Preliminary Proposal

To: Ethics and Values Studies in Science, Technology, and Society
Division of Instrumentation and Resources
National Science Foundation
1800 G St. N.W., Rm. 312
Washington D.C. 20550

From: J.D. Andrade, PI, Professor and Chairman
Department of Bioengineering
University of Utah
SLC, UT 84112
(801)581-4379
FAX: (801)581-8692

Title: Science-Based Ethics, Values, and Communication in Journalism, Advertising, and Law, and in a General High School Population

Cost: $100,000, Approximate Total Costs

Duration: Two Years

Objectives: To research the possibility and potential of imparting science-based values and objectives to the general population and to particular professions, especially journalism, advertising, and law.

Introduction and Rationale:

Scientific and technical issues and information are becoming increasingly important in modern society. Journalists and other mass media professionals must deal with a wide range of scientific and medical announcements and "discoveries" (1-3). Lawyers, judges, and political leaders are expected to assess the testimony and statements of expert witnesses, often two different sets of witnesses representing plaintiff and defendants, of perhaps questionable objectivity (4). Advertising and marketing professionals must often deal with technical and medical issues and products.

It is generally acknowledged that science education in the United States is very weak, except for the small subset of the population which chose to focus on science, engineering, and medicine in their college and university studies.

In view of the major importance of science and technology in modern society, it is reasonable to expect that all college and university graduates, particularly those in the professional and decision-making fields, have at least some appreciation of science and technology. The very fields noted above as being highly affected by science and technology - i.e. communications (including journalism), marketing and advertising, and law - are those fields in which the students chose to minimize participation in science and technical courses. They must be given a practical, relevant, and effective background in science and technology, particularly the topics of scientific method and critical thinking; risk and probability; scientific controversy; experts, non-experts, and credibility; and science-based decision making.

Picasso once said (I can't find the original quotation): Start with what they know, then teach by relating to - expanding upon - what they know. Then they smile and say, "Ah, I understand that!" - and then the rest is easy.

Many of the people who should appreciate and apply the methods, values, and ethics of science are the same people who are most afraid of - or disinterested in - science. The teaching and discovery process must be particularly effective in order to reach them.

Everyone likes to see their name (and their friend's names) in print. Imagine a state-wide science writing contest for high schoolers - not only science students, but all high school students - in the following categories:

1. Sports
2. Cars and Transportation
3. Sex and Health
4. Music and Communication
5. Agriculture and Environment
6. Home and Family
7. Business

There's clearly a category for every interest - the physics and materials science of beer cans? Physics and optics of optical disks? Digital audio? The physics and chemistry of fuel-injection? Turbocharging? It would take work with high school newspaper editors, local merchants (for contest prizes and awards), etc. and a carefully planned contest. The basic idea is to induce people to learn by building on their interests and present knowledge.

I once taught high school biology to a parochial school class of students with disciplinary problems who were expelled from public school. There was only

one way to "teach" biology - sex. We studied sex from every angle - always relating it to human sex. Their flourishing hormones provided sufficient motivation and interest to learn a lot of biology.

The trick is to build on their interests and on their experience. The same holds for science-shy journalists, advertiser, and lawyers.

Why these three?

Journalists because they inform the general public - through the mass media. If we can improve the science interests or even science tolerance of journalists, there could be a significant improvement in the coverage of science and technology in media.

Why advertising majors? Where do the bulk of our lesser educated populace get their input? Advertising is certainly a major component. There are a few ads with a science and technology component - often they are misleading and non-objective.

Why lawyers? Not necessarily to educate the general population, but because lawyers and judges must evaluate testimony and pass judgement on science-related issues which can have dramatic, extensive social and economic impacts (4).

Methods

1. Develop special science-related courses designed and keyed to the specific audience of interest, particularly at the freshman and sophomore level.

   I wish to target 3 populations:

   a. Journalism and Communications students (and faculty);
   b. Advertising, Marketing and Business majors;
   c. Law students and their faculty.

   I would work very closely with faculty colleagues in these departments and programs and with interested faculty in the basic science department at the University of Utah.

   A graduate course on a related subject is already scheduled for Spring, 1990 (see Appendix).

2. Develop methods to address the "unreachable" high school population via contest mechanisms - largely using high school and local community newspapers. This is easy to do in Utah due to our small state population (about 1.7 million). I propose to organize five regional state discussion conferences (using regional college facilities and faculty, as well as local business and political leaders and celebrities). Local community high school newspaper editors and their faculty supervisors, and others selected to appeal to the students (local coaches, musicians?) would be invited (expenses paid!) to participate in discussions and to develop an amateur science/technical writing contest in many categories. The theme would be Science is Common Sense. The objective would be to have high school students observe and relate - by writing. We would arrange for a large fraction of the submissions to be published in high school or local papers.

   Winners would receive appropriate prizes and their contributions would be published in larger circulation newspapers or magazines.

Research:

The courses and contests will be the experimental tools by which I will assess the increase (or decrease) in science interest, knowledge, and values of the participants. I would include a professional educator to help design and implement appropriate measures of success or failure of these approaches.

Budget:

Up to $50,000/year for two years, mainly for course development and initial offerings (visiting speakers, teaching assistants, supplies), secretarial assistance, contest organization and conduction, research materials and supplies, and for journal articles and book preparations.

Dissemination:

Results of the work would be presented at one or more national education conferences. Journal articles would also be prepared for Journalism Educator and for related publications in the other disciplines. Conference presentations would also be given in specialty conferences, such as the annual conference of the Association for Education in Journalism and Mass Communication. Depending on time and results, I intend to produce a book on the subject.

Credentials:

J. Andrade's technical bio-sketch is included as Appendix B. He has a strong interest in interdisciplinary science and engineering research and education. He also had some limited experience as a high school biology teacher some 24 years ago.

References:

1. S.M. Friedman, S. Dunwoody, (L. Rogers, eds.), Scientists and Journalist: Reporting Science as News, AAAS, 1986.

2. D. Nelkin, Selling Science, Freeman, 1987.

3. J. Goodfied, Reflections on Science and the Media, AAAS, 1984.

4. W.A. Thomas, ed., Science and Law: An Essential Alliance, Westview Press, 1983.

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BIOENGINEERING 695
COMMUNICATIONS 691

Investigative Science Reporting:
Separating Fact from Fantasy

Spring Quarter, 1990 - 3 credit hours

1 evening/week, 7-9:30 PM

Instructor/
Coordinator : J.D. Andrade, Chairman, Department of Bioengineering

Format: 1 or 2 short lectures and an extended discussion one evening each week. A short paper is required on each weekly topic. There will also be a weekly one hour discussion session for students enrolled for credit with the instructor.

Enrollment: The course is designed for advanced undergraduates and for graduate students in Communications, English, Law, Engineering or Science. Professional journalists and interested faculty are urged to attend and participate.

Description/
Objectives: Science, medicine, engineering, and technology are very popular topics in the mass media and in the court room. Companies, universities, government, and other institutions are eager to report their findings and discoveries. to the public. The public is very receptive to science and related news. Most journalists have little scientific or technical education or background. Most scientists, physicians, or engineers have little experience in presenting their work to journalists or to the lay public.

This course will use a case study approach to examine the following questions:

- What is news?
- How can journalists separate fact from fantasy?
- What and who are credible and reliable technical sources?
- How should scientists respond to press inquiries?
- Who are credible and reliable journalists and publications?

Output: The course lectures and discussions will be videotaped and transcribed into a book format for possible publication.

Texts/Readings: S.M. Friedman, S. Dunwoody, and C.L. Rogers, eds. Scientists and Journalists: Reporting Science as News, The Free Press (Macmillan), 1986.

D. Nelkin, Selling Science, W.H. Freeman, 1987.

W. Burkett, News Reporting: Science, Medicine, and High Technology, Iowa State University Press, 1986.

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Key Papers: N.Y. Times, Wall Street Journal, USA Today, Salt Lake papers,

Tentative Lecture - Discussion Topics

Week 1: J. Andrade - Science: Fields, specialities, majors, and experts. The scientific method; scientific uncertainty.

C. Rogers - How do Scientists Interact with Journalists? Experience from the AAAS.

Week 2: J. Andrade - Engineering and Technology: Fields, applications, safety, regulation, cost-benefit analyses.

E. Yates, Science Reporter, KSL TV - Science and Engineering Reporting in the Television Media.

Week 3: C. Samuelson, Vice President for Health Science - Medicine and Health Care: Fields and specialties, medical research, ethics.

J. Dwan, Director of Community Relations, University of Utah Medical Center - The Barney Clark Artificial Heart Story.

Week 4: J. Maddox, Editor of Nature - and/or D. Koshland, Editor of Science - Science Fact or Science Fantasy: Peer review and the scientific publication process.

Week 5: D. Nelkin, School of Journalism, New York University - Selling Science to the General Public.

P. Fogle, Director of News Services, University of Utah - Cold Fusion: The press release, investigative reporting, follow-up.

Week 6: Jon Franklin, Science Journalism Program, Oregon State University - Popular Science Writing.

Week 7: S. Dunwoody, School of Journalism, University of Wisconsin - The Scientist as a Source.

S.M. Friedman, Director, Science and Environmental Writing Program, Lehigh University - The Journalist's World and Problems

Week 8: William Thomas - Scientific and Technical Experts in the Court Room

Week 9: C. Sagan - The Visible Scientist
(Frontiers of Science lecturer?)

Week 10: J. Andrade - Investigative Science Reporting: Key questions, credible sources and experts, ethics, responsibility, objectivity.

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