Attracting Girls, Advancing Women in Science and Technology

Why is this necessary?

What can academies do to remove obstacles?

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IANAS Sci. Ed. Rio de Janeiro, June 12, 2010

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1. Introduction

InterAcademy Council Advisory Report
"Women for Science" adopted by IAP in 2006

Issues:

- Underrepresentation of women in S&T
- Obstacles
- Women essential to S&T capacity building
- What Academies can do to empower women

IANAS is the first regional network to have established a Women for Science Working Group for implementing the IAC report recommendations

2.1 Women in S&T – why necessary?

The facts

- Women constitute half of humanity. Yet their numbers in mathematics, physical sciences and engineering remain low.
- Professional women seldom reach the decision-making levels in universities and other research institutions.
- Science academies typically have fewer than 10% women members.

2.2 Women in S&T – why necessary?

The benefits to science

- Mathematical, scientific and engineering talent is rare in the general population. Such talents should be encouraged and nurtured. Putting up artificial barriers must not be tolerated.
- Excluding women scientists induces bias in science, most glaringly so in the medical sciences.
- Science has always been enriched by the diversity of talents and views of its practitioners.

!! Women for Science !!

2.3 Women in S&T – why necessary?

Essential to economic development

- Utilizing the talents of women should not be viewed solely from the perspective of gender equity
- It must be understood that full involvement of women in science and technology (S&T) is essential to global economic development and environmental sustainability

2.4 Women in S&T – why necessary?

•Global economic development requires an S&T foundation in both developed *and* developing countries.

•Rural women in developing countries are responsible for farming, and for providing water, fuel, nutrition, and health-care to their communities.

•Women migrating to the megacities need clean water, food, sanitation, electricity and food, as well as access to health care, information and education for their families.

For global capacity building, empowerment of women "at the grass roots" is essential.

2.5 Women in S&T – why necessary?

Women experts will be the most effective for transferring technology to women at the grass roots.

Welcome and value women scientists and engineers in research institutes and NGOs

They will help engage and empower the women at the grass roots, as partners in capacity building and development.

University of Maryland civil engineering students work with women from a mountain village in Thailand to build a wastewater system for a health clinic.

3.1 Obstacles

Traditional myths

- Girls cannot do math
- Girls do not care about science
- Technology is for boys

The facts

In US high schools in the 20th century, girls were discouraged from taking physics and advanced mathematics classes. Boys far outperformed girls in math and science. Now, almost as many girls as boys take such classes. Girls do as well as boys, if not better.

Sociological research proves that low expectations lead to poor performance. Teachers get what they expect!

Brian Nosek, Univ. Virginia

3.2 Obstacles
- the image of science

mad scientist

3.2 Obstacles
- the image of science

- Scientists are strange balding guys in white lab coats working days, nights and weekends
- Science has no role in real life (real life being based on cell phones, texting and computer games)
- Women cannot be scientists – our text books show only men
- If a woman wants to be a scientist, no one will want to marry her
- A women can only be a scientist if she has no children

  - no such rule for men!

The bad image of science is a big deterrent for boys, and even more so for girls - a major concern for science academies.

3.3 Institutional climate
- hostile to women

Traditionally:

Women scientists and engineers, (as well as some racial minorities,) are not part of the “old boys’ club”

Women staff members are marginalized and undervalued

The huge work load and long working hours make it difficult to reach a decent work-family balance

4.1 What Academies can do
- transform science education

Support development of science curricula and teacher (re-)education

IANAS Science Education Program!

4.2 What Academies can do
- transform the image of science

Academy web sites where men and women scientists show the excitement, relevance, and importance of science and technology

- Academy members, men and women, volunteer to speak at schools
- Use the IANAS website for exchange of ideas and materials between academies. Provide translations. **WfS- WG**

4.2 What Academies can do
- transform the image of science

2009 Nobel

Elizabeth Blackburn

Carol Greider

medicine

Elinor Ostrom, economics

Ada Yonath chemistry

4.2 What Academies can do

The image of science - women

- in Academy pamphlets and publications, include pictures of women scientists
- biographies of women scientists written for students **WfS-WG**
  - o include details on their youth, family life
  - o Latin American, Caribbean women scientists
  - o US, Canadian women scientists
  - o provide translations

4.2 What Academies can do

The image of science - women

Visibility of women scientists

- portray women scientists at work
- invite them as speakers at academy meetings
- invite them to serve on decision-making committees
- propose them for awards
- nominate them for academy membership!

4.3 What Academies can do
- transform the practice of science

Good Management Practice – *Key Tool*

All members (male, female) of an organization
(school, university, industry, business, ..)

perform to the maximum of their abilities

for the benefit of the organization

4.3 Good Management Practice

- Top-level commitment to an inclusive culture
- A structure for effecting change at all levels
- Reviewing all policies and procedures for gender impact
- Transparency in communication, recruiting, hiring, promoting
- Widening the “inner circle” of decision-makers
- Leadership training and mentoring
- Supporting a healthy work-family balance
- Regular monitoring; sex-disaggregated statistics

4.4 What Academies can do

- reaching out to the grass roots

Value your country's female scientists and engineers – they are key to capacity building

4.4 What Academies can do
- reaching out to the grass roots

Make use of existing internet café's in the urban and rural areas

- for disseminating scientific information on health, clean water, sanitation, agriculture, education, and technology
- for interesting children in science and technology

Conclusions

- A sustainable future for the world requires all science and technology talent available
- Science and technology literacy is essential
- IANAS rightly chose reformation of Science Education as a top priority program.
- Good science teaching nourishes all talent irrespective of gender or racial minority status