

Report of the External Reviewers

Program Assessment Study

The Department of Physics

California State Polytechnic University, Pomona

Reviewed by

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Abstract:

After meeting with the Associate Vice President for Academic Programs, the Dean of the College of Science, the Chair of the Department of Physics, most of the tenure/tenure track faculty, the staff and several students, the reviewers find a university, college and department making solid strides toward integrating the assessment process with periodic program reviews. The department, while currently engaged many of the common forms of on-going assessment that are standard in physics departments nationwide, seems eager to codify, formalize and expand its assessment process. In addition, it is clear that the department is dedicated to continual improvement of student learning and students report that the program is very effective.

The purpose of this report is to assist the department in its efforts to develop a cohesive, consistent and effective assessment process by examining their Physics Department Assessment Plan (draft of April 3, 2003) and to provide ideas, insights and suggestions. There are a large number of ideas contained in this review. Certainly, they should not all be implemented. However, all of them should be considered by the department. After all, the purpose of our review is not to enforce our view of an assessment process upon this department, but to assist them in developing a plan that they find efficient and useful.

Below is a detailed description of our visit, a list of findings and our recommendations.

Details of Our Campus Visit:

The campus visit occurred on Tuesday May 27th, 2003. A detailed schedule appears below:

Time	Event	Attendees
8:15-9am	Campus Tour	John Mallinckrodt
9-9:30am	Entrance Interview	Elhami Ibrahim, Assoc. VP Academic Programs Donald Straney, Dean, College of Science John Mallinckrodt
9:30-10am	Meet with Department Chair	Mary Mogge, Chair, Dept of Physics
10-10:30am	Meeting with Curriculum Committee	Kai-S Lam, Chair Antonio Aurilia, Kurt Vandervoort
10:30-11am	Meeting with Lower Division Lab Committee	John Fang, Chair Bob Bush, Hector Mireles, Roger Morehouse
11-11:30am	Meeting with Budget & Planning Committee	Soumya Chakravarti, Chair Steve McCauley, Mary Mogge, Peter Siegel
11:30-1pm	Lunch with faculty and students	Peter Siegel, Soumya Chakravarti, Mary Mogge, Genie, Emily
1-1:30pm	Radiation Lab Tour	Peter Siegel
1:30-2pm	Meet faculty	Steve McCauley and Harvey Leff
2-2:30pm	Meet students	Genie, Emily, Kenny, Bob, Benny
2:30-3pm	Meet staff	Beverly Schuster, Doug Johnson, Jolene Houser, Mark Harnetiaux
3:30-4pm	Exit Interview	Elhami Ibrahim, Assoc. VP Academic Programs Donald Straney, Dean, College of Science John Mallinckrodt

Findings of the Reviewers:

- **The department seems eager to codify, formalize and expand its assessment process.**

Even though the department appears to do an excellent job of taking advantage of the common forms of on-going assessment that are standard in physics departments nationwide, they are very interested in developing a formal assessment process that is effective in helping them achieve their mission “to provide a rigorous undergraduate education in physics.”

- **Institutional support for an assessment program that is integrated with Academic Program Review is strong.**

The Academic Senate and the Cal Poly administration are in the process of building this integrated process. They clearly state in their draft of “A Guide to Program Assessment and Academic Program Review,” that “Program assessment is about giving faculty the information to improve academic programs – to make them more valuable and attractive...” The guide goes on to state that the results of assessment plans are a “key component in future academic program reviews.” The guide also recommends that assessment coordinators be given four units of assigned time. This is a strong statement regarding the importance of building an integrated assessment process.

- **The Physics Department Assessment Plan Draft is clearly focused on student learning.**

The document clearly speaks to the department’s, “commitment to meet our professional obligations to our students.” The draft goes on to enumerate specific “Desired Outcomes” for each specific client population. It is very important to point out that the department realizes that it must address the distinct learning needs of each population and does so admirably.

- **The Desired Outcomes are completely consistent with national norms for physics departments.**

The science of physics has come to realize over the last decade that it is no longer just training physicists. Data shows that skills and knowledge base developed in the study of physics is widely applicable. The desired outcomes listed are an excellent compilation of the goals of education in physics and are clearly in accord with workplace skills lists from the American Institute of Physics and the Accreditation Board for Engineering and Technology (ABET).

- **The Assessment Activities described in the plan are heavily dependent upon surveys.**

Five of the seven “Question and Concern” items are addressed with a survey of one type or another. While surveys have a valuable roll to play, there are other methodologies that we will recommend.

- **The Questions and Concerns raised in the Assessment Activities are not connected as directly as they could be to the Desired Outcomes.**

The Questions and Concerns are all important points that the department should investigate. In addition, they are clearly, “capable of charting new directions” for the program. However, they could be more strongly linked to the Desired Outcomes for each population.

General Recommendations of the Reviewers:

- **The department should consider housing the primary authority for assessment in its existing Budget and Planning Committee.**

While it is true that assessment touches nearly every part of the department’s governance structure, the organization of assessment activities needs some centrality. Assessment activities will most likely be carried out by other committees such as Lower Division Labs, Curriculum and Personnel, but a cohesive assessment process must be coordinated. Since, implementing the results of assessment activities can only occur with planning and budgetary prioritizing, it seems a natural fit to place the prime responsibility for assessment with the Budget and Planning Committee. This committee will however be charged with a greater need to begin its processes earlier in the academic year and meet more frequently.

- **The department should consider breaking the Assessment Activities into three types; Start-up Actions, On-going Activities and Current Issues.**

Starting an integrated assessment program requires different actions than maintaining one. A well maintained assessment process will constantly lead to new collections of issues. More clarity could be brought to the plan if these distinct phases of the assessment program were explicit. In addition, the connection between the Desired Outcomes and the Questions and Concerns could be seen more directly.

- **The department should consider reducing the dependence upon surveys.**

Surveys are notoriously difficult to design, validate and analyze. In addition, they are time consuming and expensive to administer. Surveys can be useful, but many well designed and validated instruments are available such as the MPEX and FCI. Also, the AIP Statistics Division has a large collection of reports that provide a good snapshot of many of the issues that the current plan addresses.

- **The department should consider how professional development of faculty should be included.**

Information about the structure, content and success of physics teaching and learning can often be efficiently gained by faculty from a variety of institutions getting together. AAPT regional and national meetings have a great deal of content related to these matters. Faculty should be encouraged to and rewarded for attendance at and participation in the meetings of this type.

Specific Recommendations of the Reviewers:

- **The department should consider breaking out the Desired Outcomes for client population 1 into at least three distinct career tracks; graduate school, employment and high school teaching.**

The professional societies in physics are helping departments realize that they are not just in the business of preparing students for graduate school. While the training for this endeavor seems to be a great benefit for those that follow other career tracks, it might be worth investigating whether the department feels that the learning outcomes for all three should be the same.

- **The department should consider building timelines for Start-up Actions and On-going Activities**

Timelines can provide a clearer picture of the assessment process. In addition, they may find that timelines will help build a sense of accomplishment especially through the start-up actions.

- **The department should consider constructing Outcomes/Area Matricies as a Start-up Action.**

An integrated assessment process must have clear lines of responsibility. Building an Outcomes/Curriculum Matrix will assist the Curriculum or Lower Division Lab committee as they move forward assessing the course of study. An Outcomes/Budget Matrix might help the Budget and Planning Committee focus funding in areas that are found to need it as a result of the assessment process.

- **The department should consider building an alumni database as a Start-up Action.**

Alumni are an underutilized resource for most physics departments. In addition to being able to provide a wealth of relevant assessment data, they can often arrange for equipment donations, student internships and financial donations. There are few activities that are more rewarding for most faculty than meeting with their previous students. The college development personnel should be able to assist the department in building this database.

- **The department should consider creating an Advisory Board.**

An Advisory Board consisting of faculty, former students and local industry can provide the department with valuable input for the success of their assessment efforts. This group will have direct insight into the skills and knowledge students must have to be successful in the work place. These individuals and the organizations they represent can also provide equipment donations, student internships and financial donations.

- **The department should consider adding the following On-Going Activities for client population 1.**

- Senior research projects as a capstone activity.

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- Student seminar presentations as a capstone activity.
 - Maintain consistency in introductory courses with CAN and IMPAC.
 - Encourage faculty contacts with other physics educators as a form of professional development.
 - Compare careers of graduates with national norms established by AIP.
 - Institutionalize alumni contacts such as annual newsletters and invitations to seminars.
- **The department should consider adding the following On-Going Activities for client population 2.**
 - Maintain consistency in introductory courses with CAN and IMPAC.
 - Continue dialog with departments whose students are served.
 - Participate in accreditations of these other departments (e.g. ABET).
 - **The department should consider adding the following On-Going Activities for client population 3.**
 - Maintain consistency with campus standards for General Education courses.
 - **The department should consider adding the following On-Going Activities for client population 4.**
 - Maintain consistency with the requirements of the Commission on Teacher Credentialing.
 - Maintain consistency with the California Science Content Standards.