CHAPTERS IN BOOKS

T. Jarvis (1996) 'Promoting a Quality Curriculum' Science in O'Neill J and Kitson N (eds) Effective Curriculum Management: Coordinating Learning in the Primary School London: Routledge pp 97-107
T. Jarvis (1995) 'What shall we put in the fruit salad?: Developing Investigative Thinking and Skills in Children' in Moyles J. (ed) Beginning Teaching: Beginning Learning Buckingham: OUP pp 115-128
T. Jarvis (1995) 'Young Children's Developing Ideas of Science and Scientists' in B. Fraser B., Parker L. and Rennie L. (eds) Gender, Science and Mathematics: Shortening the Shadow Dordrecht: Kluwer Academic Publishers pp 29-40
T. Jarvis (1994) 'Design and Technology' in Harrison J. and Edwards J. (eds) Developing Health Education in the Curriculum London: David Fulton pp 96-100
T. Jarvis (1994) 'Design and Technology' in Kerr D. (ed) (1994) Developing Education for Industrial Understanding in the Curriculum London: David Fulton pp 86-89
T. Jarvis (1994) 'Design and Technology' in Goodall S. (ed) Developing Environmental Education in the Curriculum London: David Fulton pp 55-59
T. Jarvis (1993) 'Design and Technology' in Edwards J . and Fogelman K. (eds) Developing Citizenship in the Curriculum London: David Fulton pp 62-65
A. Jones, T. Jarvis, S. Minett, C. Butcher (1990) 'Science for Children with Special Needs' in Jones A. (ed) *Science Education for Pupils with Special Needs* Nottingham: Nottingham Polytechnic

ARTICLES IN JOURNALS

T. Jarvis & T. Pell (2001) Developing attitude to science scales for use with children of ages from five to eleven years *International Journal in Science Education* Vol 23(8) pp847-862.
T. Jarvis, F. McKeon, D. Coates and J. Vause (2001)Beyond generic mentoring: Teaching student-teachers to teach primary science *Research in Science & Technological Education* 19(1) pp 5-23.
B. Buzzard and T. Jarvis (1999) 'Optimising INSET Approaches in Primary Science and Technology' *Journal of Inservice Education* Vol 25(2)
Coates D, Jarvis T, McKeon F and Vause J (1998) 'All together now: Science support for mentors and students' *Primary Science Review* 55 pp 9-11
Stephenson P, Jarvis T and McKeon F (1998) 'Primary Science Initial Teacher Training' *Science Teacher Education* 22 pp 14-15
T. Jarvis and L. Rennie (1998) 'Factors that Influence Children's Developing Perception of Technology' *International Journal of Technology and Design Education* 8(3) pp 261-279
T. Jarvis, L. Hargreaves and C. Comber (1997) An Evaluation of the Role of Email in Promoting Science Investigative Skills in Primary Schools *Research in Science Education* 27(1) pp 223-236
T. Jarvis and L. Rennie (1996) Perceptions about Technology held by Teachers in England *Research in Science & Technological Education* 14(1) pp 43-54
T. Jarvis and L. Rennie (1996) Understanding Technology: the Development of a Concept *International Journal of Science Education* 18(8) pp 977-992
T. Jarvis (1996) Developing Directed School-based Tasks in Primary Science *Journal of Teacher Development* 5(3) pp 30-38
L. Rennie and T. Jarvis (1995) Children's Choice of Drawings to Communicate their Ideas about Technology *Research in Science Education* 25(3) pp 239-252
L. Rennie and T. Jarvis (1995) Measuring Children's Perceptions of Technology *International Journal of Science Education* 17(6) pp 755-74
L. Rennie and T. Jarvis (1995) English and Australian Children's Perceptions about Technology *Research in Science & Technological Education* 13(1) pp 37-52
T. Jarvis and S. Cavendish (1994) Subject Competency of Teachers and Level of Dependency on Resource Packs to Teach Levers, Gears and Pulleys *Research in Science Education* 24 pp 166-172
T. Jarvis (1993) Establishing and Using Nature Areas in Birmingham and Leicestershire primary schools *Environmental Education* 42 pp 9-12
J. Hislam and T. Jarvis (1992) Bridging the Discipline Gap: Linking Story Themes with Science and Technology *Education 3-13* 20(2) pp 38-44 [adapted and reprinted in *Investigating* (Australian Primary & Junior Science Journal) (1993) 9(1) pp 2-4]
T. Jarvis (1992) Making Science Relevant: Investigating the Concrete Industry *Primary Science Review* October No 24 pp 16-19
T. Jarvis (1991) Science and Bilingual children: Realising the Opportunities *Education 3-13* 19(1) pp 41-48
T. Jarvis (1991) Primary Technology: The Value of Evaluating and Improving Environments *Education 3-13* 19(2) pp 23-29

Articles in preparation

T. Pell & T. Jarvis *Developing attitude to science scales for use with primary teachers*

T. Jarvis, T. Pell and F. Mckeon *Developing scales to assess primary children cognitive development in science*
T. Pell, T. Jarvis and F. Mckeon *Developing scales to assess primary teachers cognitive development in science during an inservice programme*

PUBLISHED CONFERENCE PAPERS

T. Jarvis, F. McKeon and P. Stephenson (1997) Course Design in Primary Science Initial Teacher Training Conference Proceedings 3rd Summer Conference for Teacher Education in Primary Science: University Durham July 1997 pp 285-297

OTHER SIGNIFICANT OUTPUT

T. Jarvis (2001) Twenty Years of Primary Science in England *Studies in Science Education* Book Review Vol 36 pp 157-161
T. Jarvis and L. Rennie (2000) *Helping Children Understand Science and Technology* Leicester: SCIcentre
P. Stephenson, T. Jarvis and F. McKeon (1999) *Changes in Primary Science Initial Teacher Training* SCIcentre: University of Leicester
D. Coates, J. Vause, T. Jarvis and F. McKeon (1998) *A Route to Better Science Teaching in the Primary School: Mentoring in Primary Science* SCIcentre: University of Leicester
T. Jarvis, F. McKeon, J. Shears, D. Coates and J. Vause (1998)*Video on Mentoring Initial Teacher Trainees in Primary Science* SCIcentre: University of Leicester
F. McKeon, T. Jarvis P. Stephenson and C. Wilkins (1998)*Report into Course Design in Primary Science Initial Teacher Training: Place of Literacy and Numeracy in Primary Science and Science in the Early Years* SCIcentre: University of Leicester
T. Jarvis, F. McKeon and J. Shears (1998) *Video on Organising Primary Science* SCIcentre: University of Leicester
T. Jarvis, F. McKeon, L. Cook and P. Vernon (1998)*Broadsheet: Citizenship and Primary Science* SCIcentre: University of Leicester
T. Jarvis, F. McKeon and P. Stephenson (1997) *Report into Course Design in Primary Science Initial Teacher Training* SCIcentre 30 pages
L. Rennie and T. Jarvis (1994) *Helping Children Understand Technology: A Handbook for Teachers* Key Centre for School Science and Mathematics & Science, Curtin University, Perth and Technology Awareness program, Australian Department of Industry, Science and Technology

REFEREES

Professor Ken Fogelman
School of Education, Leicester University, 21, University Road, Leicester LE1 7RF
email: kfo@leicester.ac.uk

Professor Barry Fraser
Science and Mathematics Education Centre, Curtin University of Technology, GPO Box U 1987, Perth 6001, Western Australia
email: ifraserb@info.curtin.edu.au

Mr T. Everton
Deputy Principal
Homerton College, Cambridge, CB2 2PH
email: tce20@cus.cam.ac.uk

Molly Hand WeinburghDepartment of Early Childhood Education
College of Education
Georgia State University
Atlanta, GA 30303
404-651-2584
mweinburgh@gsu.edu

Academic Degrees

1993 Ph.D., Emory University, science education and educational leadership
1980 MAT, Emory University, science education/biology
1974 BA, Agnes Scott College, biology

Professional Experience

2001- pre Associate Professor: Graduate Faculty. Georgia State University, Department of Early Childhood Education. Responsibilities include teaching science methods (ECE 347) and FLC perspectives course (PERS 2002), supervision, Pre-K training, research, committee membership, and grant administration.

1999- pre Assistant Professor: Graduate Faculty. Georgia State University, Department of Early Childhood Education. Responsibilities include teaching science methods (ECE 347) and FLC perspectives course (PERS 2002), supervision, Pre-K training, research, committee membership, and grant administration.

1996-1999 Assistant Professor. Georgia State University, Department of Early Childhood Education. Responsibilities include teaching science methods (ECE 347), supervision, Pre-K training, research, committee membership, and grant administration.

1993-1996 Assistant Professor: clinical. Georgia State University, Department of Middle/Secondary Education and Instructional Technology. Responsibilities include teaching middle school methods in science (EDSC 447), middle school concepts and issues of science (EDSC 329/712), middle school concepts and issues of biology (EDSC 309), opening school experience (EDCI 465), supervision (EDCI 470/474), committee membership, and grant administration.

1991-1993 Instructor: clinical. Georgia State University, Department of Middle/Secondary Education and Instructional Technology. Responsibilities include teaching middle school methods in science (EDSC 447), middle school concepts and issues of science (EDSC 329/712), middle school concepts and issues of biology (EDSC 309), opening school experience (EDCI 465), supervision (EDCI 470/474), and committee membership.

1979-1991 Teacher. Marist School, Atlanta, GA. Responsibilities include teaching cellular biology, genetics, physiology, embryology, ecology, microbiology, AP biology, health, 7th and 8th grade ISCS and acting as instructional lead teacher.

1977-1979 Teacher. Babb Jr. High, Clayton Co., GA. Responsibilities include 8th grade general science and 9th grade honors biology.

1974-1977 Teacher. Cedar Grove High School, DeKalb Co., GA. Responsibilities include 8th grade ISCS, general biology, and honors biology.

Faculty Membership

2000 Faculty, Center for Behavioral Neuroscience (housed at Emory University and funded by the National Science Foundation)
1999 Graduate Faculty, College of Education
1996 Faculty, Professional Educational Faculty

Honors/Appointments

Woman of the Year-2000, American Biographical Institute
Phi Beta Delta Honor Society for International Scholars (March 2000 induction)
2000 International Who's Who of Professional and Business Women (nominated by Dr. Beth Farokhi)
2000 Who's Who Among America's Teachers (nominated by Sherry Pattillo, class '99)

1999 John Shrum for Excellence in Science Teacher Education, Southeastern Association of Educators of Teachers of Science (nominated by David Kumar, Florida Atlantic).
1999 Chancellor's Award for Professional Development, $1,000.
1999 Summer Professional Development in Ghana, West Africa recipient. July-August.
Nominated for National Association of Research in Science Teaching (NARST) Early Career Research Award for 1999 (nominated by Ann Stucke, North Georgia College)
Nominated for American Association of University Women (AAUW) Emerging Scholar for 1998 (nominated by Beth Farokhi, Georgia State University)
Advisory Board to the Gender Equity and Disability Subpanel, National Gender Equity Expert Panel, OERI, 1997.
Distinguished Paper Award, Georgia Educational Research Association, 1993.
Distinguished Paper Award, Georgia Educational Research Association, 1992.
Outstanding Student Paper Award, Georgia Educational Research Association, 1991.

Publications

pters

Weinburgh, M. H. (In review). Middle childhood in-service teachers' perception of the scientific method. Journal of Science Teacher Education.
Weinburgh, M. H. (In review).The effects of hands-on, inquiry science on the attitudes of African American and female students. Journal of Women and Minorities in Science and Engineering.
Weinburgh, M. H. (Fall 2000). Gender, ethnicity, and grade level as predictors of middle school students' attitudes toward science. Current Issues in Middle Level Education.
Weinburgh, M. H. & Steele, D. (2000). The Attitude Toward Science Inventory: Streamlining to improve the effectiveness. Journal of Women and Minorities in Science and Engineering, 6(1), 87-94.
Weinburgh, M. H. (1998). Middle school students' grade expectation and preferred topics in science by gender and ethnicity. Current Issues in Middle Level Education, 7(2), 74-88.
Weinburgh, M. H., Smith, L. & Smith, K. H. (1997, Oct.). "Preparing early childhood education majors to infuse technology into the teaching of mathematics and science. TechTrends, 42(5), 43-45.
Weinburgh, M. H. (1996). T.R.E.E.: Co-reform in professional development. UPDATE, 12(14), 10-11.
Weinburgh, M. H. (1996). Ethel Brown Harvey. In B. Shearer & B. Shearer (eds), Noted Women Scientist: A biographical dictionary. Vol 1: Life Science. Pp. 156-159. New Port: Greenswood Publishers.
Weinburgh, M. H. (1995, Spring). Preparing gender inclusive science teachers: Suggestions from the literature. Journal of Science Teacher Education, 6(5). 102-107.
Weinburgh, M. H. (1995). Gender differences in student attitudes toward science: A meta-analysis of the literature from 1970-1991. Journal of Research in Science Teaching, 32(4), 387-398.
Weinburgh, M. H. (1994, Fall). Gender equity in science classrooms: Recommendations for teachers. The Georgia Science Teacher, 36(1) 7-8.
Weinburgh, M. H., Franklin, B., & Franklin, C. (1994, Spring). Gender equity in science classroom: What can be done?. Current Issues in Middle Level Education, 3(1), 11-19.
Weinburgh, M. H. & Engelhard, G. (1994). Gender, prior academic achievement, and belief as predictors of student attitudes toward biology laboratory instruction. School Science and Mathematics, 94(3), 118-123.

Refereed Proceedings

Weinburgh, M. H. & Russell, Dee (2001). A workshop on curriculum as a means of transformative research in cross-cultural teacher education. Proceedings of the 41st International Conference World Education Fellowship. Sun City, South Africa.
Weinburgh, M. H. (2000). How middle childhood in-service teachers view the scientific method. In P. Rubba, P. Keig & J. Rye (eds), Proceedings of the 2000 Annual International Conference of the Association for the Education of Teachers in Science (pp. 227-241). Pensacola, FL: Association for the Education of Teachers in Science. (ERIC Document Reproduction Service No. ED ?????).
Farokhi, E. & Weinburgh, M. H. (1999). Is the climate chilly or warm for women in higher education institutions? In Proceedings of the 1999 symposium: Higher Education in Transition; the politics and practices of equity (pp 127-142). Washington, DC: American Association of University Women.
Weinburgh, M.H. (1999). Addressing issues of (gender) equity in science education: So much to do in only fifteen weeks. In Hildebrand, G. M (ed), "Gazing into the Future: Proceedings of the Gender and Science

Education (GASE) Colloquium", Boston, The University of Melbourne, Parkville, Vic.
Weinburgh, M. H. (1998). Gender, ethnicity, and grade level as predictors of middle school students' attitudes toward science. In P. Rubba, P. Keig & J. Rye (eds), Proceedings of the 1998 Annual International Conference of the Association for the Education of Teachers in Science (pp. 667-677). Pensacola, FL: Association for the Education of Teachers in Science. (ERIC Document Reproduction Service No. ED 421363).
Thorsen, C. C, Weinburgh, M. H. & Wierson, C. H. (1997). Gender equity: In and out of the classroom. In Proceedings of the 1997 symposium: Gender and Race on the Campus and in the School: Beyond Affirmative Action. (pp. 97-104). Anaheim, CA: American Association of University Women.
Farokhi, E., Thorsen, C.C., & Weinburgh, M. H. (1997). Integrating gender equity and reform in higher education. In Proceedings of the 1997 symposium: Gender and Race on the Campus and in the School: Beyond Affirmative Action. (pp. 299-308). Anaheim, CA: American Association of University Women.
Weinburgh, M. H., DeHaan, R., & Goebel, C. (1996). Elementary science education partners: Pathways for professional growth for elementary science teachers. In P. Rubba, P. Keig & J. Rye (eds), Proceedings of the 1996 Annual International Conference of the Association for the Education of Teachers in Science (pp. 528-536). Pensacola, FL: Association for the Education of Teachers in Science. (ERIC Document Reproduction Service No. ED 398-060).

Textbooks/Manuals

Weinburgh, M. H. (under contract) Case #?: Draw Me a Star; Color Me a Star. In Tippins, D., Koballa, T, &Payne, B. (eds). Science Teaching and Learning in the Elementary Classroom: A Classroom Case Handbook. Allen & Bacon.
Weinburgh, M. H.(2000). Chapter 5: Weather. In Irvine, J. J. & Armento, B. J. (eds). Culturally Responsive Lesson Planning for Elementary and Middle Grades. McGraw-Hill.
Weinburgh, M. H. (1999). Gender differences in student attitudes toward science: A meta_analysis of the literature from 1970 to 1991. Journal of Research in Science Teaching, 32, 387_398. To be reprinted in full, with my original researchers' comments, in Gall, M. D., Gall, J. P., & Borg, W. R., Applying Educational Research: A Practical Guide, 4th edition. New York: Addison Wesley Longman.
Weinburgh, M. H. & Farokhi, E. (1999). A Professional Development Manual for Gender Equity in Collegiate Science, Engineering, Mathematics, and Education. Georgia Institution of Technology College Press: Atlanta, GA.
Weinburgh, M. H. & Farokhi, E. (1999). K-12 Model One: One-time, In-service Workshops. In Weinburgh & Farokhi (eds). A Professional Development Manual for Gender Equity in Collegiate Science, Engineering, Mathematics, and Education. Georgia Institution of Technology College Press: Atlanta, GA.
Weinburgh, M. H. & Farokhi, E. (1999). Model Four: Classroom Instructor Observation and Debriefing. In Weinburgh & Farokhi (eds). A Professional Development Manual for Gender Equity in Collegiate Science, Engineering, Mathematics, and Education. Georgia Institution of Technology College Press: Atlanta, GA.
Weinburgh, M. H. & Farokhi, E. (1999). Model Two: General Awareness Session followed by Topical Workshops. In Weinburgh & Farokhi (eds). A Professional Development Manual for Gender Equity in Collegiate Science, Engineering, Mathematics, and Education. Georgia Institution of Technology College Press: Atlanta, GA.
Smith, K. H. & Weinburgh, M. H. (1997). A working handbook for successful teaching in the early childhood science classroom. Oklahoma City: Custom Academic Publishing Company.
Golley, P. and Weinburgh, M. H. (1997). The Scientific Field Study. In Irvine, J. J & Armento, B.J. (eds). Perfecting Educational Practice: Culturally Responsive Curricula for Middle Grades. Pp. 133-178. AACTE and Philip Morris Co.
Weinburgh, M. H., Hughes, M., Blass, S., & Turner, J. (1997). Weather. In Irvine, J. J & Armento, B.J. (eds). Perfecting Educational Practice: Culturally Responsive Curricula for Middle Grades. Pp. 179-220. AACTE and Philip Morris Co.
Weinburgh, M. H. (1995). Month Four. In A.D.A.M. (eds). Nine Month Miracle Teachers's Guide. Pp 2:63-2:71. Atlanta, GA: ADAM.
Weinburgh, M. H. (1995). Month Eight. In A.D.A.M. (eds). Nine Month Miracle Teachers's Guide. Pp 2:102-2:115. Atlanta, GA: ADAM.
Weinburgh, M. H. (1995). Successful science teaching to middle childhood students: A methods manual. Atlanta,

GA: Georgia State University.

Weinburgh, M. H. & Putzell, S (1995). Creating multimedia using HyperCard templates: A process of infused instruction. Atlanta, GA: Georgia State University.

Weinburgh, M. H. (1994). Science Resources. Atlanta, GA: Georgia State University.

Weinburgh, M. H. , Davenport, M., Golley, P., Jacobson, T. & Weinburgh, P. (1994). Tropical Rainforest: An Interdisciplinary Approach. Atlanta, GA: Visions United.

Weinburgh, M. H. (1994). The one computer classroom. Georgia Public Television/GSU. Atlanta, GA: Georgia State University.

Weinburgh, M. H.(1994). Computer labs. Georgia Public Television/GSU. Atlanta, GA: Georgia State University.

Weinburgh, M. H. (1994). Opening School Experience: Handbook for MSIT. Oklahoma City: Custom Academic Publishing Company.

Weinburgh, M. H., North, A., Jones, J., Crane, A., & Johnston, H. (1994). Student Teaching Handbook for MSIT. Oklahoma City: Custom Academic Publishing Company.

McCloskey, M. L. & Weinburgh, M. H. (1993). Interdisciplinary curriculum pilot: Rainforest and oceans. Atlanta, GA: Visions United.

Creative Projects

Weinburgh, M. H. & al. (1996). Product Consumer #4, science CD-ROM, new software being produced for general market for 5-8 year olds. ADAM Software Co., Atlanta, GA.

Weinburgh, M. H. & al(1996). Next step in technology: Multimedia in the classroom. Television series for Georgia Public Television/GSU. Atlanta, Ga.

Weinburgh, M. H. & al. (1995). Technology in the classroom. Television series for Georgia Public Television/GSU. Atlanta, GA.

Research Reports

Farokhi, E. & Weinburgh, M.H. (1999). Issues Dealing With Gender Equity: Institutional Self-Study 1990-1998. Highlights. Report to Georgia State University administration on the findings of the National Science Foundation Grant HRD-9453106.

Farokhi, E. & Weinburgh, M.H. (1999). Issues Dealing With Gender Equity: Institutional Self-Study 1990-1998. Report to Georgia State University administration on the findings of the National Science Foundation Grant HRD-9453106.

DeHaan, R., Allwood, V., Weinburgh, M., and Stickland, B. (1998). Annual Progress Report: Elementary Science Education Partners. Report to National Science Foundation. Grant #ESI-9552864.

DeHaan, R., Allwood, V., Weinburgh, M., and Canada, B. (1997). Annual Progress Report: Elementary Science Education Partners. Report to National Science Foundation. Grant #ESI-9552864.

Grants

In Progress (approximately $5.9 million)

College of Education Scholarly Inquiry Grant Program, "Fifth Grade Students' Attitudes Toward Science: Evaluation of the Elementary Science Education Partners Program", PI: Molly Weinburgh, $1,500, January-June 2001.

College of Education Preparing Tomorrow's Teachers Today, "Elementary Education Preservice Program Evaluation", Co-PIs: Molly Weinburgh and Sunya Collier, $8,300. November 2000-June 2001.

National Science Foundation (NSF), "Teacher Enhancement Through an Elementary Science Education Partner", PI: Bob DeHaan (Emory University), Co-PIs: Molly Weinburgh (Georgia State University), Vernon Allwood (Morehouse School of Medicine), and Ben Canada (Atlanta Public Schools), $5.7 million overall: $768,171 to GSU. September 1995-December 2000.

Eisenhower Higher Education, "The Decatur Elementary Math/Science Project: Enhancing Teacher Change", Co-PIs: Lynn Hart and Molly Weinburgh. $20,345. June 2000-March 2001.

Georgia State University (GSU)/Improving Instruction Grant. "Developing a Cross-Discipline, Web-based Freshman Core Course. Co-PIs: Molly Weinburgh, Sam Deitz, and David Vanko. $3,900. June 2000-June 2001.

In Review (approximately $5.8 million)

National Science Foundation (NSF), "Integrating Inquiry-based Science and The Language Arts: Elementary Science Education Partners II", PI: Molly Weinburgh (Georgia State University), Co-PIs: Bob DeHaan (Emory), Paul Ohme (Georgia Tech), Vernon Allwood (Morehouse School of Medicine), and Stephen Dolinger (Fulton County Schools). $5.8 million. September 2001-July 2005.

Eisenhower Higher Education, "Decatur Elementary Math and Science Project - Year 2", Co-PIs: Lynn Hart and Molly Weinburgh, $32,010. June 1, 2001- May 2, 2002.

Eisenhower Higher Education, "Selecting Science Curriculum Material for K-5 Classrooms: Using the National Research Council's Selecting Instructional Materials Guide", PI: Molly Weinburgh, $43,117. June 1, 2001-May 2, 2002. USAID, "Partnership for Primary Education Teacher Training In Malawi", PI: Molly Weinburgh, $2.2 million, May 2001-2005.

Completed (approximately $350,000)

Board of Regents (BOR), "Developing Teacher Education Exchange: University of Cape Coast and Four University System of Georgia Schools. Dr. Fobih, Dr. McIntosy, Dr. Call, Dr. Weinburgh, and Mr. Paracka. $18,200. March 2000-December 2000. (GC&SU #1047636250337)

National Science Foundation (NSF), "Integrating Gender Equity and Reform", Co-PI: Beth Farokhi; Strand Leader: Molly Weinburgh, $141,000. September 1995-July 1998.

SouthEastern Regional Vision for Education (SERVE), "An Interpretative Study of Elementary School Teachers' Conception of the Nature of Inquiry and of Their Roles While Participating In An Inquiry Based Science Curriculum. PI: Molly Weinburgh, $15,120. January 1998-June 1998.

Quality Improvement Funds (QIF), "Hands-on Equipment for Early childhood Science Instruction", Co-PIs: Olga Jarrett and Molly Weinburgh, $8,500. January 1997-June 1997.

Council for Public Broadcasting (CPB), "Developing Technology Rich Educational Environments in Science", PI: Kathy O'Neill, Co-PI: Molly Weinburgh, $5,000. September 1996-July 1997.

Principles of Educating Teachers (POET), "University/school collaboration for the Enhancement of Math, Science, Technology Integration for Teacher Education", Co-PIs: Molly Weinburgh, Laura Smith, Olga Jarrett, and Kathy Smith, $4,011. September 1996-July 1997.

Coca Cola, "Developing technology rich educational environments", PI: Kathy O'Neill; writer: Molly Weinburgh, $106,000. 1995-1996.

Eisenhower, "Science/Math Academy: Enhancing middle grades science and math teaching through strengthening content", PI: Molly Weinburgh and Joan Jones, $22,476, 1995-1996.

Quality Improvement Grants (QIF), "Creating a demonstration instructional area as an open access resource", Molly Weinburgh, $47,932., 1994-1995.

EarthWatch, "Maternal diets affect on birth weight and weight gain of infant during first year", Prisca Namapara, director, member of research team to Zimbabwe , summer 1983.

Professional Presentation

International

"Urban, African-American Students' Realistic Understanding of the Nature of Scientific Knowledge". presented at the annual international conference of the National Association of Research in Science Teaching. New Orleans, LA, April 30, 2000. Co-presenters: Michael Hughes, Don Steele.

"Embracing an Antiracist Agenda for Science Education: Explorations of Racism and White Privilege from Northern and Southern Perspectives". Invited symposium, "Science for all: Is it a fitting objective?", presented at the annual international conference of the National Association of Research in Science Teaching. New Orleans, LA, April 30, 2000. Co-presenters: Brad Lewis, Leslie Jones, Michael Hayes.

"Science Education for All???? Examining Connections/Disconnections Between Theory and Classroom Practice and Finally Moving this Ideas from Rhetoric Toward Reality". Invited panel presented at the annual international conference of the National Association of Research in Science Teaching. New Orleans, LA, April 30, 2000. Co-presenters: Pamela Abder-Fraser, Phyllis Anderson, Randy McGinnis, Kim Ross, Angela Calabrese-Barton, Lorie Hammond, Will Letts, Brad Lewis, Obed Norman, Karen Sadler.

"How Middle Childhood In-service Teachers View The Scientific Method". Presented at the annual international conference of the Association for the Education of Teachers of Science. Akron, OH. January 9, 2000.

"K-12 Benchmarks and Standards: What Role Should They Play in Pre-Service Programs?" Presented at the annual international conference of the Association for the Education of Teachers of Science. Akron, OH. January

9, 2000. Co-presenter: Jo Ellen Roseman.

"Addressing Issues of (Gender) Equity in Science Education: So much to do in only fifteen weeks." Invitational Colloquium: Gender and Science Education. Boston: March 31-April 2, 1999.

"Does Hands-on, Inquiry Science Really Help African-American and Female Students?". Presented at the annual international conference of the National Association for Research In Science Teaching, Boston, MA, March 1999.

"Finding Textbooks that meet Benchmarks and Standards". Presented at the annual international conference of the Association for the Education of Teachers of Science, Austin, TX, January, 16, 1999. Co-presenters: Jo Ellen Roseman, Molly Weinburgh, Norm Lederman.

"Images of Inclusive Science education: Involving Diverse Learners in School Science".Presented at the annual international conference of the Association for the Education of Teachers of Science, Austin, TX, January, 16, 1999. Co-presenters: Janice Koch, S. Maxwell Hines, Molly Weinburgh, Virginia Epps, Pamela Fraser-Abder.

"Women, Science, Inequities, and the Glass Ceiling-Science Education's Role". Symposium presented at the annual international conference of the National Association for Research in Science Teaching, April 21, 1998, San Diego, CA. Co-presenters: Rena Faye Norby, Milly Graham, and Clauda Melear.

"Perspectives on Developing Gender Equity Workshops for Faculty at Teaching and Research Institutions". Panel presented at the annual international conference of the National Association for Research in Science Teaching, April 21, 1998, San Diego, CA. Co-presenters: Marti Schriver, and Carolyn Thorsen.

"The Effects of Hands-on, Kit-based Instruction on Fourth Grade Teachers' Willingness to Teach Science". Presented at the annual international meeting of the Association for the Education of Teachers of Science. Co-presenter: Michael Hughes. January 10, 1997, Cincinnati, OH.

"Elementary Science Education Partners: Pathways to Professional Development". Presented at the annual international meting of the Association of Educators of Teachers of Science. Co-presenter: Camille Goebel. January 13, 1996, Seattle, WA.

"Race and Gender as Predictors of Middle School Students Attitude Toward Science" Presented at the annual international meeting of the Association for the Education of Teachers in Science. January 7, 1995, Charleston, WV.

"Achievement, Grade Level and Gender as Predictors of Student Attitudes Toward Science". Presented at the annual international meeting of the National Association of Research in Science Teaching. March 26, 1994, Anaheim, CA.

"Gender Equity in Science Classrooms: What can Teacher Preparation Do?". Presented at the annual international meeting of the Association of Educators of Teacher of Science . January 7, 1994, El Paso, TX.

National

"Is the Climate Chilly or Warm for Women in Higher Education Institutions?". Presented at the bi-annual Symposium for Higher Education, American Association of University Women, Washington, DC, June 1999. Co-presenter: Beth Farokhi.

"Self-Efficacy and Outcome Expectations in Undergraduate Women". Poster session at the American Psychological Association, August 17, 1998, San Francisco, CA. M. K. Baird, M. H. Weinburgh, & E. Farokhi.

"Streamlining the Attitude Toward Science Inventory to Improve the Effectiveness of Data Gathering". Presented at the American Educational Research Association, April 16, 1998, San Diego, CA. Co-presenter: Donald Steele.

"Perfecting Educational Practice: Culturally Responsive Curriculum Development" Presented at the annual meeting of the American Association of Colleges for Teacher Education. New Orleans, LA, February 26, 1998. Co-presenters: Jackie Irvine, Romana Frasher, Joan Jones, Virginia Causey.

"Gender, Ethnicity, and Grade Level as Predictors of Middle School Students' Attitudes Toward Science". Presented at the annual meeting of the Association for the Education of Teachers of Science. Minneapolis, MN, January 10, 1998.

"Gender Equity In and Out of the Classroom". Presented at the semi-annual symposium of the American Association of University Women. Co-presenters: Carolyn Weis and Carolyn Thorsen. June 20, 1997, Anaheim, CA.

"Integrating Gender Equity and Reform in Higher Education". Presented at the semi-annual symposium of the American Association of University Women. Co-presenters: Beth Farokhi and Carolyn Thorsen. June 20,

1997, Anaheim, CA.

"Integrating Gender Equity and Reform: Reports from the participating institutions". Presented at the annual meeting of the American Educational Research Association. Co-presenter: Denise Mewborn. March 24, 1997, Chicago, IL.

"Culturally Responsive Pedagogy: Weather Unit". Presented at the annual meeting of the American Association of Colleges of Teacher Education. Co-presenters: Jackie Irvine, Ramona Frasher, and Virgina Causey. October 16, 1996, Augusta, GA.

"Elementary Science Education Partners". Presented at the National Science Foundation's Dynamic Partnerships: Seeding and Sustaining Education Reform. Co-presenters: Ben Canada, Kathryn Kozaitis, Vernon Allwood, and Bob DeHaan. June 19, 1996, Washington, DC.

"Developing Culturally Responsive Middle Grades Curriculum Material". Presented at the annual meeting of the American Association of Colleges for Teacher Education. Co-presenters: Virgina Causey, Jackie Irvine, Ramona Frasher, and Joan Jones. February 22, 1996, Chicago, IL.

"Achievement, Grade Level, and Gender as Predictors of Student Attitudes Toward Science". Presented at the Distinguished Research Session of the annual meeting of the American Educational Research Association. April 7, 1994, New Orleans, LA.

"Gender Equity in Science Classrooms: Recommendations for the classroom teacher". Presented at the annual meeting of the National Science Teachers Association. March 30, 1994, Anaheim, CA.

"Critical Thinking in a Student Centered Classroom". Presented at the Fall Forum of the Coalition of Essential Schools. Co-presenters: Francis Freedman and Pete Weinburgh. November 1993, Louisville, KY.

"Gender Differences in Student Attitudes Toward Science: A Meta-analysis of the literature from 1970-1991". Presented at the Distinguished Paper Session at the annual meeting of the American Educational Research Association . April 1993, Atlanta, GA.

Regional

"Longitudinal Study of the Effect of a Local Systemic Change Project of Fifth Grade Students' Attitudes Toward Science. Presented at the annual meeting of the Southeastern Association of Educators of Teachers of Science, Athens, GA, October 29, 1999.

"Helping Teachers Become Comfortable with Technology". Presented at the Technology for Teachers Conference, Atlanta, GA, December 10, 1998.

"Inquiry Approaches to Content Learning". Presented that regional meeting of National Science Teachers Association. Birmingham, AL. November 19, 1998.

"Validity vs Permission: What is a Researcher to do?" Presented at the annual meeting of the Southeastern Association of Educators of Teachers of Science. Wachulla Springs, Fl., November 7, 1997.

"Gender Equity and Reform: Report from the first year". Presented at the annual meeting of the Southeastern Association for Education of Teachers of Science. November 15, 1996, Smyrna, GA.

"Perfecting Educational Practice: The Georgia Model". Presented at the annual meeting of the National Science Teachers Association regional meeting. Co-presenters: Catherine Gardner and Maryellen Cosgrove. October 31, 1996, Atlanta, GA.

"InGEAR: A Collaborative for Reform". Presented at the South Atlantic Regional Conference of the American Association of University Women. Co-presenter: Lynn Wolf. June 15, 1996, Charleston, SC.

"Partners as Change Agents in Elementary Science Classrooms". Presented at the annual meeting of the Southeastern Association of Educators of Teachers of Science. March 8, 1996, Auburn, AL.

"Developing a Technology Course for Middle Childhood Majors". Presented at the annual meeting of the Southeastern Association for the Education of Teachers in Science. March 4, 1995, Pensacola, FL.

"Gender Equity in Science Classrooms: A Challenge to Teacher Education Programs". Presented at the annual meeting of the Southeastern Regional Association of Teacher Educators. October 1993, Nashville, TN.

State

"Urban Fifth Grade Students' Attitudes Toward Science: A Three Year Study"Attitudes Toward Science. Presented at the annual meeting of the Georgia Educational Research Association, Morrow, GA, October 22, 1999.

"The Role of Parents in Creating Educational Equity". Presented at the Saturday School for Scholars and Leaders, Atlanta, GA, November 7, 1998.

"An Examination of Student Attitudes Toward Science During the First Two Years of a Five-year Science

Initiative". Presented at the Georgia Educational Research Association, Morrow Ga. , November 5, 1998.

"Designing, Implementing, and Evaluating Two Undergraduate Teacher Preparation Programs", Panel presented at the Georgia Association of Teacher Educators, October 15, 1998, Atlanta, GA.

"Using Technology to Enhance Learning In Math and Science". Presented at the annual Microcomputers Online With Education '98 conference, March 18, 1998, Atlanta GA and the annual Georgia Staff Development Council, March 20, 1998, Atlanta, GA.

"Middle School Students' Grade Expectation and Preferred Topics in Science". Presented at the annual meeting of the Georgia Educational Research Association. Atlanta, GA, November 14, 1997.

"Listening to the Voices of Early Childhood Education Majors as They Learn to Infuse Technology into the Teaching of Mathematics and Science". Presented at the annual meeting of the Georgia Association of Teacher Education. Co-presenters: Laura Smith, Kathy Smith, Takise Brown, Rich Evarts, Tricia Borah, and Chantara Rumph. October 16, 1997, Macon, GA.

"Perfecting Educational Practice: Culturally Responsive Curricula for Middle Grades". Presented at the annual meeting of the Georgia Association of Colleges for Teacher Education. Co-presenters: Jackie Irvine, Ramona Frasher, and Beverly Armento. October 15, 1997, Macon GA.

"Integrating Gender Equity and Reform". Presented at the annual meeting of the Georgia Educational Research Association. Co-presenters: Carolyn Thorsen and Ruby Thompson. November 1, 1996, Atlanta, GA.

"Developing Technology Rich Educational Environments: A co-reform effort". Presented at the annual meeting of the Georgia Association of Colleges for Teacher Education. March 22, 1996, Chattanooga, TN.

"Where Did I Get It?". Presented at the fourth annual statewide Conference for Teachers of Minorities in Mathematics and Science. March 15, 1996, Atlanta, GA.

"Developing Technology Rich Educational Environments: A co-reform effort". Presented at the annual GPTV Conference. Co-presenter: Kathy O'Neill. March 21, 1996, Clayton State College.

"Middle School Students Attitude Toward Science as Predicted by Race and Gender". Presented at the annual meeting of the Georgia Educational Research Association. October 26, 1995, Atlanta, GA.

"Developing Technology Rich Education Environments: A co-reform effort". Presented at the annual meeting of the Georgia Association of Teacher Educators. October 13, 1995, Savannah, GA.

"Elementary Science Education Partners". Presented at the conference on Improving Student Learning Through Action Research and Assessment. Co-presenter: Bob DeHaan . April 28, 1995, Kennesaw, GA.

"The Influence of the Cooperating Teacher on Pre-service Teachers' Beliefs and Practice". Presented at the annual meeting of the Georgia Association of Teacher Education. Co-presenter: Joan Jones. October 14, 1994, Atlanta, GA.

"Using the Reflective Teaching Model in Teacher Education". Presented at the annual meeting of the Georgia Association of Teacher Education. Co-presenters: Beverly Armento and Joan Jones. October 13, 1994, Atlanta, GA.

"Teaching Activities from the Math/Science/Social Studies Block". Presented at the annual meeting of the Georgia Association of Teacher Education. Co-presenters: Beverly Armento and Joan Jones. October 13, 1994, Atlanta, GA.

"Developing the Student-as-Worker". Presented at the annual meeting of the Georgia Independent School Association. Co-presenter: Pete Weinburgh. November 1993, Atlanta, GA.

"Achievement, Grade Level, and Gender as Predictors of Student Attitudes Toward Science". Presented at the annual meeting of the Georgia Educational Research Association. October 1993, Atlanta, GA.

"Gender Differences in Student Attitudes Toward Science: A Meta-analysis of the literature from 1970-1991". Presented at the annual meeting of the Georgia Educational Research Association . October 1992, Decatur, GA.

"Gender, Prior Academic Achievement, and Belief as Predictors of Student Attitudes Toward Biology Laboratory Instruction". Presented at the annual meeting of the Georgia Educational Research Association. October 24, 1991, Decatur, GA.

Invited speeches

International

"Educational Reform Around the World". University of Kumasi, Ghana, July 28, 1999.

"Good Childhood: What does that mean?". Keynote for "Good Childhood", Hanzehogeschool, Groningen, The Netherlands, March 23, 1998.

"Using Technology to Enhance Learning with Early Childhood Students". Hanzehogeschool/Faculty Gamma, Groningen, The Netherlands, March 24, 1998.

"Reflective Teaching Model: The Cote d'Ivoire Model". Ecole Normale Superiure, Abadajan, Africa. March 11-April 11, 1997.

Regional

"Science Teacher Education in the New Millennium: Issues and Challenges". Keynote for annual conference of the Southeastern Association for Teachers in Science, October 7, 2000.

State

"The Study of Whiteness: Missing Link to Ethnic Studies". Panel discussion. Human Relations Student Leadership Retreat. November 13, 1999. Office of Diversity, Georgia State University, Atlanta, GA

"How to Mentor/Tutor". Community Service: An Integration of Living and Learning. 1999 Atlanta, GA.

"Status of Women in Medicine". Association of Women in Medicine, March 24, 1996. Atlanta, GA.

"Equity in Education: The Role of Counselors". Region I Counselors. November 9, 1995. Savannah, GA.

"Surviving and Thriving at Emory". Presidents Council on the Status of Women Faculty, October 14, 1995, Decatur, GA.

"Meeting the Needs of Girls and Women". Diversity Panel, Georgia Initiative in Mathematics and Science. September 28, 1995, Decatur, GA.

"Gender Inclusive Lesson Planning". CEISMC: Gender Journey, July 26, 1995, Atlanta, GA.

"Education Makes a Difference". Kappa Delta Pi, May 6, 1995, Atlanta, GA.

"Observing, Recording, and Changing Gender Biased Actions in the Classroom". Georgia Department of Education: Vocational/Applied Technology Instructional Division. January 19, 1995, Savannah, GA.

"Gender Equity in Schools: Suggestions for High School Counselors". Cobb County Board of Education. January 28, 1994, Cobb County, GA.

"Gender Equity in Schools: Suggestions for Middle School Counselors". Cobb County Board of Education. January 21, 1994, Cobb County, GA.

"Gender Equity in Schools: Suggestions for Elementary School Counselors". Cobb County Board of Education. January 14, 1994, Cobb County, GA.

"Gender Equity in Science: Problems, Practices, Solutions". College Board Southern Regional Conference. May 1993, Atlanta, GA.

In-Service Workshops

"How do YOU advise?" Advisement Training Workshop. Georgia State University, April 18, 2000. Presented with Beth Farokhi.

"Lesson Planning". St. Thomas Moore Elementary School. Decatur, GA., April 12.

"And they all came tumbling down.....Building with Blocks", Best Practices Pre-K workshops," September 29, October 27, November 17, December 8, 1999. Presented with Sunya Collier, Barbara Meyers and Laura Smith.

"Science Using an Inquiry Approach", Center of Excellence for Research and Policy on Basic Skill, June 21-23, 1999, Nashville, TN.

"Equity in Teaching: A closer look at gender", Health Occupations Education Update Workshop, Blue Ridge Area Health Education Center, July 20, 1998, Rome, GA.

"What Does Gender Have to Do With It?", ESEP workshop for SKIL teachers, July 2, 1998, Atlanta, GA.

"Getting the Most Out of Science", Bunche Middle School, November 4, 1997, Atlanta, GA.

"Tools". Pre-K workshops. August 26, October 1, 8, 15, 22, and 29, 1997

"How to Plan with Limited Resources". Instructional Technology Center. August 5, 1997. Atlanta, GA.

"Evaluating Software: P-16". Instructional Technology Center. July 30, 1997. Atlanta, GA

"Introduction to Inquiry". Atlanta Public Schools. Co-presenter: Brenda Grazer. July 14-18, 1997. Atlanta, GA.

"Questioning". Elementary Science Education Partners: SKIL workshop. July 11, 1997. Atlanta, GA.

"Science for all Students: What is equity?". Elementary Science Education Partners: SKIL workshop, July 8, 1997, Atlanta, GA.

"Science for Elementary Students". International Preparatory School, April 14, 1997, Atlanta, GA.

"Food Chemistry". ESEP teachers in Atlanta Public Schools. February 5/6, 13/14, 19/20 and 26/27. Atlanta, GA.

"Improving Student Achievement: Blooming in Your Classroom". Pace Academy. February 16, 1997, Atlanta, GA.
"Sensational Science for Four Year Olds". Pre-K workshops. January 14, January 28, February 12, February 18, and February 25, 1997.
"Using Bloom to Improve Student Achievement". Salem High School. January 21 and 22, 1997. Conyers, GA.
"How Does Your Classroom Change? The Student-Centered Classroom". Georgia Superintendents Technology Workshop. November 22, 1996. Atlanta, GA.
"Math and Science for Four-Year Olds". Best Practices Pre-K workshops," October 9, 16, 23, and 30, 1996.
"Mixtures and Solutions". ESEP teachers of Atlanta Public Schools. March 12 and 13, 1996. Atlanta, GA.
"Solids and Liquids". ESEP teachers of Atlanta Public Schools. February 27 and 28, 1996. Atlanta, GA.
"Food Chemistry". ESEP teachers of Atlanta Public Schools. February 20 and 21, 1996. Atlanta, GA.
"Balance and Motion". ESEP teachers of Atlanta Public Schools. February 6 and 7, 1996. Atlanta, GA.
"Plant Growth and Development". ESEP teachers of Atlanta Public Schools. January 30 and 31, 1996. Atlanta, GA.
"Student Teachers: Roles and Responsibilities of the Cooperating Teacher". Teacher Support Specialist Workshop for DeKalb County. July 19, 1995. Decatur, Ga.
"Gender Equity in the Classroom". Summer Institute for Middle and Secondary School Counselors. July 12, 1995. Unicoi State Park, Helen, GA.
"Preparing for Block Scheduling". Nerinx Hall. June 26-27, 1995. St. Louis, MO. Co-presenters: Pete Weinburgh and Francis Freedman.
"Smuggling Higher Level Thinking Skills into the Classroom". Upstate School Consortium at Furman University. February 7, 1995. Greenville, NC. Co-presenter: Pete Weinburgh.
"Student Teachers: Roles and Responsibilities of the Cooperating Teacher". Teacher Support Specialist Workshop for DeKalb County. August 27, 1994. Decatur, Ga.
"Developing Higher-Order Thinking Skills". Cor Jesu Academy, May 27, 1994, St. Louis, MO. Co-presenters: Pete Weinburgh and Francis Freedman.
"Creating Your Own Student-Centered Classroom". The Ashville School. February 18-19, 1994. Ashville, NC. Co-presenters: Pete Weinburgh and Francis Freedman.
"Integration of Higher-Order Thinking Skills into Science and Social Studies Instruction". Hutchinson Elementary School. January 12, 1994. Atlanta, GA. Co-presenter: Beverly Armento.
"Strategies to Get Students More Involved" . Tenth grade teachers at Salem High School. Monthly seminar September 1993-March 1994. Conyers, GA.
"Getting the HOTS for Science". Long Middle School. October 23, 1993. Atlanta, GA.
"Gender Equity in All Science Classrooms". Chattanooga City Schools. August 28, 1993. Chattanooga, TN.
"Student Teachers: Roles and Responsibilities of the Cooperating Teacher". Teacher Support Specialist Workshop for DeKalb County. July 12, 1993. Decatur, Ga.
"The Why and How of Developing a Working Team". Team Chairs of Rockdale County. May 27, 1993. Conyers, GA.

Professional Memberships (*active member)
Council of Science Society Presidents (CSSP) 1999-2001
National Association of Research in Science Teaching (NARST)*
2000-02 Culture, Social and Gender Issues; Co-coordinator of stand
1996-99 Equity Committee, member
Association for the Education of Teachers of Science (AETS)*
2001 President
2000 President-elect
1998-01 Member of Board
1998-01 Committee on Membership and Communication, chair
1997-98 Leadership team, member
1997-98 Committee for Inclusive Science Education, associate member
1997-98 Ad Hoc Committee on Structure and Finances of AETS Annual Meetings, member
1996-98 Ad Hoc Committee on Mentoring, member
1995-97 Ad Hoc Committee on Conventions, member
Southeastern Association for the Education of Teachers of Science (SAETS)*
1998-01 Regional Director

1997-08 Past-president
1996-07 President
1995-06 President-elect

National Science Teachers Association (NSTA)*
1997 AETS session representative, Nashville, TN
1996 Local Arrangement Committee: Area Convention, Co-liaison

Georgia Science Teachers Association (GSTA)

American Educational Research Association (AERA)*
1995 SIG:EST liaison to Committee on Role and Status of Women in Educational Research and Development
1994 SIG:EST paper session reviewer

Georgia Educational Research Association (GERA)*
1999-01 Executive Council, Member-At-Large
1997-99 Outstanding Research Committee, chair
1992-93 Executive Council, student member

School Science and Mathematics (SSAM)*
1999-02 Membership Committee

Georgia Association of Teacher Educators (GATE)*

American Association of University Women (AAUW)*

American Association of Female Educators (AAFE)

American Association for the Advancement of Science (AAAS)
2001-03 Nominated for Electorate Nominating Committee of Section Q

National Association for the Education of Young Children (NAEYC)

Dissertation Committee

Chair:

Kathy Smith (August 3, 2000) Early Childhood Teachers' Pedagogical Content Knowledge in Mathematics: A quantitative Study

Member:

Brenda Brockstein
Terrie Kielborn (University of Florida)
Deena Hoch
Kip Henderson
Raymond Komenan
Anne Morton

Lucinda Gibson (April 14, 2000). Phases of Learning During Action Learning Experiences: An Exploratory Study. Dr. Willis, chair

Marie Borim (November 1999). Factors Influencing Inservice Teachers' Gender Equity Awareness: A qualitative Study. Dr. Lakes, chair

Ann Stucke (July 2, 1999). An Interpretative Study of Elementary School Teachers' Conceptions of the Nature of Inquiry and of Their roles While Participating in an Inquiry Based Science Curriculum. Dr. Lucy, chair

Susan Green (April 20,1999). Women's Mid_Life Career Change: The Case of Episcopal Women Priests. Dr. Willis, chair

Catherine Carter (November, 1998). A Cast Study of Meaningful Learning in a Collaborative Concept Mapping Strategy as a Preparation for a College Biology Laboratory. Dr. Hassard, chair

Joyce Lockwood (September, 1997). The Effects of College Students' Gender and Ethnicity on Occupational Choice of Gender-Dominated Occupations. Dr. Willis, chair

Priscilla Golley (July, 1997). An Investigation of Teachers' Perceptions and Implementation of Interdisciplinary Mathematics and Science. Dr. Lucy, chair

Carol White (October, 1996). Voices of Collegiate Women: Influences that Impact Women Silence in an Undergraduate Classroom. Dr. Willis, chair

Master Thesis Committee

Jamia Jester (April 12, 2000). Changing the Culture of the Classroom: A Study of the Elementary Science Education Partners (ESEP) Program. Dr. Kozaitis, chair.

Committee Assignment

University

Vice President for Research and Sponsored Programs Search Committee, member (1999-2000)
Faculty Senate, member from ECE, assigned to Research and Diversity committees (1998-2001)
Prejudice Awareness Summit; Exploratory Committee (1999)
Diversity Education Programs Advisory Board (1998 to present)
Professional Education Committee, Diversity chair (1997 to present)
Professional Education Committee, Executive committee (1997-present)
Project LINK, Cote d'Ivoire visiting team (1996 to present)
Faculty Senate, member from MSIT, assigned to the Research, Diversity, and Budget committees (1993-1995)
German/GSU Exchange Program, host, (April 1996)
Gender Equity Team (1994 to present)
Advisory Board, Integrating Gender Equity and Reform, NSF funded project (1995-1997)
Georgia Science Olympiad, Regional Tournament, session coordinator, 1996
Georgia Science Olympiad, State Tournament, session coordinator, 1995
Faculty Liaison for Educational Partnership with Fulton High School (1991-1994)
Student Affairs Committee, member (1991-1993)

College of Education

Diversity Committee of the Professional Education Faculty, Chair (1998-present)
Advisory Board for Preparing Tomorrow's Teachers (1999-2002)
Instructional Technology Center Advisory Board (1999)
Faculty Affairs, member (1997-1999)
Leadership Team, Integrating Gender Equity and Reform (1995-1998)
Search Committee, Local Coordinator for Elementary Science Education Partners (Fall 1995)
Advisory Board, TREE's, Coke Cola funded project, (1995-1997)
Liaison Committee for College of Education Instructional Technology Center (1995-1996)
Search Committee, MSIT department chair (Spring, 1995)
Georgia State University Legislative Reception, representing "best programs" of College of Education, ESEP project January 1998.
Georgia State University Legislative Reception, representing "best programs" of College of Education, Technology, January 1995.
Georgia State University Legislative Reception, representing "best programs" of College of Education, MSIT Diversity Education, January 1994
NCATE, Curriculum and Instruction Committee (1992-1995)
Student Georgia Association of Educators faculty advisor (1991-1996)

Department

Search Committee, Math position (1998)
BSE Committee, ECE (1996-present)
Pre-K Committee, ECE (1996-present)
Ph.D. Committee, ECE (1996-present)

Professional Service to Community and Profession

Committees (also see Professional Memberships)

National Leadership Project, AAAS/NRC/AETS, 1997
Educational Technology Committee, Professional Standards Commission, 1997
Metro-Atlanta P-16 Academic Standards Development Committee, 1997-1999.
Staff Development Committee, Elementary Science Education Partners, 1995-2001
Executive Committee, Elementary Science Education Partners, 1995-2001
Science Curriculum Review Committee, Atlanta Public Schools, 1996

Advisory Boards

Project Inquiry: Building a Presence for Science in the Lowcountry, NSF funded Teacher Enhancement Grant, 1999- present

Curriculum Advisory Board, Atlanta Girls' School, 1999-present

Girls Incorporated, NSF funded "Teaching Smart", 1999-present

Gender Equity and Disability Subpanel of the Gender Equity Expert Panel, US Department of Education's Office of Educational Research and Improvement, 1997-present

Advisory Board, Elementary Science Education Partners, 1995-2001

Michael C. Carlos Museum Educational Board, 1993/present

Review Board

Journal of Elementary Science Education, Kevin Finson, Editor, 2000- present.

Reviewer

The Journal of Research in Science Teaching, James Gallagher, Editor and Charles Thompson, Associate Editor, 1998-present.

The Journal of Science Education for Students with Disabilities, Dana Caseau and Jim Marshall, Editors, 1998-present

Georgia Educational Researcher, Bob Michael and Judy Monsaas, Co-editors, 1996-present.

Journal of Elementary Science Education, Kevin Finson, Editor and Joseph Peters, Editor Emeritus, 1996-present.

NECC,

- conference proposals, 2000

NARST,

- strand 6 co-chair of strand, 2000-2001
- strand 4 conference proposals, 2000
- strand 6 conference proposals, 1999
- strand 6 conference proposals, 1998

SAETS

- conference proposals, 2000
- conference proposals, 1999
- conference proposals, 1998
- conference proposals, 1997

AETS sessions at the Fall 1997 NSTA regional conference.

AETS conference proposals, 1997

Georgia Department of Education, Document for Counselors: K-12, Gender Equity sections, 1995.

Georgia State University Research Initiation Grant, 1994, 1995.

Georgia Association for Supervision and Curriculum Development Mini-grant competition, 1994.

American Educational Research Journal, student reviewer, 1993.

Consultant

A.D.A.M. Software, Inc., Atlanta, Ga., 1993-1996.

Visions United, Atlanta, GA. 1994-1996.

Evaluation of NSF "Mathematica" grant at Georgia Institute of Technology, Atlanta, GA. John Wiggins: PI, 1995.

Evaluation, NSF "Gift" grant at Georgia Institute of Technology, Atlanta, GA. Joanna Fox: PI, 1995.

Critical Friend, Salem High School, Conyers, GA 1993-1996.

Teaching and Administrative Load

Quarter System

Fall 1993

EDSC 447, Methods of Middle Childhood Science	5 hours
EDCI 470, Supervision: Middle Childhood	5 hours

	EDCI 474, Supervision: Secondary	10 hours
Winter 1994		
	EDSC 447, Methods of Middle Childhood Science	5 hours
	ECSC 447, Methods of Middle Childhood Science	5 hours
	EDCI 470, Supervision: Middle Childhood	5 hours
Spring 1994		
	EDCI 474, Supervision: Secondary	5 hours
	EDCI 470, Supervision: Middle Childhood	10 hours
Summer 1994		
	EDSC 325, Science Concepts: Middle Childhood	5 hours
	EDSC 712, Science Issues and Concepts	5 hours
Fall 1994		
	EDCI 465, Opening School Experience	5 hours
	EDSC 447, Methods of Middle Childhood Science	5 hours
	EDCI 470, Supervision: Middle Childhood	10 hours
Winter 1995		
	EDSC 447, Methods of Middle Childhood Science	5 hours
	EDCI 474, Supervision: Secondary	5 hours
	EDCI 470, Supervision: Middle Childhood	5 hours
	coordinator of Math/Science/Social Studies Block	
Spring 1995		
	EDCI 474, Supervision: Secondary	5 hours
	EDCI 470, Supervision: Middle Childhood	10 hours
	coordinator of Math/Science/Social Studies Block	
Summer 1995		
	EDSC 325, Science Concepts: Middle Childhood	5 hours
	EDSC 712, Science Issues and Concepts	5 hours
Fall 1995		
	EDCI 465, Opening School Experience	5 hours
	EDSC 447, Methods of Middle Childhood Science	5 hours
	EDCI 470, Supervision: Middle Childhood	5 hours
	EDCI 881, Directed Readings	5 hours
	coordinator of Math/Science/Social Studies Block	
Winter 1996		
	EDSC 447, Methods of Middle Childhood Science	5 hour
	EDCI 881, Directed Readings	5 hours
	coordinator of Math/Science/Social Studies Block,	
	NSF release	
Spring 1996		
	EDCI 474, Supervision: Secondary	5 hours
	EDCI 470, Supervision: Middle Childhood	5 hours
	NSF release	
Summer 1996		
	EDSC 712, Science Issues and Concepts	5 hours
	NSF release	
Fall 1996		
	ECE 347, Science Methods	5 hours
	Pre-K state training	5 hours
	NSF release	
Winter 1997		
	ECE 347, Science methods	5 hours
	Pre-K state training	5 hours
	NSF release	
Spring 1997		

	ECE 347, Science Methods	5 hours
	NSF release	
Summer 1997		
	NSF release	
Fall 1997		
	ECE 347, Science Methods	5 hours
	Pre-K state training	5 hours
	NSF release	
Winter 1998		
	ECE 347, Science Methods	5 hours
	NSF release	
Spring 1998		
	ECE 347, Science Methods	5 hours
	NSF release	

Semester System

Fall 1998		
	ECE 3470, Science Methods	3 hours
	NSF release	
Spring 1999		
	ECE 3470, Science Methods	3 hours
	NSF release	
Fall 1999		
	ECE 3470	3 hours
	Pre-K training	3 hours
	NSF release	
Spring 2000		
	ECE 3470	3 hours
	NSF release	
Fall 2000		
	ECE 3470	3 hours
	PERS 2002	2 hours
	Faculty on Retainment	? hours
	NSF release	
	Eisenhower release	

Election Committee Report
October, 2001
Sandra K. Abell, Chair

Committee Members: Lloyd Barrow, Saouma Boujaoude, Angelo Collins, Cathy Loving

1. Given the Presidential charge at the March, 2001 Board meeting, the Election Committee worked to find nominees for the position of NSTA Research Director, given the important role this person serves as liaison to the NARST Board and spokesperson for science education research interests in NSTA. The following individuals agreed to be nominated for the position and their names were forwarded to the NSTA Nominations Committee:

   Patricia Simmons, University of Missouri, St. Louis
   John Staver, Kansas State University

2. **The Election Committee recommends that the following individuals be placed on the NARST ballot for President-elect**:

   Andy Anderson, Michigan State University
   ???

3. **The Election Committee recommends that the following individuals be placed on the NARST ballot for Board members at large**:

   Zoubeida Dagher, University of Delaware
   David Jackson, University of Georgia
   Gregory Kelly, University of California-Santa Barbara
   Gail Richmond, Michigan State University
   Mike U. Smith, Mercer University
   Deborah Smith, Woodcreek Elementary Magnet School for Math, Science and Technology, Lansing, MI

4. The procedures for the Election Committee have been modified to include information about qualifications of candidates. Many details about elections procedures were removed from the bylaws during the last update. I have tried to account for them in the procedures. Some questions arose while I was updating these procedures:
   a. What is the procedure in case of a tie? The old bylaws indicated that a tie would be established by a voted of the members present at the Annual Meeting, which seems cumbersome and inefficient. Other ideas?
   b. The old bylaws indicated that the Election Committee Chair prepares and counts the ballots. Our practice for many years is that the Executive Secretary does so. Is there any reason to change this practice?
   c. The old bylaws/procedures allow for petitions to add names to the ballot, but this has not been part of recent practice. What is your pleasure?

Home: C: ICreport

Sept. 22, 2001

TO: NARST Executive Board

FROM: Sharon Lynch

RE: NARST International Committee Board Report prepared for the October, 2001 Executive Board Meeting in New Orleans, LA

I. Preparations for NARST 2002 Annual Conference.

A. In preparation for the Annual Conference, as is tradition, we will sponsor an ICASE Symposium. This year, the Chairs of the ICASE Symposium will be the actual president of ICASE, as well as the Chair of NARST International Committee. ICASE Symposium scheduled for the 2002 NARST Annual Meeting is shaping up. To be truly international, we need somewhat broader representation from some other areas of the globe.

Chairs:
Robin Groves (President ICASE)
Sharon Lynch (Chair, NARST IC)

Participants:

Judy Dori Israel
Yoshisuke Kumano Japan
Ling Liang People's Republic of China
Martina Neiswandt Germany
Peter Okebukola Nigeria
Leonie Reynolds Australia
Norm Thompson Kenya
Emmett Wright USA

Discussant: Pamela Fraser-Abder

Symposium on International Science Teacher Education Policy: Supply, Demand and Teacher Quality

The issue: As science literacy becomes increasingly important across the globe, so too does the issue of science teacher preparation, and by extension, teacher supply and demand issues. For instance, in the U.S. a large number of science teachers are slated to retire in the next ten years, and it appears that colleges and universities are not preparing a sufficient number of teachers to replace them. The problems are especially severe for chemistry and physics

teaching. Moreover, the diversity of the science teacher population in no way matches the diversity of the student population, and this situation seems to be worsening. Within the US, some states and school districts have sought to alleviate our science teacher shortage by recruiting science teachers from abroad, perhaps exacerbating science teacher shortages in other countries.

On the brighter side, recent large scale international studies such as TIMSS have shown that the prognosis for preparing and retaining high quality science teachers is high where teacher salaries, working conditions and benefits are competitive with other professions, where science teaching is accorded high status.

Consequently, NARST members would seem to have much to gain by comparative studies of science teacher supply and demand and the governmental policies and social forces that affect this. The proposed symposium will focus on the following questions, by inviting persons studying how different countries (or specific regions associated with policy-making forces within countries) are coping with science teacher supply and demand issues:

1. What is the current state of science teacher supply and demand? What are the projections? (Break down by subject matter disciplines if necessary).

2. In general, what is the public perception of the quality of the science teaching force? Are there data that support these perceptions?

3. What social forces affect science teacher supply and demand? What policies can affect these social forces?

4. What policies are in place that affect the state of science teacher supply and demand? What policies have promise and support from governmental or professional organizations that can affect science teacher supply and demand?

5. What are the interactions between science teacher supply and demand, science teacher quality, and policies?

B. We invited ESERA to continue to discuss relationships between the ESERA and NARST. It was agreed that ESERA would like to try and take up the offer of a symposium at the 2002 NARST annual conference. The title would be 'Research in Science Education in Europe'. The general form of it would be:

Introduction about ESERA
Paper on European Collaborative Project
Paper on Large National Project (German)
Plus one more paper to be decided.

Robin Millar is assisting with organization. The prospects for this symposium look quite

good, and it may provide a means to engage members of various organizations in NARST and make other international connections organizationally and individually.

Many thanks to Jonathan Osborne for re-opening these discussions at the ESERA conference in Greece, in August 2001, and catalyzing interest in the symposium among ESERA members.

C. There was some discussion at the IC meeting last March about a third symposium that would be take the form of an "International Research Bazaar", an opportunity to for NARST members to link there research interests. While this remains a good idea, the organizers felt that this was too much to take on for this year, and may revisit the planning at the 2002 Annual Meeting.

II. Web Site Elaboration.

Karen Sullenger has been in discussions with David Zandvliet about this. The categories include Global Science Education Organizations, Global Journals, Global News including upcoming events, summaries of meetings, and calls for science education research papers. Work in progress. It will probably be up in some manner by around Oct. 30, 2001. We will have a call to all NARST members asking them to list all relevant items.

III. Email and Post Transmission of Information on Annual Conference Proposals: Alberto Rodriguez, Chair of the Equity Committee, asked Sharon Lynch to forward a the IC email list a three part motion on the advisability of electronic and regular post notification of members about annual meeting deadlines. The motion was forwarded and 5 responses were received which are included verbatim in Appendix A. (It should be pointed out that the IC email list only includes those members who attended the IC meetings in the last 2 years and is relatively limited. It may not be representative of the opinions of all international NARST members.)

IV. **Science Education Collaborations with NARST Internationally—Policy.** Over the summer, Sharon Lynch was charged with taking over Sandi Abell's work to formulate a policy on NARST's relationship with other international organizations (because Sandi had taken on additional managerial duties). Nothing to report at this time, but I aim for some sort of preliminary draft at the time of the October Board Meeting.

Appendix H

Date: Tue, 11 Sep 2001 13:01:34 -0500
From: Peter Hewson <pwhewson@facstaff.wisc.edu>
To: Sharon Lynch <slynch@gwu.edu>
Subject: Re: International issues: Messages from Alberto Rodriguez and Cheryl Mason

Hello Sharon:

While I share Alberto's concern (it is an ongoing one), I support your response, since I believe his concerns are largely taken care of with existing policies. The issue that is still a concern is notification of the Call for Proposals: both the form and the date. I think we have to assume that both paper and electronic notification (as well as submission) needs to continue. The latter is not at issue; what is a concern is how to get paper notification to people without access to email and the web. Some possibilities: 1) indicate that those people without electronic access could use the previous year's call for proposals (since changes tend to be minor) for form of proposal, date of reception, and address, if they have not received the current newsletter by, say, a month before the deadline; 2) hand out a provisional Call for Proposals at the Annual Meeting, with indications of when a final Call would be available? This would be a draft of the final Call, based on the previous Call, with a clear statement that this for planning purposes I also suggest that one should be explicit about accommodations (since who knows about deadline leniency?), and the circumstances in which they will be made. I guess the concern is that it would open up a window for others to complain if they submitted their proposals late, but I'd be willing to give it a try.

Peter.

To reply to Alberto's concern. In Canada, this is not a problem except to the extent of receiving the NARST newsletter late. He is right here that we do not get it in enough time. But once we get the Global site running that could be an answer to part of the problem. Once it becomes well known. This may be a 1 to two year sollution though.

His real concern seems to be people who do not have computer access or unreliable access to the internet. This would be true of new colleagues in Bhutan for example. Only those in the two major traingin schools have internet access and one only recently. Perhaps this information could be part of the information pamphlet we have about NARST or other documents we distribute. Just part of the information is that paper submissions are welcome to all conference call for papers. Another idea could be to establish/identify International people as contacts for this kind of information. They would be kept informed and other could contact them by local means. Do we have an idea of how many researchers this affects or what regions? Other than these ideas/questions I agree with you we are doing the best we can.

Regards,

Karen
--
Karen Sullenger
sullengr@unb.ca

I regard to the comment made by alberto I entirely agree with him and I hope you could pursue the issue in the board.
Hope to see you in New Orleans in April

Avi

Prof. Avi Hofstein
Department of Science Teaching
The Weizmann Institute of Science
Rehovot, 76100, Israel
tel:972-8-9343811

I believe that the deadline for the NARST conference is too early for foreign people. This is true there are many foreign researchers got a similar feeling!!

However, for a big conference you need more time for preparation. Basically, it is understandable and sending paper through IT is good because we can save resources.

But there are always problems for the new technology. How could you find missing files through IT? Some sort of security system needed. For example, each presentor has an resposibility to contact NARST office if there is no response for your submission within five days and so on.

Agreement needed.

Yoshisuke Kumano, Ph.D.
Associate Professor of Science Education
Faculty of Education, Shizuoka University
836 Ohya, Shizuoka-Shi, 422-8529, JAPAN
(Indonesia, now!)
edykuma@ipc.shizuoka.ac.jp
yoshikumano@hotmail.com

> > In response to the discussion about electronic submissions, I provide
> these
> > comments for your decision making.
> >
> > My experience (and also that of my colleagues at Curtin) in
> communicating
> > with university colleagues in less well resourced countries (for
> example,
> > recently in Ruanda, Ethiopia, Papua New Guinea) is that electronic
> > communication is by far the preferred option.
> >
> > All my experiences are that university, and even high school, colleagues
> in
> > less well resourced country do have access to electronic communication.
> >
> > Electronic communication is efficient, cost-effective for them and also
> is
> > mostly reliable. In many countries, regular mail is quite the opposite
> and
> > also can take an extremely long time to arrive at its destination.
> >
> > I agree that printed material should not be phased out but to reduce the
> > mailing of printed material will save costs to NARST and members. Maybe
> the
> > International Committee can ask NARST members if they prefer /would be
> > willing to receive only electronic communciations.
> >
> > Best wishes
> >
> > David Treagust
> >

BouJaoud <BouJaoud@aub.edu.lb>, cctsai <cctsai@cc.nctu.edu.tw>, changcy <changcy@cc.ntnu.edu.tw>, CTL999F <CTL999F@HOTMAIL.COM>, cvauf <cvauf@physik.uni-bremen.de>, David Treagust <D.Treagust@SMEC.CURTIN.EDU.AU>, ddmaleix <ddmaleix@usc.edu>, EDYKUMA <EDYKUMA@ipc.shizuoka.ac.jp>, International committee members <aufschna@physik.uni-bremen.de>, iungo <iungo@msn.com>, Judy Dori <dori@ceci.mit.edu>, lhatch <lhatch@wsu.edu>, lreyes <lreyes@col1.telecom.com.co>, MURFIN <MURFIN@ACF2.NYU.EDU>, Norm Lederman <lederman@ucs.orst.edu>, Nthomson <Nthomson@coe.uga.edu>, Peter Labudde <labudde@sis.unibe.ch>,
pokebukola <pokebukola@HOTMAIL.COM>, POMEROY <POMEROY@BEAVER.EDU>, pwhewson <pwhewson@facstaff.wisc.edu>, Rjb <Rjb@unlserve.unl.edu>, Robin Groves <grovesr@ozemail.com.au>, Sandra K Abell <sabell@purdue.edu>, Sharon Lynch <slynch@gwis2.circ.gwu.edu>, sullengr <sullengr@unb.ca>
>CC: albertor@nmsu.edu, clmason@nsf.gov
>Subject: International issues: Messages from Alberto Rodriguez and Cheryl Mason
>Date: Tue, 11 Sep 2001 09:50:06 -0400
>
>Dear IC members,
>
>I will be forwarding you two messages. The first is from Alberto Rodriguez.
>He requested that I send this to you. The second is from Cheryl Mason,
>President Elect of NARST, concerning the same issue. Please read both
>carefully.
>
>I will close with my own views on this.
>
>I would be happy to represent your views at the NARST Board meeting and invite
>you to discuss among us immediately here, or at our meeting in April. Thanks.
>
>
>
> >===== Original Message From Sharon Lynch <slynch@gwis2.circ.gwu.edu>
=====
>Alberto, I thought you sent this out directly to the IC. Upon checking my
>messages from July-August, I see I was mistaken. I will forward it, now.
>
>Best,
>
>
>Sharon Lynch, Professor
>George Washington University
>Graduate School of Education and Human Development
>Department of Teacher Preparation and Special Education
>2134 G St. NW
>Washington, DC 20052
>202-994-6174 FAX: 202-994-3365
>

>
>On Sun, 9 Sep 2001, alberto rodriguez wrote:
>
> > Sharon:
> > Did you get the message I sent below? Have you heard from the members
> > of the International Committee yet? Please let me know. If I don't
> > hear from you soon, I'd assume that you are away on business, so I'll
> > attempt to contact the members of the Committee myself.
> > Thanks,
> > Alberto
> >
> >
> > >X-Sender: albertor@cnmailsvr.nmsu.edu
> > >Date: Sat, 18 Aug 2001 02:01:28 -0600
> > >To: slynch@gwu.edu
> > >From: alberto rodriguez <albertor@NMSU.Edu>
> > >Subject: International Issues
> > >Cc: albertor@nmsu.edu
> > >Status:
> > >
> > >Sharon:
> > >Please pass on this message to your colleagues in the International
> > >Committee, and let me know what they think by Sept. 05. I intend to
> > >propose the changes indicated at the next Board meeting, and your
> > >feedback/support will be appreciated.
> > >Cheers,
> > >Alberto.
> > >
> > >Electronic Submission of Proposals and International Members
> > >It has come to my attention that the printed NARST call for
> > >proposals may be reaching international members passed the deadline
> > >for submission of proposals. For example, the latest Newsletter has
> > >a June date, yet some of us received it in early August. This means
> > >that many international members may receive the call for proposals
> > >in early September. This is a serious issue for international
> > >members who have limited access to e-mail, and who are not able to
> > >submit their proposals electronically. This problem is compounded by
> > >the fact that the deadline for printed proposals is even earlier
> > >than that for electronic submissions. In addition, some members of
> > >the Board wish to phase out the submission of electronic proposals
> > >altogether. Therefore, at the Fall Board meeting, I'd like to
> > >propose the following motions:
> > >1. That the NARST Newsletter (and call for proposals) be mailed a
> > >month before the date printed on the newsletter.
> > >2. That international members be afforded some flexibility in the
> > >handling of their (printed) proposal submission by focusing on when
> > >the proposal was submitted (postage date) and not on when the
> > >proposal was received.
> > >3. That the submission of printed proposals NOT be phased out. This

>>>alternative should be kept open to encourage the submission of
>>>proposals from colleagues who have limited access to e-mail in their
>>>home countries. Further, all printed submissions should also include
>>>an electronic disc copy so that conference organizers could easily
>>>transfer this copy to their data base.
>>>What do you think?
>>>I'm sending a copy of this e-mail to Sharon Lynch, Chair of the
>>>International Committee, in hope that she and other members of this
>>>Committee will support these motions too.
>
>From Cheryl Mason:
>>
>Alberto, I'm disappointed that you didn't bring a couple of these issues up
>during our conversations this summer. Anyway, you do have some good
>comments and they will definitely be taken into consideration, but I would
>like to repond to a couple of them. First of all, the Board has never had
>any plans to eliminate the paper submission route; we are just trying to
>address the needs of our members by streamlining our submission, review
>process and program development. As far as the International members who
>might not make the deadline, we have always said that allowances will be
>made for them when unusual circumstances have interferred with a timely
>submission. I look forward to our working together this year as the
>leadership team strives to make NARST a prominent voice in research, policy
>and practice in the realm of Science Education. Please don't hesitate to
>contact me if you have other comments or concerns, since I have always
>enjoyed our telephone conversations. Take care. Cheryl
>
>
>Cheryl L. Mason, Ph.D.
>Program Director
>Elementary, Secondary and Informal Education
>National Science Foundation
>4201 Wilson Blvd., Suite 885
>Arlington, VA 22230
>USA
>
>clmason@nsf.gov
>Telephone: 703-292-5117
>Fax: 703.292.9044
>NSF Home Page: http://www.nsf.gov
>ESIE Home Page: http://www.ehr.nsf.gov/ehr/esie
>
>Sharon Lynch's comments:
>
>It is hard for me to see this motion as a solution because, at this point, I
>am not sure that there is a problem. Can you help by clarifying? This is
>what I know about it:
>1. Regular mail submissions are not going to be phased out and latitude has
>been and will be provided for international members who have communication

>problems.
>2. Most international members to whom I have spoken report that electronic
>communication is more efficient than regular mail, and prefer it.
>3. Requiring that a large mailing be sent out a month before the Newsletter
>date is unlikely to be helpful, because of the nature of the US mail system.
>It is unwieldy for large mailings even if they are sent out FIRST CLASS. One
>would have to get the Newsletter out at least 2-3 months in advance to
>guarantee receipt within the US in a timely fashion for the submission of the
>proposals. I don't know what is practical for assuring timely receipt abroad,
>and suppose that it differs from country to country, greatly.
>
>The larger issue is how to improve all services, especially communications,
>for all NARST members, WITHOUT exhorbitant increases in NARST dues. This is
>what the NARST Executive Board seems to spend most of its time working toward.
> It is hard because we have largely relied upon the services of a number of
>volunteers and host universities, rather than hiring an executive director
>(expensive). I for one, am appreciative of the hard work done by individual
>NARST faculty members who are not trained for some of the tasks that they have
>agreed to take on, and do this work on behalf of NARST out of dedication and
>good will.
>
>However, from where each one of you is sitting, you may have different views
>on this, and I would be happy to represent all of them in their diversity.
>Thanks.
>
>Best,
>
>
>Sharon Lynch
>The George Washington University
>2134 G St. NW
>Washington, DC 20052
>
>Phone: 202-994-6174 FAX: 202-994-3365
>

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Report on the work of the JRST Award Committee for Best Paper in JRST

Chairperson: Jonathan Osborne

Committee Members

Anil Banerjee, Marcia Fetters, Deed Goldston, Helene Sørensen, Martha Dreuth-Fewell, Douglas Huffman, Carole Mitchner, Chris Ohana, Julie Bianchini, Juanita Jo Matkins, Renee Schwartz, Edith Gummer, Theresa Greenfield, Bradford F Lewis , Sherry Southerland, Danielle Ford, William Newman, Deb Smith, Maria Pilar Jimenez Aleixandre, Anita Zohar

1. The process of undertaking the review and grading the articles is underway. Unfortunately (and as I suspect is normal) I have received only about 60% of the assessments that I would have expected to receive by now for issues 1 to 5. Two reminders have been sent and one committee member has indicated that she will be unable to do the assessments due to the pressure of work. The other reviews should be forthcoming shortly. The next deadline for assessments 6-8 is Oct 29 and January 18 for Issues 9-10. The deadline for the final round will be Feb 20.

2. At the meeting of the committee held at the annual meeting, there was extensive discussion of the criteria for rating these papers. It was felt that some of the criteria needed further elucidation. In addition, that there was some duplication and that criteria 7 permeated many of the other criteria so should be considered for removal. Attached is a redrafted version of the criteria for consideration of the committee at the next meeting in April.

Criteria and Instructions for Ranking the Articles in an Issue of the Journal of Research in Science Teaching (Draft Version 1)

Scan all articles in the issue you are judging before you begin the reading and rating process. Then rate all articles in the issue using the following criteria. After all articles are rated, review the ratings across articles to insure consistency and reliability. In reviewing the articles try and ignore any personal prejudices that you may have about the importance or significance of the theme of the article and judge the article using only the following criteria. You are strongly encouraged to contact other members in your group to discuss your ratings.

1. **Significance of Problem or Issue** (10 points)
   How important or critical is the problem or issue being addressed by the author(s)? Timeliness, relevance and scope are all aspects of this concept. Marks for this criterion should, however, be awarded not so much on your judgement of its significance but on the case made by the author(s) for its significance.

2. **Background** (10 points)
   How adequate is the presentation of related theory and relevant literature? Does this section of the paper cover the literature in the area in a comprehensive and clear manner, acknowledging the significance of salient research and arguing the case for the work that is to be introduced.

3. **Approach** (10 points)
   How adequate and sound is the approach to the problem or issue? In a research article there should be a well-reasoned argument to for the design and the methods used for data analysis. In a position paper, the logic and nature of the argument should be carefully constructed and critically and thoughtfully argued.

4. **Significance of Conclusions** (10 points)
   Are the conclusions based on the evidence presented and logical argument? Are the implications and their importance recognised in a clear, thoughtful and cogent manner? Do they address relevant concerns in science education?

5. **Potential Impact of the Outcomes or Positions** (10 points)
   What is the potential to influence thinking and practices in science education? Do the outcomes or positions have potential impact? Has that potential for impact been considered and discussed by the author(s)?

6. **Uniqueness and originality** (10 points)
   How new or original are the approach and/ or ideas presented in the article? Does the article challenge existing thinking or practice in a thoughtful, critical and relevant manner. Could the article be considered to be ground-breaking?

7. **Communication** (10 points)

How well written is the article?

8. **Overall** (10 points)
   What is your general opinion of the quality of the article from a broad perspective? In arriving at such a judgement, you should ignore any views you hold about the content or the theme and simply consider the whole article, how well the research has been designed, conducted and reported.

Record your ratings for each article on a separate rating sheet along with the necessary descriptive information about the article. You should also include comments related to your overall rating.

OUTSTANDING PAPER AWARD

Fifty one papers were nominated for the *NARST Outstanding Paper Award*. Of those nominated, 35 authors sent electronic versions of their papers. Each reviewer received 10 or fewer papers for the first round of review. The committee members and chair nominated author(s) from diverse research areas and interest for representation from all groups. At the submission time of this report, the results of the first round of review were unknown.

Report: 2002 Committee for the Distinguished Contributions to Science Education Through Research Award

As a newly elected member of the NARST Executive Board, I was asked prior to the 2001 annual meeting to accept the chair of the NARST Distinguished Career Award committee. I accepted and the departing chair, Dr. Pam Simmons, handed over the committee records to me. As her last official act, Dr. Simmons arranged with the NARST Newsletter to publish the 2002 call for nominations.

I begin my duties by establishing email contact with the committee members. Second, I followed the NARST Newsletter call for nominations with two announcements on the NARST listserve. Third, I contacted all of the previous nominees (except of course those who had won the award) and gave them to opportunity to remain in the award selection process. In my email to the previous nominees, I noted that past recipients of the NARST Distinguished Career Award had been in contention for more than one year.

At the time of this report, there are nine nominations representing both significant diversity and accomplishment. The nine nominees represent five nationalities and two races. Three of the nominees are women. There was a tenth nomination but that person declined. The current nominees are listed below ranked by the year of original nomination.

Nominee	Year Of Original Nomination
Yager, Bob	1998
Howe, Ann	1999
Anderson, Ron	2001
Champagne, Audrey	2001
Fraser, Barry	2001
Gabel, Dorothy	2001
Ogunniyi, Meshach	2001
Yore, Larry	2002
Zoller, Uri	2002

The committee members of the 2002 Distinguished Contributions to Science Education Through Research Award are:

Bruce Waldrip
Reneé Schwartz
Hanna Arzi
Carl Berger
Fouad Abd-El-Khalick
Anita Roychoudhury

With the exception of Carl Berger, all committee members have responded and are ready to receive nomination portfolios by email. Our projected timetable is as follows:

Receipt of vita and letters by chair: November 30, 2001
Committee member review process: Dec, 2001-January 15, 2002
1st rankings of top three nominees due by Jan. 15, 2002
Email discussions and final selection due by Jan. 23, 2002
Final selection completed by Jan. 25 and recommendation forwarded to Board

Bill Cobern
Chair, Distinguished Contributions to Science Education Through Research Award Committee
15 September, 2001

Early Career Research Award (ECRA)
NARST summer Board Meeting Report
October 19-20, 2001

Submitted by: J. Randy McGinnis, Chair, 2004, (jm250@umail.umd.edu)

Committee Membership:

Valerie Atkinson, 2002, (VALARIE@TRICITY.WSU.EDU)
George Bodner, 2002, (GMBODNER@PURDUE.EDU)
Kathy Frame, 2003, (KFRAME@CAPACCESS.ORG)
Barbara Crawford, 2003, (bac21@psu.edu)
Jennifer Snyder, 2004, (SNYDERJ@UMKC.EDU)
Dana Zeidler, 2004, (ZEIDLER@TEMPEST.COEDU.USF.EDU)
Ex-officio: **Norman G. Lederman**

I. Committee Charges

The Early Career Research Award Committee is responsible for identifying a member of NARST whose research in the five years immediately following receipt of the doctorate is worthy of recognition by the Association.

II. Summary of Activities and Accomplishments

1. The committee convened at the 2001 NARST annual meeting (4 members present: K. Fisher (former Chair), R. McGinnis (current Chair), Dana Zeidler, and Kathy Frame). The committee discussed the committee charge, reviewed proposed changes, and elicited additional ideas. A revision to the call for award nominations was finalized. An additional sentence was added to the previous call in the spirit to bring the call in full compliance with the president's charge: "*All NARST members are encouraged to consider nominating an eligible and deserving early career member.*" The revision of the ECRA Nominee Rating Sheet remained incomplete. The agreed upon revised call for the ECRA is the following:

CALL FOR NOMINATIONS

Nominations are invited for the NARST Early Career Research Award.

The NARST Early Career Research Award acknowledges contributions to science education through research by individuals during the five years immediately following receipt of the doctoral degree. To qualify for the award this year, the nominee must have received the doctoral degree on or after January 1, 1996. All NARST members are encouraged to consider nominating an eligible and deserving early career member.

Nominations for the award must be accompanied by seven (7) copies of supporting material including

a) a letter of nomination which discusses the nominee's impact on the field,
b) the nominee's vita,

c) a two-page summary of the nominee's research interests, prepared by the nominee,
d) three of the nominee's best papers, and
e) three letters of support to be sent separately.

Nomination materials should be received by J. Randy McGinnis at the address below no later than November 16, 2001.

Science Teaching Center, Rm. 2226 Benjamin
Department of Curriculum & Instruction
University of Maryland, College Park
College Park, MD 20742

Each candidate is reviewed independently by six NARST committee members. If you are interested in seeing the rating sheet that is used in this process, please request it from jm250@umail.umd.edu and indicate whether you are on a Macintosh or IBM-type computer.

2. April-May. The ECRA Chair engaged in ongoing electronic discussion with the ECRA committee members on revisions to the Nominee Rating Sheet. Minor changes to the ECRA Nominee Rating Sheet involved minor editing and the increase of opportunities for committee "Comment.". Major changes included the addition of the categories "Creativity and Innovation," "Research Conference Presentations," and "Research Grant Awards." After several iterations, a best draft was sent to the Chair of the Equity Committee for consultation. The Equity chair complimented the ECRA committee for its work to fulfill the committee's charge, and offered only a minor suggestion regarding clarification of the "Overall rank among nominees" identification. He also sent it out to his committee members for comment and review. In response to the Equity Committee Chair's comments, the ECRA committee adjusted the "Overall rank among nominees" identification, and finalized the revision of the ECRA Nominee Rating Form. Attached to this report is the revised ECRA Nominee Rating Form.

3. Early June. The ECRA Chair submitted electronically the Call for the ECRA Award to the NARST News editors (Randy Yerrick and Helen Parke). It was accepted and appeared in the June issue (volume 44, 2, 16).

4. Late June. The ECRA Chair posted electronically the Call for the ECRA Award to the NARST Listserv. In addition, in response to the charge by the NARST President to ensure inclusiveness by reviewing all NARST awards existing criteria for solicitation of nominees and for the identification of an awardee, the ECRA Chair prepared and submitted a report to the NARST President detailing the actions of the ECRA committee to fulfill this charge. A copy was sent to all the ECRA committee members for inspection and comment.

5. July to September. The ECRA Chair answered inquiries concerning the award (requests for the rating sheet, award criteria, and deadlines) and served as contact

point for those intending to submit materials. In addition, the Call for the ECRA was posted a second time on the NARST Listserv.

6. Future Plans (Present to the 2002 NARST annual meeting).The committee shall continue to solicit nominations until the award deadline (November 16, 2001). All nominations will be reviewed by the committee using the award criteria, and an awardee will be selected by the end of January, 2002. This information will be forwarded to the appropriate NARST contact (Executive Secretary and President) by or before February 1, 2002. All nominees for the award will be informed of their status before the annual meeting.

III. Recommendations

1. To carry out the charges of the committee using the revised criteria.
2. To submit for inclusion in the NARST Procedures and Schedules revised items pertaining to the ECRA award.
3. To review charges and procedures in committee at the 2002 NARST annual meeting.

NARST October 2001 Board Meeting

Report from NARST Outstanding Doctoral Research Award Committee

During discussion at the meeting during NARST in St Louis, the committee decided that the call for submissions and the criteria for judgment revised during 2000 had been implemented easily and effectively in judging the 2001 award. They wished to maintain this format for 2002, so the only change made was in the wording in an effort to encourage submissions from a wider group. The Call for Submissions was sent to the editors of NARST News and to the web master, twice. Unfortunately, when the June issue of NARST News arrived, I found a badly edited version from the previous year, and a similar incorrect version on the NARST Web. Randy Yerrick offered and immediate apology and corrected the NARST News version that was on the web. It took several emails to get the Web version corrected.

During June, July and August, I published the correct Call for Submissions on the NARST list serve, several times in August.

The due date for abstracts was September 15, 2001, and at the time of writing this report, 20 submissions have arrived. There were some people who contacted me indicating submissions were on their way, so I gave several days grace. I have received all of the promised submissions at this time.

The dreadful events of September 11 have affected both some applicants and my committee members. I believe one committee member lost a cousin in New York. Another committee member has indicated that he will not read abstracts. However, my committee has been dedicated in the past and I believe we will get some good reading done in the first round of judging the abstracts, and later, the final dissertations.

Léonie Rennie, Committee Chair
September 25, 2001

Outstanding Master's Research Award Committee

No Report

Equity Committee Report - Alberto J. Rodriguez..- Chair
NARST Fall Board Meeting 2001. New Orleans

This report is divided into three sections. The first aims to follow up on the status of motions that have been already passed. The second part presents new motions in regard to electronic submissions of NARST proposals and in regard to the Board minutes. The third part presents new items from the Equity Committee and the Equity and Gender Strand.

a. **Follow Up of Previously Passed Motions**

I'm preparing a report to all NARST members on the activities of the Equity Committee for the past year. To this end, I would like to provide members with accurate and up to date information regarding the status of some motions that have already been passed by the Board. I would like the Board—and in particular the appropriate Chairs of committees mentioned below—to respond to each of the items in the following table:

Motion	Decision/ Meeting Date	Action/ Person Responsible	Status
#6 . .That gender, ethnic background, areas of research, professional rank, and other areas be considered when appointing members to committees	Passed unanimously October 14, 2000.	Abell charged Haury to revise membership form so that members can state interest in various committees	Unknown? We are assuming that the wording of the motion will be incorporated into the Procedures Manual.
#8. . .That criteria for award be revised for consistency and that creativity be considered as a category.	Motion was withdrawn and committees were charged to consider suggestions. October 14, 2000.	D. Treagust charged Policy Ad. Comm. To review awards procedures to consider issues of consistency and creativity Board charged Policy Ad.	There was no report given on this charge at the spring mtg. Abell—the new Chair of the Policy Ad. Comm.— charged all Chairs to

		Comm. To examine award criteria for consistency and have criteria updated by Spring Board meeting (2001).	submit changes to her by June 15 (President's Report March 2001). We hope the next Fall Board meeting will provide us with some specific information.
#11. . .That a revised version of the NARST Procedures Manual be posted permanently on the NARST web page	Passed unanimously October 14, 2000.	No action has been taken to enact this motion, and the Manual has not been revised yet.	We hope to find out the status of the manual and why it has not been posted on the web.
#11 (part b) That at least twice a year a note be posted on the NARST Newsletter to remind members to become familiar with the submission and selection process of the various awards, as well as with policies guiding the organization.	Motion was withdrawn and Membership committee given charge. October 14, 2000.	Membership Committee was to consider ways to keep membership informed and report back to Board at spring meeting.	No report was given on this charge by the Membership Committee. We hope to hear about the status of this charge as it also relates to #6 above.

b. New Motions

Electronic Submissions

1. Whereas the last NARST newsletter was sent late; and whereas, the call for proposal may have reached some international members past the due date, be it resolved that the NARST Newsletter (with the call for proposals) be sent:
   a. At least ONE month before its printed date, and
   b. Early enough to give international members at least ONE month before the proposals are due.
2. Whereas some members are concerned that some international members may not have easy access to the internet; whereas, some members may be able to only send printed proposals; and whereas, some of these proposals may get to the US at a later date due to delays in the mail system, be it resolved that the following policy be included in the Procedures Manual:
   c. The submission of printed proposals will always be accepted by NARST.
   d. International members will always be afforded some flexibility in the handling of their (printed) proposal submission by focusing on when the proposal was submitted (postage date) and not on when the proposal was received.
   e. International members who submit printed proposals must also submit an electronic copy on a disc so that conference organizers could easily transfer this copy to their data base.

Board Minutes

Whereas, access to information, representation, fairness, and voice are the foundations of equity, be it resolved that the minutes for each Board meeting be posted on the NARST's web page within a month after they are approved by the Board.

The International Association for the Advancement of Curriculum Studies

Whereas, the current social events affecting the USA and the world make more imperative than ever to explore ways to enhance and strengthen international collaboration with educational organizations, and given the importance to explore and implement more effective ways to address common educational issues across countries, be it resolved that NARST join the International Association for the Advancement of Curriculum Studies. Be it further resolved that NARST donates $500 to the operating costs of this newly formed global organization.

Note: I have been elected to Chair the Affiliated Societies and Associations Committee of this international organization. The meetings will be held every three years, and the first meeting will be in Shanghai, China in 2003. Bill Pinar is the current President. By joining IAACS all NARST members will automatically become members of this organization.

III. The Multimedia Equity Room (MER)

Even though the novel format session by Rodriguez and Yerrick for presenting research using a variety of multimedia tools was scheduled for the last day of the conference and for the last session of the day, they had a good turn out of national and international members. We hope to set up a Multimedia Equity Room again for the upcoming conference in New Orleans with the support of Apple computers—and of course the Board. The room will be available to all members of the Equity and Gender issues strand interested in showcasing their research work in a room equipped with several apple computers and other multimedia equipment. Randy Yerrick and Rodriguez have prepared a simple application form that will assist David Zanduliet schedule all related presentations in the MER room. We appreciate the support and interest of the Board in exploring novel and more engaging formats for members to present their research work at annual meetings. Note: These computers will be available free of charge.

Membership
NARST summer Board Meeting Report
October 19-20, 2001

Submitted by: J. Randy McGinnis, Chair, 2004, (jm250@umail.umd.edu)

Committee Membership:

Peter Rubba, 2002, (PAR4@PSU.EDU)
Joe Engleman, 2002, (ENGEMANN@ED.BROCKU.CA)
Laura Barden, 2003, (lm-barden@wiu.edu)
Jazlin Ebenezer, 2004, (unknown)
Rola Khishfe, 2004, (rolak2@hotmail.com)
Ex-officio: **Norman G. Lederman**

I. Committee Charges

The Membership Committee recruits members to NARST and ensures that the organization is responsive to the on-going needs of the membership.

II. Summary of Activities and Accomplishments

1. The committee convened at the 2001 NARST annual meeting (2 committee members were present, Joe Englemann and Laura Barden, and four visitors, Joe Pomeroy (jrpomeroy@ucdavis.edu) , Holly Priestly (holly@vm.temple.edu), Bill Priestly , retiring committee member (wpriest@vm.temple.edu), and Bill Holliday (wh22@umail.umd.edu). In addition, the former committee Chair (K. Fisher) and the incoming committee Chair (R. McGinnis) were present. The committee discussed the committee charge, reviewed the activities of the previous year that culminating in the Membership Committee's sponsored sessions, and elicited additional ideas. The committee thanked Bill Holliday for his long-term assistance with the evening "New Generation of Researcher's Reception." In considering future sessions sponsored by the Membership Committee, consensus was reached that the "New Generation of Researcher's Reception" should be maintained, along with some type of sessions that explored in some manner the topics discussed in the 2001 annual conference sessions entitled "New Generation: From Dissertation to the Early Years," "New Researcher: Success in the Early Years." In addition, the "Mentor/Mentee Orientation" (hosted by Leslie Jones and Bill Priestley) was viewed as a success, and identified for continuing as a session at the next NARST annual conference. Discussion also was directed at ways to advertise the 2002 NARST annual meeting so as to recruit new members. Holly Priestley volunteered to make contact with teacher education groups local to New Orleans and with the chemistry education community. Bill Priestley also volunteered along with Holly to greet new 2002 NARST conference attendees at the registration area

2. April.. The Membership Chair met with Bill Holliday and secured his commitment to host the 2002 "New Generation of Researcher's Reception." Discussion included ideas on increasing audience participation.

3. July. The Membership Chair made contact with the 2002 NARST Program Coordinator (David Zandvliet) to begin plans for the scheduling of potential Membership Committee sponsored sessions. David was supportive and indicated that all information should be sent to him directly (in September, 2001).

4. August. The Membership Chair was approached by a graduate student, Ms. Carol Brandt, a Ph.D. candidate at the University of New Mexico, who wanted to develop a new session that would focus on graduate student professional development. She was encouraged to develop the idea under the sponsorship of the Membership Committee and to coordinate proposed dissuasion topics with Bill Holliday (so as to reduce replication). She did so. The Membership Chair provided Ms. Brandt guidance on session development sections (recruitment of a session panel, identification of topics, need for a moderator and discussant), and received her completed proposal session electronically. The proposed session expands on Ms. Brandt's original idea on graduate student professional development to include professional development for researchers as junior faculty. The proposal is attached for Board review.

5. September. The Membership Chair contacted Holly Priestley in regards to her proposed efforts for the Membership Committee. She informed the Chair that she had posted information of the 2002 NARST annual meeting on the Carolina Supply Calendar website. In addition, Holly posted notice of the 2002 NARST annual conference on the AETS Listserv.

III. Recommendations

1. To carry out the charges of the committee.
2. To contact the committee members and delegate responsibilities pertaining to the proposed membership sponsored sessions at the 2002 NARST annual meeting (particularly the Mentor/Mentee Orientation).

Appendix:
A Proposed New Session Sponsored by the NARST Membership Committee

Transition from Graduate Student to Successful Junior Faculty
(A Symposium)

Introduction
Few experiences in our graduate training prepare us for the baffling process of applying for faculty positions, and then adapting to that first year as a junior faculty. This 90-minute session is intended to de-mystify the process of making the transition from our role as graduate students to new faculty members. Each of the panelists below has recently navigated these murky waters; they offer their personal experience and resources that helped them to make decisions along the way.

Panelists:
Nedra J. Davis: Balancing Time, Energy and Commitments during the Dissertation
Kim Bilica: Mixed Identities - How to Situate Oneself in the "Gray Zone"
April Luehmann: Negotiating a Contract
Donna Ross: Accepting a Job and Being ABD
Hedy Moscovici: The Tenure Process
James T. McDonald: Resources for Making the Transition

Presider: Committee Member, NARST Membership Committee

Discussant: Jeff Bloom: Entering the Community of Researchers

Moderator: Carol Brandt, University of New Mexico, cbrandt@unm.edu

Nedra J. Davis: Balancing Time, Energy and Commitments during the Dissertation
Northern Arizona University, nedras@aol.com
Balancing personal and family demands with doctoral study requires planning ahead. Some tips for graduate students will be discussed with input from those who have gone before, or are currently in a doctoral program.

Kim Bilica: Mixed Identities
University of New York, Buffalo, kbilica@buffalo.edu
One challenge to junior faculty is learning to situate oneself in the "gray zone" between the end of a graduate career and the beginning of a career as full-time faculty. As we make this journey, several important personal conflicts arise. These issues include keeping and making contacts, perceiving oneself in old and new situations, and making the mental shift from "there" to "here" without going crazy.

April Luehmann Barab: Negotiating a Contract
Indiana University, abarab@indiana.edu
You go through your curriculum vitae preparation, the job talks and the interviews to hear the exciting news that they have chosen you! You have the job. But what comes next? If you are like me, you find yourself in the unfamiliar circumstances of negotiating "negotiations." Somewhat like buying a used car, there is a game of sorts in which you must engage to determine your salary, benefits, additional "perks" as well as academic responsibilities. To complicate matters, this negotiation process feels very personal in nature. It is essential that you understand the process so that you can maneuver through it with *grace*, *strength* and *integrity*. This requires an in-depth understanding of the process. What is negotiable and to what extent? How can negotiated issues serve to define your professional identity? Who can serve as mentors and in what capacity? What is worth fighting for? I will explore and share with you both my personal experiences with this process as well as advice from those who have mentored many through this process.

Donna Ross: Accepting a Job and Being ABD
San Diego State University, dlross@mail.sdsu.edu
Taking a job ABD: Lucky duck or sitting duck? Finding a great job before you finish the dissertation sounds perfect, and in many ways it is, but there are challenges to consider. Some the advantages include: a salary while you write, the envy of your Ph.D. program colleagues, a big incentive to finish the dissertation, and the lack of pressure to find a job before the student loans are due. Some of the potential disadvantages include the lack of time to write, the tenure clock ticking as you work on your dissertation, moving stresses when you should be writing, a deadline with potential to influence job security or salary, and a lack of status at the new university. This portion of the session will recommend ways to approach and manage a new job while finishing the dissertation.

Hedy Moscovici: The Tenure Process
California State University - Dominguez Hills, hmoscovici@research.csudh.edu
During our lives, we have to climb many mountains. The completion of the dissertation was not an easy mountain to climb. Now, after finishing we have a feeling of exhaustion, but also of fulfillment - we've made it. Well, there is no time to rest, as one needs to earn money. So, here we are again, trying to climb another mountain. This discussion on the tenure process will address various issues related to this topic:

- Meaning of tenure (different perspectives)
- Teaching, scholarship and service - matching university goals with career goals
- Getting involved - how much is too much?

James T. McDonald: Resources for Making the Transition
Purdue University, jimmc@purdue.edu
Online and printed resources will be shared with participants that cover a variety of subjects. These resources can help with dissertation writing, a forum to share with other graduate students, conducting a job search, enhancing teaching skills, improving technical skills and learning about the overall academic landscape as you make the

transition from graduate student to science education faculty. Resources from listservs, web pages, and books.

Jeffrey Bloom: Entering the Community of Researchers
Northern Arizona University, **Jeff.Bloom@NAU.EDU**
Entering into and working in the academic community of science education research and teacher education can be exciting, challenging, and stressful. My interests in this session are to explore the notion of "community of practice" (Wenger, 1998). Through an examination of the major aspects of community, meaning, practice, and identity, we will explore the more specific professional and personal dimensions, which characterize our development as full participants in the science education community, as well as agents of change within the community.

Report from NSTA representative to NARST Board of Directors
Maureen M. McMahon, Submitted: 9/15/01

Dear NARST Board Members:

NSTA has continued to work diligently over the past 6 months to increase their presence in the national legislative arena while moving more of their interests and efforts into growing as a professional development provider, specifically as a distance education provider.

Most importantly for NARST, however, we have made headway in creating a research-oriented joint NARST-NSTA publication(s). Last year at this time I reported that NSTA was eager and willing to collaborate with NARST to create and publish a joint teacher-friendly science education research series. At the Spring 2001 NARST and NSTA conferences in St. Louis, the research committees of both organizations committed to supporting this joint venture.

Frank Crawley (Research Coordinator, NARST) and I (Research Director, NSTA) worked with a Director of NSTA Press over the past several months to discuss the joint effort. A call for submissions has been drafted to be posted in NSTA Reports, on the NSTA website, NARST listserve and NARST website for the first issue of PEERs Matter (Practical Experience and Educational Research Matter) to be published in the summer of 2002. The broad theme of the first issue will be Assessment. The call for submissions is attached to this report. Frank Crawley and I will serve as co-editors for the first issue and our respective research committee members will serve as members of the joint editorial review board for this peer reviewed print/electronic journal. Note: Please refer to last year's BOD reports for structure details of the joint publication.

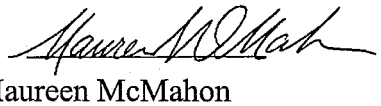
Items for Discussion

We need to discuss the joint responsibilities and royalties for this publication series.

Motions

Based on the joint publication discussion referred to above, I intend to make a motion regarding NARST making a commitment(s) to this effort for a two-year window of time, the scope of the commitment to be determined during discussion.

Respectfully submitted,



Maureen McMahon
California State University, Long Beach
Department of Science Education
mmcmahon@csulb.edu

American Association for the Advancement of Science Representation

No Report

International Council of Association for Science Education Representation

No Report

Report
October '01

Ad Hoc Committee on Environmental Science Education

Prepared by:
Dr. Michaela Zint, University of Michigan

The Ad Hoc Committee on Environmental Science Education (ESE) first met at the 2000 NARST Annual Meeting and met again during most recent 2001 Annual Meeting [minutes of both meetings are attached]. We request to continue to exist as a group to provide collaboration and networking opportunities for NARST members with ESE interests and to help attract new members who have research and teaching interests in ESE.

Considering that we have only been in existence for a short period of time, our group has been quite active. In addition to meeting during the NARST Annual Meetings, NARST members interested in ESE have been communicating via a list serv (i.e., NARST-EE@umich.edu) between meetings. The 2000 and 2001 meetings (during the same time as the Special Interest Group meetings) were attended by 17 and 16 individuals, respectively and our entire group currently consists of 53 members who have expressed an interest in ESE and participate on our list serv [NARST-ESE membership list is attached]. Last year, Yvonne Meichtry took the lead in managing our group's call for proposals for a NARST ESE symposium, resulting in 27 submission. Ten of these were presented as part of two symposia led by Yvonne Meichtry and myself during the 2001 Annual Meeting. There were also at least 20 additional ESE focused presentations during this past Annual Meeting. I am aware that Justin Dillon has submitted an ESE symposium for the upcoming 2002 Annual Meeting and again, expect many additional ESE focused presentations from our members. Our group hopes to meet again during the 2002 Annual Meeting at the same time as the Special Interest Group meetings (as that is what we are aspiring to).

As partly intended by the formation of our group, our ESE activities have managed to bring a number of new members to NARST and brought back past members who had left NARST because it had not met their ESE needs!

So far, there have been no official committee members other than Dr. Krajcik and myself as co-chairs. Instead, any NARST member with an interest in ESE has been invited to participate in our meetings during the Annual Meeting and via our list serv. Given our group's current size, I now believe it may be appropriate to form a committee to guide our future efforts. In light of their unique interest and past contributions, I recommend that *Drs. Yvonne Meichtry, Justin Dillon, Paul Hart,* and *William Carlson* be asked to serve in this capacity. I also believe it may be time for a new chair and recommend Yvonne Meichtry in light of her commitment to the group. Of course, I would be glad to continue to serve as well as a member of the committee.

One related question that I have is if space can be created for the Special Interest Groups and committees like ours on the NARST web page. We, for example, would like to post our minutes and membership list so that other NARST members and potential new NARST members can learn of our activities.

Any thoughts, suggestions are welcome and please direct any questions, comments, or concerns to me: Michaela Zint, zintmich@umich.edu, Ph (734) 763-6961.

Ad Hoc Committee on Environmental Science Education (ESE)
MINUTES of 2nd Meeting

Tuesday, March 27th, 8:30-10:30pm
NARST Annual Meeting 2001, St. Louis, MO

Organized and Minutes Prepared by:
Michaela Zint, University of Michigan

Sixteen participants attended this official meeting (see end of these minutes).

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Bill	Carlsen	Penn State	wcarlsen@psu.edu
Justin	Dillon	King's College London	justin.dillon@kcl.ac.uk
Paul	Hart	University of Regina	Paul.Hart@uregina.ca
Gail	Luera	University of Michigan-Dearborn	grl@umich.edu
Yvonne	Meichtry	Northern Kentucky University	Yvonne Meichtryy@nku.edu
Kyung-	Noh	Korea National Univ. of Edu.	kinoh@hanmail.net

Ian			
Irene	Teh-Cheong	Curtin University of Technology	tehcheon@ses.curtin.edu.au
Wolff-Michael	Roth	University Victoria	mroth@uvic.ca
Ali	Sammel	University of Western Ontario	asammel@golden.net
Rowena	Scott	Curtin University, Australia	rowena@brunet.bn
Tali	Tal	Technion	rtal@tx.technion.ac.il
Valerie	Talsma	University of Pittsburgh	vtalsma@pitt.edu
David B.	Zandvliet	Simon Fraser University	dbz@sfu.ca
Michaela	Zint	University of Michigan	Michaela Zintmich@umich.edu
Uri	Zoller	Haifa University-Oranim	uriz@research.haifa.ac.il

Ad Hoc Committee on Environmental Science Education
MINUTES

Prepared by Michaela Zint
Sunday, April 30th, 8-10pm
NARST Annual Meeting 2000, New Orleans

Organizers:
Michaela Zint, SNR&E, University of Michigan
Joseph S. Krajcik, SOE, University of Michigan

Seventeen participants attended the meeting (see end of these minutes).

Zint began by explaining that this meeting came about as a result of an informal conversation with Krajcik. At this meeting Zint expressed the need for greater networking opportunities with environmental education faculty members and Krajcik suggested that NARST may provide such a forum. The day's ad hoc meeting was set up as a result. Zint also explained that Krajcik was unable to attend due to a scheduling conflict.

Zint suggested the following agenda, approved by participants:

(1) learn about colleagues' interests with regard to environmental education,
(2) learn about relevant support networks/groups, and
(3) suggest potential roles for NARST.

(1) Introductions

Each participant briefly had an opportunity to describe his/her interest in environmental education research, teaching, and service. It was also noted that there were a number of individuals who had expressed an interest in attending meeting but were unable to participate for a variety of reasons, and that informal conversations suggested that many NARST members had an interest in environmental education.

(2) Networks/groups

The following formal ways to network for academicians interested in environmental education were identified:

American Educational Research Association
- Ecological and Environmental Education Special Interest Group
  - http://www.uwsp.edu/acad/educ/hstmauri/eesig.htm
  - Newsletter
  - http://www.uwsp.edu/acad/educ/hstmauri/eesigp.htm

Geographical Association
- (http://www.geography.org.uk/home.htm)
- Environmental Education Working Group
  - (Info will be available on GA www site in near future)

Report
October '01

Ad Hoc Committee on Environmental Science Education

Prepared by:
Dr. Michaela Zint, University of Michigan

The Ad Hoc Committee on Environmental Science Education (ESE) first met at the 2000 NARST Annual Meeting and met again during most recent 2001 Annual Meeting [minutes of both meetings are attached]. We request to continue to exist as a group to provide collaboration and networking opportunities for NARST members with ESE interests and to help attract new members who have research and teaching interests in ESE.

Considering that we have only been in existence for a short period of time, our group has been quite active. In addition to meeting during the NARST Annual Meetings, NARST members interested in ESE have been communicating via a list serv (i.e., NARST-EE@umich.edu) between meetings. The 2000 and 2001 meetings (during the same time as the Special Interest Group meetings) were attended by 17 and 16 individuals, respectively and our entire group currently consists of 53 members who have expressed an interest in ESE and participate on our list serv [NARST-ESE membership list is attached]. Last year, Yvonne Meichtry took the lead in managing our group's call for proposals for a NARST ESE symposium, resulting in 27 submission. Ten of these were presented as part of two symposia led by Yvonne Meichtry and myself during the 2001 Annual Meeting. There were also at least 20 additional ESE focused presentations during this past Annual Meeting. This year I am aware that two ESE symposia have been submitted for the upcoming 2002 Annual Meeting by members of our group, one by Justin Dillon and one by Paul Hart. I am also again expecting many additional individual ESE focused presentations from our members. Our group hopes to meet again during the 2002 Annual Meeting at the same time as the Special Interest Group meetings (as that is what we are aspiring to).

As partly intended by the formation of our group, our ESE activities have managed to bring a number of new members to NARST and brought back past members who had left NARST because it had not met their ESE needs!

So far, there have been no official committee members other than Dr. Krajcik and myself as co-chairs. Instead, any NARST member with an interest in ESE has been invited to participate in our meetings during the Annual Meeting and via our list serv. Given our group's current size, I now believe it may be appropriate to form a committee to guide our future efforts. In light of their unique interest and past contributions, I recommend that *Drs. Yvonne Meichtry, Justin Dillon, Paul Hart,* and *William Carlson* be asked to serve in this capacity. I also believe it may be time for a new chair and recommend Yvonne Meichtry in light of her commitment to the group. Of course, I would be glad to continue to serve as well as a member of the committee.

One related question that I have is if space can be created for the Special Interest Groups and committees like ours on the NARST web page. We, for example, would like to post our minutes and membership list so that other NARST members and potential new NARST members can learn of our activities.

Any thoughts, suggestions are welcome and please direct any questions, comments, or concerns to me: Michaela Zint, zintmich@umich.edu, Ph (734) 763-6961.

Ad Hoc Committee on Environmental Science Education (ESE)
MINUTES of 2nd Meeting

Tuesday, March 27th, 8:30-10:30pm
NARST Annual Meeting 2001, St. Louis, MO

Organized and Minutes Prepared by:
Michaela Zint, University of Michigan

Sixteen participants attended this official meeting (see end of these minutes).

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Kyung-	Noh	Korea National Univ. of Edu.	kinoh@hanmail.net

Ian			
Irene	Teh-Cheong	Curtin University of Technology	tehcheon@ses.curtin.edu.au
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Environmental Education Working Group
(Info will be available on GA www site in near future)

North American Association for Environmental Education
http://www.naaee.org/
Higher Education Commission
Research Commission

eefac@eelink.net (managed by Zint, zintmich@umich.edu)
[This list serv is currently restricted to faculty who teach environmental education methods courses as included in "Environmental Education Undergraduate and Graduate Programs and Faculty in the United States" http://www.naaee.org/html/pubintro.htm]

env-ed-research@mailbase.ac.uk (managed by Alan Reid)
[Info about this list is at http://www.mailbase.ac.uk/lists/env-ed-research/]

The following peer reviewed journals that focus on environmental education were also identified:

Australian Journal of Environmental Education (refereed)
[Information will be included in the reconstructed Australian Association for Environmental Education www site in the future, for more information currently contact Annette Gough, aggough@deakin.edu.au]
Canadian Journal of Environmental Education
http://www.edu.uleth.ca/ciccte/cjee/default.html
Eingana, journal of the Victorian Association for Environmental Education, Australia
[For more information contact Pam Welsford, vaee@netspace.net.au]
Environmental Education Research
http://www.tandf.co.uk/journals/carfax/13504622.html
Journal of Environmental Education
http://www.heldref.org/html/body_jee.html
International Journal of Environmental Education and Information
http://www.salford.ac.uk/env-res/eei/eei.html
International Research in Geographical and Environmental Education
http://www.catchword.co.uk/titles/10382046.htm
Related journals:
Journal of Experiential Education
Journal of Interpretation (Canada)
Journal of Interpretation (USA)
Journal of Outdoor Education
More are listed at http://eelink.net/ee-research.html

(3) NARST's Role

After a brief discussion, participants concluded that it was necessary to pursue the establishment of an environmental science education special interest group within

NARST. This decision was based on the observation that the many NARST members interested in this topic will otherwise not be able to have their expectations met by the association (e.g. presentations as part of related vs. unrelated conference sessions, pre-conference workshops focused on environmental science education, articles in NARST publications). It was also recognized, however, that there should be close ties to other groups within NARST with relevant interests such as the proposed informal science education special interest group.

It was also agreed that proposed special interest group and its associated activities be entitled "environmental science education" vs "environmental education." Environmental education is not equal to environmental advocacy but many misperceive it as such. Adding the term "science" was suggested as a way to help to overcome this credibility issue. However, it was also recognized that environmental education is an interdisciplinary activity that involves the natural and social sciences. There was some concern that by using "environmental science education" the group might be perceived as biased toward the natural sciences. In addition, participants felt that the group's activities should not just focus on sub-urban and rural audiences but also urban audiences (which have traditionally not been the focus of environmental education activities). Finally, the group felt that there was a need to highlight quality environmental education research to enhance the credibility of this discipline within NARST.

The group decided that within the next year it would try to organize a pre-conference workshop and/or symposium at the next NARST conference focusing on research in environmental science education (NOT program development). Carlson and Meichtry respectively, agreed to coordinate these activities. It was also suggested that the group coordinate a special workshop to be held in coordination with AERA in 2002.

At this point the group decided to adjourn and continue discussions via a group email (NARST-EE@umich.edu) which Zint agreed to set up. Zint ended the meeting by thanking participants for attending the meeting and Krajcik for his support.

Organizers:

Michaela Zint	SNR&E, University of Michigan	zintmich@umich.edu
Joseph S. Krajcik	SOE, University of Michigan	krajcik@umich.edu

Participants:

Eleanor Abrams	University of New Hampshire	eleanor.abrams@unh.edu
Ulrich Bosler	IPN Kiel	bosler@ipn.uni-kiel.de
Bill Carlsen	Cornell University	wsc2@cornell.edu
Kim Dahl	Teague Middle School	kim_dahl@scps.k12.fl.us
Justin Dillon	King's College London	justin.dillon@kcl.ac.uk
Celia Evans	University of New Hampshire	celia.evans@unh.edu
Kass Hogan	Institute of Ecosystem Studies	hogank@ecostudies.org
Beth Klein	SUNY Cortland	kleine@cortland.edu
Yvonne Meichtry	Northern Kentucky University	meichtryy@nku.edu
Anneliese Mueller	University of New Hampshire	amueller@cisunix.unh.edu
Dan Shepardson	Purdue University	dshep@purdue.edu
Tali Tal	University of Michigan	tal@umich.edu
Valerie Talsma	University of Pittsburgh	vtalsma@pitt.edu

Starlin D. Weaver — Salisbury State University — sdweaver@ssu.edu
Brian White — Univ. of Massachusetts Boston — brian.white@umb.edu

Current NARST members with an interest in ESE who actively participate:

Eleanor	Abrams	University of New Hampshire	eleanor.abrams@unh.edu
Rita	Bell	Monterey Bay Aquarium	rbell@mbayaq.org
Kathleen K.	Blouch	Capital Area Inst.for Math. & Science	kblouch@mathscience.org
Alec M.	Bodzin	Lehigh University	amb4@lehigh.edu
Ulrich	Bosler	IPN Kiel	bosler@ipn.uni-kiel.de
Michael	Bower	Lakehead University	gmbower@compuserve.com
Bill	Carlsen	Penn State	wcarlsen@psu.edu
Jennifer	Chidsey	Ross School	jlchidsey@hotmail.com
Pauline	Chinn	University of Hawaii	chinn@hawaii.edu
Kim	Dahl	Teague Middle School	kim_dahl@scps.k12.fl.us
Nancy T.	Davis	Florida State University	ntdavis52@yahoo.com
Rachael	Dempsey	Inst. for Science Education, Germany	RCDempsey@aol.com
Justin	Dillon	King's College London	justin.dillon@kcl.ac.uk
Don	Duggan-Haas	Kalamazoo College	haasdona@pilot.msu.edu
Daniel C.	Edelson	Northwestern University	d-edelson@northwestern.edu
Celia	Evans	University of New Hampshire	celia.evans@unh.edu
Marcia	Fetters	University of Toledo	mfetter2@pop3.utoledo.edu
Rosanne W.	Fortner	Ohio State University	fortner.2@osu.edu
Allan	Harrison	Central Queensland University	a.harrison@cqu.edu.au
Paul	Hart	University of Regina	Paul.Hart@uregina.ca
Kass	Hogan	Institute of Ecosystem Studies	hogank@ecostudies.org
Beth	Klein	SUNY Cortland	kleine@cortland.edu
Dave	Klindienst	Pennsylvania State University	dbk3@psu.edu
Joseph S.	Krajcik	University of Michigan	krajcik@umich.edu
Bridget	Lewin	University of California Santa Barbara	lewin@sbceo.org
Gail	Luera	University of Michigan-Dearborn	grl@umich.edu
Ted	May	North Dakota State University	Ted_May@ndsu.nodak.edu
Jim	McDonald	Purdue University	jimmc@purdue.edu
Andrea	McLoughlin	Long Island University	amclough@liu.edu
Yvonne	Meichtry	Northern Kentucky University	meichtryy@nku.edu
Anneliese	Mueller	University of New Hampshire	amueller@cisunix.unh.edu
Kyung-Ian	Noh	Korea National Univ. of Edu.	kinoh@hanmail.net
Timothy P.	Olsen	University of Wisconsin-Madison	tpolsen@facstaff.wisc.edu
Tony	Olusanya	Lagos State University, Nigeria	oakolusanya@hotmail.com
Wolff-Michael	Roth	University Victoria	mroth@uvic.ca
Troy	Sadler	University of South Florida	tsadler@tempest.coedu.usf.edu
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Bonnie	Shapiro	University of Calgary	bshapiro@ucalgary.ca
Dan	Shepardson	Purdue University	dshep@purdue.edu

Lucille (Lucy)	Slinger	University of Wisconsin - La Crosse	slinger.luci@uwlax.edu
Tali	Tal	Technion	rtal@tx.technion.ac.il
Valerie	Talsma	University of Pittsburgh	vtalsma@pitt.edu
Irene	Teh-Cheong	Curtin University of Technology	irenecpa@shbie.ubd.edu.bn
Jeff	Thomas	University of Southern Indiana	jthomas@zebra.net
John	Trowbridge	Southeastern Louisiana University	jtrowbridge@selu.edu
Starlin D.	Weaver	Salisbury State University	sdweaver@ssu.edu
Nicole	Weber	UMASS Boston	weberphin@hotmail.com
Sandra S.	West	Southwest Texas State University	sw04@swt.edu
Brian	White	UMASS Boston	brian.white@umb.edu
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Michaela	Zint	University of Michigan	zintmich@umich.edu
Uri	Zoller	Haifa University-Oranim	uriz@research.haifa.ac.il

Report of the *Informal Science Education Ad Hoc Committee*

Lynn D. Dierking, Institute for Learning Innovation
John H. Falk, Institute for Learning Innovation
Patricia Simmons, University of Missouri at St. Louis
Léonie Rennie, Curtin University of Technology
David Anderson, Queensland University of Technology
Kirsten Ellenbogen, King's College London
Eric Pyle, Western Virginia University
Angela Barton, University of Texas-Austin
Julie Thomas, Texas Tech University

October 5, 2001

Introduction

In the spring of 1999, an ad hoc committee focused on Informal Science Education was established by the Board with the goal of exploring interest among NARST members for additional leadership by the NARST organization in the area of informal science learning research. A major task in 2000 was to survey NARST members about their perceptions of the NARST organization's positioning relative to out-of-school, informal science learning, including their interest in the NARST organization increasing their profile in this research area. A report detailing the findings of the survey and discussing its implications and recommendations for NARST was presented to the Board in September 2000. The Board and leadership of the NARST organization endorsed the findings and recommendations of the ad hoc committee, directing us to develop a plan for a strategic initiative in the area of Informal Science Education. The Ad Hoc Committee did so and developed the following goals for 2001-2002:

1) Play an advocacy role within the NARST science education community (educators, administrators, politicians and researchers) by more clearly identifying and describing the vast number of ways and places in which people of all ages learn science.

2) Work within the NARST organization and leadership to explore collaborative research initiatives and conference session opportunities.

3) Explore strategies for recruiting and retaining NARST members with specific research interests in this area.

4) Explore mechanisms to build and nurture a strong community of researchers in this area, with opportunities to work on collaborative research projects, discuss findings and issues and share their research findings with one another and the larger NARST science education community.

This report summarizes the progress of the Ad Hoc Committee on our 20010-2002 goals to date and describes our action plan leading up to the Annual Meeting.

Progress To Date on 2001-2002 Committee Goals

At the 2001 annual meeting in St. Louis the committee organized our 2001-2002 activities and developed the following objectives and concrete action plan:

1) Develop a policy statement in the area of informal science education research that can be used by the NARST organization to promote and advocate the importance of out-of-school science learning and the need for scholarly research in the area.

2) Explore the feasibility/need for facilitating more exchange within this community of researchers, by exploring various strategies such as the creation of a web-based discussion site or special site with information regarding research on such learning.

3) Facilitate discussions within the NARST organization and leadership to explore collaborative research initiatives and conference session opportunities.

4) Develop a membership development strategy to recruit and retain NARST members with specific research interests in this area.

5) Discuss the future of the ad-hoc committee to determine whether it is ultimately the best mechanism for organizing and implementing this strategic initiative.

The Ad Hoc Committee has made the most progress on Objective 1 and 2. At this point, we have an agreed upon definition for this arena of research, embedded within the beginnings of a draft policy statement to present to the Board at the Spring 2002 Board meeting (see Appendix A). This policy statement will more clearly identify and describe the variety of out-of-school environments in which science learning occurs, the issues related to conducting research in the area and begin to lay out a potential research agenda for the field. Within this policy statement also are initial recommendations for building and facilitating this community of researchers, as well as recommendations for opportunities for collaborative research initiatives with other research areas in NARST. We are also exploring an appropriate moniker for this area of research (e.g., informal, out-of-school, free-choice, lifelong, public understanding of science, etc.).

Our plans through the 2002 Annual meeting include to:

1) expand and refine the policy statement;
2) initiate discussions within the NARST organization and leadership to explore collaborative research initiatives;
3) develop a membership development strategy to recruit and retain NARST members with specific research interests in this area; and,
4) recommend the best future mechanism for implementing this strategic initiative, including a discussion about the future of the ad-hoc committee.

Appendix A

Draft Policy Statement

Informal Science Education Ad Hoc Committee

Policy Statement

Defining the Domain

Informal Learning is the most commonly applied term for the learning that occurs outside of the traditional, formal schooling realm (pre-college, university and advanced degrees). It has significant limitations because it artificially delimits efforts to describe the type of real world learning that humans engage in daily; learning that occurs across a broad spatial and temporal context, both inside and outside of schooling. As a growing number of researchers choose to try and understand how people come to learn about the world, it has become increasingly apparent that such understanding must include more than just the experiences of schooling.

At the core of this effort to understand real world learning is a firm belief that learning rarely, if ever, occurs and develops from a single experience. Rather, learning in general, and science learning in particular, is cumulative, emerging over time through myriad human experiences, including, but not limited to experiences in museums, schools, while watching television, reading newspapers and books, conversing with friends and family, and increasingly frequently, through interactions with the Internet. The experiences children and adults have in these various situations dynamically interact to influence the ways individuals construct scientific knowledge, attitudes, behaviors and understanding. In this view, learning is an organic, dynamic, never-ending, and quite holistic phenomenon of constructing personal meaning. This broad view of learning recognizes that much of what people come to know about the world, including the world of science content and process, derive from real world experiences within a diversity of appropriate physical and social contexts, motivated by an intrinsic desire to learn.

Historically much of the research on this type of learning has occurred within museum-like settings. Learning from museums, or other comparable educational institutions (zoos, aquariums, nature centers, etc.), actually represents a very nominal number of the situations in which this type of learning occurs. However, the growing body of research on learning in and from museum-like settings provides an important baseline of understanding about learning in such free-choice situations. Clearly lacking, though, are comparable studies of learning from film, radio, community-based organizations like scouts, and summer camps, home and friends, the work place, the Internet and a whole range of other real-world situations.

As the desire to investigate learning in these settings increases, the need for an enhanced theory of real world, lifelong learning becomes critical. The conceptual and methodological challenges engendered by this type of research have only begun to be understood. The National Association for Research in Science Teaching has an opportunity to play a significant role in fostering and advancing research into the long-term, cumulative nature of science learning; learning that is strongly socioculturally mediated and occurs across a wide range of physical contexts beyond

schooling. The result will be a more holistic, large-scale understanding of the entire learning process, both inside and outside of schooling environments.
Implicit in this thinking is a discussion of an appropriate moniker for this area of research. There are many possibilities, (e.g., informal, out-of-school, free-choice, lifelong, public understanding of science, etc.). The Ad Hoc Committee is still considering the appropriate one, however, they do know that it needs to reflect the following: learning that is self-directed, voluntary, and guided by the learner's needs and interests-learning that is engaged in throughout his or her life (Informal Learning Environments Newsletter, May/June, 1998; Daedalus, 1999; Teachers College Press, 2001; Falk & Dierking, in press).

Clearly there is a trend toward this type of research in the field, which NARST has participated in by establishing Strand 9, supporting the joint AERA/NARST session at the Year 2000 annual meeting and by publishing a paper set devoted to the topic in the Journal for Research in Science Teaching. However, it is the Ad Hoc Committee's feeling that the NARST organization could be doing more to support scholarship in this arena. In the past 5-10 years interest in this area of research has grown tremendously. The American Educational Research Association now has an Informal Learning Environments Special Interest Group with a bi-yearly newsletter. In 1998 the journal Science Education initiated a permanent special section on Informal Science Education, due in great part to the success of a special issue devoted to that topic in 1997, Volume 81(6), and in 1998, the National Science Teachers Association published a policy statement on informal learning. These are all-important efforts, but the ad hoc committee still feels there is a leadership role that could be played by the NARST organization.

NARST has a potential opportunity to take a leadership role by supporting research in this area of out-of-school learning. By raising the profile of such research, the committee feels that NARST would demonstrate its understanding of the fundamental role that such learning plays in the lives of children and adults across the life span. By promoting a broader definition and framework for this type of learning and efforts to investigate its relationship to learning from schooling environments, NARST has an opportunity to shape a larger vision for the 21st Century Learner that includes informal (free-choice) learning.

Issues Related to Conducting Research in this Domain

In the past decade research in neuroscience has demonstrated that learning is strongly influenced by prior knowledge and experience, interest and motivations, all shaping the expectations that people have for a learning experience. Learning is also a cumulative process--it can take days, weeks, or even months for new experiences to be sufficiently integrated with prior knowledge before learning is measurable, let alone noticeable, even to the learner. New data also suggests that most learning has more to do with consolidation and reinforcement of previously understood ideas than with the creation of totally new knowledge structures. And neuroscience research also demonstrates the importance of motivation, interest and emotion in the learning process itself, suggesting that when people are interested and curious about something, there is a high possibility that they will follow up on that feeling with action, resulting in meaningful learning.

To frame research to investigate such meaningful learning the research designs should:

1) investigate learning in authentic situations, so that their learning is studied in "real" contexts;

2) include multiple, creative methodologies for assessing learning in a variety of ways;

3) be opportunities for the group to be the unit of analysis, not just individuals;

4) include efforts to investigate the learning that happens both at home and in the community, and include efforts to demonstrate the connections between these experiences and schooling environments;

5) investigate the processes of learning as well as the products of learning; and,

6) be longitudinal with opportunities to track children for several years to see how experiences are used and connected to subsequent experiences.

Recommendations

The committee recommends several ways that the NARST organization could provide leadership in this area including:

1) Promote an awareness of the vast number of ways, ages and places in which a person learns science and the importance of conducting scholarly research in this arena;

2) Play an advocacy role by bringing to the educational community's (teachers, administrators, politicians and researchers) attention the place and value of these settings;

3) Encourage the search for methodologies that are appropriate to this area of research and support their refinement and validation;

4) Continue to support collaborative sessions such as the successful jointly sponsored AERA/NARST pre-conference workshop at the 2000 meeting;

5) Support and encourage collaborative research, with informal science researchers being natural research partners with others in NARST doing more formal research, for example, encouraging research that explores the intersections between the Technology and Informal Science might be beneficial.

6) Initiate the creation of a web-based discussion site and special site for information regarding research on learning in informal settings;

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Estes, Marilyn

From: Emily van Zee [evz@wam.umd.edu]
Sent: Monday, October 01, 2001 11:09 AM
To: Sandra Abell; EstesMa@missouri.edu
Subject: report from Ad Hoc Committee on Practitioner Research

Here it is!
Emily and Debi

Report from Ad Hoc Committee on Practitioner Research

Co-Chairs:
Deborah Roberts, Montgomery County Public Schools, Maryland
Emily van Zee, Science Teaching Center, University of Maryland College Park

Committee Members:
Mary Bell, Glenn Dale Elementary School, Glenn Dale, MD; Allen Feldman, University of Massachusetts; Monica Hartmann, University of Michigan; Chris Horne, Frederick County Public Schools, MD; Elaine Howes, Columbia University; Chin-Tang Liu, Temple University; Connie Nissley, Green Acres School, Md; Kathleen Roth, Michigan State University and LessonLab Inc; Jim Minstrell, Talaria, Inc., Deborah Smith, Michigan State; Maria Varelas, University of Illinois.

I. Summary

We deeply appreciate the decision to schedule a reception for teacher researchers during the 2001 annual meeting in St. Louis and recommend that this welcoming effort continue. About 40 people came and enjoyed having an informal setting to meet one another and share experiences. Participants included both K12 teachers and college faculty interested in studying their own teaching practices. Some teachers who presented Monday were unable to attend the reception Monday evening as they had to return to school on Tuesday and left before the reception. We recommend that the teacher researcher reception be scheduled for Sunday evening.

The co-chairs of the committee organized several sessions at the 2001 annual NSTA and NARST meetings, both in St. Louis, to provide contexts for practitioner researchers to present their studies and to learn from one another. Thirty presenters participated in the joint NSTA/NARST Poster Session for Teachers Inquiring into Science Learning and Teaching at the NSTA meeting on Saturday, March 24. Many of these also participated in a discussion session that immediately followed the poster session: Teachers as Researchers: Who? What? When? Where? Why? We hope to replicate this format at the 2002 NSTA meeting in San Diego. A joint NSTA/NARST poster session already has been approved. We await decision for a second session that we submitted directly to NSTA for the 2002 meeting.

The president, Sandra Abell, organized a symposium: Research into Practice/ Practice into Research: A Symposium for Teacher Researchers, which was well attended on Monday, March 26 (43 participants). Several teachers and college faculty described their histories as teacher researchers, how they became interested in documenting their own teaching practices, what questions they have about this kind of research, and where the field is heading.

The co-chairs of the committee facilitated a NARST session with a novel format: Collaborative Inquiry on the Process of Researching While Teaching (46 participants). After all participants introduced themselves, presenters from the joint NSTA/NARST poster session met in small groups with other participants to talk about how they had collected and interpreted their data. Then we re-convened as a large group to discuss issues that arise in this kind of research.

Participants in the collaborative inquiry also responded to a questionnaire about methodology that they use and issues they would like to see NARST address. Many participants felt that there should be more emphasis on teacher research at NARST. Several suggested developing a "whole new strand" on teacher research for NARST, stressing the value and importance of teacher research. Several felt there should be some emphasis put on developing more and better collaboration between university researchers and teacher researchers. Having teacher research accepted by the scientific community was also mentioned. Other issues were support issues. Participants were looking for guidance on conducting action research, help in finding ways to do teacher research such as how and where to write grants, and help in understanding the many different types of software available to help in analyzing data.

At our committee meeting, we discussed a variety of issues that need to be addressed. These included consideration of ethical issues surrounding human subjects consent, ways to increase participation of teachers in NARST, and suggestions for improving communication. We agreed to begin planning a teacher researcher conference to coincide with the NSTA and NARST meetings in Philadelphia in 2003. We also began planning components of a webpage for teacher researchers.

Plans underway include the already approved joint NSTA/NARST poster session at the 2002 NSTA meeting in San Diego, a submitted NSTA session that would provide a context for discussion researching while teaching, and a submitted novel format session at the 2002 NARST session in New Orleans to continue our collaborative inquiry. We also submitted a proposal for a pre-conference workshop, Inquiring into One's Own Teaching Practices. In addition, we have begun constructing a webpage through blackboard.com.

II. Committee Meeting, March 26, 2001 in St. Louis

The Ad Hoc Committee on Practitioner Research held its second meeting on March 26, 2001 in St. Louis. Participants included Mary Bell, Glenn Dale Elementary School, Glenn Dale, MD; Monica Hartmann, University of Michigan; Chris Horne, Frederick County Public Schools, MD; Chin-Tang Liu, Temple University; Connie Nissley, Green Acres School, Md; Deborah Roberts, Montgomery County Public Schools, MD: Kathleen Roth, Michigan State University and LessonLab Inc; Emily van Zee, University of Maryland, College Park; and Maria Varelas, University of Illinois, Chicago.

We discussed a variety of issues that need to be addressed:

Human subjects procedures:
We need to address issues relevant to obtaining consent from students to collect data in one's own classroom. Rules may be more strictly interpreted and enforced than in the past. At Maria's institution, for example, all research was halted until human subject procedures were revised. Now faculty can not access data collected in their own classrooms until students have completed not only the course, but also the course sequence. At schools, teachers can not access data until students graduate from the school.

Participation issues:
If teachers are to become more involved in NARST, we need:
to find ways to fund their on-going participation
(travel grants from corporations?)
to contact and interest local teachers in participating
(lower or no registration fee?)
to encourage more positive discourse during sessions
(constructive comments)
to provide a program that meets needs and interests
to schedule relevant sessions on Saturday or Sunday
to schedule activity on first night (reception)
Poster session?
to schedule formats with more participation (small groups?)

Possible action plan:
Plan a Teacher Research Conference in 2003 when NSTA and NARST are again together (Philadelphia); we may be able to get funding from Spencer or Carnegie Foundations

Communication issues:
We need a way to identify members who are teachers on membership form, proposal forms
Like NSTA categories on registration form

We need to develop a NARST teacher researcher web page
Access to relevant literature
Examples of teacher research
Place to find out what teachers are doing
List of relevant conferences
Links to relevant resources

Researchers need to hear the voices of teachers in response to findings.
Teachers could discuss research with researcher in small groups. Research should speak to teachers.

III. Activities during the 2001 NSTA and NARST Meetings

Activities for teacher researchers at the 2001 annual meeting were well attended. The activities included:

Joint NSTA/NARST Poster Session for Teachers Inquiring into Science Learning and Teaching, Saturday, March 24, 3:30-4:30 p.m., organized by Deborah Roberts and Emily van Zee (30 presenters)

Relevant NSTA session: Teachers as Researchers: Who? What? When? Where? Why? Saturday, March 24, 5:00-6:00 p.m., organized by Deborah Roberts and Emily van Zee (about 30 participants) (See below for summary of responses to questionnaire)

Symposium: Research into Practice/Practice into Research: A Symposium for Teacher Researchers, chaired by Sandra Abell, Monday, March 26, 1-2 p.m.
(43 participants)

Collaborative Inquiry on the Process of Researching While Teaching, Monday, March 26, 3-4 p.m., chaired by Deborah Roberts and Emily van Zee (46 participants) (See below for summary of responses to questionnaire)

Reception for Teacher Researchers, Monday, March 26, 7:30-8:30 p.m.
(About 40 participants) (See below for summary of responses to questions)

IV. Responses to Questionnaires Distributed at Sessions during the 2001 Annual Meeting

At several of the above activities, we distributed questionnaires to document participants' interests and concerns. Summaries of the responses are included below:

Summary of Responses to NSTA/NARST Questionnaire

At the 2001 National Science Teachers Association annual meeting in St. Louis, there was a joint NSTA/NARST poster session for teachers inquiring into science learning and teaching. Immediately following the poster session, there was a session entitled Teachers as Researchers: Who? What? When? Where? Why? at which about thirty participants in the poster session and others engaged in a conversation about teaching and researching in one's own classroom. Seventeen participants responded to a questionnaire about ways in which they were inquiring into science learning and teaching and issues that they would like to see addressed. Here is a summary of their responses:

In what ways are you inquiring into science learning and teaching? Common themes in the responses included finding out how to collect data, what constitutes data, how to handle audio and video taping in the classroom and then transcribing those tapes, and what time commitment is involved in that. Some participants were interested in better understanding inquiry teaching, the meaning of the term "inquiry," and ways to improve skills in asking questions, engaging students in inquiry, and soliciting opinions and comments from students. Along the same lines were interests in using discussion to help children with special needs, using student writing to learn about student understanding, and helping students learn to work cooperatively. Others were studying what student teachers believe about teaching before they engage in teaching, and what conceptions they have about science learning and teaching before they study methods of teaching. There were interests in understanding how teachers relate to student teachers, and how the in-service teachers make comments on units designed by pre-service teachers. Several people were interested in how to better prepare student teachers for working in an urban environment, and how to entice them to choose an urban school, and then how to keep them there.

Issues that the participants would like addressed were mostly support issues; what are good instruments to use to gather data, what support is available to teachers doing research, what grants are available, and what are the best sources of information for teachers via the internet. Some were interested in pursuing learning issues, such as: student conceptual understanding, creating an environment for learning science and looking at interactions between student and teacher, and student to student, in the science classroom. Several participants mentioned that they would like to see professional development for science teachers offered. Also several were interested in finding ways to better disseminate research to others, and putting more emphasis on doing research while teaching.

The comments offered were positive, people enjoyed hearing others' perspectives and ideas, networking and connecting with like-minded colleagues, listening to others and getting new ideas. Some were surprised by the ideas shared of what teacher research is, and found the session to be motivating. Most felt the session was informative and that teachers reflecting on their own practices was important work. Some participants felt affirmed by the experience. One person put it this way - It will be hard to convey to others this powerful experience.

Summary of Responses to NARST Session Questionnaire

At the 2001 annual meeting of the National Association for Research in Science Teaching in St. Louis, forty six teachers and researchers participated in a Collaborative Inquiry about the Process of Researching While Teaching. Although the group was large, we arranged the chairs in a circle and began by going around the circle introducing ourselves as a way to get to know one another's names and research interests. Then we met in small groups with presenters from the NSTA/NARST poster session briefly describing their studies. Finally we came back together as a whole group to discuss issues about teaching and learning. Participants also responded to a questionnaire asking the following:

What kinds of data have you been collecting?

This was a comprehensive list. Types of data collected were classified by participants as both qualitative and quantitative. Student work in many forms was collected as data; concept maps, journal writing entries, open response questions, performance assessments, email, online dialogues, transcripts of classroom discourse, surveys, drawings, portfolios, exams, quizzes, and pre and post tests. Some researchers were conducting interviews, studying site plans, looking at students spatial ability, changes in interest and confidence during a science methods course, lesson plans, video and audio tapes both of students, and teachers looking at their teaching.

How have you been interpreting data?

Both qualitative and quantitative methods were mentioned. Developing case studies, looking for major themes and patterns, using teacher study groups to help analyze data, making comparisons, looking at shifts in behaviors, and using NUDIST to help code information were some of the

qualitative methods. Quantitative methods mentioned were using statistical analysis, using SPSS, analysis of congruence, regression analysis, correlational analysis, pre and post test analysis, and frequency. Several researchers noted that they were in the process of finding best ways to analyze the data they were collecting, and a few were still in the collecting phase, and had not moved to analysis yet.

What questions do you have about the process of researching while teaching?

One recurring theme that appeared in the responses to this question was how to account for bias in the research and have the interpretation of data be accurate. Another recurring theme was how to find the time to collect and analyze data while teaching. Ethical issues were raised; voluntary participation in studies, and human subjects in studies, and the legalities involved. Some were interested in how others were doing their research and how to find support groups.

What issues would you like to see NARST address for members interested in teaching while researching?

Many participants felt that there should be more emphasis on teacher research at NARST. Several suggested developing a "whole new strand" on teacher research for NARST, stressing the value and importance of teacher research. Several felt there should be some emphasis put on developing more and better collaboration between university researchers and teacher researchers. Having teacher research accepted by the scientific community was also mentioned. Other issues were support issues. Participants were looking for guidance on conducting action research, help in finding ways to do teacher research such as how and where to write grants, and help in understanding the many different types of software available to help in analyzing data.

Comments

Only one person felt that only the first fifteen minutes was not valuable. The rest of the comments stressed that the participants felt that the time was well spent and valuable. Many people enjoyed the introduction of each participant at the beginning of the session, although the group was large. Most people found it to be a "good forum to learn and share collectively about what we are doing." Many enjoyed listening to different issues being addressed and the variety of ways in which research was being conducted. One person felt the session would have been better in smaller groups.

Summary of Responses on Charts Displayed at NARST Reception

At the NARST reception for teacher researchers, we posted large chart paper sheets on the walls and invited participants to contribute their thoughts about the following questions:

What should be the foci for teacher researcher sessions at next year's meeting?
Theoretical studies framing the research questions
What are our questions?
Action research poster session
Technology issues addressed/presented:
hyper-researcher, nudist, voice recognition
Creative ideas for funding
More examples of case studies including teachers doing research
Research methodology used by teachers to understand practice
Teacher research in higher ed
Research by early childhood teachers
PD issues in urban schools
Whole-school vs local "reform"

What should be on a NARST Teachers as Researchers Website?
Resources to help us as teacher researchers
Links to teachers who are doing research so we can share ideas

Resources include links to NSTA NARST good books and articles in journals
Resources for funding sources
Exemplary articles
Research methodology used
Suggestions for building school climate for this type of work
Suggestions for getting started and sustaining the work
Details of on-going studies on this topic
Whom to contact about what practices
Funding information

How have you obtained funding and/or resources to conduct research on your own practices?
Science Ed funds at the local level< eg. SF Ed Fund
PTA mini grants at the school level
None
Spencer Teacher Research grant
NSF- CTEP
USDA
FCT, Fundacao da Ciencia e Tecnologia (Portugal)
State Eisenhower Dollars
State grant (Flinn Foundation, Arizona only)
Local funding from our dean
NSF

V Activities Underway

Website

We are setting up a website through blackboard.com. The website will provide a place for people to post and discuss their research in progress, to access resources such as conference and grant information, a bibliography, and list of articles by participants in the website, and suggestions for how to get started. We have invited NARST members and participants in the 2001 practitioner research sessions to contribute.

Plans for 2002 Annual Meetings

NSTA: San Diego Approved, 9:30-10:30, Saturday, March 30, 2002

Poster Session for Teachers Inquiring into Science Learning and Teaching

This session will provide an opportunity to present findings for teachers and teacher educators who are conducting research on their own teaching practices. Presenters will prepare posters that present their research questions, rationale, data sources, methods of analysis, interpretations, and implications for instruction. Presenters also will prepare handouts that summarize their studies. Near the close of the session, the co-chairs (listed above) will facilitate a whole group discussion of issues raised by this kind of research. The co-chairs also will demonstrate a website under development for teacher researchers in science contexts. We anticipate that many of the presenters will be individuals and groups who have contributed to the website by providing information about their studies and resources they have found useful. We also plan to seek presenters from teachers and teacher educators in the San Diego area.

NSTA: San Diego: Submitted

Learning about Learning: Reflecting on Positives in the Classroom
Teachers share what they're learning by looking at their own practices. See what you have in common with them, and how to understand your teaching practice better.

In this session a group of teachers will share the findings of their classroom research studies on

science teaching and learning. This will include the original question, the rationale for the study, data collected, ways in which the data was interpreted, and implications for practice. Each presenter will give a brief summary of their project and then will invite the audience to participate in small group discussions, in order to have an in depth conversation with the presenter in whose study they are most interested. Some of the possible studies we hope to present are: ways in which they can integrate and enrich science learning through reading and writing; how listening to student conversation during science activities can facilitate better planning, teaching and learning; how to involve students who are not proficient in English in science learning and discussion; how inquiry based teaching facilitates in depth student learning; and ways in which technology can enhance science learning. We will close with a whole group discussion raising questions and directions for further study, and resources available to those who would like to become reflective practitioners.

NARST: New Orleans: Novel Format Session Submitted
Collaborative Inquiry about Collecting and Interpreting Data in One's Own Classroom

A collaborative inquiry is a novel format with the intent to generate as well as disseminate knowledge. This session will build upon a collaborative inquiry at the 2001 NARST annual meeting in St. Louis. In response to a questionnaire, participants identified the following issues that they would like NARST to address for members interested in conducting research on their own teaching practices: guidance in conducting research while teaching, ways to find support such as grants, information about software useful for analyzing data, ethical issues and ways to build a community of teacher researchers. The purpose of the proposed session will be to gather insights and information from participants about these topics and to dispense relevant information prepared for this session. An underlying purpose of the session will be to create a context within which participants can both contribute to and learn from the NARST research community.

NARST: New Orleans: Pre-Conference Workshop Submitted

Abstract:
What are you curious about in your classroom? How might you explore those issues? What data sources might be relevant? How might you interpret those data? For what purposes? This workshop is for preK-12 teachers, graduate students, college science faculty, college science education faculty, and informal science educators who are interested in inquiring into their own teaching practices. The purpose of the workshop is to learn and refine ways to interpret data gathered in one's own classroom. The emphasis will be on qualitative studies. Participants will work in small groups with facilitators who have had some experience in researching while teaching. Participants are encouraged to bring data from their own classrooms such as videoclips, copies of student work, reflective journals etc. to share and discuss in the small groups. The workshop will close with a whole group discussion of issues encountered in this type of research. Participants will receive a notebook with a bibliography of practitioner research in science contexts, copies of facilitators' self-studies, and relevant resources.

Ad Hoc Committee on Practitioner Research

I. Committee Meeting, April 29, 2000 in New Orleans

The Ad Hoc Committee on Practitioner Research held its first meeting on April 29, 2000 in New Orleans. Participants included Elaine Howes, Jim Minstrell, Chris Pappas (sitting in for Maria Varelas) and co-chairs Deborah Roberts and Emily van Zee. Additional members of the committee include Kathryn Roth, Allen Feldman, and Joseph Kracjik (CHECK SPELLING).

First we discussed whose research should be the focus of this committee. Then we considered functions, possible actions, and recommendations that the committee might make.

Individuals whose research is the focus of this committee:

This committee is focusing on the needs of individuals who are conducting research on their own practices. These may include:

- pre K-12 teachers
- curriculum specialists, administrators, state science supervisors and other school personnel
- informal science educators
- college science faculty
- college science education faculty

Functions:

We identified the following functions for the committee:

- Welcome teachers and other school district practitioners to the organization
- Promote and facilitate research by teachers and other practitioners
- Increase awareness and understanding of research conducted by teachers and others who are undertaking research on their own practices
- Foster continuing development of research methods feasible for use by teachers and others who are conducting research on their own practices.
  For example, what constitutes evidence? How are data used in support of claims?
- Increase presentations of research by teachers and other practitioners.

Possible Actions:

These functions may be accomplished through the following possible actions:

- Sponsor pre-session workshop to support/facilitate research by teachers and other practitioners
- Sponsor on-going data analysis sessions during the annual meeting similar to those conducted at the Ethnography in Education Research Forum
- Invite guest speakers who are teachers who conduct research in their own classrooms
- Provide ways for teachers to apply for funding to join NARST and attend meetings, similar to AAAS corporate sponsorships of registrations for teachers and AERA graduate student travel grants
- Create on-going forum for issues in practitioner research at all levels, preK-university
- Organize a conference for teachers and other practitioners who are conducting research on science learning and teaching (perhaps in conjunction with NSTA/NARST meeting)
- Develop a web site to provide information and assistance to teachers and others interested in conducting research on their own practices
- Reach out to teachers in the city where the annual meeting is held and invite them to come to sessions where teachers are presenting their research
- Create ways to provide grant opportunities for teachers to support their research
- Establish an electronic newsletter for teacher researchers and others conducting research on their own practices
- Start a print journal or devote part of JRST to practitioner research
- Provide a special membership rate for teachers (but include voting privileges)
- Link to the International Conference on Teacher Research that usually meets the weekend after AERA

Recommendations:

We agreed on the following recommendations for NARST members and the organization:

- Treat teachers as individuals who have valuable information to contribute to the science education community
- Encourage teachers to participate by acknowledging there is value in the research they conduct
- Invite teachers to present with or without university connection
- Provide positive feedback and reflection when teachers present

o Avoid causing the devastation that teachers sometimes experience when they become aware of interpretations, which may or may not be appropriate, of data collected in their classrooms by others, or even by themselves when associated with a university project

II. Relevant Activities during the 2000 Meeting in New Orleans

There were several well-attended sessions during the New Orleans meeting that had been arranged by President Abell. These included a reception for teacher researchers on Friday evening and a symposium on Sunday morning.

Reception for Teacher Researchers

At the reception on Friday evening, April 28, we invited attendees to select a topic and contribute their wisdom on post-its in response to the following questions: "What is your definition of teacher research? What questions do you have about teacher research? Why is teacher research exciting? satisfying? frustrating? challenging? beneficial? What advice do you have for teachers interested in becoming teacher researchers?"

Definitions of "teacher research" varied widely. These included research conducted ON teachers by others who study teacher behaviors, attitudes, beliefs, and knowledge, research conducted WITH teachers by university researchers who design collaborative projects, research conducted BY teachers investigating science topics, and research conducted BY teachers on science teaching and learning in their own classrooms.

Questions about teacher research seemed to center around the latter definition of research, that is, research conducted by teachers on their own teaching practices. Some questions focused on the status of such research: " Is it still research even if no new (here-to-fore not known) findings come from the "research"?""Is it teacher research if the work never gets published/presented for general consumption?" "Teacher research is very powerful for those of us who participate in it and yet it isn't recognized by many as "real" research. Does this matter? If so, should we do anything about it?" Some questions focused on pragmatic issues: "For the classroom teacher as researcher, how do you learn to manage the politics within the institution which constrain practice?" "How can I get better at advising doctoral students (and master's) in developing and conducting teacher research? " " How can teacher research become a bona fide component of teacher preparation programs?" One question pondered the nature of such research: "why is teacher research motivating?"

Advice included "Start simple; keep it simple" and "Work with a person who encourages you to choose your own issues."

Comments about teacher research included that it is exciting ("because you will always be so surprised"), satisfying ("because when I discover I have just failed to help

students learn something I can put on my researcher "hat" and begin to probe the alternative understandings of my students. That way I never fail."), frustrating ("because the positivist dinosaurs invalidate teacher research as too subjective due to our refusal to objectify the people we're studying, including ourselves"), challenging (because "there is little money and little support") and beneficial ("because it will help you improve learning and your teaching").

Research into Practice: A Symposium for Teacher Researchers

At the symposium on Sunday, April 30, participants discussed a wide variety of issues. These also seemed to focus on teacher research as inquiry into one's own teaching practices.

One characteristic of such teacher research is that the things that are being studied are changing whereas in traditional research one is "holding things in place." Teacher researchers struggle to write along the way, not only in finding time to do their writing but also in exploring alternative ways of communicating such as stories, photo essays, etc Another issue is who is the audience for teacher research? Is it just for the teacher doing the research? for school colleagues? for a broader community? What is valuable in making the findings of teacher research public?
What is the role of universities?

Also discussed were differences between literary traditions and science, that teachers in literacy fields are used to writing "what do you think about it" but teachers in science are used to doing experiments, controlling variables, trying to find the "right" answer. They are more comfortable with an engineering approach to research, to trying to design the best prototype lesson given everything they know and then trying it out, which is a form of research.

Another issue is the nature of questions that teachers choose to research and ways in which these change as the research progresses. Teacher questions can be very broad ("How do we teach science? How do kids learn science?) How does one develop a manageable question? One that is doable? What data are appropriate to collect? What is one going to do with those data?

Time is a huge issues, how to find time to read the literature, to meet with colleagues, to interpret data, to write things up, to present at conferences.

III. Preparations for the 2001 Meeting in St. Louis

The co-chairs of the committee have carried out three of the action items in planning for the 2001 NARST meeting in St. Louis. These include applying for a joint NSTA/NARST poster session for teacher researchers, for a NARST session that focuses on methodology, and for a pre-conference workshop to support and facilitate research by teachers and other practitioners.

NARST/NSTA Poster Session for Teachers Who Are Inquiring into Science Learning and Teaching

The co-chairs of the committee applied to host a poster session at the National Science Teachers Association meeting that precedes the NARST meeting in St. Louis as one of the joint NARST/NSTA sessions. Their proposal was approved. This poster session will showcase the work of teachers who have formulated questions to explore in the context of their own science teaching practices and of teachers who are collaborating with others as colleagues (rather than as subjects) in research projects based in colleges, government agencies such as NASA, museums, or other institutions. The National Research Council recommended that professional development for teachers of science "provide opportunities to learn and use the skills of research to generate new knowledge about science and the teaching and learning of science" (NRC, 1996, p. 68). This poster session will provide an opportunity for teachers who have been participating in such professional development to share their findings.

Application for NARST Session on Methodology for Practitioner Researchers

The co-chairs of the committee also applied to host a "novel format" session at the NARST meeting entitled "Collaborative Inquiry about the Process of Researching While Teaching." The purpose of this session will be to provide opportunities for teachers and others who conduct research on their own teaching practices to discuss how they conduct research while they teach. This session will be grounded in the studies by presenters in the joint NSTA/NARST poster session for teacher researchers and for teacher educators who model researching while
teaching their courses. If approved, the presenters will facilitate small group discussions by sharing some of the data they collected in their classrooms and inviting participants to join them in interpreting these data. The emphasis during this session will not be upon the findings, which will have been reported during the joint NSTA/NARST poster session, but rather upon reflecting about the methodology used in these studies. An underlying purpose of the session will be to create a context within which participants can both contribute to and learn from the NARST research community.

Application for NARST Pre-Conference Workshop

In addition, the co-chairs of the committee have applied to put on a pre-conference workshop entitled "Inquiring into One's Own Teaching Practices." If approved, the workshop will begin with introductions of all participants. Next the facilitators will briefly summarize their own studies (1-3 minutes each). Then we will break into small groups by level: elementary teachers, middle school teachers, high school teachers, college science faculty, college education faculty, and informal science educators. During a series of four small-group data-interpretation sessions, participant presenters will state the issues they are examining, describe their settings, present some data, and invite the other participants to help them develop interpretations of these data.

Facilitators will help moderate these conversations. The workshop will close with a whole group discussion of issues that emerge when one attempts to conduct research in one's own classroom.

NARST PROCEDURES AND SCHEDULES

October 2001

Table of Contents

NARST AWARDS COMMITTEES — Page(s)

- JRST Award Committee 2-6
- NARST Outstanding Paper Award 7-10
- Distinguished Contribution Award Committee 11
- Early Career Research Award 12-15
- Doctoral Dissertation Award Committee 16-22
- Masters Thesis Award Committee 23-31

OTHER COMMITTEES

- Policy Advisory Committee 32
- Financial Advisory Committee 33
- Publications Advisory Committee 34
- Program Committee 35
  - Guidelines for Strand Coordinators 36-48
- Research Committee 49
- Election Committee 50-56
- International Committee 57
- Equity Committee 58
- Membership Committee 59

PRESIDENTIAL TEAM DUTIES

- President-elect 60-61
- President 62
- Past President 63

APPOINTMENTS TO OTHER NARST POSITIONS

- JRST Editor 64-65
- Executive Secretary 66
- Annual Meeting Coordinator 67

NARST Awards Committees

JRST Award Committee

Charge:

The *JRST* Award Committee is responsible for identifying the outstanding article appearing each year in *JRST.*

Procedures:

Phase 1

During this phase, the outstanding article within each issue of the year's Volume is selected. Each committee member reads 2-3 issues and assigns points in various categories to each article (see Criteria) and rank each article. Members of the committee are encouraged to contact other members reviewing the same issue via e-mail to discuss the relative merits of the articles and to utilize the diversity of expertise of our members. The article receiving the highest ranking from each issue is selected. If two or more articles are very close in ranking in a given issue, both articles are entered in the second phase review.

Phase 2

The article receiving the highest ranking from each issue is then reviewed a second time and rated. During this round, each committee member receives ten articles to read, evaluate and rank. Again, e-mail communication with other members of the committee is encouraged. At the end of this review, if two or more articles are close in ranking, a third round of reading assignments is made. These articles are evaluated and a rank order is assigned by each committee member. The article receiving the highest rank is declared the outstanding article.

Time Line and Due Dates:

July 15	Issues 1-5 evaluations due
October 30	Issues 6-8 evaluations due
January 19	Issues 9 & 10 evaluations due
February 1	First round winners send to members for second round evaluation
February 15	Second round evaluations due
March 1	Third round evaluations due (if a third round is needed)
March 5	Winning article and author(s) send to NARST President
March or April	Board Report to NARST President
March or April	Award presented at the NARST Annual Meeting Luncheon

Documents and Sample Letters:

Letter to Committee Members:

Dear ,

Welcome to the JRST Award Committee. As you know, our task is to find and identify the outstanding JRST research article for the year. The authors are recognized at the annual NARST national meeting. This is an important way NARST recognizes excellence in scholarship in our research community, and our committee's task is a challenging and important one. Although the task requires significant time commitments, I see this task as one that can be intellectually stimulating for each of us as we are challenged to read carefully a broad spectrum of research and scholarship that is published in JRST. I think we will each come to value the diversity and multiple strengths of our organization as we engage in this process.

Phase 1

During this phase, the outstanding article within each issue of the year's Volume is selected. Each committee member will read 2-3 issues and assign points in various categories to each article (see Criteria) and rank each article. You are encouraged to contact other members reviewing the same issue via e-mail to discuss the relative merits of the articles and to utilize the diversity of expertise of our members. The article receiving the highest ranking from each issue will be selected. If two or more articles are very close in ranking in a given issue, we will enter both articles in the second phase review.

Phase 2

The article receiving the highest ranking from each issue is then reviewed a second time and rated. During this round, each committee member will receive ten articles to read, evaluate and rank. Again, e-mail communication with other members of the committee is encouraged. At the end of this review, if two or more articles are close in ranking, a third round of reading assignments will be made. These articles will be evaluated and a rank order will be assigned by each committee member. The article receiving the highest rank is declared the outstanding article.

Evaluation forms and a criteria list are enclosed for your use. They should be used for each article read in your assigned issues. These are similar to the forms that have been used in the past. If you do not have enough copies, feel free to make additional copies. If your first assignment includes Issues 1-5, you should complete and send them to me by July 15. Those members assigned numbers 6, 7 and 8 will need to submit their assessments by October 30. Finally, those with numbers 9 and 10 will need to submit their assessments by January 19, of the following year. You will receive the second round of ten papers to review by February 1. Please note the fast turn-around time in this round - we will need your reviews back by February 15.

I am asking each of you to acknowledge your receipt of this letter and your acceptance of your reading and review assignment by sending me an e-mail message at < >. This will help me assure that we have enough reviewers for each issue. Please note your assignments in this letter. Also attached is the address and e-mail address of all members. Please look at this information carefully and let me know if there are any changes. This will likely be the only letter you will get from me. Virtually all correspondence from now on will be carried out electronically. This is why it is imperative that you **let me know if your e-mail address changes**.

Thank you for your willingness to serve on the JRST Award Committee. All NARST members appreciate your help and support in this important endeavor. Please do not hesitate to e-mail me or call me if you have any questions. I look forward to working with you this year on the JRST Award Committee.

Timeline:

July 15	Issues 1-5 evaluations due
October 30	Issues 6-8 evaluations due
January 19	Issues 9 & 10 evaluations due
February 1	First round winners send to members for second round evaluation
February 15	Second round evaluations due
March 1	Third round evaluations due (if a third round is needed)
March 5	Winning article and author(s) send to NARST President
March/April	Board Report to NARST President
March/April	Award presented at the NARST Annual Meeting Luncheon

JRST Award Committee (cont.)

Criteria and Instructions for Ranking the Articles in an Issue of the Journal of Research in Science Teaching

1.	Significance of Problem or Issue (10 pts.)	How important or critical is the problem or issue being addressed by the author(s)? Timeliness, relevance and scope are all aspects of this concept.
2.	Background (10 pts.)	How adequate is the presentation of related theory and relevant literature?
3.	Approach (10 pts.)	How adequate and sound is the approach to the problem or issue? In a research article this includes design and data analysis; in a position paper this includes the logic and nature of the argument used.
4.	Significance of Conclusions or Positions (10 pts.)	Are they based on the evidence and logical argument and then presented in such a way as to address relevant concerns in science education?
5.	Potential Impact of the Outcomes or Positions (10 pts.)	What is the potential to influence thinking and practices in science education? Do the outcomes or positions have potential impact?
6.	Uniqueness (10 pts.)	How new are the approach and/or ideas presented in the article?
7.	Communication (10 pts.)	How well written is the article?
8.	Overall (10 pts.)	What is your general opinion of the article from a broad perspective?

Record your ratings for each article on a separate rating sheet along with the necessary descriptive information about the article. You should also include comments related to your overall rating.

JRST Award Committee (cont.)

ARTICLE EVALUATION FORM

JRST Volume _____ Number _____ Page #s _____

Title _____

_____

Reviewer :_____ E-mail: _____ FAX: _____

RATING SCALE

POOR		BELOW AVERAGE		ADEQUATE		GOOD		EXCELLENT	
1	2	3	4	5	6	7	8	9	10

	Points	Criterion
1.	_____	Significance of Problem or Issue
2.	_____	Background
3.	_____	Approach
4.	_____	Significance of Conclusions or Positions
5.	_____	Potential Impact of Outcomes or Position
6.	_____	Uniqueness
7.	_____	Communication
8.	_____	Overall
	TOTAL _____	

RANK _____

Rank in comparison to the 12 articles,
(1 indicates the highest rank and 12 indicates the lowest rank.)

OVERALL COMMENTS:

_____

_____

_____

RETURN TO:
Chair, JRST Committee

NARST Outstanding Paper Award Committee

Charge:

The Outstanding Paper Award Committee is responsible for identifying the outstanding paper presented at the previous year's annual meeting.

Procedure:

Selection of the NARST Outstanding Paper is conducted in three rounds.

In the FIRST ROUND, each paper is rated by five (5) committee members. Each committee member rates 10-12 papers. Papers are carefully assigned to raters to avoid any obvious conflicts of interest even though author names and affiliations remain anonymous. The criteria for evaluation focuses equally on significance, conceptual/theoretical background, research approach, conclusions, craftsmanship/communication, and creativity.

In the SECOND ROUND each of the papers rated in round one in the top five are rated by five (5) committee members, with each committee member reviewing 5-6 papers. Assignment to reviewers is such that no paper is reviewed in the second round by a committee member who reviewed it in the first round.

In ROUND THREE those papers rated in round two in the top three are rated by all committee members to identify those papers rated in the first, second, and third places.

Timeline:

October 10	First Round Reviews Completed
December 5	Second Round Reviews Completed
February 10	Recommendations forwarded to President
March 1	Recipient(s) notified by President
March/April	Award presented at the Annual Meeting Luncheon

NARST Outstanding Paper Award Committee (cont.)

Documents and Sample Letters:

Letter to nominees

May

Dear Dr. :

Congratulations! Your paper _____ was nominated for the XXXX NARST Outstanding Paper Award. If you accept the nomination, NARST requires that you submit ten (10) copies of the paper for review. Your name and the name of the co-authors and affiliations should appear on a separate cover page and only on this page, to ensure anonymity in the review process. Unfortunately, I do not have the staff to remove names and affiliations, so it is important that you complete this requirement. In order for your paper to be sent out for review, I will need to receive the ten (10) copies by July 20, 2001. Please note that the copies you submit should be identical to the paper you presented at the NARST 2001 Annual Meeting; otherwise, your paper will be disqualified.

I appreciate your interest in the NARST Outstanding Paper Award and look forward to receiving your copies and reading your paper. If you have any questions, please feel free to call me at XXXXXXXX or send me an E-mail message at XXXXXX You can also contact my secretary, XXXXX at XXXXX or E-mail her at XXXXX if you have questions regarding the review.

Sincerely,

XXXXXXXXXX
Chairperson, NARST Award Committee

NARST Outstanding Paper Award Committee (cont.)

NARST OUTSTANDING PAPER RATING SHEET

PAPER # _____

POSSIBLE CRITERIA	POINTS	RATING
1. Significance of the Study: How important is the study to the science education community and/or the education community at large?	10	
2. Conceptual/Theoretical: Is the background of the study embedded in theoretical constructs? Does the study fit or reinforce the belief system that underlies the paradigm which the research follows?	10	
3. Research Approach: Is the methodology suitable to the question(s) asked (i.e., empirical or theoretical)? Is the description of method sufficient to allow the reader to understand what was done?	10	
4. Conclusions: Do the conclusions add to, refine, or refute the theoretical constructs? Are the conclusions valid and/or viable? Are they presented in a way that is meaningful to science educators?	10	
5. Craftsmanship/Communication: Does the paper demonstrate clarity, coherence, insightfulness, and incisiveness in communications? Does the paper advance a(n) central idea(s) or theme(s)?	10	
6. Creativity: Does the study break new ground? Does it involve risk-taking? Does it invite criticism?	10	
TOTALS	60	
ADDITIONAL COMMENTS:		

NARST Outstanding Paper Award Committee (cont.)

SUMMARY SCORE SHEET

Reviewer Name: _____

PAPER #	TOTAL SCORE	RANKING

Distinguished Contribution Through Research Award Committee

Charge:

The Distinguished Contribution Award Committee is responsible for identifying a member of NARST whose lifetime research has made a significant impact in science education.

Procedures:

Nominations are solicited through NARST News, the listserv, the NARST web page and through personal contacts by the Committee.

Nominations are to be sought from as wide a field of candidates as possible to be inclusive of gender, age and ethnicity.

The Committee Chair informs the members of the Committee of the nominees and decides (with the help of the Committee if needed) if any nomination is ineligible.

Letter is sent to nominees by the Chair to ascertain if persons wish to participate in the selection process. If they do, they are to supply a two-page CV highlighting main aspects of their contribution to research.

This two-page CV is presented to the NARST Executive Board at the October Meeting. The NARST Executive Board is asked to ratify these nominations.

The Committee Chair asks the Nominees to submit a full CV outlining their contributions to research and the names of three persons from whom letters of support can be solicited.

The Chair obtains nominees full CV and letters of support and makes copies to be sent out to members of the Committee who are asked to rank the individuals.

The decision of the nominated recipient of the Distinguished Contributions Through Research Award is made by the accumulated rankings.

The selected recipient shall be ratified by members of the NARST Executive Board.

The President notifies the recipient of the award in advance of the Annual Meeting.

The Distinguished Contributions Through Research Award recipient will be presented a plaque inscribed with a 250-word (or less) citation.

Early Career Research Award Committee

Charge:

The Early Career Research Award Committee is responsible for identifying a member of NARST whose research in the five years immediately following receipt of the doctorate is worthy of recognition by the Association.

Procedures:

1. March/April NARST Annual Meeting. Obtain list of committee members and determine addresses including e-mail, fax, and phone.

2. August/September. Send the first Call for Nominations over the NARST net and to the NARST Newsletter Editor.

Nominations are to be sought from as wide a field of candidates as possible to be inclusive of gender, age and ethnicity.

Timeline:

April - give Call for Nominations for the upcoming year to the NARST Newsletter editor

August - issue 1st call for nominations on the NARST listserv and web page

September - issue 2nd call for nominations on the NARST listserv

October - prepare report for fall NARST Board meeting

November 15 - nominations due. The Chair reviews all packages for completeness and requests additional material where necessary.

November 20 - When the packages are complete, they are organized with one copy of each package for each of the six reviewers along with a rating sheet for each nominee. An e-mail is also sent so that reviewers will be expecting the package.

January 1 - The ratings and recommendations are received from committee members. The Chair reviews and summarizes the results. If there is a tie or no clear decision, the Chair will also rate the candidates, although this is rarely necessary.

By or before February 1 - notify Executive Secretary and President of results. This notification must be sufficiently informative for the Executive Secretary to prepare the Plaque. Include the candidate's name, institution, date and institution of Ph.D. award, and inscription of about 100 words.

March/April - Review and modify as necessary the procedure for managing this committee (summarized in this document). Submit any changes to the Executive Secretary and President. Prepare report for spring NARST Board meeting.

Early Career Research Award Committee (cont.)

CALL FOR NOMINATIONS

Nominations are invited for the NARST **Early Career Research Award.**

The NARST Early Career Research Award acknowledges contributions to science education through research by individuals during the five years immediately following receipt of the doctoral degree. To qualify for the award this year, the nominee must have received the doctoral degree on or after January 1, XXXX. *All NARST members are encouraged to consider nominating an eligible and deserving early career member.*

Nominations for the award must be accompanied by seven (7) copies of supporting material including

a) a letter of nomination which discusses the nominee's impact on the field,
b) the nominee's vita,
c) a two-page summary of the nominee's research interests, prepared by the nominee,
d) three of the nominee's best papers, and
e) three letters of support to be sent separately.

Each candidate is reviewed independently by six NARST committee members. If you are interested in seeing the rating sheet that is used in this process, please request it from the committee chair.

Nomination materials should be sent to XXXXXXX at the address below no later than November 15, XXXX.

Early Career Research Award Committee (cont.)

NOMINEE RECORD RATING SHEET

Nominee _____

I. Submitted Papers

Paper 1 Title: _____	Low				High
Intellectual Quality of Scholarship	1	2	3	4	5
Quality of Theoretical Foundations	1	2	3	4	5
Methodological Rigor	1	2	3	4	5
Creativity/Innovation	1	2	3	4	5

Paper 2 Title: _____					
Intellectual Quality of Scholarship	1	2	3	4	5
Quality of Theoretical Foundations	1	2	3	4	5
Methodological Rigor					
Creativity/Innovation	1	2	3	4	5

Paper 3 Title: _____					
Intellectual Quality of Scholarship	1	2	3	4	5
Quality of Theoretical Foundations	1	2	3	4	5
Methodological Rigor					
Creativity/Innovation	1	2	3	4	5

Comments on Quality of the Papers:

II. Other Indicators (Vita Review)

Prominence of Journals in Which Published	1	2	3	4	5
Quantity of Publications	1	2	3	4	5
Research Conference Presentations	1	2	3	4	5
Research Grant Awards	1	2	3	4	5

Comments on Other Indicators:

III. Nomination Letters

Nominee's Letter	**0.5**	**1.0**	**1.5**	**2.0**	**2.5**
Support Letter 1	**0.5**	**1.0**	**1.5**	**2.0**	**2.5**
Support Letter 2	**0.5**	**1.0**	**1.5**	**2.0**	**2.5**
Support Letter 3	**0.5**	**1.0**	**1.5**	**2.0**	**2.5**

Comments on the Nomination Letters:

IV. Summary

Total Numeric Rating _____

Overall Rank
Among Nominees _____
(1st, 2nd, etc.)

NARST Outstanding Doctoral Research Award Committee

Charge:

The Outstanding Doctoral Research Award Committee is responsible for identifying a doctoral dissertation completed by a NARST member in the previous year that is worthy of recognition by the Association.

Procedures:

1. At the NARST annual meeting decisions relating to the following year's procedures are discussed and agreed by the committee.
2. Send the Call for Submissions for the Award to the NARST Newsletter and have it posted on the NARST listserv and web page (see example attached). Nominations are to be sought from as wide a field of candidates as possible to be inclusive of gender, age and ethnicity.
3. Send a letter of introduction and timeline for the upcoming process to the committee. Send reminder to NARST listserv.
4. Acknowledge receipt of submissions as they arrive and check NARST membership of candidates.
5. Assign ID numbers randomly to submissions. Send packages containing abstracts, rating sheets, criteria for judging, and a cover letter (with deadline reminder) to the committee.
6. Receive and acknowledge ratings from committee. Combine the ratings, determine the average rank for each applicant and select the top three or four candidates as finalists. Inform the committee of the results of judging.
7. Inform all candidates about the status of their abstracts, and request full dissertations from finalists.
8. Assign ID numbers to complete dissertations and send rating sheets, criteria for judging, and a cover letter (with deadline reminder) to the committee.
9. Receive and acknowledge ratings from committee members. Combine the ratings, determine the recipient and inform the President of NARST, who informs the recipient. Chair informs committee and the executive secretary of the result.
10. Send consolation letters to the other finalists and a report to the NARST Board of Directors.

No ties are allowed for the selection of the awardee. In case of a tie for the winner, the chair of the committee makes an informed decision.

NARST Outstanding Doctoral Research Award Committee (cont.)

Timeline:

The dates in the time line are approximate, as actual dates will vary according to the dates for the NARST annual meeting.

Date	Event
April-May	Chair sends announcement to the NARST News and requests posting on NARST web page
July-August	Chair posts Announcement on Listserv
Sept 1	Chair sends email to committee members reminding them of the upcoming process, and checks addresses for sending abstracts
Sept 15	Deadline for receiving abstracts Chair sends letters/emails to candidates acknowledging receipt of abstracts as they arrive
Sept 20	Chair sends packages of abstracts to committee members
End Oct	Deadline for receiving ratings of abstracts from committee members
Nov 5	Chair informs committee members of outcome from first round of judging
Nov 5	Chair sends letters to all candidates regarding status of abstracts
Nov 20	Deadline to receive unbound copy of dissertation from finalists
End Nov	Chair sends dissertations and cover letter to committee members Committee members acknowledge receipt of package by email ASAP
mid Jan	Chair sends reminder to committee members that the deadline for dissertation ratings is end of January.
End Jan	Deadline for receiving final rankings
Early Feb	Declare recipient and inform NARST President and Executive Secretary. President contacts recipient, and then contacts committee chair when this is done.
Mid Feb	After recipient is notified by the NARST President, Chair sends letter to committee members notifying them of the recipient and sends consolation letter to other finalists. Chair informs Executive Secretary of result.
Mid Feb	Chair sends committee report to NARST President and Secretary by email and hard copy.
March-April	Annual meeting of NARST. Chair prepares agenda to enable discussion and agreement about judging process, timelines, etc., for the following year.

NARST Outstanding Doctoral Research Award Committee (cont.)

Sample Call for Submissions for NARST Outstanding Doctoral Research Award

The NARST Outstanding Doctoral Research Award Committee invites all current NARST members who completed a dissertation within the 15 months prior to September 15, [current year] to submit an expanded ten page abstract to the committee for consideration for the [following year] NARST Outstanding Doctoral Research Award. Nominations are to be sought from as wide a field of candidates as possible to be inclusive of gender, age and ethnicity.

Judging will occur in two rounds. The first round of judging will be based on the ten page abstract. From these, a small group of finalists will be asked to submit one unbound copy of the complete dissertation. The final decision of the committee will be based on the complete dissertation. The first round of judging will be completed in November and all applicants will be notified. The recipient will be announced at the awards luncheon at the [following year] annual meeting in [location].

The committee welcomes doctoral dissertations from all research perspectives. The ten-page abstract should be structured to describe clearly the following: (1) the purpose or objectives of the study; (2) conceptual/theoretical framework; (3) research approach/method; (4) data sources and methods of analysis; (5) findings or results; (6) conclusions and implications; and (7) significance of the study.

Judging in both rounds (for abstracts and dissertations) will be based on the following three central questions: (1) Is the question being asked of importance to the community of science educators? (2) Is the research approach and its implementation thorough and appropriate for the research question(s)? and (3) Are the results and conclusions appropriate for the context of the study? Specific criteria considered in relation to these questions include: the significance of the research problem/area; conceptual/theoretical background; thoroughness of the research approach and methods; identification of conclusions/outcomes and their implications for science education; clarity and coherence of communication; and overall originality or creativity. In the past, successful applicants have been those able to make a case for the significance of their study to the science education community as a whole; and/or who convinced the reviewers of the originality of the questions asked or methods employed.

Submission Procedure: Persons wishing to be considered for the award should submit the following: (A) eleven copies of a **ten page**, double spaced abstract (margins are limited to 1 inch all around using 10-12 cpi font); (B) eleven copies of a **five page** abbreviated bibliography, one attached to each abstract; and (C) one copy of a cover sheet which includes the author's name, address (where they can be reached in September to December, [current year]), e-mail address, telephone and fax numbers, title of the study, the name and address of the institution where the dissertation was completed, a list of the members of the dissertation committee, and the date the dissertation was passed. The major advisor/professor/supervisor or chair of the dissertation committee should sign the cover sheet. NOTE: The title of the study should appear on the first page of the abstract, but the author's name and other identifying information should appear ONLY on the cover sheet.

Abstracts must be **received** by the Chair of the Award Committee at the following address by **September 15, [current year]**. (Include address information here.)

NARST Outstanding Doctoral Research Award Committee (cont.)

CRITERIA FOR JUDGING NARST OUTSTANDING DOCTORAL RESEARCH AWARD

Please read each dissertation/abstract using the following criteria to make your evaluation. Each criterion is worth ten points (i.e., 10 is the highest possible score). Record your ratings for each dissertation/abstract on the rating sheet. Return the ratings sheets and any comments to the Chair of the Committee by the due date.

1.	Significance of the Research Problem	How important or critical is the research problem to the science education community and/or the education community at large? Does the study contribute significantly to the knowledge base in science education?
2.	Conceptual/Theoretical Background	Is the study embedded in theoretical constructs? Does the study fit or reinforce the belief system that underlies the paradigm which the research follows?
3.	Research Approach	Is the research approach suitable to the question(s) asked (e.g. experimental, correlational, naturalistic, interpretive, ethnographic, historical, etc.)? Is the description sufficient to allow the reader to understand what was done? Are data gathering and data analysis procedures, and context of the study (e.g., sample, setting, description of culture, etc.) adequately described? Are the standards for judging the candidate's knowledge claims explicit, appropriate and well justified?
4.	Conclusions/Outcomes/Significance	Do the conclusions add to, refine, or refute the theoretical constructs? Are the conclusions valid and/or viable? Are they presented in a way that is meaningful to science educators? Are the implications of the study drawn clearly and well justified?
5.	Quality of Communication	Does the presentation of the dissertation demonstrate clarity, coherence, insightfulness, and incisiveness in communication? Is/are the genre(s) used throughout the dissertation appropriate and well justified?
6.	Originality/Creativity	Does the study break new ground? Does it involve risk-taking? Does it invite criticism?

PLEASE FAX YOUR RATINGS SHEETS TO [committee chair, give fax number]

NARST Outstanding Doctoral Research Award Committee (cont.)

RATING SHEET FOR NARST OUTSTANDING DOCTORAL RESEARCH AWARD

Reviewer_____

Please rate each dissertation/abstract on each criterion using a ten point scale where 10 is highest and 1 is lowest. Each criterion is defined on the attached page.

Abstract ID	1. Significance	2. Background	3. Research Approach	4. Conclusions	5. Communication	6. Originality	Total (Max = 60)
01							
01	Comments:						
02							
02	Comments:						

NARST Outstanding Doctoral Research Award Committee (cont.)

Sample Letter to Finalist

[address]

Dear [give name],

Thank you very much for participating in the NARST Outstanding Doctoral Research Award process for the Year [current year]. The committee's judging of the abstracts is now completed and I am pleased to inform you that your dissertation has been selected as a finalist for the award.

The final judging of the dissertation award is made on the complete dissertation, therefore I request that you send one, single-sided, unbound copy of the dissertation to me at the address below. Please ensure that any information which might identify you is removed so that judging is anonymous. I will arrange for copies to be made and sent to the committee members. In order to give me time to do this, and to allow the committee time to complete its deliberations, I need to have the copy of your dissertation by [date of deadline]. Please respond to me at once by email confirming that you have received this letter and that you intend to send your dissertation to arrive by the due date

The recipient will be announced at the awards luncheon at the [following year] annual meeting in [location], although when the judging process is complete, you will be informed of the result.

Please accept my congratulations for being selected as a finalist for this award and I look forward to receiving the copy of your dissertation.

Yours sincerely,

signed
Chair, NARST Outstanding Doctoral Research Award Committee

Please send a copy of your unbound dissertation to the address below, to arrive by [give date]

Place name of Chair, address and contact details here

Sample Letter to Non Finalist

[address]

Dear [name],

Thank you very much for participating in the NARST Outstanding Doctoral Research Award process for the Year [current year].

The committee's judging of the abstracts is now complete and I am sorry to inform you that your dissertation has not been selected as a finalist for the award. The judging process was very thorough and all abstracts received ratings that indicated they were of high quality. We are very pleased to see such high quality research being carried out by NARST members.

On behalf of the Committee, I thank you for your participation in the judging process and wish you the very best of good fortune in your future career.

Yours sincerely,

signed
Chair, NARST Outstanding Doctoral Research Award Committee

NARST Outstanding Master's Research Award Committee

Charge:

The Master's Research Award Committee is responsible for identifying master's research completed by a NARST member in the previous year that is worthy of recognition by the Association.

Procedures:

Phase I: Publicizing the Award: Announce in NARST NEWS - June issue, post on NARST listserv and home page. Nominations are sought from as wide a field of candidates as possible to be inclusive of gender, age and ethnicity.

Phase II: Rating Research Summaries
Upon receiving applications, make a folder for each applicant. Make enough copies of the summaries to send to each committee member. Assign each summary a code number for identification and be sure candidates names do not appear on any of the page headings. Also, assign an identification code to each committee member.

Phase III: Ranking Finalists. Top three theses from the rating are considered for final selection. Don't do phase II if three or fewer theses were submitted.

Phase IV: Announcing Award Recipient. The chair informs the committee, the President, and the Executive Secretary of the results. The President informs the recipient, the ES prepares the plaque, and the Chair informs the unsuccessful finalists.

Timeline:

June	Announce in NARST NEWS
August	Announce on NARST listserv and post on web page
Oct. 1	Applications due from candidates
Nov. 22	Rating Sheets due from committee
Dec. 15	Notify finalists (send regrets to non-finalists)
Jan. 8	Ten unbound copies of entire thesis due from candidate finalists
Feb 19	Final ranking due from committee
Feb 27	Notify President and Executive Secretary of recipient. President informs recipient.
March	Chair notifies unsuccessful candidates
March/April	Award presented by chair at Annual Meeting Luncheon

NARST Outstanding Master's Research Award Committee (cont.)

CALL FOR APPLICATIONS—NARST Outstanding Research Award

We seek quality applications for the NARST Outstanding Master's Research Award. This award is an honor not only for the individual researcher receiving the award, but also for the faculty member who chaired the Master's degree committee, and the institution granting the degree. If your institution grants Master's degrees with an emphasis in science education, please review the work of recent graduates and submit your best candidates for this award. The research product may be any research report, including but not limited to a bound Thesis, resulting from independent, original research that was required and completed as part of a Master's Degree program. Nominations are sought from as wide a field of candidates as possible to be inclusive of gender, age and ethnicity.

The deadline for applications for the Outstanding Master's Thesis Award is October 1st.

Eligibility

- Applicant must have been awarded a Master's Degree between September 1 and August 31 of the year prior to the annual meeting at which the award will be made.
- Applicant must be a member of NARST

Application

- One sheet which includes the applicants name, address, home and business phone telephone numbers, e-mail address and the title and an abstract of the research report;
- Ten copies of a 5-page summary of the research report. These summaries should contain the title of the research report, but NOT the name of the author;
- One copy of some evidence that the research was officially recognized as fulfillment of a research requirement for a Master's Degree by university or college standards (for example, a photocopy of the official, signed cover sheet);
- One copy of a letter of support from a NARST member;
- A stamped self-addressed post card or envelope if the applicant wants confirmation that the materials were received.
- All application materials must be received by October 1, XXXX and sent to:
- The chair of the committee (name, address and e-mail).

NARST Outstanding Master's Research Award Committee (cont.)

Applicant Letter #1:

Name and address of applicant

Dear _____:

Thank you for submitting your application for the Outstanding Master's Research Award for the National Association for Research in Science Teaching. We have received all the necessary materials.

All candidates will be notified of their application status by the middle of December. Finalists will be asked to submit 10 copies of their entire thesis.

Thank you again.

Sincerely,
Name of Chair

Committee Letter #1:

Name and address of committee member

Dr._____:

Thank you for your participation on the Outstanding Master's Thesis Award Committee.

Enclosed please find:

- copies of summaries submitted for the award (each submission had a letter of support and was an officially recognized research product)
- one instruction sheet
- one rating sheet for each summary to record your ratings.

Please send the rating sheets and thesis summaries back by November 22, 2000 to:

Name, address, fax and e-mail of Chair of Committee

It is extremely important that we meet deadlines. Thank you very much for your time and effort!

Sincerely,
Name of Chair

NARST Outstanding Master's Research Award Committee (cont.)

NARST OUTSTANDING MASTER'S RESEARCH EVALUATION CRITERIA

Please read each research summary submitted, using the following criteria to make your evaluation. Each criterion is worth 10 points. Record your ratings for each paper on a separate rating sheet. Return the rating sheets (or copies of same), and comments to the Chair of the Committee.

1.	Significance of the Study	How important or critical is the study to the science education community and/or the education community at large? Does the study contribute significantly to the knowledge base in science education?
2.	Conceptual/Theoretical Background	Is the study embedded in theoretical constructs? Does the study fit or reinforce the belief system that underlies the paradigm which the research follows?
3.	Research Approach	Is the research approach suitable to the question(s) asked (e.g. experimental, correlational, naturalistic, interpretive, ethnographic, historical, etc.)? Is the description sufficient to allow the reader to understand what was done? Are data gathering and data analysis procedures, and context of the study (e.g. Sample, setting, description of culture, etc.) adequately described?
4.	Conclusions	Do the conclusions add to, refine, or refute the theoretical constructs? Are the conclusions valid and/or viable? Are they presented in a way that is meaningful to science educators?
5.	Craftsmanship/Communication	Does the paper demonstrate clarity, coherence, insightfulness, and incisiveness in communication? Does the paper advance a(n) central idea(s) or theme(s)?
6.	Creativity	Does the study break new ground? Does it involve risk-taking? Does it invite criticism?

NARST Outstanding Master's Research Award Committee (cont.)

RATING SHEET

RESEARCH ID _____ RATERS ID _____

RESEARCH TITLE_____

1 Low ---------- 10 High

_____ 1. Significance of the Study

_____ 2. Conceptual/Theoretical

_____ 3. Research Approach

_____ 4. Conclusions

_____ 5. Craftsmanship/Communication

_____ 6. Creativity

_____ TOTAL

Please send rating sheets back by November 22nd to:

Name, address, e-mail and fax of Chair

Applicant Letter #2: Congratulations Finalist

Name and address of applicant

Dear _____:

Thank you for your participation in the award process for the Outstanding Master's Thesis from National Association for Research in Science Teaching. We are pleased to inform you that your thesis is a finalist.

Please send ten UNBOUND copies of your entire thesis to the following address. I prefer that you use double-sided photocopying to reduce costs for copying and postage.

Send to:
Name, address, e-mail and fax of Chair

We must receive your thesis by January 8th. Theses received after this date will not be considered for the award.

As soon as you receive this message, please SEND A REPLY to me confirming that you have received this message and that you intend to send copies of your thesis for the review process.

Again, thank you and congratulations! Please feel free to contact me via e-mail or phone should you have questions or concerns. We look forward to hearing from you soon.

Sincerely,
Name and address of Chair
NARST Committee for Outstanding Master's Thesis

Applicant Letter #3: Notification of Review

Name and address of applicant:

Dear _____:

Thank you for sending your full thesis for the Outstanding Master's Thesis Award for the National Association for Research in Science Teaching. A copy of your thesis plus the theses of the other two finalists has been sent to the nine members of the Outstanding Master's Thesis Award Committee. We expect to have our decision about a month before the NARST annual meeting in April.

Thanks again!

Sincerely,
Name of Chair

NARST Outstanding Master's Research Award Committee (cont.)

Committee Letter #2 :Entire thesis enclosed

Name and address of receiver

Dear _____:

We have reached the final phase of the Outstanding Master's Thesis Award. Enclosed are the full theses from each of the three finalists with one ranking sheet. Please rank them 1st, 2nd, and 3rd and send your results to me by February 15, XXXX. I would prefer receiving your ratings by e-mail or Fax to expedite the process.

Name, address, fax and e-mail of Chair

You do not need to return the theses, but please hold on to them in case of a tie. I will send you an e-mail with the results. Thanks again for your time and effort!

Sincerely,

Chair

Full Thesis RANKING SHEET

RATER: _____

Please rank the following theses 1st, 2nd and 3rd in the space provided.

INSERT RESEARCH TITLES 1-X

Comments:

Please send your results back by February 19, XXXX to:
Name, address, fax and e-mail of Committee Chair

Application Letter #4: Regrets

Name and address of applicant

Dear _____:

Thank you for your participation in the National Association for Research in Science Teaching Outstanding Master's Research Award. We are sorry to inform you that your thesis did not receive the award. We appreciate your participation and wish you good luck in future endeavors.

Sincerely,
Name of Chair

Committee Letter #3: Results

Name and address of receiver

Dear _____:

These are the results of our committees deliberations:

1st and Award recipient,
TITLE

The committee will be meeting during the NARST Annual Meeting on (day, date, time and location). Coffee and rolls will be available. As a number of issues surfaced this year, I urge you to attend.

Thank you for your participation, hard work, and effort. I look forward to seeing you at the Annual Meeting!
Sincerely,

NARST Outstanding Master's Research Award Committee (cont.)

Correspondence Record

	Ratings Returned	Rankings Returned	Misc.				
Reviewer name							
Reviewer name							
Reviewer name							
Reviewer name							
Reviewer name							
Reviewer name							
Reviewer name							
Reviewer name							
Reviewer name							

Other NARST Committees

Policy Advisory Committee

Charge:

The Policy Advisory Committee conducts an annual review of the Bylaws and the structure and orientation of the Association, and reviews new activities or ventures of the Association.

Procedures:

The Chair of the Policy Advisory Committee sends the current version of the NARST Procedures Manual to Board Members for Review each July and makes revisions as needed by the October board meeting.

The Policy Advisory Committee develops new policies for the association as directed by the Board.

Financial Advisory Committee

Charge:

The Financial Advisory Committee reviews the annual budget prepared by the Executive Secretary, approves program expenses, approves publication costs and new ventures, offers advice and recommendations to the Board of Directors regarding all financial affairs of the Association, and arranges for an annual audit externally conducted audit of the financial accounts of the Association.

Procedures:

1. In September, Executive Secretary prepares a draft budget for the next year and sends it to the Chair of the Finance Committee.

2. Chair of the Finance Committee, reviews and discusses the draft budget with the Executive Secretary.

3. Chair of the Finance Committee asks the Executive Secretary to send a copy of the draft budget and previous year's budget and expenditures to members of the Finance Committee. Chair sends email informing members of the Finance Committee that the Executive Secretary is sending the budget information and describing the responsibility and procedures for reviewing the budget.

4. Executive Secretary arranges a conference call for members of the Finance Committee to review, revise, and approve budget.

5. If significant budget revisions are required, a revised budget is sent via email to members of the committee for review and final approval.

6. At the fall board meeting, the Chair of the Finance Committee submits and recommends the revised budget for approval by the Board of Directors.

7. Chair of the Finance Committee reviews financial reports from the Executive Secretary whenever submitted.

8. An annual audit of the Executive Secretary's financial records for the year are conducted and the report is presented at the spring meeting of the Executive Board. [Question: Should this be reviewed by the Finance Committee before submitting to the Executive Board? At present, it is reviewed by the Chair of the Finance Committee at the Board Meeting, but is not reviewed by the members of the Finance Committee.]

Timeline:

- September - Executive secretary prepares draft budget for next year, sends to Finance Committee, organizes conference call, and Finance Committee reviews, revises and approves budget for recommendation to Board of Directors.
- Fall Board meeting - Chair, Finance Committee, presents budget to Board of Directors.

Publications Advisory Committee

Charge:

The Publication Advisory Committee recommends policy concerning the Association's publications. The Chair of the Publication Advisory Committee serves as a liaison to the JRST Editorial Board.

Procedures:

For NARST Monographs

1. The Committee periodically puts a call for monographs on the Listserv, web page and in NARST News.

2. All proposals are received by the Committee Chair. (In some cases, the Committee is contacted in advance of the proposal to 'test the feelings' of the Committee. This can save a lot of time and effort if the topic is one that has little chance of being approved.)

3. Proposals are reviewed by committee members and three additional NARST members.

4. Reviews are sent back to Chair (within one month) and the Chair synthesizes the comments of the reviewers.

5. The Chair recommends to the Board whether a monograph proposal should be accepted or not.

6. The Chair informs the committee and proposers of the Board action.

Program Committee

Charge:

The Program Committee assists the President-Elect and the Annual Meeting Coordinator in planning and conducting the Annual Meeting.

Procedures:

See attached Guidelines for Strand Coordinators.

Timeline:

Sample Letters and Documents:

GUIDELINES FOR STRAND COORDINATORS
2002 NARST ANNUAL MEETING
New Orleans, Louisiana

The roles and responsibilities of Strand Coordinators are defined clearly in this document. Please take the time to read it carefully before starting your work. Please read the Call for Proposals before beginning the review process. The Call is posted to the web in late spring and usually appears in the June issue of NARST NEWS. (put website address).

GENERAL INFORMATION

1. Advisory Nature of Strands

Final program decisions will be based on the advice and opinions of the Strand Coordinators. Norse's current policy is that the Program Committee Chair (the NARST president-elect) still has ultimate responsibility for the program as a whole. Considerations such as how many meeting rooms are available at the conference hotel and how the rooms will be set up (e.g., for poster session or round tables) will influence how many proposals can be accepted altogether and how many of each session format will be possible. The Program Chair and Annual Meeting Coordinator are responsible for ensuring that equity is achieved, and appears to have been achieved, in terms of having common procedures and standards across strands. Consequently, the Strand Coordinators' recommendations about acceptance/rejection of proposals and session formats are advisory to the Chair and Coordinator, who will be responsible for checking all recommendations for consistency across strands and for ensuring that what is accepted will fit into the hotel space available. Also it will be important that all decisions about concerning acceptance or rejection are reported to paper proposes by the AMC and not by Strand Coordinators. Thus, please direct any questions or complaints regarding the status of a proposal to the AMC.

2. Limits on the Number of Presentations

Prior to the 1995 meeting, the Board approved some new rules concerning how many times a person may present. These are set out on page one of the Call for papers proposals. The new rules are inherently complex, but they have been worded in the Call for Proposals in a way that is as clear comprehensible as possible. If anyone contacts you for an interpretation of the rules, please don't hesitate to refer those inquiries to the Coordinator. The responsibility for ensuring that no individual exceeds the upper limit in terms of the number of presentations lies both with the Strand Coordinators and Annual Meeting Coordinator. The Strand Coordinators should base recommendations for acceptance/rejection on the quality of proposals only and not on the number of proposals submitted.

3. Equal Status of all Session Formats

In the past, sometimes a proposal that was late or deemed borderline in quality has been reassigned to a format other than what was requested as a 'consolation' prize. For example, a proposal that requested a single paper format was reassigned as a poster presentation. This downgraded the perceived value of the poster session format. In 1994, the Program Committee met in Anaheim and decided that various session formats should be considered different but of equal merit and status. Therefore proposals are NOT to be reassigned to a format other than what was requested as the first choice. Exception: Authors are specifically asked if they are willing to be reassigned as interactive poster sessions. You may reassign those who indicate a willingness to be reassigned to an interactive format. Interactive formats encourage a higher degree of interaction and also allow for more papers to be grouped in one session.

4. Criteria to be Used in Reviewing Proposals

Strand Coordinators and Assessors should be guided in their reviews by the criteria set out in the call for proposals. First, it continues to be important that proposals are based on completed research, although the meaning of 'completed' is ambiguous and you will need to exercise your judgment here. Second, the call for papers identifies the following criteria:

a. Subject/Problem. Is there a clear focus, rationale, model, theory, or philosophy upon which the proposal is based?
b. Design or Procedure. Is the methodology, procedure, design, or organization appropriate?
c. Data Analyses and Findings. Do the syntheses of ideas or data analyses and findings appear to be appropriate and complete?
d. Contribution. Do the conclusions contribute valuable insights into the teaching/learning of science?
e. General Interest. Does the presentation promise to be of general interest to NARST members?

Finally, it is important for multiple paper proposals that the individual papers comprise a cohesive and integrated set of consistent, high quality.

5. Invited Strand Sessions

Each Strand Coordinator may recommend one invited strand session (e.g., speaker, symposium). These sessions do not go through the normal review process. Suggestions for invited sessions are advisory to the Chair and Coordinator, who is are responsible for the overall balance of the annual meeting. You are encouraged to assemble a session and invite participants. Please make it clear to participants, however, that the session is not confirmed at this time. These special sessions will be scheduled at the same time as concurrent sessions. A cover sheet, brief description, and an abstract are required for each of these sessions. These special sessions
must be clearly marked and should not have a proposal number. Please confirm your plans with the Annual Meeting Coordinator.

STEPS IN PROCESSING PROPOSALS
2002 NARST ANNUAL MEETING
New Orleans, Louisiana
Sunday, April 7 -Wednesday, April 10

1. Redirecting Proposals and Checking for Proper Submission

Check whether you have received any proposal that are more appropriate in another strand fits another strand much better than yours - please notify the ACM. In addition, you can check for abnormalities in the submission process. For instance, if someone submits a proposal as a symposium yet the abstract includes many paper titles, we will contact the person submitting the proposal and clarify the formats.

2. Checking Completeness and Acknowledging Receipt of Proposals

For the new electronic submission format the AMC has completed a check on the completeness of the proposals in terms of the completed forms, abstract, session selection, synopsis, etc. If an essential item in a proposal is missing, please inform the AMC. After both the AMC and Strand
Coordinators agree that the proposals are complete. This year the AMC will e-mail confirmation of receipt of complete proposals.

3. Selecting Assessors

Every proposal should be evaluated by three Assessors (two is the absolute minimum). All Assessors will be chosen by you and should be NARST members. For each proposal, an Assessor should be sent (or given access to):

- the abstract and synopsis with identification code
- a cover letter (email) which clearly indicates the date the Assessors' ratings should be sent to you along with your address, email, and fax number (enclosed)
- a copy of the assessor rating sheet for each proposal reviewed (enclosed)
- a copy of the assessor summary rating sheet (enclosed)

As a Strand Coordinator, you should act as an Assessor yourself only when a tiebreaker is needed, when one of your Assessors doesn't respond in time, or when a proposal arrives late.

Although approximately 20-30% of proposals will come from overseas, most Strand Coordinators and nearly everyone assessing proposals reside in North America. Consequently, it would be highly desirable if you were able to select some overseas members as Assessors. You can send materials electronically, so this should not be a problem. Sending out a request for assessors over the NARST listserve is one way to recruit assessors. Assessors need to return only the completed Assessor Rating Sheets and Assessor Summary Rating Sheet to you. **Monday, October 22, 2001** has been identified as the target date for returning these materials to you.

4. Resolving Disputes and Conflicts of Interest

Strand Coordinators should try to resolve disputes (e.g., opposing opinions from the three Assessors) and send us a definite recommendation about accepting or rejecting each proposal. Hopefully, if Assessors disagree, the Strand Coordinator's own judgment will be used to reach a decision. However, should it prove impossible to reach a decision, the particular case should be marked clearly and sent to the AMC for resolution. Also a potential conflict of interest could arise where the Strand Coordinator is an author of a proposal. In such cases, proposals should be sent out to Assessors in the normal way. However, after these proposals have been looked at reviewed by Assessors, they should be marked clearly as involving a potential conflict of interest and sent for scrutiny by the AMC.

5. Sending Information Regarding Accepted Proposals to Coordinator (MONDAY, OCTOBER 29, 2001 Deadline)

For each strand, paper proposals rated by the Assessors and the Strand Coordinator as being of high quality among those submitted to the strand will be accepted by the Chair of the Program Committee without further checking or moderation (space permitting). The actual number of time slots allocated to your strand will be based on the total number of papers received, the number of papers received for each strand, and hotel availability. In cases where the proposals are rated by the Assessors and the Strand Coordinator as being of high quality, all that needs to be sent to the AMC is:

- a list of the accepted proposals including identification codes, authors, and abbreviated titles
- your recommendations about how to group proposals into sessions
- your recommendations for session titles for the grouped proposals

An attachment called Rating Summary Sheet is provided that should be of help to you in reporting this information to the Coordinator. To save time, please send this **information BY FAX OR E-MAIL BY MONDAY, OCTOBER 29, 2001** (or earlier if possible). Clearly this represents a tight deadline for you, but it is vital that we receive information by this deadline so that we can include a draft version of the preliminary program that can be posted to the web in December and also included in the NARST News. We will need to go to press even if information is not received from some strands.

6. Recommending Groupings and Formats of Proposals (MONDAY, OCTOBER 29, 2001)

Although final decisions about how to put the program together will have to be made by the Chair and Coordinator, advice from Strand Coordinators about groupings and formats is essential since the Strand Coordinators will be much more familiar with the content of the proposals. To save time, please send this information **BY FAX OR E-MAIL BY Monday, October 29, 2001** (or earlier if possible).

7. Sending Summaries of Assessor's Comments to AMC

The **ONLY** summaries that you will need to send to the AMC for resolution are:

- those determined by Assessors and the Strand Coordinator to be either borderline proposals recommended for acceptance or proposals recommended for rejection
- those that could have a conflict of interest (e.g., authored by a Strand Coordinator)
- those for which the Strand Coordinator is seeking help in reaching a final decision about acceptance or rejection.

The material that should be sent for each proposal in this category includes:

- strand coordinator's recommendation for acceptance/rejection with comments
- **copies** of the **three assessors' reports**; **you must include these for all proposals in this category regardless of how they were submitted**. Please note that you are to send copies of the assessors' reports—you must maintain the originals since you will later send copies of the reviews to all first authors.

Please send these by **FAX or EMAIL** no later than **MONDAY, OCTOBER 29, 2001**.

8. Providing Names of Assessors

- Please send to the Coordinator a list of the names of the Assessors who provided assessments. Each Assessor will receive a letter of thanks from the president-elect and will be listed in the annual meeting program as an assessor. *It is also recommended that you send a letter of appreciation to each of your assessors.*

9. Summary of Deadlines in Proposal Review Process

Date	Tasks
September 15 (revised from August 15)	• Proposals due to AMC
Late September	• Strand Coordinators assist AMC in error checking proposals / database completed • Assessors assigned specific proposals for blind review access granted to web folders

Mon., October 22	• Assessors send completed proposal ratings and documentation to Strand Coordinators
Mon., October 29	• Strand Coordinators send information about accepted proposals to AMC • Strand Coordinators e-mail or fax **copies** of assessor rating sheets for rejected, conflict of interest, borderline proposals • Strand Coordinators send Suggested Groupings to AMC with session titles assigned

Very important: Once the acceptance and rejection letters have been sent to authors by the AMC, the Strand Coordinators will be notified. **At this time, the Strand Coordinators will send the a summary of the reviews to the first authors.**

10. APPENDICES

Files That You May Find Useful:
(feel free to cut and paste into your correspondence with assessors)

1. Assessor's Letter Example
2. Assessor's Rating Sheet for NARST Proposals
3. Ratings Summary Sheet for NARST Proposals
4. Strand Coordinator's Recommended Groupings
5. Step-by-Step Groupings (guidelines)

Assessor's Letter Example

Date

Dear (Assessor's name):

Thank you for agreeing to serve as an Assessor for NARST proposals submitted to *Strand 1-Learning: Students' Conceptions and Conceptual Change*. Your task is relatively straightforward; you are to provide a fair assessment of the proposals sent to you.

Attached you will find instructions for accessing proposals (########) and copies of the Assessor's Rating Sheet for NARST Proposals. Please make copies of this Rating Sheet as needed in order to record your rating for each proposal on a separate sheet. Copies of the Rating Sheet will be sent to the first author of every proposal. Therefore, comments would be very useful and your name **should not** appear on the form. You will also find enclosed a copy of an Assessor's Rating Summary Sheet. This Summary Sheet will be used to record your overall recommendation for each proposal you review. In many cases you may use this form as a guideline for sending your comments to me in the form of an e-mail (address@uni.edu) or alternatively, the completed form may be faxed to (########).

Each proposal you access includes an abstract and a synopsis of the work. Begin your review of each proposal by writing the strand number, proposal identification code, and your Assessor's Code Number at the top of the Assessor's Rating Sheet. **Your Code Number is _____.** Next, read both the abstract and the synopsis. Then, record your rating of the proposal on the Assessor's Rating Sheet by circling either 1, 2, 3, 4, or 5 for each of the five assessment criteria and indicate whether the proposal should be definitely accepted, probably accepted, or rejected by checking one of the three boxes. Also, write any comments that provide further insight into your recommendation in the space provided on the Rating Sheet. Your comments are particularly important if your recommendation is to reject. After reviewing all proposals sent to you, record your overall recommendation for each proposal on the Assessor's Rating Summary Sheet.

Please send one Assessor's Rating for each proposal you reviewed to me on or before **October 22, 2001** at the address below. You may send this material by fax, or email attachment.

Sincerely,
(name)

Program Committee (cont.)

Assessor's Rating Sheet for NARST Proposals

Strand Number: _____ **Identification Code of Proposal:** _____

Code Number of Assessor: _____

Assessment Criteria and Ratings:

		Highly Satisfactory				Unsatisfactory
1.	**Subject/Problem** Is there a clear focus, rationale, model, theory or philosophy on which the proposal is based?	5	4	3	2	1
2.	**Design /Procedure** Is the methodology, procedure, design or organization appropriate?	5	4	3	2	1
3.	**Data Analysis and Findings** Do the syntheses of ideas or data analyses and findings appear to be appropriate and complete?	5	4	3	2	1
4.	**Contribution** Do the conclusions contribute valuable insights into the teaching/learning of science?	5	4	3	2	1
5.	**General Interest** Does the presentation promise to be of general interest to NARST members?	5	4	3	2	1

Overall Recommendation:

Definitely Accept _____
Probably Accept _____
Reject _____

Review Comments and Suggestions for Improvement:

_____

Program Committee (cont.)

Ratings Summary Sheet for NARST Proposals
(for use by Strand Coordinators)

Strand Number: _____

Page _____ **of** _____

Proposal ID Code	Author	Title	Rating by Assessor 1	R A

Program Committee (cont.)

Strand Coordinator's Recommended Groupings

Session Format	Pres./Discussant (if applicable*)	Recommended Session Title	P Se

*If a specific Presider/Discussant was requested on the coversheet write his/her name here.

This form when completed should be faxed (604-291-4203) or emailed as an attachment or in the body of the message to the AMC – (dbz@sfu.ca) attention: David B. Zandvliet

Step-by-Step Guide for Grouping Proposals and Assigning Session Titles

You will enter all of your sessions on the form titled "Strand Coordinator's Recommended Groupings." When completed, this form will convey all of the necessary information regarding the structure of your strand. The proposal ID number for all **accepted** proposals should appear on this form. Remember when making your assignments that we are attempting to honor the requested first choice for format. Papers should be reviewed on their merit. We are hoping to get away from the perception that some formats are of lesser importance by avoiding the occasional past practice of reassigning borderline papers to other formats (ex: reassigning a borderline single paper to a poster session). When you enter, please enter the session types in this order (detailed instructions for entering this information on the form follows):

- **Paper Sets Grouped by Committee** (you will group and assign session titles)
- **Round Tables** (several round table discussions going on concurrently in one room; thus, you will need to group by similarity of topic and then assign a session title)
- **Discussion Group** (group these as if they were single papers and assign a title)
- **Novel Format** (proposers were able to select a full time slot or a shorter time slot, so it will then be necessary to group these based on similarity of format and topic; titles will need to be assigned for those that are grouped)
- **Multiple Paper Sets** (the proposers will indicate a session title and grouping)
- **Symposia** (the proposers will indicate a session title; no grouping is necessary)
- **Poster Sessions** (you do not have to group or assign a session title; simply list them on the form and indicate the session format as Poster Session)
- **Interactive Poster Sessions** (you will group and assign session titles)

Instructions for Assigning Single Papers to Paper Sets Grouped by Committee:

1. Group the papers based on similarity of topic. Most time slots will be 90 minutes in length, so group four papers into a 90-minute time slot. Based on the time slots you are allocated for your strand, you may also need to group some into 60-minute time slots. These time slots may have 2 or 3 papers grouped together.
2. Based on the common theme that runs through the papers in a group, assign a session title that conveys that theme to the audience.
3. Enter all of the Paper Sets Grouped by Committee on the form titled "Strand Coordinator's Recommended Groupings and Session Titles." For each paper set, please enter the information as follows:

- Enter **Paper Set by Committee** in the column "Session Format."
- Skip the pres./discussant column unless you would like to recommend an assignment.
- Enter the session title that you have assigned in the next column.
- Enter all of the proposal ID numbers for the single papers grouped in this set in the next column.
- In the last column, enter the time allocated as either 90 or 60 minutes.
- Repeat until all Paper Sets Grouped by Committee have been entered.

Instructions for Assigning Round Tables:

1. Group several round tables in one room based on similarity of topic and time requested. Assign 3 to 4 papers to a room. Scheduling may require that some proposers requesting 90 minutes be given 60 minutes; we will work together on this should it become necessary.
2. Based on the common theme that runs through the papers in a group, assign a session title that conveys that theme to the audience.
3. Following all of your Paper Sets Grouped by Committee, enter all of your Round Table sessions on the form. Please follow these instructions for entering:

- Enter **Round Table** in the column "Session Format."
- Skip the pres./discussant column unless you would like to recommend an assignment.
- Enter the session title that you have assigned in the next column.
- Enter all of the proposal ID numbers for the papers grouped in this set in the next column.
- In the last column, enter the time allocated (either 60 or 90 minutes).
- Repeat until all round table sessions have been entered.

Instructions for Assigning Discussion Groups:

1. **Group the proposals based on similarity of topic. Most time slots will be 90 minutes in length, so group four proposals into a 90-minute time slot. Based on the time slots you are allocated for your strand, you may also need to group some into 60-minute time slots. These time slots may have 2 or 3 proposals grouped together.**
2. Based on the common theme that runs through the papers in each discussion group, assign a title that conveys that theme to the audience.
3. Enter all of the discussion groups on the form. You should already have entered all of the paper sets grouped by committee and all of the round tables. Enter the information as follows:

- Enter **Discussion Group** in the column "Session Format."
- Skip the pres./discussant column unless you would like to recommend an assignment.
- Enter the session title that you have assigned in the next column.
- Enter all of the proposal ID numbers for the proposals grouped in this discussion group in the next column.
- In the last column, enter the time allocated as either 60 or 90 minutes.
- Repeat until all discussion group sessions have been entered.

Instructions for Assigning Novel Formats:

1. Some of those proposing a novel format may have requested a full 60 or 90-minute time slot. Attempt to honor this if scheduling permits. Those requesting smaller time slots should be grouped according to similarity of format, topic, and time selected. For instance, you would group two novel formats requesting 45 minutes each into one 90-minute slot.
2. For those requesting and receiving a full time slot, the session title can be the same as the paper title. For those that are grouped, you will need to assign a session titles.
3. Enter all of the novel formats on the form following your discussion group entries. Please use these guidelines:

- Enter **Novel Format** in the column "Session Format."
- Skip the pres./discussant column unless you would like to recommend an assignment.
- Enter the session title in the next column.
- Enter all of the proposal ID numbers for the proposals in this set in the next column.
- In the last column, enter the time allocated as either 60 or 90 minutes.
- Repeat until all novel format sessions have been entered.

Instructions for Entering Multiple Paper Sets:

Obviously, you do not need to "assign" papers to a group. In addition, the proposer of each multiple paper set should have indicated a session title. We are requesting, however, that this information be entered on the form to provide us with an overall representation of your strand. Enter the information as follows:

- Enter **Multiple Paper Set** (MP Set) in the first column.
- Enter the pres./discussant if one was requested by the MP Set proposers. If one was not requested, you may skip this unless you would like to recommend an assignment.
- Enter the session title.
- Enter all of the proposal ID numbers for the papers in this set (ex: if there are four papers in MP Set with the proposal number 04-12, they will be 04-12.1, 04-12.2, 04-12.3, 04-12.4).
- In the last column, enter the time allocated as either 60 or 90 minutes (most will have requested 90 minutes, and this will usually be the allocated time, as well).
- Repeat until all MP Set sessions have been entered.

Instructions for Entering Symposia:

There are no groupings to be assigned for this format type. Also, the session title will be the same as the paper title for this format (Note: if someone has requested "symposium" yet has sent in a proposal that has multiple papers, this will need to be reclassified as a multiple paper set. Please notify us if this happens.). Enter the information as follows:

- Enter **Symposium** in the first column.
- Enter the pres./discussant if one was requested.
- Enter the session title—this should be the same as the paper title.
- Enter the proposal ID number for the symposium.
- In the last column, enter the time allocated as either 60 or 90 minutes.
- Repeat until all symposia sessions have been entered.

Instructions for Entering Poster Sessions:

You will simply enter **Poster Session** in column one. You may skip columns two and three. You can enter multiple ID numbers in column four (as many as you can fit; in other words, each poster presentation does not need its own row). Skip the time allocated column. Repeat this for subsequent rows until you have entered all of the poster session ID numbers.

Instructions for Assigning Interactive Poster Sessions:

1. If you have enough interactives to make multiple sessions, group the papers based on similarity of topic. Most time slots will be 90 minutes in length, so group six to eight papers into a 90-minute time slot. You may also need to group some into 60-minute time slots. These time slots may have 4-5 papers grouped together.
2. Based on the common theme that runs through the papers in a group, assign a session title that conveys that theme to the audience. This may need to be very broad since there may be a great deal of diversity among papers.
3. Enter all of the Interactive Poster Sessions on the form titled "Strand Coordinator's Recommended Groupings and Session Titles." For each interactive poster session, please enter the information as follows:

- Enter **Interactive Poster Session** in the column "Session Format."
- Skip the pres./discussant column unless you would like to recommend an assignment.
- Enter the session title that you have assigned in the next column.
- Enter all of the proposal ID numbers for the single papers grouped in this set in the next column.
- In the last column, enter the time allocated as either 90 or 60 minutes.
- Repeat until all Interactive Poster Sessions have been entered.

Research Committee

Charge:

The Research Committee advises the Association on research matters.

Research Committee Activities:

1. The evaluation and selection of proposals for NARST Pre-Conference Workshops;
2. The evaluation and selection of proposals for the NARST sessions at NSTA;
3. Membership on the NSTA Research Committee;
4. Revision of research areas including in NARST Membership form;
5. The support of commissioned papers on timely and important research topics;
6. New ideas for increasing the visibility of NARST research.

Procedures and Timeline:

1. The call for pre-conference workshops goes out around 1 September for the following Spring meeting. Research Committee members review proposals and return results in October.
2. The call for NARST sessions at NSTA goes out in the Spring for the NSTA Annual Meeting the following Spring. Research Committee members review proposals and return results around 1 April.
3. The Chair of the Research Committee is recommended by the NARST liaison to NSTA (usually one of the Presidential team) to serve as a member of the NSTA Research Committee.
4. Categories of research interest for the membership form are reviewed and updated by Research Committee members every few years.
5. On a regular basis, research papers are commissioned as one means of disseminating NARST-related research to wider and more varied audiences.
6. Research Committee regularly reviews new mechanisms of producing press releases, developing web pages, sponsoring workshops or other events related to the increased visibility and understanding of NARST-related research.

Election Committee

Charge:

The Election Committee conducts the election of Association officers.

Procedures:

NARST Officers

1. Election committee meets at the Annual Meeting and begins the process of identifying possible candidates for President and the Board of Directors.
2. A Notice is placed in the NARST News and listserv by the Election Committee Chair encouraging voting members to bring names of possible candidates for president and the board of directors to the attention of the members of the election committee.
3. Election Committee members create an ordered list of 6-8 individual members who could serve NARST well as President-elect. Candidates for President-elect must have completed a term on the NARST Board. Care is taken to represent the diversity of NARST members in the nominations process. The Chair of the Election Committee contacts individuals so identified in order of priority to learn of their willingness to stand for election. At the time of initial contact, details of the appointment, including the need to keep travel dates open for attending the meeting of the board directly prior to the annual meeting, are provided. When two individuals have agreed to stand for election, no further contacts are made.
4. Election Committee members agree on a process to create an ordered list of 10-12 individuals members who could serve NARST well as members of the Board of Directors. Candidates for the Board of Directors will have demonstrated service to NARST through strong performance on NARST committees, as strand coordinators, or in other positions of service to the organization. Care is taken to represent the diversity of NARST members in the nominations process. The Chair of the Election Committee contacts individuals so identified in order of priority to learn of their willingness to stand for election. At the time of initial contact, details of the appointment, including the need to keep travel dates open for attending the meeting of the board directly prior to the annual meeting, are provided. When six individuals have agreed to stand for election, no further contacts are made.
5. The Election Committee Chair presents the slate of officers to the Board of Directors at the October board meeting.
6. The Chair contacts the nominees to request a candidate statement for the ballot. The Executive Secretary provides examples from previous elections and receives all candidate statements. The Executive Secretary prepares a ballot with candidate statements and sends to all members at least 3 months prior to the annual meeting.
7. Ballots are received and counted by the Executive Secretary no less than 2 months prior to the annual meeting. Election is by a plurality of votes.
8. The Executive Secretary informs the President of the results of the election, and the President informs all elected and defeated candidates of the outcome of the election.

NSTA Research Director

During years when NSTA is electing a new Research Division Director, the NARST Election Committee also nominates 1-2 NARST members to the NSTA Nominations Committee to stand for election as NSTA Research Director (historically this person also sits on the NARST Board in ex officio status). The Chair sends a call for nominations to the membership via the listserv and also requests nominations from the Election Committee. The Election Committee votes on the nominees. The Chair of the NARST Election Committee sends the final nominees to the chair of the NSTA Nominations Committee by mid-

Election Committee (cont.)

September. The NARST President writes a letter of support for the nominee(s) before the Oct. 1 NSTA nominations deadline.

Timeline:

Annual Meeting	The Election Committee begins deliberations on composing a slate of candidates.
June	NARST News carries a notice to voting members that they are encouraged to bring names of possible candidates for president and the board of directors to the attention of the members of the Election Committee.
	Election Committee finalizes ordered lists for President-elect and Board members. The Chair of the Election Committee begins to call nominees to ask them to serve.
(September)	Election Committee conducts nominations for NSTA Research Division Director during election years.
October	Slate of Officers reviewed by Board of Directors.
30 October	Chair notifies candidates and asks for candidate statements. Chair sends list of duties and reminds candidates to schedule their travel to the annual meeting around the potential of board meetings pre and post annual meeting.
15 November	Candidate statements due to Executive Secretary
15 December	Ballot prepared by Executive Secretary and checked by Chair of Election Committee.
15 January	Ballots mailed by Executive Secretary to Voting Members.
15 February	Ballots due. Executive Secretary counts ballots and informs President of results.
25 February	President informs successful candidates of their duties, including attendance at the first and second meetings of the Board of Directors at the Annual Meeting. President also informs unsuccessful candidates.

Letter #1: Offer to be on the slate for the Board of Directors

Name and address of candidate

Dear,

On behalf of the elections committee, I would like to invite you to be considered as a candidate for the NARST Board of Directors commencing at the annual meeting in XXXX.

There will be six candidates and three persons will be elected to the Board.

Membership of the Board requires attendance at three Board meetings – one prior to the annual meeting, one following the annual meeting and one in October. Expenses are provided for the October meeting only. Members of the Board of Directors chair committees and take a leadership role in the Association.

Thank you for your consideration. I look forward to hearing from you at your earliest convenience.

Chair, Elections Committee

Letter #2: Sent to candidates by Past President after the October board meeting

Name and address of candidate

Dear (Board of Directors Candidate):

At its October meeting, the NARST Board of Directors approved the slate of officers proposed by the Election Committee. Now it is official - you are a candidate for the NARST Board of Directors.

As a candidate, you have the opportunity to place a statement of about 250 words in the ballot that will help NARST members make informed choices in the election. The Executive Secretary (include email address) should receive an electronic version of your statement no later than 15 November.

In the event you are elected to the Board, you should know that newly elected Board members are encouraged to attend the meeting of the Board that takes place just before the Annual Meeting and begin their official duties at the Board meeting that begins at the end of the Annual Meeting. The Board also meets once in October. The attached list of Board Member responsibilities should help you understand the expectations, should you be elected.

Thanks again for agreeing to stand for election.

Sincerely,
Chair, Election Committee

Enclosure: Board Member Responsibilities

Election Committee (cont.)

Board Member Responsibilities

1. Attend and participate in board meetings
   - Attend entire board meeting—Fall (a weekend in October) and Spring (two sessions, one prior to the Annual meeting and one following the Annual meeting). NOTE: New board members are expected to attend the board meeting prior to the Annual Meeting, although they do not have voting rights until the board meeting following the Annual Meeting.
     - *Confidentiality of Board Members*: At times the board will go into closed sessions. It is critical that the substance of these session be kept confidential.
   - Take part in conference calls
   - Respond to email conferences and votes
   - Attend NARST Awards Luncheon, Business Meeting, and Past Presidents Reception at the Annual Meeting

2. Chair Committees
   - Chair 1 or more NARST Standing Committees
   - Set agendas for and oversee committee meetings at Annual Meeting
   - Meet with committee via email as needed throughout the year
   - Delegate committee work to members
   - Ensure that committee work is completed and deadlines met
   - Keep committee members informed of meetings, board decisions, etc.
   - Write committee reports for fall and spring board meeting books
   - Propose discussion items and motions based on committee meetings at the board meeting

3. Ad hoc Committee
   - Chair or serve on ad hoc committees as requested by the president (examples include JRST editor search committee; Executive Secretary search committee)

4. Represent NARST
   - Serve as liaison between NARST members and board
   - Represent NARST at other professional meetings
   - Seek ways to further the interests of the association

Letter #3: Sent to elected board members by President

Dear "new board member",

As the President of NARST, it is my pleasure to inform you that the election results have been tallied and you have been elected as a member of the Executive Board for a period of three years (Annual Meeting, XXXX- Annual Meeting XXXX). Congratulations on such a deserving accomplishment!

Your Board member responsibilities are outlined in the attached statement. In terms of this year's Annual Meeting, your responsibilities are as follows:

1. Attend the first Board meeting on XXXX at XXXX (dinner provided). During this meeting your role will be as guest and observer. You are welcome to participate in the discussion, but may not yet make, second, or vote on motions.

2. Attend committee meetings for any committee(s) you are assigned to chair. The outgoing chair will conduct the meeting. President-elect XXXX will correspond with you about potential committee assignments prior to the meeting.

3. Attend NARST Awards Luncheon (seated at one of the reserved tables), Business Meeting, and Past Presidents Reception.

4. Attend the second Board meeting on XXXX from XXXX (breakfast and lunch provided). You will have full voting rights at this meeting and will be asked to present a brief summary from your committee meetings.

As you know, we try to keep the election results reasonably confidential until the meeting. I have also attached the NARST mission statement, bylaws, and current procedures manual for your information.

Congratulations again, and see you in St. Louis!

Sincerely,
NARST President

Attached: Board Member Responsibilities
NARST Mission Statement
NARST Bylaws
NARST Procedures Manual

Letter #4: Sent by President to unsuccessful candidates to the board:

Dear "name"

The NARST election results have been tallied and I am very sorry to inform you that your nomination to the Executive Board has not been successful.

As President of NARST, I sincerely thank you on behalf of the board and the membership for taking the time, effort, and commitment to be a candidate.

I look forward to seeing you in St. Louis. Best wishes for continued success in your science education research, teaching, and service efforts.

Sincerely,

President

Letter #5: Offer to be on the slate for President-elect

Name and address of applicant

Dear,

On behalf of the Elections Committee, I would like to invite you to be considered as a candidate for the NARST President-Elect commencing at the annual meeting in XXXX.

There will be two candidates and one person will be elected.

The Elections Committee believe that you would be an ideal candidate for this position.

Thank you for your consideration. I look forward to hearing from you at your earliest convenience.

Chair, Elections Committee

Letter #6: Approval to be on the slate for President-elect

Name and address of applicant

Dear (Presidential Candidate):

At its Fall meeting, the NARST Board of Directors approved the slate of officers proposed by the Election Committee. Now it is official - you are a candidate for the NARST President.

As a presidential candidate, you have the opportunity to place a statement in the ballot that will help NARST members make informed choices in the election. The Executive Secretary (give email address), should receive hard and disk copies of the text of your statement no later than 15 November.

Thanks again for agreeing to stand for election.

Sincerely,
Name
Chair, Election Committee

International Committee

Charge:

The International Committee is responsible for projects focusing on international science education research and meetings.

Procedures:

The Chair of the International Committee or a representative from the committee serves as NARST's representative to the International Council of Associations of Science Education (ICASE).

The International Committee hosts a symposium at each Annual Meeting.

Time Line and Due Dates:

Documents and Sample Letters:

Equity Committee

Charge:

The Equity Committee is responsible for providing leadership and guidance to the association on issues of equity, including but not limited to gender, ethnicity, socioeconomic status, disabling conditions, sexual orientations, language and religion.

Procedures:

1) Compile data, communicate results, and suggest recommendations to the Board related to equity in all areas of the organization.
2) Recommend or sponsor strand coordinators, reviewers, and keynote speakers for the annual meeting.
3) Promote the publication of a periodic review of research on equity issues and related policy or conceptual papers.
4) Facilitate discussions among members about the organization's role in promoting equity within and outside the organization.
5) Contribute ideas related to equity issues for programmatic-and publication-related venues of the organization.
6) Promote research dealing with equity for all, especially under represented populations.

Timeline:

Most of the business of the Equity Committee is conducted at the annual meetings, with follow-up at Board meetings, and then by email as the need arises.

Documents and Sample Letters:

Membership Committee

Charge:

The Membership Committee recruits members to NARST and ensures that the organization is responsive to the ongoing needs of the membership.

Procedures:

Time Line and Due Dates:

Presidential Team Duties

President-elect Duties

MONTH	DUTY
May	• Work with Program Committee on finalizing conference theme • Finalize call for proposals with Annual Meeting Coordinator (AMC)
August	• Invite speakers for conference general sessions
September	• Write President-elect report for Fall Board Meeting • Prepare report of the annual meeting with AMC for Fall Board Meeting
October Early	• Strand Coordinators send program information to AMC (President-elect can do final check of accepts/rejects) • Send AMC suggestions for program and special sessions • Work with AMC to finalize preliminary program
November Early	• Send thank you letters to Strand Coordinators and their dept heads (as requested): Ask for suggestions for new Strand Coordinators • Obtain advertisers for conference (Book publishers, etc.)
December	
January	• Invite Kluwer to participate in Past-presidents Reception
February Early Late	• Working with committee chairs and executive secretary, compile list of members to be placed on committees; e-mail individuals on list to confirm interest in specific committees • Think about ad-hoc committees • Select new Strand Coordinators • Re-contact speakers for conference general session; ensure they're coming and notify them of their session. Ask about av needs and tell AMC. • Send out committee members and Strand Coordinators list to Board for a vote. • Prepare President-elect and program committee reports for Spring Board Meeting

President-elect Duties (cont.)

MONTH	DUTY
March Early	• Send letters about Past-presidents Reception @ NARST to past presidents, past executive directors, distinguished contribution to research recipients, and past journal editors • Ask Strand Coordinators to write summary for their strand, post it on web before conference, and write report for newsletter • Prepare announcements for listserv net to highlight conference themes, etc. • Send letters to new committee members and Strand Coordinators notifying them of approval and of committee meeting times at the conference • Prepare agenda for 2nd board meeting
Late At Annual Meeting	• Prepare introductions for the various general session speakers at the Annual Meeting and introduction of President at Awards Lunch and at Past-presidents reception • Prepare brief speech for end of awards banquet • Visit all committee meetings • Conduct 2nd board meeting

President Duties

- Represent NARST on the board of an affiliate as agreed to by Presidential team.
- Notify award recipients of their awards (committee chairs notify runners up).
- Notify newly elected board members of their election and responsibilities (include bylaws, procedures manual).
- Send letters of thanks to all outgoing committee members and strand coordinators.
- Preside over board meetings during presidential term.
- Conduct board business electronically as needed.
- Prepare bi-annual presidential report.
- Write president's column for NARST News.
- Prepare Awards Luncheon agenda and speech.
- Preside over Awards Luncheon.
- Prepare agenda for and preside over business meeting.
- Communicate with Executive Secretary on organizational business matters.
- Coordinate searches as needed (e.g., JRST editors, Executive Secretary).
- Create ad hoc committees as needed.
- Charge standing committees to carry out specific tasks.
- Send letters of thanks to outgoing board members.

Past President Duties

- Represent NARST on the board of an affiliate as agreed to by Presidential team.
- Chair the Election Committee
- Chair the Policy Advisory Committee and update Procedures Manual.
- Prepare bi-annual reports to the Board.
- Consult with Presidential Team on issues as they arise
- Participate in all board discussions and decisions, electronically and at Board meetings.
- Serve on search committees for NARST positions as needed.

Appointments to Other NARST Positions

JRST Editor

Sample Position Announcement
New JRST Editor Needed for 2000-2005

The National Association for Research in Science Teaching (NARST) is searching for a new Editor of the *Journal of Research in Science Teaching* for 2000-2005. Although Andy Anderson and Jim Gallagher have just begun their three year appointment as co-editors of JRST, the process of identifying a new Editor must now begin. We intend that the new Editor will serve for five years as in previous editorships prior to Andy and Jim's appointment. To make the transition smooth and to identify the best qualified applicants, the search for a new JRST Editor is now underway.

The position provides the person chosen, and the host institution, international visibility in the area of science education. The JRST Editor provides the world's science educators with the organisation's broad views and goals as illustrated by published manuscripts. By providing editorials, the Journal can and should take on leadership roles in science education and be in a position to influence policy and practice.

Upon approval by the NARST Board of Directors, the new JRST Editor for 2000-2005 will work with Professors Anderson and Gallagher for the second half of the calendar year 2000. Full responsibilities are scheduled to begin in 2001 and continue for a five-year term, including a six month hand over period in the first half of 2005 for the next appointee(s) to become acquainted with the position and its opportunities.

RESPONSIBILITIES OF THE POSITION

High Levels of Organisation and Management

- Show evidence of being able to administer a large flow of manuscripts each year and to process them in an effective manner.

Vision

- Indicate very clearly the vision that they have not only for ensuring that JRST continues to be a premier journal, but also for taking the organisation into the new millennium through innovative and creative leadership. This vision should be consistent with the published vision of NARST.
- Be committed to a diversity of styles of research and ensure that the review process remains international so as to reflect multiple perspectives and diversity.

Personal Qualifications

- Be an active member of NARST with high visibility within the organisation such as being a regularly attendee at conferences.
- Be a respected scholar in science education, have a strong research record of publications in high-quality journals, and possess excellent writing and editing skills.
- Have a strong commitment to maintaining the high quality of manuscripts that are published in the Journal.

Responsibilities

- Be responsible for producing 10 issues of JRST per year.
- Attend Board meetings at the NARST annual meeting and in the Fall.

INSTITUTIONAL COMMITMENTS

- Office space for accommodating journal production activities.
- Computers to process the journal including electronic mail.

NARST COMMITMENTS

- Financial support of a maximum of $24000 per annum to cover office expenses, including one quarter-time secretary, postage, faxes and mail (international priority mail for overseas).
- Provide financial support to attend the NARST Board meeting in the Fall (this does not include the annual meeting)
- Reasonable efforts by the NARST Board to facilitate the editor's responsibilities, as directed by the Board from time to time and consistent with previous expectations.

APPLICATIONS

Interested persons are encouraged to discuss the nature of this position informally with the chairs of the search committee --Norm Lederman (lederman@ucs.orst.edu/Fax 1 541 737-1817/Phone 1 541 737-1819) and David Treagust (itreagus@info.curtin.edu.au/ Fax 61 8 9266 7924/Phone 61 8 9266 2503), the current and past journal editors, or members of the NARST Board.

Applicants should forward a letter describing the reasons for seeking the position and providing details related to the relevant criteria listed above. With the application, please provide evidence of institutional commitment, a curriculum vitae, and names of three persons who may serve as professional references. A letter of intention is due by September 1st, 1999 at which time a mailing address will be provided for submitting final submissions due by October, 1st, 1999.

Executive Secretary
Sample Search Announcement

NARST Executive Secretary Search

NARST seeks to appoint a new Executive Secretary, effective XXX, XXXX. The commitment for the Executive Secretary is five years, terminating at the end of the XXX board meeting of XXXX. The Executive Secretary position provides the person and the host institution with international visibility in the field of science education.

The Executive Secretary plays a pivotal role in the organization's activities and structure. The Executive Secretary provides a host of services for the organization including, but not limited to: 1) overseeing all monetary and contractual exchanges for the organization; 2) maintaining membership records and communications; 3) coordinating annual meeting pre- and on-site registration; 4) recording, maintaining and distributing reports and minutes for the executive board meetings; and 5) serving as ex-officio member on numerous NARST committees.

The NARST budget provides funds to the office of Executive Secretary for supplies, printing, postage, and telephone expenses; 1/2 time clerical support; travel for the Executive Secretary to two yearly board meetings; and up to $9000 in travel for graduate student travel to the annual meeting to work the registration table. NARST also provides a $3000 start-up discretionary monies. The institution is expected to commit release time to the Executive Secretary, 1/2 time clerical support, and electronic mail and accounting systems support.

NOTE: In August, 2001 a new administrative structure was put in place for NARST Management which changed both the duties and the funding of the Executive Secretary. The previous two paragraphs may no longer apply.

All interested candidates should submit their names as soon as possible, but no later than XXXX to XXXX via email. Applicants will then prepare a letter of intent that will be submitted to the Executive Board for approval. Letters of intent will be due XXX and should address the following areas: 1) reasons for wanting to assume the position, 2) previous service to NARST, 3) experience in organizational management, 4) vision for NARST as an organization, 5) commitment to the position through the year XXXX, and 6) evidence of institutional support. The Board intends to approve the new Executive Secretary by XXXX.

We need your help in filling this critical position in the NARST organization. If you are interested, please contact XXXX immediately. If you know of an individual who would make a good Executive Secretary, please encourage him/her to apply.

Annual Meeting Coordinator

Sample Announcement: NARST Annual Meeting Coordinator Search

NARST seeks to appoint a new Annual Meeting Coordinator (AMC), effective March 15, XXX. The commitment for the AMC is 3 years (March XXX-April XXX), beginning with an apprenticeship during this year's Annual Meeting, having primary responsibility for the 20XX and 20XXAnnual Meetings, and serving to mentor the next AMC for the 20XX Annual Meeting. The AMC position provides the person and the host institution with international visibility in the field of science education.

The AMC plays a pivotal role in the organization's activities and structure. The AMC's major responsibility is to work with the President-Elect to coordinate the annual meeting.
In particular, the roles of the AMC include:

- Communications with the President-Elect, President, and Executive Secretary concerning meeting preparations;
- Communications with a technology assistant who sets up and manages the databases and online information;
- Site visits to future meeting venues;
- Training and coordinating the activities of the strand coordinators;
- Notification of authors regarding the receipt of their coversheets and proposals; and regarding the acceptance/rejection status of their proposals
- Scheduling of the program;
- Coordinating events and the scheduling of rooms with the hotel;
- Compiling the call for proposals, preliminary program, and the final program and abstract book;
- Publication of final program and abstract book;
- Running a "problem-solving" booth at the meeting.

The NARST budget provides $10,000 to the AMC for supplies, expenses, and release time (e.g., to hire a graduate teaching assistant or support summer salary). In addition, NARST pays for AMC travel to site visits and to the annual meeting. The institution is expected to commit release time and clerical support to the AMC. For the first year of the position, the AMC will have the assistance of a technology coordinator, who has had experience with the NARST databases and online submissions. In subsequent years, the AMC will have the option to move this position to his/her home institution, with financial support from NARST.

All interested candidates should submit an electronic letter of intent as soon as possible, but no later than XXX to XXXX. Letters of intent should address the following areas: 1) reasons for wanting to assume the position, 2) previous service to NARST, 3) experience in program organization, 4) commitment to the position through the year 2004, and 5) institutional support. The Board intends to approve the new AMC before the Annual Meeting so that the individual can serve as an apprentice to XXX, current AMC, during the meeting.

We need your help in filling this critical position in the NARST organization. If you are interested, please contact us immediately. If you know of an individual who would make a good AMC, please encourage him/her to apply.

NARST MEMBERS -

For travel reimbursement please be sure to sign travel expense voucher and include federal id number (social security number).

Please make copies for future use.

Send signed travel voucher to Marilyn Estes at address below. If you have any questions, please feel free to contact me.

Marilyn Estes
University of Missouri-Columbia
303 Townsend Hall
Columbia, MO 65211
573-884-1401