

E-NARST NEWS

National Association for
Research in Science Teaching

*Organized to improve science
teaching through research*

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Message from the President

Jonathan Osborne, President of NARST

NARST seems to be enjoying robust health. The San Francisco conference had the greatest number ever of people attending (~1150) and membership for this year is looking like it will likewise be record breaking. In addition we have over \$700,000 in reserves. This year we have moved the management of the organization to a professional management company—Drohan Management—whose contact details can be found elsewhere in this newsletter. They will be dealing with membership, board meetings and the conference; and we hope that you will see a series of improvements during the course of the

year. You can, for instance, now renew your membership electronically—something which many of you have been asking for. Likewise, you will be able to register for the conference next year on the website so there will be no more faxing of the form.



Past President Jim Shymansky and President-elect Jonathan Osborne at the 2006 Conference Awards Banquet in San Francisco.

However, the state of science education is not in such good health. Increasingly, those of us working in science education are aware of the rising tide of panic about the lack of interest of today's young in the study of science. In the UK alone, I am beginning to lose count of the number of conferences to which I have been invited to discuss this matter. The government

here has now publicly set itself the aspiration of increasing the number of students leaving school with an advanced level qualification in physics from 24,000 (the current number) to 35,000 by 2014.

Some insight into the nature of the problem comes from the attitude survey undertaken by Svein Sjoberg of Norway for the ROSE (Relevance of Science Project). In over 25 countries the survey has shown there is a negative correlation of .92 between students' interest in school science and the UN index of Human Development (HDI). This measures the average achievements in a country in three basic dimensions of human development:

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1. A long and healthy life, as measured by life expectancy at birth.
2. Knowledge, as measured by the adult literacy rate (with two-thirds weight) and the combined primary, secondary, and tertiary gross enrollment ratio (with one-third weight).
3. A decent standard of living, as measured by gross domestic product (GDP) per capita at purchasing power parity (PPP) in USD.

Increasingly, those of us working in science education are aware of the rising tide of panic about the lack of interest of today's young in the study of science.

Whilst anybody working in science knows that correlations do not necessarily show any causal relationship whatsoever, this statistic and its strength does invite some kind of theorizing as to why? There is, for instance, the argument that the gulf between science-as-it-is-taught and science-as-it-is-perceived on TV and in the media is rapidly increasing. In the words of one student—‘why are we studying the blast furnace when we have gone onto cloning now.’ Or, as another student from Sweden put it—‘the trouble with school science is that it provides uninteresting answers to questions we have never asked.’ That is—is the problem essentially a systemic one—a consequence of living in an advanced technological society where the milieu is one that almost makes school science seem lost in the past—like a foreign country where things are done differently? The evidence, for instance, is clear that school students do not distinguish between science and technology. When asked to list what are the most important scientific discoveries of the past 100 years, their answers in order of priority are the computer, mobile phone and the television. Their vision of science is of the world around them and the question arises as to how much school science reflects that? For individuals living in less developed contrasts, surrounded by artifacts that are not so advanced, it is perhaps easier to make connections between the ideas of school science and their experience of daily life.

Then there is the economic argument—many of us living in developed countries simply have our most basic needs provided for. In that context, young people do not look to science and technology as the tool that will improve the quality of their lives. Rather, they look to those disciplines that afford them the opportunity for self-expression, creativity and independence to

explore what it means to be human.

Another supposition is that the world the young inhabit today is increasingly one where the material world, the focus of science, is kept at a distance. Children are no longer permitted to explore or play with each other beyond the safety of the watchful eye of an adult. Children’s daily experiences are often virtual and not amenable to the kind of mechanical deconstruction that led my generation to disassemble every artefact in sight. In short, contemporary technology disengages students from those experiences which are fundamental to inquiry.

There are others—that we live in a humanistic society which science and technology has simply enhanced offering us better and more flexible means of communication and not a scientific and technological society; that science is now seen by too many not as a source of solutions but, rather, a source of problems; and that school science constitutes the last authoritative socio-intellectual discipline in the school curriculum which alienates students. Or maybe science is just plain hard.

There is, undoubtedly, no simple or singular answer to the issue. The health of science education depends, however, on our ability as a community to help define and inform the debate about what kind of science education we should be offering today’s youth—in what contexts and how. It is this challenge that lies at the core of our work and the vitality of NARST.

Invitation to Submit Proposals for NARST 2007 Annual Conference

Penny J. Gilmer, President-elect of NARST

As your NARST President-elect, I invite you to submit proposals for presentation at our annual meeting in 2007 in New Orleans, Louisiana. Our NARST Executive



Past President Jim Shymansky gives plaque to Penny Gilmer, outgoing member of the NARST Board. Penny is the new President-elect.

Board decided, with your input through a survey last year, to support the city of New Orleans in its recovery from hurricane, Katrina, in 2005, and to keep our meeting there. This was the year we were to be in conjunction with NSTA, but NSTA withdrew from New Orleans after the hurricane and their 2007 meeting will be in St. Louis, Missouri.

I want you to know in early May of this year Past President Jim Shymansky and I visited New Orleans and our hotel specifically to assess the situation, to see the hotel, and experience the city. We felt that all will be well next year for our meeting. Already the city is vibrant and if anything, much cleaner than I remembered it from earlier NARST meetings. I took various photographs to share with you that are in this E-NARST News and on our NARST Web site. Also the many residents and business people of New Orleans thanked me for bringing our annual meeting to New Orleans.

Board decided, with your input through a survey last year, to support the city of New Orleans in its recovery from hurricane, Katrina, in 2005, and to keep our meeting there. This was the year we were to be in conjunction with NSTA, but



The pre-conference workshops will be on Sunday afternoon, April 14th, and the opening session will be Monday morning, April 15th. We will close with our awards luncheon on Wednesday, April 17th. Our hotel is the Sheraton New Orleans Hotel on 500 Canal Street. I've included a few pictures to show you the upbeat feeling I had of our hotel and New Orleans. At a nearby restaurant called Tiramisu, there was an "Open" sign, which I took as a message that not only is the restaurant open (and it has delicious food and with walls that open to the sidewalk) but also the city of New Orleans is open to us.

As I have already e-mailed you, we have expanded the number of strands from 12 to 14, and in the process have rewritten their descriptions. (See the Table of Strands.) This helps us to update and redefine research in science education, plus to meet the need of more attendees wanting to present at our annual meeting. With additional strands, this means we needed to enlist more strand coordinators, and more NARST members accepted this responsibility. (See the Program Committee Table.) So thank you from all NARST members (now close to 900 strong, and at least 25% international!) to the 22 strand coordinators!

Our theme for the meeting is Restructuring Science Education Through Research, which is what I feel we do as science education researchers. Therefore, when you submit your proposals, keep this theme in your mind. We will have two excellent keynote speakers to enhance our focus on this theme. More on that later!

By now, you should have received the 2007 Call for Proposals, but if you have not, please go to our NARST Web site at <http://www.narst.org/> and download a pdf file with this call for proposals. With our new administrative company, Drohan Management Company (DMG), we have professionals to facilitate our communication with members. DMG 1) maintains our Web site, 2) is in charge of our proposal submissions and connection to our Strand Co-coordinators for the review process, 3) makes the CD with the NARST Conference Proceedings,

4) publishes our E-NARST News, 5) handles our finances, and 6) arranges our Executive Board meetings

(including conference calls) and our annual meetings. Robin Turner at rturner@drohanmgmt.com is our contact person at DMG. The general information e-mail address for NARST is info@narst.org.

I have also included photographs that I took in San Francisco at our 2006 meeting, so you would remember how good a meeting and location it indeed was. I hope you enjoy the photos!

Photography is one of my hobbies, so it is nice to bring a passionate hobby together with my service to NARST.

The Presidential team, the entire NARST Board, and DMG look forward to seeing you in New Orleans. If you have concerns or suggestions for improvement, please



let me know at gilmer@chem.fsu.edu. I will be traveling for four weeks to New Zealand and Australia mainly for a holiday, but also giving a paper in Wellington and at the ASERA meeting in Canberra, from mid-June to mid-July, so if it takes me a while to respond during that time period, please understand. Jim Shymansky will handle NARST affairs related to the 2007 annual meeting while I am traveling. His

e-mail address is jshymansky@umsl.edu.

Sincerely,

Penny J. Gilmer, Ph.D. (University of California, Berkeley, 1972), D. Sci.Ed. (Curtin University of Technology, 2004), Professor of Chemistry and Biochemistry, Florida State University

PLEASE NOTE CHANGES IN CALL FOR PROPOSALS

You will notice in the Call for Proposals that each attendee may be first author on only one lecture or discussion paper, first author on one poster, and a speaker in one symposium. Prepare your proposals with your most significant and best research. The first author must register by February 14, 2007 once the paper is accepted, or otherwise, if not registered, we will remove the paper from the program.

For this coming year we also require you to have a manuscript for a presentation (either for a paper or a poster) to be submitted by February 28th, 2007 for the NARST Conference Proceedings, or alternately you may distribute the manuscript (either on paper or on your own CD) at the meeting (or give a piece of paper with the Web site, where it can be downloaded).

NARST Strand Descriptions

*(approved by NARST Executive Board
for 2007 annual meeting)*

1. *Science Learning, Understanding and Conceptual Change*
How students learn for understanding and conceptual change.
2. *Science Learning: Contexts, Characteristics and Interactions*
Learning environments, teacher-student and student-student interactions, and factors related to and/or affecting learning.
3. *Science Teaching—Primary School (Grades preK-6):*
Characteristics and strategies, teacher cognition, content knowledge, pedagogical knowledge, pedagogical content knowledge, instructional materials and strategies.
4. *Science Teaching—Middle and High School (Grades 5-12):*
Characteristics and strategies, teacher cognition, content knowledge, pedagogical knowledge, pedagogical content knowledge, and instructional materials and strategies.
5. *College Science Teaching and Learning (Grades 13-20):*
Instructor cognition, content knowledge, pedagogical knowledge, pedagogical content knowledge, student understanding and learning, and conceptual change at postsecondary level.
6. *Science Learning in Informal Contexts*
Learning and teaching in museums, outdoor settings, community programs, communications media and after-school programs.
7. *Pre-service Science Teacher Education*
Pre-service professional development of teachers, pre-service teacher education programs and policy, field experience, and issues related to pre-service teacher education reform.
8. *In-service Science Teacher Education*
Continuing professional development of teachers, in-service teacher education programs and policy, and issues related to in-service teacher education reform.
9. *Reflective Practice*
Teacher inquiry, action research, self-study practices, and transformative education.
10. *Curriculum, Evaluation, and Assessment*
Curriculum development, change, implementation, dissemination and evaluation, including alternative forms of assessment of teaching and learning.
11. *Cultural, Social, and Gender Issues*
Equity and diversity issues: sociocultural, multicultural, bilingual, racial/ethnic, and gender equity studies.
12. *Educational Technology*
Computers, interactive multimedia, video and other technologies.
13. *History, Philosophy, and Sociology of Science*
Historical, philosophical and social issues of science as related to science education.
14. *Environmental Education*
Ecological education; experiential education; education for sustainable development; indigenous science.

NARST Program Committee, 2006-2007

Co-Chairs

Year Finishing	Name	E-mail	Web site
(06)	Jim Shymansky, Past President	jshymansky@umsl.edu	University of Missouri-St. Louis
(07)	Penny J. Gilmer, President-Elect	gilmer@chem.fsu.edu	http://www.chem.fsu.edu/editors/gilmer/index.html

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(07)	♦	Strand 3: Science Teaching—Primary School (Grades preK-6)		
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The State of the Association

Jim Shymansky, President 2005-2006

An address delivered at the 2006 annual meeting awards banquet April 5, 2006, San Francisco, CA

My address is going to be different from most addresses that I've heard in my 33 years of attending NARST; I am going to deliver a "state of the association" message. It will have 2 parts: I will first report on the finances and operation of our association. I will then offer my observations and assessment of where we are in terms of our mission. I have some proposals that I plan to bring to the NARST board in my final year as past-president in each of these areas. I will share them with you in my address.

Let me begin with exciting news about the board's decision to hire a management company to assume the duties that for the past 5 years have been handled by our Annual Meeting Coordinator and Electronic Services Director, David Zandvliet and our accounts operation person at the University of Missouri-Columbia, Marilyn Estes. The Drohan Management Group (DMG), a professional management company headquartered in Reston, VA, will now direct these operations. Through DMG we will have services provided by a staff of more than 30 professionals who are highly trained and experienced in managing professional organizations. The board opted for a management company over individual replacements because of the increase in the time, energy and special infrastructure needed to perform the necessary management tasks. The size, complexity and legal/accounting aspects of dealing with hotels, publishers and staff are much different that they were even 5 years ago. We just didn't feel it was fair to ask fellow members to assume such heavy responsibilities.

I will now talk about our finances. In 2005 our gross receipts were ~\$358,000. Our total disbursements were ~\$274,000. At the end of 2005, we had a reserve of ~\$700,000. For

2006 we are projecting receipts of ~\$557,000, the increase coming primarily from increased royalties on JRST as a result of a contract extension with Wiley Publishing with projected disbursements of ~\$477,000, much of this increase the result of payments of accumulated balances for 2005 management tasks and management transition costs. Even so, our surplus should grow to more than \$800,000 by this time next year, including a onetime signing bonus of \$100,000 from Wiley for the contract extension.

The bottom line is that NARST is very solvent—perhaps too solvent for a professional association. I don't have a message anywhere near as profound as that delivered by outgoing United States president, Dwight Eisenhower when in 1961 he told citizens to be wary of the growing "military-industrial complex." But I really do want to encourage you to monitor budgets—offer suggestions, and demand accountability. NARST money is your money, not whoever happens to be on the board at any given time. I

am therefore going to propose to the board this year that we deposit most if not all of our reserve in a semi-permanent trust whose revenues can be available for special projects but whose capital will remain in tact and available only for emergencies.

So much for our finances—how are we doing in terms of our mission? Our mission is stated in Article II, Section

I in the bylaws: The purpose of the Association is to promote research in science education and to disseminate the findings of this research to improve science teaching [sic] and learning." So what does this mean?

At my own dissertation defense at Florida State University in 1972, the physics professor on my committee opened the defense with the statement/question: "A dissertation



Our main job as a science educator is to help classroom teachers do a better job of teaching, i.e., helping students, K-college, understand and make better sense of their world, which I believe is the basic message of our mission statement.

is supposed to add new knowledge to a field—what new knowledge are you adding to science education?” I really wasn’t expecting such a question. I was taken aback. I did recover sufficiently to pass the defense, but I now ask you, what new knowledge are we collectively, as an association adding to the field of science education?

I’ll begin to address that question by way of a comparison. When I started my career in NARST, new researchers in our field had models that reported results like this:

Based on samples of K-college teachers drawn from across several geographic areas, science teachers wait less than one second after asking students a question before rephrasing the question, redirecting the question or even answering the question themselves—and that a longer “wait-time-I” increases the likelihood that students will answer and if the teacher does not react to the student’s answers or questions quickly (Wait-time II), the student will even elaborate on their response!

Most of you will recognize this study by the late Mary Budd Row, a past president of NARST. It is her famous “wait-time” research. Her wait-time research continues to resonate with teachers and educators. Her study was robust, easily generalized and very practical. And it took all of 12 pages—an estimated ~7,000 words—in JRST in 1974.

Contrast the findings of her wait-time research with that of a recently published study:

This study investigates the proximal and distal images of the nature of science that A-level students develop from their participation in laboratory work. It is posited that each student’s conceptual ecological system is replete with interactions, which govern attenuation of proximal understandings into distal images.

Now I have no problem with fields having their own special terminology—it is one of the things that help define a field. But this is pretty esoteric stuff—even for science educators. And this study took up 22 pages in a recent issue of JRST.

I have two reasons for sharing these two examples of research with you. My first is to ask, “for what audience should our presentations and publications be written?” You may be surprised by my answer: I think, other members of NARST. Yes, we need to produce new knowledge that will help us do a better job at being science educators. But our main job as a science educator is to help classroom teachers do a better job of teaching, i.e., helping students, K-college,

understand and make better sense of their world, which I believe is the basic message of our mission statement. Our research needs to focus on how students learn and what we can do as teachers to facilitate that learning. If we aren’t able to use—by “use” I don’t necessarily mean distribute JRST or any research journal articles to teachers, but rather I mean “translate” the research that we publish to help both pre-service and practicing teachers do a better job in their teaching—then we had better re-examine our research and/ or our mission statement.

My second reason for sharing these two examples of research, a “then” and “now,” is to point out a major problem with the trend in publishing “thick and rich” narratives in our journals. Until about 1980 or so, the average length of an article in JRST was 8 journal pages—about 4,000 words. In less than 30 years the average page length has soared to 26+ pages, about 15,000 words—with some articles occupying as many as 45 journal pages.

There are two reasons why I think “thick and rich” is not better or to use a more familiar phrase, why “less is more.” The obvious one is limited journal space and the demand for that space. In 1975, each issue of JRST contained ~9 articles per issue. In 1985, that shrunk to ~7 per issue, in 1995 to 6 per issue. In 2005, that number was down to 4.5 per issue (Table 1). In 2005, authors submitted 236 manuscripts for review of which ~50 had been accepted or accepted with revision by this time of our San Francisco conference. Even if the pattern of 4.5 per issue were to stay constant and assuming there were no other manuscripts in the publication queue, many of these 50 manuscripts will have to be held in a publication queue into 2007 or even further in the future. If something isn’t changed, the backlog of manuscripts will grow even longer.

Table 1. Profile of manuscripts published in JRST between 1975-2005

Year	Issues/Year	Papers Published	Papers/Issue	Pages/Paper
1975	4	53	13.3	8.9
1985	9	61	6.8	13.9
1995	10	60	6.0	18.0
2005	10	45	4.5	25.6

One solution to the backlog is to add pages to existing issues or to add whole issues to each volume (as was done in the International Journal of Science Education). But is a page/issue increase really the answer? Yes and no. A better

solution, I contend, is to start submitting shorter, more succinct articles. “Shorter” would immediately begin to solve backlog problems in JRST and other research journals, but there is another reason why shorter is better: Most of us simply do not have enough time to wade through all the “thick and rich” information that now clutters all our education journals. We need published articles whose questions, methods and results can be understood and judged after reading 8-10 pages, not 30 or 40 pages. Watson and Crick’s Noble Prize winning research on the structure of DNA was first reported in 1200 words in the publication, “Nature.” Do we really need ten times that many words to report the research that we do in science education? I don’t think so.

Shorter, more succinct research reports also address the never-addressed issue of “currency.” In medicine, research results are most always published very quickly with turn-around times of less than 6 months from initial submission through revision to print. In science education, we don’t seem to value currency. Research reports can languish for 2-3 years and longer between the completion of research and publication. Delays in publication of accepted manuscripts are largely due to limited journal space, but we as senior researchers, mentors, reviewers and editors are also part of the problem. We have not promoted the slightest sense of urgency in our research culture. The phrase “hot off the press” has never really applied to research in science education. Researchers often wait months, even years before they submit manuscripts for publication; reviewers for journals often sit on manuscripts for months before responding to requests for reviews; and authors often take many months before submitting revisions. We have to start demanding currency in our research and implementing policies and practices that promote currency if we are to make the most of our research and if we are to be taken seriously by people outside our own community!

I know I am speaking to an audience who is very much entrenched in qualitative research genres that you feel justify and demand “thick and rich” journal narratives. So here is what I suggest as a compromise or perhaps more of a hedge on the journal space issue: For about 2 years now, Wiley and other publishers of journals have begun posting

accepted manuscripts in various “early view” systems on their respective websites. Manuscripts are then moved to permanent, on-line homes once they have been assigned a spot in the respective journal. This is a great use of on-line technologies. But why not go one step further and do what some of the science journals are doing, e.g., the *Journal of Computational Chemistry*—cut the main article to a succinct report and move much of the material that is now being included in the printed pages to a “supplemental materials” site that is referenced by internet link in the article. If authors were given a maximum printed space of say, 10 journal pages (even less) and limited space on the web to permanently post supporting information (e.g., interview data, instruments, extended bibliographies, etc), those readers who want the additional detail can retrieve it and those who want only the basic, abridged version need only read the printed journal pages. Such a plan would capture the best of both the print and electronic worlds.

I hope it is clear from my remarks that the problems with publications that I have discussed

apply to all the science education research journals. The problems are not a question of research methodology either. The problems of limited journal space, currency of research and ensuring the addition of new knowledge that is useful are very practical problems that require practical solutions. I plan to promote the idea of limited-print articles for JRST in my final year on the NARST board and for the *International Journal of Science and Mathematics Education (IJSME)*, the latter for which I serve as a senior editor.

So, how are we doing in our mission? We need to do a better job of asking ourselves, *is this research adding knowledge that other science educators can use to improve science teaching and learning*, as we plan our research studies, direct doctoral dissertations, and review manuscripts for presentation and publication. We also need to seek creative ways for getting our new knowledge to colleagues efficiently and in a timely manner. We really can’t afford to do anything less.

Again, thank you for the opportunity to serve you. I’ve enjoyed my year as president and hope that I’ve done some good—or at least caused you to think, reflect and react.

The problems of limited journal space, currency of research and ensuring the addition of new knowledge that is useful are very practical problems that require practical solutions.

NARST Awards Committee:

Submission Invitations

Fouad Abd-El-Khalick, Chair

2007 NARST Outstanding Doctoral Research Award

The NARST Outstanding Doctoral Research Award Selection Committee invites all current NARST members who completed a dissertation within the 15 months prior to September 15, 2006 to submit an expanded ten-page abstract (in PDF format) to the committee for consideration for the 2007 NARST Outstanding Doctoral Research Award. Submissions are sought from as wide a field of candidates as possible, 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 applicants will be asked to submit one copy (in PDF format) of the complete dissertation. The final decision of the committee will be based on the complete dissertation. All applicants will be notified of their status after the first round of judging is completed in early November. The recipient will be announced at the awards luncheon at the 2007 annual meeting in New Orleans.

The committee welcomes doctoral dissertations from all research perspectives. The ten-page abstract should be structured to describe clearly the following: (1) purpose or objectives of the study; (2) conceptual/theoretical framework; (3) research approach/methods; (4) data sources and methods of analysis; (5) findings or results; (6) conclusions and implications; and (7) significance of the study. It is suggested that nominees model their abstracts after conference proposals submitted for NARST: Abstracts should foreground rationale, methods, and results.

Judging in both rounds (for abstracts and dissertations) will be based on the following three central questions: (1) Is the research question(s) 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) asked? 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 who were 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: An all-electronic submission process will be used. Persons wishing to be considered for the award should submit an e-mail with the following three attachments (in PDF format): (1) one file containing a ten-page, double-spaced abstract (margins limited to one inch all around using 12 cpi font); (2) one file containing a five-page abbreviated bibliography; (3) one file containing a cover sheet which includes the author's name, address where they can be reached through December 2006, 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. This cover sheet should be signed by the major advisor/professor/supervisor or chair of the dissertation committee. An electronic signature is acceptable. Alternatively, the dissertation supervisor/director can send an e-mail to the Chair of the Outstanding Doctoral Research Award Selection Committee endorsing the application and attesting to the accuracy of the information provided in the application. (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.)

An email with all three attachments must be received by *Shari L. Britner* at sbritner@bradley.edu no later than **September 15, 2006**. We regret that the committee will be unable to consider incomplete or late applications.

Questions regarding this award should be e-mailed to the Chair of the Committee: *Shari L. Britner* at sbritner@bradley.edu

NARST Early Career Research Award: Submission Invitation

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, 2001. All NARST members are encouraged to consider nominating an eligible and deserving early career member.

Nominations for the award must be accompanied by nine (9) 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) two additional letters of support to be sent separately.

Nomination materials should be received by the Committee Chair *Hsiao-Lin Tuan* at subltuan@cc.ncue.edu.tw or the Committee Co-chair *Norman Lederman* at ledermann@iit.edu no later than October 15, 2006.

All-electronic packages (including PDF files of all the above mentioned documents) can be e-mailed to the Committee Chair *Hsiao-Lin Tuan* at subltuan@cc.ncue.edu.tw. Hard copy packages can be mailed to the Committee Co-chair *Norman Lederman* at the following address:

Norman Lederman
Mathematics and Science Education Department
South Tower, Room 4007
3424 S. State Street
Chicago, IL 60616
USA

Note: Each candidate is reviewed independently by eight committee members. If you are interested in seeing the rating sheet that is used in this process, please request it directly from the Chair of the committee *Hsiao-Lin Tuan* at subltuan@cc.ncue.edu.tw.

NARST Distinguished Contribution to Science Education through Research Award Nominees

The National Association for Research in Science Teaching seeks to improve science education through research. To this end, the Association desires to recognize and reward individuals who have made significant contributions to science education through research. Contributions may be of several types—including, but not limited to empirical, philosophical or historical research, evaluative studies, policy-related research, and studies reflecting new techniques to be applied in research.

The recipient of the Award should have contributed over a period of at least 20 years since the award of his or her doctorate and should be at the pinnacle of his/her career. This award is the highest recognition NARST can bestow for contributions to science education through exemplary, high quality research. **Nominations are due no later than August 30 to the address below. All members are encouraged to nominate for this award.**

Please note that the award will be made to an individual who over a period of at least 20 years has:

- (a) made a continuing contribution to science education through research;
- (b) provided notable leadership in science education through research; and
- (c) had substantial impact on science education through research.

Please send the names of possible nominees to *Jane Butler Kahle* at kahlejb@muohio.edu no later than **August 30, 2006.**

NARST Annual Meeting

April 15–18, 2007

(Pre-conference workshops start morning of April 15th)

Restructuring Science Education Through Research



Photo Credit: New Orleans CVB



Photo Credit: New Orleans CVB

Sheraton New Orleans Hotel, Canal Street

2006 NARST Awardees

Dissertation Award

Name: *Stacy Olitsky*

Title: "Science learning, group membership and identity in an urban middle school"

Institution: University of Pennsylvania

Advisor: Kenneth Tobin

NARST Outstanding Paper Award:

Name(s): *Leema Kuhn* and *Brian Reiser*, Northwestern University

Title: "Students constructing and defending evidence-based scientific explanations"

JRST Award

Name(s): *Troy D. Sadler* and *Dana L. Zeidler*

Article Title: "Patterns of informal reasoning in the context of socioscientific decision making"

Citation: *Journal of Research in Science Teaching*, Volume 42(1), pp. 112-138.

Early Career Research Award:

Name(s): *Heidi Carlone*, The University of North Carolina at Greensboro

Inscription

"The Early Career Research Award recognizes Dr. Heidi Carlone for her outstanding professional accomplishments. Dr. Carlone's record of research and publications make her well known and respected as an emerging scholar in science education. Colleagues have described her research as very significant, especially in the intersecting domains of student identity, curriculum enactment, and the culture of science learning settings. Her scholarly contributions draw from cultural anthropology to offer new insights into the study of student identity, gender equity, and power relationships in science education. As a recipient of the National Association for Research in Science Teaching Early Career Research Award, she joins her predecessors in setting high standards for future awardees."

Distinguished Contribution:

Name(s): *Dr. David Treagust*, Curtin, University of Technology

Inscription

"For the past 25 years, Professor David Treagust has made significant and continuing contributions to the field of science education as a scholar, mentor, international collaborator, and leader. Professor Treagust has led an exemplary and distinguished career in science education research. Included among his many contributions and accomplishments are seminal research on the role of analogies and mental modeling in conceptual change teaching and learning, seminal research on two-tiered diagnostic assessments, and original and creative thinking in the design of research programs and projects, which resulted in a very prolific and distinguished publication record. Professor Treagust's leadership in science education included service as President of NARST and ASERA, Regional Editor to the *International Journal of Science Education*, founding Senior Editor of the *International Journal of Science and Mathematics Education*, editor of the *Australian Science Teachers Association Journal*, and advisor to the PISA international science assessment project. Professor Treagust served as doctoral advisor for a large number of students, some of whom have already achieved international recognition in science education research having received many awards including the NARST Early Career Research Award. As an international collaborator, Professor Treagust has supported the development and expansion of science education research programs in developing nations, including Indonesia, Malaysia, the Philippines, South Africa, and Sri Lanka. The research of professor Treagust has made a difference for classroom teachers, his mentoring has contributed to the continuing success and achievements of his students, and his leadership through research has impacted organizations and individuals around the globe.

Professor Treagust is most deserving of the 2006 NARST Distinguished Contributions through Research Career Award."

2006 Annual Conference Award Highlights



Photos by Penny Gilmer

NARST Equity and Ethics Committee: Understanding the Membership and Leadership of NARST

Okhee Lee and Angela Calabrese Barton

In an editorial to appear in JRST (forthcoming), the NARST Ethics and Equity Committee makes a case for why issues of representation are crucial to the science education community. In that editorial, we state that,

Increasing diversity within NARST is important in ways that extend beyond increasing the talent pool or mirroring populations because it is in how differing groups are valued as a part of the membership and how its activities are to be transformed by an increasingly diverse presence. We, as a science education research community, believe that increasing diversity is, at its root, an ethical concern because it is through increasing diversity that we will also:

- build the community's capacity to foster a research and teaching agenda that addresses cultural, racial/ethnic, and linguistic diversity,
- extend networks of social capital to enhance trust, sharing, and strength of relationships among the membership in building a community that is respectful and visionary within and beyond the NARST organization, and
- overcome the effects of latent discrimination within the community that threatens to limit the range of experiences and perspectives to be fostered by the community.

Given this call to action, as a committee, we are now compelled to ask: How diverse is the membership and leadership? And, how do we welcome, mentor, and sustain membership among underrepresented groups?

How diverse is NARST?

We are particularly interested in fostering increased participation by science education researchers from underrepresented groups. While the organization through the



Equity and Ethics Committee has undertaken several new initiatives to respond to this charge (see section on welcoming, mentoring, and sustaining membership among underrepresented groups), we find that it is often difficult to assess our progress. For example, the organization lacks accurate and updated information about

traditionally underrepresented groups in the membership. One reason for the lack of accurate information is that many members do not provide their demographic information on the membership form. Of the 1628 membership as of September 2005¹, only 980 members (60%) provided this information. Another reason is the overlap of U.S. and international membership. NARST enjoys a large international membership, with 420 international members constituting 26% of the membership. This complicates the definition and identification of underrepresented groups since the status of under representation varies in different countries. As a result, the Committee is sometimes left with having to settle with the U.S. context, although the Committee's charge involves international as well as U.S. members. As a partial solution, the Equity and Ethics Committee is working closely with the International Committee to serve underrepresented groups both within the U.S. and in other countries.

With a caution about the incomplete information, the data show that a relatively small proportion of the current U.S. NARST membership is from underrepresented groups including members of African, Hispanic, Native American, and Asian /Pacific Islander ancestry. According to the NARST membership database, of the 741 U.S. members who provided their demographic information, 130 members (18%) reported themselves as members from underrepresented groups. It is noted that some of these members are international students currently enrolled in graduate programs (mostly doctoral programs) in universities and colleges in the U.S.

The NARST Board has been well served by the Board members who work hard to promote issues of equity through the decision-making process for the organization. However, we recognize that this has happened in only an ad hoc fashion. Furthermore, NARST has not yet developed a system for documenting how well we have met our goal to promote diversity among our leadership. We see three important issues that will be taken up in coming years: (1) raising awareness around what “counts” or should count as a leadership position and working to make all of these positions more visible to the membership; (2) developing a record keeping system for documenting the numbers of underrepresented groups in leadership positions in order to make visible our direct progress towards ensuring diversity among the leadership; and (3) supporting and maintaining current efforts and developing new initiatives to ensure that the voices of underrepresented members are heard by the Board, such as creating new kinds of leadership positions within the community.

How Should We Welcome, Mentor, and Sustain Membership among Underrepresented Groups?

We believe it is imperative for NARST to foster a set of initiatives that improve how the organization accounts for diversity among its members, increase membership by individuals from underrepresented groups, and provide new venues for enhancing the visibility of the perspectives and experiences of these members in both research and organizational activities. The Equity and Ethics Committee has recently undertaken several initiatives to support research experiences, provide leadership opportunities, and establish network and mentoring among scholars from underrepresented groups in the U.S. and internationally, while also making issues of equity transparent to the organization at large.

Scholarships. As identified through its vision and mission to enhance broad and diverse membership, NARST offers scholarships for members from underrepresented groups within the U.S. The scholarships are designed to support promising young scholars (doctoral students and junior faculty) from underrepresented groups to participate in NARST events and to contribute to science education research, scholarship, and leadership. Five scholarships in the amount of \$500 each were offered to support travel expenses to attend the NARST conference and the pre-conference workshop offered by the Equity and Ethics Committee

(see the description below). The recipients of the 2005 scholarships were Bryan A. Brown, Justus Okeo Inyega, Felicia Michelle Moore, Arlisa L. Richardson, and Jamila Rashida Simpson. The 2006 awardees included Jhumki Basu, Meena Balgopal, Joi Merritt, Nonye Alozie, and Vincente Handa. Scholarships will be offered for the 2007 NARST conference, and the deadline for submission of applications will be December 31, 2006. (Note: Comparable scholarships are offered to support members outside the U.S. through the NARST International Committee.)

Pre-conference workshop. Although specific objectives may differ each year, the overall goal of the workshop is to promote junior scholars (e.g., graduate students, new doctoral degree recipients, and new assistant professors) from underrepresented groups to develop as scholars. The participants explore entry into the academy, establishing a research agenda, and building excellence in teaching via the connection between research and teaching. Additionally, the workshop lays the ground for an inclusive learning community of senior and junior scholars of color within the NARST. Participants gain meaningful insights from seasoned scholars and to begin networking as they effectively transition within the academy. Workshop instructors are respected science education scholars who have engaged in research on issues of equity. They feature presentations, lead small group discussions, and share ideas and strategies on a one-to-one basis. The workshop is open and free of charge to participants. Presenters at the 2004, 2005, and 2006 workshops were Alberto Rodriguez, Obed Norman, Mary Atwater, Guillermo Solano-Flores, and Deborah Tippins.

Committee-sponsored session. The Committee sponsors a session at the NARST conference, featuring special issues of equity that would be of interest to NARST membership at large. At the 2006 NARST conference, the Committee sponsored a session entitled, “Crafting a Voice in Academia.” The session was led by Maria Varelas, William Sandoval, Bryan Brown, and Felicia Moore along with several members of the Committee.

Equity dinner. The Committee organizes the “Equity Dinner” at NARST conferences every year. Thanks to Leslie Jones and Molly Weinburgh, this tradition has been carried on for a decade, with the celebration of its 10th year at the 2006 NARST conference. The event is well attended and warmly received.

Future plans. The plan is to institutionalize these initiatives, so that they can serve as “home” to members from underrepresented groups and other members who are committed to issues of equity. These initiatives are likely to serve as catalysts for the Committee’s activities.

¹ We appreciate Marilyn Estes at the NARST Administrative Office for providing the information in September 2005.

NARST International Committee

Recent Activities

Spring and Summer 2006

Saouma Boujaoude, Chair

During the 2006 NARST Annual Conference, the NARST International Committee organized the regular International Committee Seminar as well as another seminar that was sponsored by the European Science Educational Research Association (ESERA) and NARST International Committee. The NARST International Committee was entitled Research Schools for Graduate Students: European and South African Models of Research Enculturation. Presenters in the seminar included Justin Dillon, King’s College London; Sibel Erduran, University of Bristol; Cynthia Fakudze, University of Cape Town; and Peter Hewson, University of Wisconsin, Madison. Richard Duschl, Rutgers University was the discussant and Saouma Boujaoude, American University of Beirut was presider and discussant. Justin Dillon spoke about ESERA Summer School in terms of its aims, selection process, operation, and dissemination in addition to strengths and weaknesses of the Summer School and lessons learned from the last evaluation of the Summer School. Sibel Erduran shared her experience as a tutor at the ESERA Summer School and highlighted both the roles of coaching a small group and of conducting workshops. In his turn Peter Hewson described the goals, structures, activities, participants, and outcomes of the annual South African Research School and presented the history and future prospects of the School. Finally, Cynthia Fakudze shared her experiences as a participant in the South African Research School.

The ESERA and NARST sponsored session was entitled No Country Left Behind: ‘European’ and ‘American’ Perspectives on Research into Teaching and Learning.

Presenters in the session included Ilka Parchman, University of Oldenburg, Germany; Saouma Boujaoude, American University of Beirut; and Justin Dillon, King’s College London. In this session, the presenters explored a range of issues relevant to researchers on both sides of the Atlantic. The main thrust of the presentations was on the fact that although researcher from both sides of the Atlantic share some common languages (English, Spanish, etc.) they do not always appreciate the philosophical, epistemological or cultural differences that exist in the ‘world’ of science education. The session examined the ways by which researcher can listen to each other more effectively and work together creatively.

In addition to the above two activities, the International Committee held its meeting during the conference. Eighteen NARST members attended the meeting among whom were the winners of the NARST Travel Scholarships. The winners were: Nelofer Halai from Pakistan, Ebru Kaya from Turkey, Pongrapan Pongsophon from Thailand, Hui-Jung Chen, from Taiwan, and Tami Nahum from Israel.

Presently the NARST International Committee members are working on organizing the second year of the mentoring program. In addition, they are preparing an international seminar and a seminar in collaboration with the Australasian Science Education Research Association (ASERA) to be presented during the 2007 Annual Conference.

Journal of Research in Science Teaching

Preparing A Manuscript For Peer Review

J. Randy McGinnis and Angelo Collins, Editors

One of the frequently asked questions that we have received since we began our editorship is what is required for a manuscript to be sent out for peer review. To assist authors with this question, we offer the following information.

Submitting a Manuscript to the Journal of Research in Science Teaching: Checking a Manuscript for Issues of Compliance

Please review this list concerning issues of manuscript compliance before submitting a manuscript to *JRST*. The *JRST* Editorial office examines all manuscripts before sending them out for peer review.

Note that issues of anonymity are the most common reasons for manuscripts to be unsubmitted (i.e., sent back to the author without review).

Cover letter:

1. The cover letter should include the author(s) names and institutions. It should only be uploaded in the “cover letter” section in manuscript central. The cover letter should not be the first page of the main document of the manuscript, as this reveals the author’s (authors’) identity to the reviewers. The main document is what peer reviewers will view.

APA format:

2. *JRST* follows APA format, including guidelines for masked or anonymous review. The following is listed on the website as appropriate for masking your manuscript (<http://www3.interscience.wiley.com/cgi-bin/jabout/31817/ForAuthors.html>):

JRST employs an anonymous review policy (i.e., masked review). Therefore, the author’s (authors’) name(s) and affiliation should appear on a separate cover page, and only on this page, to ensure anonymity in the review process. If it is necessary for authors to cite their own work, the word “author” should be inserted in the text to maintain anonymity. Guidelines are listed below:

Citations in Text: Author (date) states

Citations in Reference List: Author (date). Journal Title. (Please do not include the title of the article or its volume and page number information.)

However it may also be acceptable to include author names in the citations, if it does not reveal that they are the authors of the manuscript.

Other considerations of anonymity within the manuscript:

3. Acknowledgements regarding grants and persons that have assisted in the manuscript should be contained in the cover letter only. If the manuscript is accepted for publication, then the acknowledgement section will be included in the body of the article.
4. The name of the place or institution in which the study took place should be masked if it is revealing of the author’s (authors’) identity.

Content of the manuscript:

5. Manuscripts should be scholarly and with a focus on science education. Research manuscripts should include a theoretical background, literature review, and thorough methodology. Articles with a focus on a science education activity, which do not contain



a strong theoretical framework, extensive data collection and analysis, followed by discussion are more suitable for a practitioner journal, and are not appropriate for *JRST*.

6. Manuscripts should be written in such a manner that the English is understandable. Sometimes it is necessary to have the papers edited for language use before submitting, or before the manuscript can be reviewed.
7. The expectation is that typical manuscripts will be in the 15 to 40-page range. While *JRST* reserves the right to review and publish longer manuscripts, the burden is on the author to make a compelling case for the additional pages as necessary to support particularly important and ground breaking research.

Information about files:

8. Figures and tables should be uploaded as separate files from the main document, and should be identified as “file for review.”

Examples.

The following are three recent examples of manuscripts that the JRST Editorial Office returned to the author(s) without external review.

1. A manuscript that focused exclusively on the reporting of an innovative science classroom activity.
2. A manuscript without a sufficient focus on science education.
3. A manuscript that did not conform with *JRST*'s stated anonymity policy