Developing a World View for Science Education: In North America and Across the Globe

Final Report of the International Task Force

National Science Teachers Association, August 2005

NSTA National Science Teachers Association

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Executive Summary

The international scope of everything we do has increased exponentially over the last two decades. Almost all aspects of our lives—from the products we consume, to the jobs we hold, and the stores in which we shop—have an international connection. This is also true within science education. Our students today are more likely to be from other countries and speak other languages. And international comparisons of student achievement are becoming an almost daily topic in the media and within the educational community. In recognition of this momentous change, NSTA's President appointed a task force to investigate and recommend a plan in support of an enhanced international role for NSTA. Beginning in summer 2004, the members deliberated, debated, wrote, and considered several possible directions for future NSTA international activity. At several junctures we sought input and advice from the NSTA membership—through email, town hall meetings at conferences and individual consultation. Overall, the Task Force found overwhelming and enthusiastic support for an international thrust within the Association.

The NSTA International Task Force proposes a plan to encourage and promote international collaboration. We envision that North American science teachers will have much to learn from teachers in other countries about both their culture and their successful teaching practices. This will allow us to better serve the diverse students we teach. In turn, science educators from other countries can learn much from North Americans. The Task Force, however, was constantly reminded that there are some delicate issues related to international science education that must be addressed. It cannot be perceived that NSTA, alone, is defining the international agenda. Instead, we must work with those from other countries in a collegial and collaborative fashion. At the same time, the Task Force believed that NSTA also must be bold in taking leadership and responsibility for helping teachers from North America better understand and teach the many international students in our schools.

The International Task Force recommends that:

- NSTA should increase its participation in diverse types of international activities because they are critical to the future of science education and the Association.
- NSTA should dedicate significant staff time and NSTA membership support to international efforts.
- The NSTA international staff person, in collaboration with the International Advisory Board, should develop a comprehensive plan for international activity as an initial task.
- NSTA should institute a small number of high profile international activities in order to bring attention to this subject and to highlight its importance.
- A critical component of NSTA's international efforts will be partnerships with other organizations. These relationships should be directed by the Principles Guiding International Collaboration, as set forth in this document.
- NSTA's Guidelines for Affiliation are potentially limiting to the types of organizational relationships possible, both domestic and international. They should be reviewed and revised with the understanding that they must facilitate the kinds of relationships described in this document, not impede them.

Developing a World View for Science Education: **In North America and Across the Globe**

Rationale

"We believe that if we are to achieve world class standards, we need a critical mass of teachers within the profession, who have seen at first hand what they do in other countries and then apply that knowledge back in the classroom"

Michael Barber, quoted on the Teachers' International Development
(Website *http://www.eriding.net/cpd/tipd.shtml*)

We live in an age of escalating global interdependence and competition, both of which affect education acutely. Changes in economic competitiveness are creating an increased demand for educated and technically competent workers in North America and worldwide. Yet as a result of skyrocketing levels of immigration, language and cultural barriers increasingly challenge the education of this workforce in North America. Moreover, highly publicized international comparisons such as TIMSS and PISA are causing U.S. schools and, indeed, whole countries to re-think their educational goals. Resolution of these issues—resolution that will enrich both North Americans and the world alike—will demand international collaboration. As Ted Sanders and Vivien Stewart assert "Just as schools had to adapt from the Agricultural Age to the Industrial Age, so too do schools need to adapt to what future generations will no doubt refer to as the 'Global Age'."

Science is essential to the economic success of individuals and of nations. Science is vital not just for individuals pursuing scientific careers, but for all who wish to flourish in the new millennium. Many of the world's challenges, such as exploring the universe, providing adequate and safe food supplies, and conquering epidemics demand scientific solutions. But because of the transnational nature of these issues, an understanding of the wide diversity of cultural values and customs is also essential. Moreover, success will require not only a strong contingent of culturally knowledgeable scientists, but also a scientifically literate global society, which understands the nature of the issues, demands that they be resolved, and provides the resources for doing so.

Essential to future success will be the capacity of science teachers to educate our next generation of citizens and leaders. It is critical that professional science teaching associations, including NSTA, take a leadership position in establishing a vision for accomplishing this goal. In its July 1996 position statement on international science education, NSTA argued that it was important for science teachers to view "themselves, their students, and teaching and learning in a global context." This report articulates how these words can be put into action.

In recognition of these global issues in science education, NSTA President Anne Tweed appointed a task force to investigate and recommend a plan in support of an enhanced international role for NSTA. Beginning in summer 2004, the Task Force members

studied, deliberated, debated, wrote, and considered several possible directions for future NSTA international activity. At several junctures we sought the input and advice of the NSTA membership—through email, town hall meetings at conferences and individual contact. We also coordinated our efforts closely with those developing the revised NSTA strategic plan. "Strategy 2005: Goals," emphasizes international efforts strongly, especially in Strategic Goal 1 where it speaks of engaging "…teachers of science worldwide" and "Promoting the exchange of ideas, people and resources nationally and internationally."

"Peace and prosperity in the 21st Century depend on increasing the capacity of people to think and work on a global and intercultural basis. As technology opens borders, educational and professional exchange opens minds."

Institute of International Education, http://www.iie.org/

Principles Guiding International Collaboration

Meaningful international cooperation will require significant collaboration and partnerships with grass roots teachers' organizations, professional associations, governments and agencies. Realizing this, the International Task Force has created a set of principles for international collaboration drawn liberally from the Principles for Collaboration written by the NSTA Blue Ribbon Panel and adopted by the NSTA Board of Directors in 2000. What follows should serve as a guiding vision of how international partnership must take place.

1. NSTA's primary role in international collaboration should be that of a facilitator or broker.
2. NSTA is a non-governmental, non-profit professional organization, which is participatory and democratic in nature. As such, NSTA must provide opportunities to all science educators, from pre-school to university level, to share and work jointly in the improvement of science education worldwide.
3. International collaborations must benefit teachers of science and science education internationally, including NSTA members, and contribute to developing the future scientific and technical workforce.
4. The expected results of international collaboration should exceed what any one organization could expect to achieve on its own, and promote excellence and innovation in science teaching and learning for all.
5. International collaborations must recognize and honor the unique aspects of each organization's history, educational role, constituency, and stated mission.
6. A spirit of trust and openness, as well as a desire to reach a mutually beneficial outcome, must permeate all international interactions.
7. Mirroring scientific collaboration worldwide, language, in and of itself, should not be a barrier to collaboration.

The foundation of collaborative relationships rests on a clear statement of mutual purpose, intent, and shared interest. International collaboration is a broad term

that refers to cooperatively planning, developing, facilitating or implementing activities between NSTA and other international entities. The purpose of these activities is to create synergistic efforts among the entities involved. These activities should combine the respective strengths of partners to achieve like-minded objectives, while retaining individual identities and sharing in the risks and rewards. International collaborations may range from individual and organizational memberships or affiliation, to teacher/student exchanges, study abroad programs, or virtual collaborations between teachers, classes, or schools. The "Principles Guiding International Collaboration" are recommended by the NSTA International Task Force to guide the nature, structure, and design of future NSTA international activity and to fully support NSTA's mission "…to promote excellence and innovation in science teaching and learning for all."

Scope and Range of Potential International Activities

What follows is a list of potential international-related activities in which NSTA might become involved. This list is the result of many brainstorming sessions by International Task Force members during its deliberations. The purpose of this effort was NOT to prioritize, recommend, or advocate any individual or set of activities, but rather to identify the scope and range of activities that NSTA eventually might consider. Some activities are simple and could be accomplished in the short term and at little cost. Others are complex, long-term ideas, and may be practical to implement only over many years.

Potential International Activities

I. Establish mechanisms within NSTA to facilitate international collaboration.

   a. Create structures within NSTA for planning and overseeing international activities.

      i. Dedicate a significant portion of a staff member's time to international efforts.

      ii. Establish an NSTA advisory board responsible for international activities.

      iii. Review and revise NSTA guidelines for affiliation.

   b. Promote international science education through all NSTA communications.

      i. Develop international components to the NSTA web site (including links to other international sites).

      ii. Link the NSTA "Suppliers Guide" to international audiences and link international suppliers to NSTA.

      iii. Create and publish an international newsletter.

      iv. Develop an international data base and mailing list.

   c. Establish procedures for facilitating the involvement of international visitors in NSTA conferences and for making them feel welcome.

      i. Establish a "concierge" system for internationals attending NSTA events.

      ii. Recognize International guests at NSTA functions (e.g., certificates, plaques, press releases, badges, flags at opening session, badges).

iii. Create scholarships for attendance of internationals at NSTA conferences.

iv. Develop an international awards program.

d. Create venues for science educators worldwide to meet and share ideas.

i. Host an international strand or theme at each national and some regional conferences.

ii. Host/co-host a periodic science education conference outside of the U.S. with an international focus.

e. Create professional development opportunities for science educators to experience first-hand the culture and related science found in other parts of the world.

i. Create an NSTA sponsored study abroad program for science educators.

ii. Create and maintain a program for both student and teacher international exchanges.

iii. Promote international student exchange and internship programs.

iv. Create and promote international speaker exchanges.

f. Make NSTA publications more international friendly.

i. Develop on international component for NSTA publications and perhaps a separate NSTA international journal.

ii. Develop science resources for English Language Learners.

iii. When feasible, translate NSTA publications into other languages through partnerships with other organizations.

g. Actively seek international members in NSTA and promote membership/involvement in professional science teaching organizations from other countries.

i. Translate the international e-membership marketing information into appropriate languages.

ii. Publicize membership in international science education organizations.

iii. Publicize conferences and meetings of international partner organizations.

iv. Establish a science education concierge service in partner countries that would be staffed by international graduate students educated in North America when they return to their home country.

II. Establish partnerships with other science teacher organizations throughout the world to further science education.

a. Establish mutually beneficial collaborations with ICASE and other appropriate organizations (e.g.: IRA, GLOBE, NCTM) for the purpose of furthering NSTA international objectives.

b. Develop an international inventory of NSTA "like" organizations, identifying their strengths and needs.

c. Inventory NSTA member skills and experiences related to international activity.

d. Create links and partnerships with other international groups having similar missions.

e. Encourage coordination among scientific organizations to invite international attendees to participate in NSTA activities and vice versa.

III. Seek funding from various sources to support international initiatives.

a. Search USAID and World Bank "requests for proposals" for projects that fit NSTA's mission.

b. Establish a relationship with funding organizations like USAID and the World Bank.

c. Inventory national and international funding agencies/organizations supporting international initiatives in science education.

Recommendations

As a result of comprehensive study, the NSTA International Task Force makes the following recommendations. Each recommendation is followed by statements which provide a rationale and explication, and summarizes the thinking of Task Force members.

Recommendation: NSTA should increase its participation in diverse types of international activities because they are critical to the future of science education and the Association.

Rationale and explication:

- North America is experiencing a rapid increase of immigrants whose children must be well educated in science in order to flourish economically and as citizens. Educating these children requires science teachers who possess knowledge of cultures worldwide.
- "Essential to future success will be the capacity of science teachers to educate our next generation of citizens and leaders. It is critical that professional science teaching associations, including NSTA, take a leadership position in establishing a vision for accomplishing this goal."
- "We live in an age of escalating global competition and interdependence that is affecting education acutely."
- "Many of the world's challenges…will be resolved only by applying scientific solutions within an understanding of cultural values and customs. To successfully deal with these issues will require not only a strong contingent of scientists, but also a scientifically literate global society which demands that these issues be resolved."

Recommendation: NSTA should dedicate significant staff time and NSTA membership support to international efforts.

Rationale and explication:

- Dedicated time of an NSTA staff member with international experience will be required to provide the consistency and energy to developing a coordinated international program.
- Substantial input from members with expertise in international activities is required to provide direction for international efforts.

- Advisory boards are a well proven mechanism within NSTA for guiding targeted activities such as special education and aerospace programs.

Recommendation: The NSTA international staff person, in collaboration with the International Advisory Board, should develop a comprehensive plan for international activity as an initial task.

Recommendation: NSTA should institute a small number of high profile international activities in order to bring attention to this subject and to highlight its importance.

Rationale and explication:

- Developing a plan for NSTA international activity that spans multiple years and considers costs as well as expenditures of other resources will be required to establish consistent and sustainable growth in international efforts.
- If the positive energy for international efforts is to be sustained, then immediate action on a small number of high profile activities is required. These might include:
  - Instituting an international strand within the national conference that is built upon the already functioning International Round Table. This would require few additional resources and would potentially garner much interest.
  - Following up on talks already begun with the International Reading Association regarding co-hosting an international meeting in 2007. This prospect offers potential savings on conference expenses and the opportunity for organizational mentoring from an experienced association.
- The direction that the staff member undertakes, with input from International advisory board members, should not be pre-determined, but rather should unfold organically and as need and opportunity arise. However, in its deliberation, the International Task Force determined the following broad categories of activity to be high priority.
  - Professional development, both of NSTA members and teachers of science worldwide, must be a high priority. Thus an early focus on opportunities that involve teachers—such as international conferences and study abroad programs—is essential.
  - External funding will be required to fully implement many of the goals and opportunities visualized by the Task Force. Our discussions with other professional organizations, such as the International Reading Association, indicate that funding is available and sufficient to support a wide range of activities.
  - NSTA conferences are a significant interface with many international science educators. A high priority must be set for making these events "international friendly" and of higher relevance to internationals.
  - Publications provide another important interface with international science educators. While a wholesale reformation of publications is ***not*** envisioned,

developing an international section of NSTA Reports and/or of our email newsletters might be appropriate.

Recommendation: A critical component of NSTA's international efforts will be establishing partnerships with other organizations. These relationships should be directed by the Principles Guiding International Collaboration as set forth in this document.

Recommendation: NSTA's Guidelines for Affiliation are potentially limiting to the types of organizational relationships possible, both domestic and international. They should be reviewed and revised with the understanding that they must facilitate the kinds of relationships described in the document, not impede them.

Rationale and explication:

- It is neither wise nor possible for NSTA to be the center of international science education. To be successful, an international thrust must involve partnerships and collaborations. The Principles Guiding International Collaboration serve as a set of ground rules or guidelines for such collaboration.
- Developing an inventory of the associations and organizations which represent science education worldwide is a clear imperative. Without knowing who these organizations and their leaders are, where they exist, and the scope of their activity, NSTA cannot be successful in collaboration.
- At present, the NSTA "Guidelines for Affiliation" potentially limit the opportunities for collaboration through affiliation.

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