DOCUMENT RESUME

ED 064 059 SE 013 413

AUTHOR Peckman, Herbert D.
TITLE Committee on Physics in Two Year Colleges - The First Year.
INSTITUTION Gavilan Coll., Gilroy, Calif.
PUB DATE Jan 72
NOTE 7p.

EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS Annual Reports; College Science; *Committees; *Community Colleges; Directories; *Educational Programs; *Junior Colleges; *Physics
IDENTIFIERS American Association of Physics Teachers; Committee on Physics in Two Year Colleges

ABSTRACT

The composition and activities of the Committee On Physics In Two Year Colleges in its first year of operation are discussed. The role of this committee as one of the working groups of the American Association of Physics Teachers is explored, both with respect to its responsibilities to the two year college teaching profession and to the general physics community. Projects presently underway, as well as future plans, are discussed. Projects include modular approaches to science education and the computer as an educational facility. Also included is a membership list. (Author/TS)

COMMITTEE ON PHYSICS IN TWO YEAR COLLEGES - THE FIRST YEAR

Herbert D. Peckham
Natural Science Division
Gavilan College
Gilroy, California 95020

January 31, 1972

The composition and activities of the Committee On Physics In Two Year Colleges in its first year of operation are discussed. The role of this committee as one of the working groups of the American Association Of Physics Teachers is explored both with respect to its responsibilities to the Two Year College teaching profession and to the general physics community. Projects presently under way as well as future plans are discussed.

Organization

The growth of the two year community college system into a full fledged part of the academic community has been referred to as the most significant educational development of this century in the United States. This newcomer to the academic world has generated a number of important questions concerning its own role and its relation to four year colleges and universities. To better understand and define the function of physics programs in two year colleges The Committee On Physics In Two Year Colleges (CPTYC) was established. The addresses affiliations of the current members of CPTYC are given in Appendix A. In addition, Alan C. Greene, then staff member at the Commission On College Physics, sat on the committee during the fiscal year 70-71.

The first meeting of the full committee was held at Miami, December 10-11, 1970. The CCP staff had prepared a summary of suggestions for possible CPTYC activities collected from two year college physics teachers. This summary is in Appendix B. The first task facing the committee was to select working topics from the summary with subcommittee responsibility for each. The three areas selected were: (a) a study of the two year college physics community and its problems, (b) the development of modules of instruction for non-science majors from which an instructor could construct a course, and (c) the use of the computer as an educational facility for physics courses in the two year colleges. Each of these subjects will be discussed separately later in this paper. Subsequently, the committee met in Berkeley, March 12-13, 1971; St. Louis, May 21-22, 1971; and Minneapolis, October 1-2, 1971.

Identification And Questionnaire

The committee recognized at the outset that if it were to be functionally useful, some mechanism had to be established to insure that the committee activities would be responsive to the needs of the two year college physics teachers. Goll and Rutherford were assigned the responsibility for this task.

The obvious first requirement was a mailing list. This turned out to be a difficult task because of the nature of the physics instruction in two year colleges. Many instructors teach in more than one academic discipline and letters sent to physics instructors may not reach those who teach physics under a split assignment. After an extensive search through all available mailing lists, the first CPTYC mailing list was generated. This is certainly not the end of the task since there are continual changes. Physics teachers in the two year colleges can be of immense assistance in this respect by providing up to date information concerning teaching personnel in their colleges.

Once a mailing list has been established, the problem of information gathering and processing must be undertaken. This raises important issues. It is easy to discard a long, detailed questionnaire due to lack of time or interest. It is also easy to generate a monumental collection of information that is of no real value. The CPTYC wanted to avoid both these pitfalls. It was also recognized that the initial responses could have a profound effect upon the information which might be sought subsequently.

Consequently, the decision was made that a modest attempt to gather information would be most productive and could best be accomplished by means of a newsletter. The newsletter will be the central vehicle for information exchange between the committee and the two year college physics teachers. The responses obtained from the questions in the first newsletter will be used to guide subsequent information gathering attempts. The first copy of the newsletter (*CPTYC Volume* 1, *number* 1, *Autumn*, 1971) was mailed in December 1971. The second issue will be mailed in February, 1972. It is essential that the newsletter be received by the widest possible audience, and that this audience be responsive. The newsletter will be discussed in more detail later.

Modular Approaches To Science Education

The second major undertaking of the CPTYC was the modular approach to science education. Waldman and O'Dwyer assumed the responsibility for this project. The idea of the modular approach is

not new. Recently, the *Technical Physics Project* was funded by the National Science Foundation to produce a series of modules in technical physics. Two of the CPTYC committee members, Alexander and Fibel, are on the steering committee for this project. At the Commission On College Physics conference on *Priorities For Physics Education In The Seventies* the concept of modular approaches to physics education was discussed in great detail. The concensus was that the traditional organization and content in physics education was not responsive to contemporary needs, and should at least be considered suspect. The modular approach was seen as a very attractive alternative.

The CPTYC has developed a prototype concept of a module for liberal arts students which has well defined characteristics. It was felt that the modules should be cross disciplinary wherever possible, should limit the mathematics requirement to beginning algebra (dimly remembered), should be a self contained unit with entrance and exit tests, and should provide from two to five weeks of classroom activities. The modules should be based upon physical systems with which the student can reasonably be expected to have some acquaintance, and which should be of contemporary significance to society. Typical subjects for modules might include: the supersonic jet transport, mass rapid transit systems, air pollution, power production, radioactivity, the arms race, lasers, computers, waste disposal, space exploration, artificial organs, etc. An instructor armed with modules on subjects such as these would select two or more and this would constitute a particular course. The flexibility permitted by this approach promotes relevancy of the course to current problems of society.

Alexander has prepared a draft outline of a proposal for production of modules. It is anticipated that this draft will be refined by the committee and submitted to funding agencies. Weldman has prepared a sample module which would be appropriate in an introductory physics course and which can serve as a prototype to support the application for funding. As a parallel action, the committee is refining the list of desireable characteristics which, it is hoped, will serve as a guide to shape the development of modules on a national basis. The objective of this is to promote the production of modules which can be freely interchanged between colleges.

The Computer As An Educational Facility

The final major task underway concerns the use of the computer as an integral part of the physics classroom. Peckham Alexander, and McFerran have responsibility for this phase of the committee's activities. It seems clear that whatever else happens to physics education in the seventies, the digital computer in some fashion

will play a central role. The technology has developed so rapidly that the computer can be brought into any classroom at very reasonable costs. The contemporary student, equipped with the power of a digital computer, can routinely solve problems which would have been considered out of the question in a classroom a decade ago.

The structure of a physics course should, it would seem, be somewhat different with a computer than without. Of course, the heart of the question is the instructor. The instructor who understands the power of the computer, and how students can be taught to utilize it, is in a far better position to reorganize the content of a course to reap the maximum benefit.

The committee attempted to set up a series of regional conferences of from three days to a week in duration to introduce two year college physics teachers to modern techniques involving the computer in physics education. Plans were undertaken to set up the first of these conferences in the Los Angeles area in connection with a summer project at the University of California at Irvine. The CPTYC portion of the project was to utilize funds from the Commission On College Physics. Unfortunately the funding evaporated and the plans had to be cancelled. A second attempt was made to organize a conference of the same type for the PNACP group in the Pacific Northwest. The conference was to be held at a community college in Portland. Due to funding problems, this conference also had to be cancelled.

The fundamental problem becomes clear at this point. The CPTYC has no funding available to support regional conferences of this type. Thus, such activities must be supported from other sources. Probably the best source is COSIP-C projects which permit a great deal of flexibility in the utilization of funds. The CPTYC can act as a resource body to provide instruction and locate computer facilities. Any groups desiring to organize a conference involving the computer should contact the AAPT Executive Officer.

Miscellaneous Activities

In addition to the major activities already described, committee members are gathering information to help formulate future activities. Roll is preparing a summary of deliberations and action of the Economic Concerns Committee with particular emphasis upon those items of interest to two year college faculty members. Fibel is preparing a reading list regarding the general nature and philosophy of articulation. Rutherford is screening the NSTA documents *Conditions For Good Science Teaching* and *Self Inventory* for carry over to the two year college scene. Nelson is preparing an article

summarizing the activities of PNACP activities. McFerran is preparing a similar article concerning texas COSIP-C activities. Gell is preparing a list of types of data which characterize two year college teachers to be used in future information gathering attempts. O'Dwyer is studying the New York two year college system to identify those factors that are the most important in the professional life of a two year college physics teacher.

CRPTYC - The Newsletter

As described previously, CRPTYC will be the means of communication between the CPTYC and the physics faculty in the two year colleges. Several types of material will be presented in this newsletter. Initially, the committee members have assumed the responsibility to contribute these items for the newsletter. Eventually, it is hoped that two year college faculty members will contribute most of the information for publication.

The first issue of the newsletter contained a brief summary submitted by Alexander of an article on *Negative Pressure*. Summaries of this type or articles will be in all future issues. Small items or announcements similar to those in the first issue will be continued. In issues subsequent to the first, a special page will be devoted to feature items. The features and the editors responsible for them are: Computers - Peckham, Apparatus - Alexander, The Two Year College Scene - Fibel, and New Answers To Old Questions - O'Dwyer. Any items which could be included in this feature page should be submitted to the editors above.

An additional feature of the CRPTYC newsletter will be *Gleanings From Publications*. The committee members will regularly survey a wide range of publications and report on those items which might be of interest to two year college physics teachers.

Thoughts For The Future

The continued expansion of the two year college system in the United States has generated a growing need for the type of professional committee such as CPTYC. The fact that CPTYC is one of the working committees of the American Association Of Physics Teachers reflects further upon the responsibility of the two year college physics faculty to the broader physics community. More and more, what *can* happen in upper division education will depend upon what *has* happened in science education in the two year college system. CPTYC has accepted the challenge to help stimulate and guide the growth of physics education in the two year colleges. The support of this committee by the individual faculty members will determine the success of the enterprise.

APPENDIX A

Committee On Physics In Two Year Colleges

Wilbur V. Johnson, American Association Of Physics Teachers, 1785 Massachusetts Avenue, N.W., Washington, D.C. 20036, (202)483-6070, (Chairman)

D. Murray Alexander, Physics Department, DeAnza College, 21250 Stevens Creek Boulevard, Cupertino, California 95014, (408)257-5550 ext 363.

Lewis R. Fibel, College of Education, Virginia Polytechnic Institute, Blacksburg, Virginia 24061, (703)552-6703.

Robert J. Goll, Physics Department, Miami-Dade Junior College North, 11830 N.W. 27th Avenue, Miami, Florida 33162, (305)685-4403.

Paul McFerran, Physics Department, Texarkana College, Texarkana, Texas 75501, (214)838-4541 ext 263.

Marvin L. Nelson, Physics Department, Green River Community College, 12401 S.E. 320th Street, Auburn, Washington 98002, (208)833-9111 ext 208.

Terry O'Dwyer, Physics Department, Nassau Community College, Garden City, New York 11530, (516)742-0600 ext 547.

Herbert D. Peckham, Natural Science Division, Gavilan College, Gilroy, California 95020, (408)842-8221.

Peter Roll, 217 Morrill Hall, University of Minnesota, Minneapolis, Minnesota 55455, (612)373-2451.

F. James Rutherford, Chairman, Department of Science Education, New York University, 22 Press Building, Washington Square, New York, N.Y. 10003.

Gary Waldman, Physics Department, Florissant Valley Community College, 3400 Pershall Road, Ferguson, Missouri 63033, (314)524-2020 ext 404.

APPENDIX B

Summary Of Suggestions For CPTYC Activities

Communication:

- Closer cooperation between faculties of two and four year colleges.
- Closer cooperation between two year college physics departments.
- Periodic meetings on regional and national levels.
- Joint conferences with other scientests in two year colleges.
- Establish journal for two year college physics communication.
- Establish newsletter for two year college physics communication.
- Publicize role of two year colleges to the physics community.

Preparation and Continuing Education of Two Year College Teachers:

- Establish graduate programs for college teachers.
- Encourage release time for continuing study and teaching development.

Curriculum Development:

- Detailed reports of innovative instructional methods and courses
- Encourage or generate programs for developing materials.
- Expand the role of physics in continuing education.
- Use of the computer in elementary physics.
- Development of technical physics programs.
- Encourage development of modules in contemporary physical science.

Laboratory Development:

- Evaluate physics laboratory apparatus and courses.
- Encourage equipment support by governmental agencies.
- Stimulate research at two year colleges.
- Develop laboratory instructional manual for two year colleges.
- Establish clearing house for laboratory instruments.
- Seek surplus apparatus and publicize availability.

General:

- Define the role of physics in society.
- Provide guidelines for science teaching conditions.
- Promote the role of contemporary problems in physics courses.
- Establish automatic transfer with full credit to four year colleges.
- Change the public image of physics.
- Encourage regional resource centers covering all levels.