

Committee on Education

Annual Report 1998

The members of the Committee on Education for 1998 are: Meigan C. Aronson, (Vice-Chair), Donald M. Burland, Donald L. Correll, Jr., Lori S. Goldner (Chair), Kenneth C. Hass, Don Harvey Madison, Lyle Roelofs, James J. Wynne, and Paul W. Zitzewitz. In 1998 the COE held two meetings: April 18, 1998 in Columbus, Ohio and November 8, 1998, in Detroit, MI. The COE also met jointly with the FEd on April 18, 1998. The structure of the COE membership was modified this year so that the councilor and vice-chair of the Forum on Education also serve as official members of the COE, although it is still not clear to the COE how the succession of FEd members on the COE will work.

The APS bylaws give COE a broad mission in all areas of physics education. The specifics of our mission are defined by the activities, concerns, and projects that are brought to COE by its members, by members of the APS Executive Board, or by interested members of the physics community. COE provides oversight to existing programs and offers funding and policy recommendations to the APS Council and Executive Board on matters related to physics education.

In the last year we have begun work in earnest on background papers designed (1) to inform the APS membership about some of the most pressing issues and (2) support statements or other actions recommended by the COE to the APS Council. Our agenda encompasses graduate education, undergraduate education, physics education research, and outreach programs, such as to the pre-college community or to the general public.

Activities for 1998

A. Faculty Rewards and Recognition in Physics.

The COE is pleased to report that, after reviewing comments from the APS council and substantially rewriting the document, it has officially and unanimously adopted a report to be sent to Bob Diamond of Syracuse University on faculty rewards and recognition in physics. This report, and a short summary paper drawn from it, will soon be available on the COE website. The short paper will also be sent to Stan Jones for his consideration for publication in the FEd newsletter.

This report was prepared in response to an invitation to the APS to participate in the Syracuse "Institutional Priorities and Faculty Rewards" project. As part of this project, various professional societies have been asked to report on how scholarly activities, including educational activities, are defined and rewarded. The Syracuse project seeks to extend or redefine the definition of scholarship in such a way that institutional goals are better reflected in the faculty reward structure. A task force had been appointed to advise COE on this matter: Neal Abraham, Millie Dresselhaus, Allen Goldman, Bill Kelly, Noemie Koeller, Arnold Tubis, and Howard Voss. Statements prepared by other professional societies for this study have been reviewed and discussed. A previous COE survey and document on the subject was reviewed and

the possibility of a new survey discussed. The previous document focused primarily on physics education research and related educational activities. The present review is much broader in scope.

The status of physics education research in the physics community has played a prominent role in our discussions. There was an overwhelming consensus in the COE that physics education research performed in physics departments is vital to improving the state of physics education overall; that physics education research can be evaluated in analogy to other fields of physics research; and that physics education research should be rewarded and researchers recognized in a way that is consistent with that of other sub-fields of physics. The COE therefore proposed a statement on this issue for consideration by the APS council. That statement has been presented to POPA with positive reaction but also with requested wording changes. Changes have now been made and the statements will be resubmitted to POPA, with the Syracuse report and short paper as supporting documentation.

B. The new ABET standards

The Accreditation Board for Engineering and Technology (ABET) has recently revised its criteria in a way that they (1) no longer specifically requires one year of calculus-based physics for engineering students and (2) establishes no standards, guidelines, or recommendations for the physics component of an engineering curriculum. In response to this the COE felt compelled to write a report on the subject that summarizes the situation and offers suggestions to departments and to the APS. This report has been unanimously adopted by the COE and will be publicized by

1. placing it on the COE website,
2. sending a copy to Stan Jones for consideration as a FEd news item, and
3. sending a copy to the APS news for consideration.

Among the suggested APS responses discussed by the COE were:

send a letter to ABET, possibly followed by letters to the 22 member societies, requesting clarification and guidance in interpreting the standards.

a joint effort with the ACS and AMS to prepare a public relations statement underscoring the importance of the physical sciences in educating the engineer.

Providing guidance to physics departments and researchers for choosing appropriate pedagogy to be used in introductory courses.

Provide a sample questionnaire that could be used by physics departments to be used in their interaction with engineering departments.

In response to these suggestions, the COE is currently drafting a letter to request information from ABET.

A report on innovations in physics pedagogy (including a web version) will be prepared (see below, item C) and serve in response to the third suggestion.

C. Undergraduate education

The COE has identified several issues that it will be addressing in the near future regarding undergraduate education. The two most pressing concerns are (1) declining enrollment and (2) the success of service courses. A subcommittee has been formed to address these issues and assemble information that might be useful in enhancing enrollment in physics undergraduate courses or the success of service courses. Two issues that affect both these concerns were identified by that subcommittee:

1. Pedagogical innovation Improvements to physics pedagogy are taking place all across the country but innovators are often separated and information can be difficult to obtain. The COE plans to help rectify this situation by preparing a brief report summarizing the scope of available innovations and providing references to sources of information useful in implementing these innovations.
2. "Care and Feeding" The recruiting and retention of students at any levels requires careful attention to and constant monitoring of the needs of those students. Likewise, the success of service courses requires close attention to the needs of other programs, as well as to the needs of the students taking those courses. Part of the COE report on undergraduate education will summarize some of the strategies that have been successful in addressing and monitoring these needs.

D. High School Physics

A new area of concern for the COE, and one that is particularly timely in light of the recent TIMSS results, is K-12 science. A subcommittee has been formed to investigate and report to the APS membership on the issues in and the state of high school physics education. They are currently in the information gathering stage of their investigation.

E. California Standards

The following statement was unanimously adopted by the COE at its November meeting:

"The COE affirms the recent motion of 9/26/98 by the APS executive board with regard to the state of California science standards. Furthermore, the COE supports efforts of the APS, its officers and members to promote the alignment of science education standards in other states with those developed by the NAS and the AAAS."

F. The Teacher-Scientist Alliance Institute (TSAI)

The Teacher-Scientist Alliance Institute is a national program supported by APS and AAPT to enhance elementary science education and to assist elementary teachers in implementing reform programs. The institutes provide opportunities for practicing scientists to become aware of the

issues challenges and opportunities in elementary education, and they also allow direct contact between teachers and scientists. The COE has reviewed the plans and outcomes for the 1998 Leadership Institutes in Washington DC (January) and in San Diego (May), as well as scientist training and community information workshops in districts around the country. The Committee is very impressed with the efforts that have been made in planning and organizing these institutes and with their outcomes. This program should continue to be supported by APS, and the COE should continue to maintain its oversight role.

G. College-High School Interaction Committee (CHIC)

COE has traditionally exercised oversight of the CHIC program. A new high-school interaction committee (HIC) has been formed under the leadership of the FED. Through The efforts of John Russel (University of Massachusetts at Dartmouth), Peter Lindenfeld (Rutgers University) and Ken Lyons (AT&T), the CHIC newsletter has evolved from a paper newsletter to a web-based publication. The HIC site (<http://www.physics.rutgers.edu/~lindenf/aps/>) includes two issues of the HIC newsletter, as well as links to a number of active alliances.

H. APS Centennial

The COE has reviewed the plans for the APS Centennial. The COE is pleased physics education research will be presented at the meeting, but there is still some concern over under-representation of physics education activities. Our suggestions that physics education appear as part of the Centennial wall chart and also that a plenary talk on physics education be offered at the meeting, were not implemented. The COE is particularly concerned about the wall chart and has unanimously adopted the following resolution:

"COE Resolution regarding the Centennial Wall Chart."

"The COE expresses its dismay that in a century of physics, Physics Education is not deemed to be of any significance as reflected by its absence from the centennial wall chart."

"In addition, Part of the mission of physics educators is to promote the participation of members of underrepresented groups in physics. With this in mind, the COE would like to express its support of the CSWP resolution that the inclusion of the Marilyn Monroe image is inappropriate."

"The COE strongly urges that both these decision be revised in the wall chart prior to publication or at minimum in the electronic version."

I. High school teacher days

Three very successful high-school teachers' days were organized by the Education and Outreach Department staff this year. These day-long workshops for local teachers were held at both the Los Angeles and Columbus meetings, as well as at the DPP meeting in New Orleans.

J. Other activities

The COE feels that it should enhance its contacts with the APS divisions to expand the scope of their educational activities, such as the High School Teachers' Days. To this end, APS staff members have been asked to identify an education liaison in each division. Perhaps representatives of the divisional education committees could meet with COE on a rotating basis to report on their activities and receive feedback on planning new activities.

In an effort to stay apprised of and have impact on a variety of educational issues and activities, members of the COE:

- Have attended a meeting of the APS executive board;

- Helped to organize the recent conference on revitalizing undergraduate education;

- will attend an upcoming meeting of the AAHE conference on educational change;

- put considerable effort into nominations (prize committee, new COE members, APS fellows);

- have responded to a variety of requests for input and advice.

The efficient operation of the COE continues to be enhanced by interactions with FED and AAPT, and especially by the exceptional support provided by APS staff.

Respectfully submitted,

Lori S. Goldner

Chair, Committee on Education