

SHOULD STUDENTS GRADE PROFESSORS?

Recent campus protests concerning undergraduate instruction have brought to the foreground the proposal of teacher evaluation. We asked physics teachers for their opinions, and most replies stated that physics education needs more feedback. The teachers believe that formal criticism by their students is one good method, provided it is properly conceived and executed. They also suggest personal acquaintance with students and classroom observation by other members of the faculty.

Respondents

Following is a list of the physicists whose opinions were sampled for this article. All of them have been honored by the American Association of Physics Teachers with either the Oersted Medal or the Distinguished Service Citation.

C. Luther Andrews

State University of New York at Albany

Arnold Arons

Amherst College

Sanborn C. Brown

Massachusetts Institute of Technology

J. W. Buchta

American Association of Physics Teachers

Gerald Holton

Harvard University

Paul Kirkpatrick

Stanford University

Robert B. Lindsay

Brown University

Walter C. Michels

Bryn Mawr College

Philip Morrison

Massachusetts Institute of Technology

Duane Roller

Harvey Mudd College

Richard M. Sutton

California Institute of Technology

George E. Uhlenbeck

Rockefeller University

Mark W. Zemansky

City College of the City University of New York

"Physicists believe in measuring things. It ought to be possible to measure ability in undergraduate and graduate teaching," writes Mark Zemansky in response to a PHYSICS TODAY questionnaire. Prompted by recent student protests around the country, we asked several award-winning physics teachers what they thought of student appraisal of undergraduate physics teaching. Names of respondents are in the box on this page and the questions are in bold-face type at the end of the article.

In recent months students and faculty at a succession of schools have expressed dissatisfaction over the way undergraduates are being taught. At Cornell University, a faculty committee reported that undergraduates were receiving "grossly negligent or inadequate teaching" and recommended that students evaluate their teachers' effectiveness. At City College of New York's City University, the administration has endorsed a student-initiated project for grading faculty in such areas as organization of material, knowledge of subject matter, and ability to explain involved problems.

Teachers want more feedback

In answering the PHYSICS TODAY questionnaire, all but one of the respondents agree, often emphatically, that undergraduate physics teaching needs more evaluation than it is getting. Walter Michels expresses a common sentiment when he writes, "There can be no question about the need for more evaluation. The problem is how to evaluate."

Would formal appraisal by one's students prove constructive? Yes, says the majority, provided the rating system is properly conceived and executed. "Its value depends on how it is solicited, collected, and interpreted," says Kirkpatrick. "I do think that attempts at evaluation are futile," he continues, "unless we know what we are trying to do in a physics course."

But Arons and Brown dissent strongly from the idea of formal rating by students. "I feel," says Arons, "that we are very much in need of quicker and better indices of what students learn. If we



ZEMANSKY

achieve such indices, it will be through generation of more illuminating and significant test material and better knowledge of the learning process, not through reactions to opinion polls." "Any sensitive teacher," writes Brown, "is well aware of what his students think of his teaching, and department heads soon find out who their good and poor teachers are whether or not there is a formal evaluation system."

A mere popularity vote by immature students is rejected by the majority of teachers, fearful of



BROWN

derogation of authority. "More important to the instructor is the aggregate of twenty thoughtful individual expressions of opinion," says Sutton. Kirkpatrick's feeling is, "General popular condemnation of a teacher could deprive him of student respect." Aron writes, "I felt that undergraduate criticism might indeed undermine the authority and enhance the insecurity of some teachers and

thus cause a deterioration rather than an improvement in effectiveness." The minority opinion disagrees. "It might make the teacher leave the field and go into something else, where he and the students might be happier," says Zemansky. Sutton writes, "A teacher's authority should rest primarily on his effectiveness. There is no other good basis for authority."

Student evaluation, new and old

Besides the traditional feedback mechanisms of criticism from senior colleagues and the open office door, many of the schools already have some form of student evaluation in operation. "Student committees have from time to time undertaken evaluation of all faculty members," writes Sutton, "and have rendered reports, usually helpful." Buchta says "The college of Liberal Arts at the University of Minnesota had a plan through



BUCHTA



MICHELS

which students could appraise their instructors. The participation in the plan was voluntary on the part of the instructors. Most instructors, including myself, found the comments and appraisals valuable. The students generally gave responsible replies; they were neither capricious nor vindictive."

Several of the teachers associated with small colleges stressed student-teacher intimacy as the best feedback device. "Physics classes at Bryn Mawr seldom include as many as 40 students," writes Michels. "We know the students as persons." At the University of Minnesota, a teacher would occasionally tape record his lecture as he was delivering it. "Sometimes," says Buchta, "the

instructor would be greatly surprised by some of his idiosyncrasies."

What other methods could be introduced to improve evaluation and physics teaching in general? Two of the respondents suggest delayed questionnaires. "A questionnaire sent to students several years after their graduation" is proposed by Roller. "It should be in two parts: one concerned with the general college program, the other addressed to former physics majors." Roller cautions, however, that the questionnaires "should not be confined to 'honors' students. There is something wrong—all of us know what it is—when a college does not have confidence in the opinions of all of its graduates." Several teachers urge closer relationship between instructor and student. "Open avenues of complaint" is stressed by Sutton. "If students don't come in, ask them individually or in small groups." "All good teaching," says Andrews, "involves continuous feedback, classroom discussions, regular problem sets read and returned, individual conferences, demonstrations in which the students stand around the table and participate." To recognize good teaching, Uhlenbeck urges the reward of academic promotion. "I think it rarely happens nowadays," he admits ruefully.

Teaching and campus democracy

Implicit throughout the teachers' comments is their concern for democracy on the campus. Arons states the minority opinion when he says, "I do not believe that a sound educational institution,



ARONS



KIRKPATRICK

with high academic standards, can possibly operate as a democracy. To see the chaos and debilitation that result from too much deference to student opinion, one has only to look at some of the Latin American universities that have been unfortunate enough to let student feedback take the form of student voice in university government. Perhaps it is only a small price for students to pay—to confront an occasional ineffectual course or teacher

and to gain in return the statistically high level of standards and performance that characterize American education in general."

Most of the teachers, however, agree in essence with what was expressed by Kirkpatrick. "It is often protested that students do not know good teaching from bad; that they confuse entertainment with instruction and praise the teacher who holds their interest, works them lightly, and



ANDREWS



UHLENBECK

grades them liberally. Though much of this may be true, it does not justify the simple discarding of student opinion. Only the student sees the teacher at work. Others have opinions derived in various indirect ways about a teacher's performance but only the student has the directly observed data. He may not know how to interpret it, but if we simply throw it away we are left with almost nothing. We must learn how to calibrate the student, draw out the data within him, and process them for the exposure of reliable conclusions."

Here are the questions PHYSICS TODAY sent out and representative excerpts from the answers that came back.

1. Do you feel that undergraduate physics teaching requires more evaluation than it is getting?

"Every teacher's work deserves thoughtful, anonymous evaluation by his students annually. There should always be avenues open for complaint to which students could turn without fear of reprisal."—Sutton

"All teaching needs more evaluation by students as well as by teachers and administration. Education should be a cooperative venture, participated in by relatively immature students and relatively mature students, the latter being the teachers. Students should be informed, continually and explicitly, of the specific objectives of any course; then a student may be able to judge whether these objectives have been attained, and how they might be modified or augmented."—Roller

2. Would evaluation of physics teachers by their students be constructive?

"Yes, if set in proper frames of reference: mutual responsibility for the educational process and what goes on in lecture, lab, and classroom. The important thing is to keep the avenues of communication open both ways. There should be simple ways for student gripes to be conveyed, and formal surveys should be infrequent."—*Sutton*



SUTTON



LINDSAY

"Yes, if you could get students to be serious and honest. Students might regard the project as a prank."—*Zemansky*

"It could be if properly handled. The problem is not who should evaluate teachers but how to induce good teachers to continue to teach well and poorer teachers to do better. Student evaluation if badly handled could achieve the opposite. If teacher evaluation is used as only one of many inputs, it can no doubt improve the quality of teaching in many cases. The current habit of some first-rate universities, namely to consider teaching ability very little or not at all in making appointments to the faculty, is a poor policy."—*Holton*

"It might help if restricted to the better students and arranged so that only the individual teachers and department chairman see the evaluations."—*Lindsay*

"In my experience with student evaluations I have found that, statistically, the responses were serious and thoughtful with relatively little animosity and irresponsibility. Many suggestions were indeed constructive, but I was ultimately convinced that polls had very little net effect. Competent teachers were recognized and reinforced in their approach; poor teachers tended to become more withdrawn and hostile. Rather than improving the situation, one might have argued that the poll made it worse. I am not prepared to make a compelling, objective argument either way, but I certainly feel that it is far from clear that student evaluations of the familiar type do any net good. I am not aware,

for example, that the 'Confidential Guide' continually published at Harvard University has any net good effect on teacher performance at Harvard."—*Arons*

3. Do you feel that undergraduate criticism might undermine the authority of teachers?

"This depends entirely on how the information is solicited and how it is used. If it is made clear that students are legitimate judges of teaching effectiveness, but not the sole judges, I see little danger."—*Michels*

"No. Results should not be made public, however. Only the teacher and the chairman of the department should have access to the results of students' questionnaires."—*Uhlenbeck*

"Least likely if the evaluations are made by students after they have been graduated, preferably several years after graduation."—*Roller*

4. What feedback mechanisms are already operative in your institution to determine a teacher's performance for himself and others? Do you believe them to be effective?

"A young teacher is observed by every member of the department's Appointments Committee and is taken aside by each observer and is told the truth. It works fairly well."—*Zemansky*

"Our best mechanism is small classes in which demonstrations provoke discussion."—*Andrews*

"For small institutions like the Rockefeller University, the teacher's performance is usually established by hearsay in a satisfactory and just way."—*Uhlenbeck*

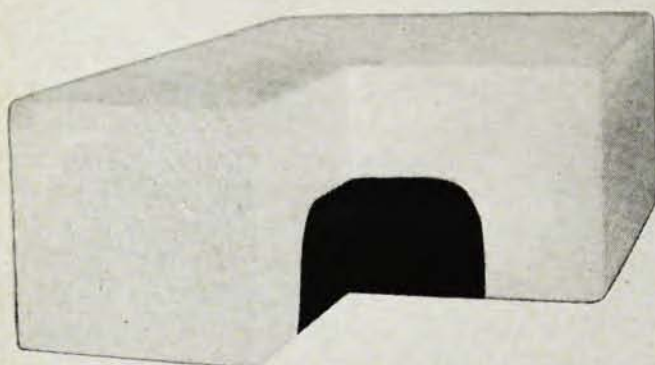
"Unsigned questionnaires. They are effective but could be expanded."—*Morrison*



MORRISON

"Occasionally, I give my classes the task of bringing to the following lecture a 'progress report'. I say very little about it, beyond that it should be about one page long, and that it need not be signed. The result is that some students take this request terribly literally, and bring in a table of contents of what they have been studying. Others laconically say 'all is well' or 'help'. But between these extremes, this part-therapeutic,

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part-informative progress report provides a great deal of feedback which would have been difficult to gather in any other way."—*Holton*

"Opinions expressed orally by alumni when they visit the college; comments made to the teacher by other faculty members who visit his course. The department head listens to, but does not invite, complaints made by a student."—*Roller*



HOLTON



ROLLER

"Department chairmen should assume greater responsibility for arranging seminars to discuss teaching problems."—*Lindsay*

"Private discussion between student and teacher seems to be the most effective long-range feedback mechanism. It works very well provided a real effort at communication is established by both the teacher and the student."—*Brown*

5. What other feedback mechanisms do you think could and should be introduced?

"Teachers' roll-books should be examined. The chairman should find out whether the teacher gives quizzes, looks at or grades lab reports, knows his students' names, helps students outside of class, has a friendly attitude toward them."—*Zemansky*

"Personal acquaintance between teacher and student. Systems encouraging or requiring students to submit reports on their teachers to higher administrative levels succeed only when introduced and operated with exceptional tact and on campuses where the climate is favorable and not recently disturbed by intramural academic acrimony."—*Kirkpatrick*

"The student is subject to so many simultaneous influences that the 'signal' produced by a course is buried in the 'noise'. One can discriminate against noise by using a measuring device with sufficiently slow response, such as questionnaires several years after graduation. But such a device is very poor for measuring the effect of slowly changing techniques of instruction."—*Michels*

"Sample oral interviews with graduate students."—*Morrison*