DOCUMENT RESUME

ED 227 069 SP 021 800

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TITLE The Faculty Role in Educational Excellence.
INSTITUTION National Commission on Excellence in Education (ED), Washington, DC.
SPONS AGENCY Department of Education, Washington, DC.
PUB DATE Jun 82
CONTRACT NIE-P-82-0017
NOTE 55p.; Paper presented at a Panel Discussion of the National Commission on Excellence in Education (Kingston, RI, August 27-28, 1982).
PUB TYPE Reports - Descriptive (141) -- Speeches/Conference Papers (150) -- Information Analyses (070)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Academic Achievement; Academic Standards; *College Faculty; College Students; *Course Content; Higher Education; *Institutional Characteristics; Intellectual Development; *Professional Autonomy; Program Effectiveness; Relevance (Education); Teacher Attitudes; *Teacher Effectiveness; Teacher Evaluation; Teaching Methods
IDENTIFIERS *National Commission on Excellence in Education

ABSTRACT

The high degree of autonomy college faculty members exercise in organizing and teaching courses suggests that faculty perceptions of educational purposes, subject matter structure and importance, and expectations for student learning are major determinants of educational success. Despite diversity and local autonomy present in its system, American higher education shows a substantial degree of coherence. Students and faculty move with reasonable ease from one institution to another. The autonomy of individual faculty members is countered by a complex network of influences: (1) prior educational and work experience and background characteristics; (2) textbooks and other instructional materials; (3) direct contact with other faculty members (e.g., curriculum committees, departmental discussions, informal contact); (4) professional literature; (5) professional associations and learned societies; and (6) the accreditation process. The first section of this paper describes the nature of the faculty network and its constraining influence on faculty teaching, educational content, and standards. The second section discusses how the effects of faculty views and expectations on student learning, as constrained by the existing system of influences, are or might be assessed. Procedures are described that would extend knowledge of the educational accomplishments of the higher education system while allowing for its diversity. (JD)

THE FACULTY ROLE IN EDUCATIONAL EXCELLENCE

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Educational Testing Service
June, 1982

For 30 years, American higher education has probably been studied in greater scope and intensity than has any other educational system. Yet information has not been produced that would give defensible answers to such fundamental questions as the following:

- What do the students who go through the American higher education system learn?
- With great diversity in educational curricula and programs, how effective is any one curricular or programmatic approach in comparison with any other?
- How good, or how poor, is the system as a whole in relation to what it might be?

An immediate response to such questions might be that they are naive, that American higher education is too complex to permit realistic or useful answers to such broad questions. This paper will propose that questions as broad as those can be answered, although they will not be answered simply, and that faculty members are the central actors in determining the questions as well as the answers.

The American College, edited in 1962 by Nevitt Sanford, reported the results of an unusually productive decade of research about higher education in America. In the 29 chapters by 30 authors, the dominant themes were related almost exclusively to student development in the social and cultural context of the institution and, to a lesser extent, society at large. Little was said about the content or substance of student learning. The two

This publication was prepared with funding from the U.S. Department of Education, under contract # NIEP 820017. Contractors undertaking such projects under government sponsorship are encouraged to express freely their judgement in professional and technical matters. Points of view or opinions do not necessarily represent those of the U.S. Department of Education.

or three chapters in which the curriculum was discussed treated it almost entirely in terms of its effect on student personality development.

The slighting of intellectual development in favor of a broader view of students' developmental needs was purposeful and legitimate in view of the convictions first, that higher education had been too narrowly focused on academic concerns to accomplish them much as well as was desirable, and second, that the personal development of students deserved more attention than it had been getting. During the twenty years since publication of The American College, the personal development of students has dominated studies of higher education. The severe limitations in our understanding of intellectual growth have only slowly begun to be widely recognized and have barely begun to be sketched.

Feldman and Newcomb (1967) in an exhaustive review of studies from the middle 1920's to the middle 1960's on the impact of college on students, discussed values, goals, satisfactions, attitudes, interests, and personality traits. "Learning" is not in their index. References to "academic achievement" deal with students' attitudes toward achievement and to peer and faculty influences on those attitudes. The scope and depth of the knowledge and understanding students acquired in college were almost completely neglected, without explanation.

From 1967 to 1973, the Carnegie Commission on Higher Education under Clark Kerr produced an extensive, probing series of reports on American higher education that received wide attention in the United States and abroad. Its impact has been substantial, on federal legislation as well as on institutional practice and public policy. Despite general acclaim,

though, it too slighted the substance of higher education. One knowledgeable critic objected that the Carnegie Commission "does not inquire into what is meant by quality with a rigor equal to that with which it pursues . . . the quantitative" (Niblett, 1973). Another agreed, noting that the Commission "spent most of its energy and attention on the arrangements and circumstances of higher education rather than on the education itself" (McDonald, 1973). Alan Pifer, president of the Carnegie Corporation, acknowledged that the Commission did indeed neglect the curricula of higher education, but pointed out that the Commission had not been asked to address that topic (Carnegie Council, 1980, p. 31).

The Carnegie Council on Policy Studies in Higher Education, successor to the Carnegie Commission, had a similarly productive life from 1974 to 1979 and gave somewhat more attention to questions of curricula and student learning. Appearing repeatedly in the Carnegie Council's reports, though, and in statements of others who have systematically observed higher education's functions, is a wistful acknowledgement that little is known of students' actual learning as they progress through their undergraduate programs. Howard Bowen (1977), after having completed for the Carnegie Council probably the most exhaustive search that has yet been made for evidence of the broad range of effects of higher education, called the evidence about college effects on verbal and quantitative skills "distressingly meager" (p. 67). On a later date, he commented that, "the residue of a college education--after the initial forgetting of detail--is a virtual mystery" (Bowen, 1979). The Carnegie Commission itself had noted earlier, "Performance is very hard to measure in this area [the education of individual students] given the millions of students, the thousands of

"campuses, and the several and quite imprecise criteria" (Carnegie Commission, 1973, p. 20).

The following comments, repeating the common theme that we know too little about student learning, span the past 15 years.

> [T]he questions of what should be taught, and how and when, are still more a matter of mythology than of rational judgment (Boyer, 1967, cited in Trent & Cohen, 1973, p. 1033).

> Most studies [in the area of curriculum] . . . merely note trends and describe what is being done . . . but ignore the relationship of the trend to the goals of the college or the effectiveness of the course (Trent & Cohen, 1973, p. 1032).

> Of all the matters treated in this chapter [on undergraduate science education] an assessment of the quality of science education and its change with time is most central. Yet our information is almost nonexistent (Doty & Zinberg, 1973, p. 164).

> By what standards may one judge how effective current teaching and learning actually are and how effective they can reasonably be expected to become? . . . Questions of this sort arise because little is known about the outcomes of college instruction (Wilson, Gaff, Dienst, Wood & Bavry, 1975, p. 87).

> It would seem an appropriate time to look at what it is English departments do (Lambdin & Fowler, 1981, p. 335).

One of the problems in identifying with any degree of precision the kinds of learning or intellectual growth attributable to college and university programs was described by the Carnegie Commission as the sheer numbers and diversity of the students, institutions, and educational objectives. To those sources of diversity can be added the thousands of courses being taught by hundreds of thousands of faculty members, each with considerable autonomy. In those circumstances, the failure to find evidence of results that can be attributed generally to our large, complex, decentralized higher education system as a whole is understandable.

A different kind of inquiry might examine how the coherent systematic structure that is apparent in American higher education despite its diversity has been established and is maintained. How are courses--say in American history to 1860, or the first course in organic chemistry, or 19th century English literature--in widely different institutions, being taught to students who vary enormously in prior learning and academic interest, kept sufficiently similar that students can transfer from one institution to another in the same major field without starting over entirely? How can graduate students from widely different undergraduate colleges experience similar levels of success in the same graduate programs? How can employers know what to expect when they require a college degree for employment without specifying which college must have awarded the degree? This kind of question will be addressed in this paper. A second kind of question to be addressed includes how the mystery around the residue of a college education, or the mythology of what should be taught and how and when, might be reduced; or how information might be provided on the quality of science education, or on what it is English departments do.

The central role of the course in student learning

Veysey (1973) has called the course the most durable element in American higher education. It is the unit in which the content to be learned is organized and through which instruction occurs. Even the learning activities of students outside class are guided by the organization of the course. While much of the attention of curriculum committees, educational policy committees, and other faculty groups is given to the ways courses may be strung together to constitute a worthwhile education, the actual instruction and learning are products of each individual course.

Courses successfully completed determine a student's progression through college, from lower to upper division to graduation, from introductory to advanced material, from prescribed to elective content. They provide structure to the student's major field of study. They determine how the student's general education or breadth of learning is defined. The courses taken constitute the substance of an undergraduate education.

Within a course, each faculty member determines the nature of the material to be taught--the content to be covered, its scope, depth, and detail; the way it is to be presented to the students and the activities in which they will be asked to engage; and what will be required of the students to demonstrate to the professor that they have indeed acquired a reasonable grasp of the course material. On large campuses, where several sections of the same class may be taught by different persons, the content, text, instructional procedures, and final examination may be common to all the sections. These courses tend to be introductory or basic lower-division courses taught by junior faculty or teaching assistants, and they often have their character determined by a senior faculty member who directs the course according to his or her perceptions of what is important.

Even courses that might be expected to be fairly standard across the country show significant variations. An example is an elementary course invariably found in electrical engineering programs usually titled something like Basic Electric Circuits. The course commonly covers "basic concepts of current flow," or "basic circuit theorems," starting with circuit analysis of direct-current circuits and ending with an introduction to alternating currents and sinusoidal wave forms, perhaps with a beginning on three-phase circuits. The elements of this course are in every electrical engineering

program, varying only in their placement, such as whether three-phase circuits are introduced at the end of the basic course or are held off for a second course. Yet this well-established course, with content that is widely agreed upon, is taught differently by different professors.

One faculty member, when interviewed about how he approached that course, described his objectives as getting his students to understand the basic concepts, equations, and problem-solving methods so they would be able to move successfully into the more advanced course. His procedure was to introduce new material in a lecture, illustrate how to solve related problems in circuit analysis, assign weekly sets of problems to be worked outside class, and review the solution of those problems in the first class session the following week. Another faculty member teaching the same course at a similar university stated his primary objective to be to help his students learn how to think. The course content was secondary to the problem-solving process. His students, he said, would forget the specifics of the course within a few months of completing it, remembering only what was reviewed and relearned in their following courses. But the processes of thinking--of knowing how to attack a problem, of applying equations in different types of problems, of verifying results--were likely to persist and were the kinds of learning he wanted his students to have acquired by the end of the course. His methods were not wholly different from those of the first professor, although their goals and emphases varied. He also spent class time illustrating how to solve problems in electrical circuits, but more time was spent on fewer problems, with more emphasis on process than content. Basic concepts such as resistance and capacitance were introduced almost incidentally as systematic variations in a basic problem

as much as physical elements of an electric circuit. In contrast, they were the heart of the course as taught by the first professor.

Both classes were successful, at least to the extent that students who completed them had reasonable success in more advanced courses. Beyond that, neither professor knew what the impact of his course had been--whether more than definitions of concepts and how to apply the appropriate equations to solve problems of circuit analysis had been or could have been learned, or whether their students were successful in more advanced courses only through extensive relearning of the material, or whether too much effort had been spent on some less consequential parts of the course at the expense of more useful learning. Both professors knew how well their classes performed on course examinations; both could compare their current classes informally with former classes; both believed they were successful in teaching their students what was most important in that course. But neither knew how well his students compared with students from similar classes elsewhere in the facility with which they handled more advanced courses or in the general usefulness of the understandings or intellectual insights acquired in that course.

Two issues are suggested by the above illustration. One is how such variations in faculty objectives and expectations come about. In contrast to the highly circumscribed course just described, faculty goals and expectations are substantially greater in such courses as Shakespeare's later plays, or the natural history of vertebrates, or introduction to philosophy. The upper-division courses in professional fields such as engineering and in the physical sciences can also be expected to vary more widely than the lower-division courses as the basic groundwork in those

fields is completed. These variations in faculty perspective almost certainly produce variations in the scope and depth of student learning. At present, we have no way to exmaine those presumed variations in effects.

The second issue illustrated by the course in electric circuits is what effects variations in faculty goals and expectations may have on the broad aspects of student learning—the aspects that persist after the details of the course have been forgotten or that color the students' approaches to other courses or other intellectual activities. How are the purposes of the college or university furthered by the activities of faculty and students in their various courses? If we assume, as we must, that college courses have desirable effects on the students who take them, can we also assume that any reasonable approach to a particular course is as effective as any other? In the kaleidoscopic array of available courses from which students choose about 40 to constitute their undergraduate education, how do variations in faculty goals and expectations within individual courses affect the educational coherence of any student's chosen 40?

No evidence can be found that the observable variability in courses and educational programs is undesirable. A case might be made that programs are not variable enough, that the faculty members in some fields are too homogeneous in their backgrounds and present perspectives to provide as much diversity as is needed. Hodgkinson (1971) raised that possibility. Whatever its merits may be, the present system for establishing what is to be taught and the levels of student accomplishment to be sought is not well understood, and its results are poorly documented.

If courses constitute the substance of an undergraduate education, and if faculty members have great individual latitude in determining the content,

instructional procedures, and standards for evaluating learning within their courses, the achievements and deficiencies of American higher education will be observed most directly in the course objectives set by individual faculty members and in the students' achievement of those objectives. The Carnegie Commission (1973) was discouraged from assessing the collective accomplishments of American higher education by the great diversity in institutions, programs, courses, and standards of achievement. Yet diversity in itself does not prevent the assessment of performance; it only requires that the assessment reflect that diversity.

The central role of the course in educational programs and the high degree of autonomy faculty members exercise in organizing and teaching their courses suggest that the views of faculty members—their perceptions of educational purposes, of subject matter structure and importance, and their expectations for student learning—are major determinants of educational success. Despite diversity and local autonomy in American higher education, it shows a substantial degree of coherence. Students and faculty move with reasonable ease from institution to institution. The autonomy of individual faculty members is countered by a complex network of influences that, without central direction, impose some order on the higher education system. The remainder of this paper will describe, first, the nature of that faculty network and its constraining influence on faculty teaching and on educational content and standards. A second section will discuss how the effects of faculty views and expectations on student learning, as constrained by the existing system of influences, are and might be assessed. Finally, procedures will be described that would extend our knowledge of the educational accomplishments of the higher education system while allowing for its diversity.

Influences on faculty performances

A number of forces can be identified that operate on faculty members to influence their course planning, teaching procedures, and expectations for student learning. The following list is incomplete and heterogeneous in degree of importance, but it provides a point of departure.

1. Prior educational and work experience; background characteristics.
2. Textbooks.
3. Direct contact with other faculty members (e.g., curriculum committees, departmental discussions, informal contact).
4. Professional literature.
5. Professional associations; learned societies.
6. The accreditation process.

Faculty background. Faculty members' initial efforts at course planning and teaching are probably modeled closely after the courses they took as undergraduates or that they taught as graduate assistants under a senior faculty member. In their first courses they may be given a course outline or syllabus from the course as it had been taught or, more likely, simply told what text had been used. Their organization and presentation of the course reflect their own experiences and their usually naive notions, despite their not too distant experiences as undergraduates, of what a class of undergraduates can be expected to learn. Typically, their early expectations are far too high, based on an image of undergraduates that gives them the qualities of eager, interested graduate students, despite the reality of their great variability in interest and capability. Since faculty members were among the most capable undergraduates, their own

experiences as a student do not give them an accurate picture of their current students. With experience, faculty members become more modest in their expectations and probably more successful in helping their students learn. The initial teaching procedures and expectations for student performance, though, flow from the faculty members' own prior experience as students and teaching assistants. Whether that experience, often in a major research university, is appropriate for the less rigorous curricula and generally less competent students of the more representative colleges and universities, in which most faculty members teach, has been questioned (Doty & Zinberg, 1973; Dunham, 1969).

One of the consequences of the leveling off of enrollments and the decline in financial support for higher education during the last few years has been a growing concern for the evaluation of faculty members as teachers rather than primarily as scholars and researchers. Paralleling that trend has been a growth in programs of systematic attention to the improvement of teaching. As these programs mature, the influence on student learning of faculty members' prior experiences as students and their impressionistic views of the teaching and learning processes may decline. Yet the observation of any such change may itself by impressionistic.

While their own experiences as students and teaching assistants exercise a direct influence on faculty members' expectations for their students, other background factors--age, sex, social origins, and academic field, for example--have an indirect influence. Ladd and Lipset (1975), reporting on the Carnegie Commission's extensive faculty and student survey, pointed out the strong relationships between faculty members' academic field and sex, race, religion, and social origin. Faculty members in law and medicine, for

example, were generally from families of comparatively high educational and occupational levels. Faculty in the undergraduate professional schools--education, engineering, business, and agriculture--came from more modest social backgrounds. The arts and sciences faculty members were somewhere between the other groups.

One of Ladd and Lipset's major points, indicated in their title, The Divided Academy, was the pervasiveness of the differences in points of view across academic fields, which followed fairly closely the differences in social origins. In academic affairs, as well as in politics, faculty in the social sciences and humanities adopted more liberal positions than did faculty in the physical sciences, who in turn were more liberal than those in the applied fields. That order from liberalism to conservatism was reflected in the percentages of faculty members who would give students a greater role in determining course content and procedures, who would liberalize grading practices, and who would relax academic standards to accommodate more minority students. The differences in the social and political values of faculty members thus were related to their educational views and presumably to their activities in class and their expectations for students. Yet Wilson, et al. (1975) found faculty values unrelated to student or colleague judgments of teaching performance.

Similar differences across academic fields have been seen in views more directly related to teaching and learning. Faculty members in the natural sciences, in contrast to those in the social sciences and humanities, gave more attention to their students' problem-solving performance and less to their verbal ability; were more concerned with the application of learning to new problems and less concerned with the students' personal

qualities (Warren, 1972). Faculty members in the social sciences and the humanities focused more narrowly on the specific tasks of a course (Riesman, Gusfield & Gamson, 1970) compared with those in the natural sicences, gave more attention to their students' personal development, wanted a more personal student-faculty relationship, and were more inclined to trust their students' ability to direct their own studies (Riesman, Gusfield, & Gamson, 1970; Wilson, et al., 1975).

These differences in faculty members' orientation toward academic tasks have been frequently observed in one form or another (Bruner, 1960; Hirst, 1974; Parsons & Platt, 1973). Whether they are determined by the characteristics of the field, the nature of the persons attracted to the field, or most likely, both, is in one sense immaterial. The social and academic backgrounds of faculty members and their preferred approaches to instruction are both strongly associated with their academic field. Expectations for student learning are more clearly defined, more specific, more closely tied to predetermined standards, and less adaptable to student variations in preference and ability among faculty in the physical sciences and applied fields, such as engineering and business, than among those in the social sciences and humanities.

The preferences of students parallel those distinctions among fields of study, which may reflect a realistic and unsurprising confluence of the characteristics of subject-matter fields and of the faculty members and students attracted to them. Yet that comfortable agreement in the perspectives of the participants in a field may preclude the asking of critical questions about the effectiveness of current teaching procedures and about the levels of achievement to which current procedures lead. The physical

sciences and engineering, for example, stress analytic processes and attract people who are capable and comfortable with analytic thought processes (Enyeart, Baker, and Van Harlingen, 1980; White and Fernstenberg, 1978). The humanities, in contrast, give more attention to integrative thinking, placing comparatively more emphasis on finding connections among ideas than on identifying their differences. Yet integrative thinking is highly valued among mature scientists and engineers, as is analytic thinking among many humanists. Undergraduate instruction may reflect a natural bias, due partly to faculty characteristics, that limits intellectual development in the sciences and the humanities.

Textbooks. The writing, production, and sale of textbooks for introductory and lower-division college courses constitute a major industry. Faculty members, particularly in the lower division but in the upper division as well, organize their courses to a large extent around the content and organization of an available text. In addition to providing the subject-matter content and a teaching tool that will help carry the class, additional materials integrated with the text are often provided--workbooks, teachers' guides, exam questions, case study materials, and books of readings (Grambsch, 1981). Their appeal is easy to see. For a time after World War II, the more extended use of paperbacks and reprints gave faculty members greater freedom and flexibility in course content and structure than reliance on a single text (Smelser, 1973). More recently, the growing cost of paperbacks and the tendency to use more than one has returned the economic advantage to single primary texts, and their other advantages seem to have ended the "flirtation" with paperbacks (Carnegie Foundation for the Advancement of Teaching, 1977).

Whether textbooks dominate the selection and organization of course content or faculty members adapt them to their own purposes--as derived from personal predilections, the curricular structure established by their department, and the capabilities and interests of their students--depends on the individual faculty member. Their decisions probably change with their own teaching experience and with the level and nature of the course. A course in a well-defined sequence for majors in the field is more likely to be tied closely to a textbook than is one intended for nonmajors or one that is optional for majors.

Textbooks have done more than help faculty members organize their courses. They have also had a national impact on fields of study as to content, organization, and teaching procedures (Carnegie Foundation, 1977). One text, for example, "profoundly changed lower-level biology teaching" (Doty & Zinberg, 1973). Three major texts between 1946 and 1953 turned around the teaching of history, moving it from an overemphasis on sequences of events to deeper examinations of historical methods of understanding and to the values that are revealed by and shape historical study. (Ward, 1981).

The relationship between textbooks and faculty members operates in both directions. Most textbooks are written by faculty members. They serve, then, as a vehicle for communication among faculty members, reflecting to some extent the collective faculty experience with students in their courses as well as developments in the field. The influence of faculty experiences on textbook writing is biased, however, by the disproportionate numbers of textbook authors from a relatively few major universities (Bungum, 1980). Faculty experiences in less renowned

institutions are poorly represented. Publishers reduce that bias to some extent by guiding textbook writers to produce a text that will sell in the less selective as well as more selective institutions, drawing their information from faculty members at large (Carnegie Foundation for the Advancement of Teaching, 1977). Thus one link in a complex process that keeps some coherence in higher education curricula despite the high level of discretion under which individual faculty members teach is provided by textbook publishers helping a select group of faculty members write textbooks that will be useful to a broad range of faculty members in conducting their courses.

Contact with other faculty members. Faculty members build on their initial views of the kinds of academic performance to be fostered in their students through a variety of formal, semi-formal, and informal contacts with other faculty members. The formal contacts include meetings with the department head or with departmental committees to discuss the nature and purpose of a course. These meetings, and the results of earlier such meetings that have been formalized into curricular plans, course syllabi, and required texts, are the only direct guidance faculty members have for constructing their courses. Those formal sources for structuring courses, however, still leave faculty members an appreciable amount of latitude in the actual presentation of a course, in the academic tasks they set for their students, in the levels of accomplishment they expect, and in the kinds of evidence of achievement they collect. While some large classes in large universities have a greater degree of structure imposed on faculty members, the far more common pattern leaves much to the discretion of the individual.

A second kind of formal faculty contact that is growing in frequency is provided by organized programs of faculty development (Centra, 1977; Lindquist, 1981). These tend to be more often built around teaching procedures and student satisfaction than around course content or student learning. A faculty member to whom students give poor ratings as a teacher, for example, may learn, through an organized program for faculty improvement, that he or she expects prior learning that many students don't have, presents the content without enough structure for the students to absorb it readily, or is unclear about his or her expectations.

The organized professional contacts faculty members have outside the college or university, largely in the activities of professional associations, are labeled semi-formal because their relevance to classroom instruction is often incidental to their formal purpose. They may occur in groups organized around a discipline, a specialized area within a discipline, a broad issue such as values in higher education, a narrower issue such as the teaching of freshman composition, an institutional type, a curricular form such as general education or interdisciplinary studies, or they may be ad hoc groups concerned with almost any educational topic. These groups, organized for a different purpose, may affect the way a faculty member will present a course, the kinds of learning expected of the students, or the level of accomplishment set as a course goal.

Finally, the informal relationships faculty members have with colleagues in the same or different departments influence their course presentations, their expectations for students, and the ways they evaluate student learning. Despite the importance of scholarly publication and research to faculty members in many contexts, the great majority consider

teaching to be their primary responsibility (Trow, 1977; Wilson, et al., 1975) and can be expected to exchange ideas and procedures related to teaching with their colleagues. As faculty members grow in experience, their contacts with other faculty members as well as their own experiences might be expected to bring about a gradual change in perspective. Among slightly more than 300 faculty members in 15 California colleges and universities, those over 50 years of age were more likely than younger faculty to be concerned with the general intellectual growth of their students and to value strict academic standards. Those under 30 were least concerned with students' general intellectual growth, valuing the fixed structure and knowledge of the discipline more highly, and were most likely to be flexible in their standards for student performance (Warren, 1972). While Gaff and Wilson (1971) reported evidence consistent with those findings, Wilson et al. (1975) found no relationship between age and student or faculty nominations as effective teachers. The effective teachers were those who were most involved with the students in educationally relevant ways, which might be expected to parallel the older faculty members' concern for general intellectual growth reported by Warren (1972). High social involvement with students was not associated with student or faculty judgments of effectiveness as a teacher (Wilson et al., 1975).

While faculty members exercise great autonomy in their classes, their organization of their classes and their expectations for student learning must be moderated to some extent by their contacts with other faculty members. Yet only indirect and mixed evidence of that influence is available.

Learned societies and professional associations. The learned societies--associations of faculty members based in the disciplines, such as the American Historical Association and the Modern Language Association--have a somewhat longer history than the professional associations, such as the American Dietetic Association, which are concerned with relations between their profession and society at large to a greater extent than the learned societies (Cheit, 1975). Some associations--the American Chemical Society and the American Psychological Association, for example--are members of both categories. Some associations of faculty members, such as the American Society for Engineering Education, have been formed to give their exclusive attention to educational issues in a particular field. Other associations, such as the American Association for Higher Education and the Association of General and Liberal Studies, cut across disciplines. The various types of associations and the distinctions among them are not important to the purposes of this paper. The point that is of interest is that most faculty members have several professional associations with which they may affiliate, and many of the associations play a direct role in helping to determine the general content of courses that are offered to undergraduates. Their influence on the specific content is less certain.

An informal survey of learned societies and professional associations by the Carnegie Council (Carnegie Foundation, 1977) indicated more interest in graduate than in undergraduate studies and more in how the field is taught than in what is taught. Most associations resist specifying content for undergraduate curricula for fear of limiting academic freedom and stifling faculty creativity. Yet some associations, after study by committees composed largely if not entirely of faculty members, have published

recommendations that have heavily influenced undergraduate curricula. Griffith (1981) described a 1955 report by the American Society for Engineering Education that had a major influence in shifting engineering curricula toward greater scientific depth. A panel of mathematicians from education and industry under the auspices of the National Research Council (1968) reported on the topics that mathematicians in industry thought were the most serious deficiencies in their undergraduate programs. By 1975, those topics were well represented in mathematics curricula (Warren, 1977).

From time to time, apparently, the undergraduate curriculum in some particular field lags behind developments outside higher education in that field. At those times the professional associations or learned societies carry out curriculum studies that lead to a restructuring of the undergraduate curriculum in that field. The committees that carry out these curricular reexaminations are primarily college and university faculty members who bring to their deliberations some understanding of the changes in the field and the qualities of the students to be educated.

The associations tend to address four kinds of issues when dealing with the undergraduate curriculum. First, they identify broad and often vague educational goals, such as "to improve our understanding of the world in which we live" (Dawson, 1981). Second, they recommend preferred sequences or patterns of courses, frequently in the lower division, as in the American Chemical Society's recommendation that physical and organic chemistry precede the course in instrumental analysis (Committee on Professional Training, 1978). Third, they develop and disseminate teaching materials (Carnegie Foundation, 1977). Fourth, they provide training programs that present some mix of teaching procedures and the organization

of content (Dawson, 1981). The direct influence these activities have on the actual conduct of college classes is difficult to judge. The impact of the first two is questionable despite the occasional influence of a report like that of the American Society for Engineering Education (Griffith, 1981) or the National Research Council (1968). The third activity, the development of teaching materials, probably has an appreciable effect on introductory courses with large enrollments and multiple instructors. The fourth probably influences classroom procedures more than content.

Clearly, the learned societies and professional associations provide a vehicle in their education committees that brings faculty members from varied institutions toegther, sometimes with extracollegiate representatives of the field, to reexamine and revise undergraduate curricula. The deliberations of those committees reflect the teaching experiences of the faculty members involved, and their reports influence, occasionally in dramatic ways, the teaching of courses in the relevant fields. The comparatively high level of generality at which the associations operate, though, suggests that their impact on education may be strongest in the informal exchange of ideas about things to do in the classroom among the participants on committees and in professional meetings.

Professional literature. In almost every academic field a journal can be found devoted primarily to college teaching in that field, and some fields, such as English and physics, have several. Almost all the issues faced by college faculty members are addressed. Articles can be found on (1) presenting particular course content, (2) teaching general intellectual skills, such as problem solving, rather than specific content, (3) the use of various pedagogical devices such as computer-assisted instruction, small

group discussion, individualized instruction, lecturing, laboratory procedures, and teaching resources, (4) curricular organization, such as the preferred "core" courses in a given field or an appropriate sequence of courses, and (5) goals and procedures for continued faculty development. Suggestions for the content and procedures for teaching virtually any lower-division course can be found in the journals on college teaching.

Comparatively neglected in the journals are procedures for determining instructional success. The Journal of Chemical Education is a minor exception in occasionally providing an "Exam Question Exchange" in which faculty members present two or three exam questions that have worked well for them on particular topics. Missing, though, is information on students' comparative levels of performance and the form and extent of the instruction that led to the observed performance. Faculty members can find help in professional journals with almost every question they might have except, "How effective is my teaching in relation to that of other faculty members teaching a similar course to similar kinds of students?"

Books tend to cover similar ground except for the detailed suggestions for teaching a particular topic or concept. Textbooks, of course, provide structure for the content of a course, some teaching procedures, and often examination questions, usually in introductory texts. A few books on methods of teaching are directed to college faculty. A larger number deal with the philosophy and objectives of higher education and with broad issues of the curriculum. Sanford's book twenty years ago (Sanford, 1962) was a milestone in progress toward identifying with greater clarity the effects of higher education, although as noted earlier, it gave little attention to the curriculum or to students' academic learning. Chickering (1981) has recently

edited a book that takes a new and fairly comprehensive look at higher education and that gives a major section to the academic disciplines and their associated curricula. Even the chapters on the disciplines, though, and one on instructional methods give almost no information on the substance of student learning. The books produced by the Carnegie Commission and the Carnegie Council (1980) dominate the recent literature on higher education and are an impressive and comprehensive accomplishment. They also, though, show the same gap in information and understanding that appears in the journals.

One book, now ten years old, addressed directly the question asked above on how faculty members might evaluate their own teaching effectiveness. Milton (1972), drawing his information from published and unpublished studies as well as personal experience, described faculty members as generally confident that their teaching was quite good and uninterested in looking closely or critically at its effects. The studies Milton reviewed reinforced his own observations that, although students leave college having learned much they did not know at entrance, how that learning is most readily brought about is still largely a mystery. One teaching procedure seems no better or worse than any other, and at times students learn as well without an instructor as with one. More recent reviews have provided nothing to change Milton's conclusions (Centra, 1978; Levinson-Rose & Menges, 1981; McMillan, 1975).

The professional literature, books as well as journals, are an impressive and comprehensive source of a variety of kinds of information that can help faculty members define their teaching objectives, organize their courses, keep them current, relate them to general curricular goals, identify

useful teaching techniques and materials, and improve their teaching capabilities. The effects of any of these activities on student learning, though, is still the mystery that Bowen (1979) noted. While our graduates are, on the whole, competent and reasonably knowledgeable in their fields, we know little of the scope or detail of that competence or of how it was acquired.

Accreditation. The accreditation process is a well-established procedure through which institutions and professions exercise some control over the programs of institutions at large. The various accreditation commissions--those of the regional associations which accredit colleges and universities as total institutions, and those of the specialized associations which accredit programs of a single profession within a university or specialized school--are composed largely of academic administrators and a few faculty members. They establish standards of institutional organization and procedures that reflect the collective perceptions of what constitutes good practice among administrative and faculty leaders in currently accredited institutions and programs. Their authority depends on the acceptance by most of the existing institutions and the general public of the soundness of their standards and procedures.

The accrediting associations face the same dilemma as the professional associations in attempting to assure minimum levels of educational quality while allowing for great insitutional diversity and autonomy. In fact, many of the specialized accrediting agencies are either offshoots of or are still affiliates of professional associations. The American Chemical Society, for example, provides an approval program similar to accreditation for undergraduate chemistry departments through its Committee on Professional Training.

Another dilemma the accrediting associations continue to struggle with is whether their primary purpose is to define and maintain minimum standards of educational quality or to promote continued improvement in quality whatever an institution's or program's existing level of quality may be. Both dilemmas force the standards each accrediting agency publishes to be general enough for broad application in any situation. For example, virtually every accrediting agency requires that the faculty of an institution or program be qualified in the areas in which they teach, but the dimensions and standards of quality are left undefined. The actual decisions about faculty quality, and its implicit definition, are left to the current members of the accrediting commission, who act on information provided by a visiting team drawn from faculty members and administrators of similar institutions. How severe the constraints should be on an institution's decisions about the qualifications of its faculty, and whether a program with a faculty capable of providing a minimally acceptable education should be denied accreditation if the faculty is not capable of providing much educational improvement, illustrate the two dilemmas.

Both dilemmas are resolved partly through direct observation of an institution or program by a visiting team of experienced faculty and administrators who exercise their professional judgment within the broad guidelines of the published standards. Whether a faculty is judged acceptably qualified or not will then depend on other aspects of the institution such as its educational objectives, teaching procedures, administrative strengths, and student characteristics. The first dilemma--between assurance of quality and acceptance of institutional diversity--is resolved to some extent by giving each institution or program the responsibility of

describing, through a self-study, the ways it satisfies the agency's standards.

These two major accreditation functions--the visiting team and the self-study--act as vehicles for the exchange of perspectives on educational practice and performance. A program or institution, faced with the task of providing evidence that will convince an external group of experts that it is successfully educating its students, must find some way to document its faculty's beliefs that their courses are indeed soundly conceived and effectively taught. That exercise in self-evaluation can be informative, sobering, and a prod toward faculty improvement. The visiting experts then, in reviewing the self-study with the faculty, make informal comments and suggestions, drawn from experiences at their own institutions and from similar visits to other institutions. Visiting team members will often leave with new ideas and perceptions picked up from the institution visited. The accrediting process thus serves as an information exchange, informing faculty members of effective practices at other institutions, as well as an incentive toward self-examination.

The collective wisdom of experienced faculty members is a major educational resource, and the accrediting process systematically spreads that wisdom. Yet the self-study or visiting team that gives attention to what students have learned is rare, if any exists at all (Peterson, 1979; Warren, 1980). Howard Bowen (1979) argued forcefully for the evaluation of student intellectual and personal growth in assessing quality in education while pointing out the inadequacy of our present reliance on intuitive judgments, however sensitive and perceptive they may be.

> [W]e might gradually through trial and error develop sound methods which would supplement our intuitive judgments and serve as a corrective for the wishful thinking and the empty rhetoric in which we all indulge (Bowen, 1979, p. 28).

The network of faculty influences

The six sources described above on which faculty members draw in planning and teaching their courses are clearly interrelated. All six draw their own force from faculty participation and direct it toward further faculty development. None exercises any formal authority on another except as the accrediting agencies may put the pressure of codified standards on faculty in programs seeking professional and public acceptance.

Faculty members enter their teaching careers with attitudes toward teaching and views of the important content of their disciplines that were shaped by their experiences with their own teachers. In their early teaching years, the structure they give their courses, the teaching techniques they use, and their expectations for their students are probably influenced most heavily by their own experiences as students, by the textbooks they use, and by other faculty in their own department. As they become more experienced they are more likely to teach advanced courses, to rely less on the organization provided by a text, and to draw from broader faculty contacts in professional associations and perhaps in accreditation activities. For some faculty members, the literature on college teaching in their fields will exercise some influence. But while the existence of these influences on college teaching is undeniable, the extent and forcefulness of their impact, their relative importance, and the extent to which they reinforce or interfere with each other are total mysteries.

Each of the six influences described is based almost entirely on the views of other faculty members. Even academic vice presidents and deans are limited in their points of contact with the network of influences, entering it primarily in their establishment of faculty committees and in the accrediting process. And in both these activities they operate through faculty members. All faculty members are connected to this network at least through their experiences as graduate students and their contacts with other members of their department. Most probably they participate in four or more sources of influence, which suggests that information probably flows quite efficiently through the network. Information that starts with only a few people in an accrediting visit or in an ad hoc committee representing some faculty interest group will be taken to other faculty members, move to other professional groups, appear in professional articles, be picked up by graduate students and become part of their courses when they start to teach, and will eventually become incorporated into textbooks.

The winnowing that occurs as new ideas, instructional devices, and curricular structures are moved through the network probably accounts to a large extent for the consistency that can be observed across the country in academic content and teaching procedures, at least within major fields of study. Despite the great diversity and institutional autonomy of American higher education, to a large extent a bachelor's degree in a given field of study in a state university in Idaho and one from the same field at a state university in Tennessee represent fairly similar educational experiences. Consensus is broad while individual institutions and faculty members are free to experiment. The schisms that occur within disciplines, as in Marxist challenges to the dominant view of American history or in a

reformulation of the functions of literary criticism, do not invalidate the contention that curricular consensus is widely held. When alternative views are in dispute, they tend to be clearly distinguished, and the broad areas of curricular agreement are unaffected.

Hodgkinson (1971) commented with some concern on the growing homogeneity he found among colleges and universities in the U.S. despite their autonomy. Each institution, independently of any other, seemed to want to be as much as possible like the major research universities. He would have preferred to see institutions cherish their differences, building their own versions of excellence. To aid a process of differential development, he proposed establishing a formal information network, probably managed by the professional associations and learned societies, that would gather and circulate a wide range of information on statistical trends, curricular changes, instructional procedures, and other kinds of information that would give faculty members, administrators, students, and any other interested group a context in which to observe institutional performance. The contention here is that much of the formal network Hodgkinson proposes already exists informally in the range of faculty influences described earlier. Whether those formal and informal processes would be more useful if they were formally integrated and centrally managed requires information not now available. Their current effects and the ways they are accomplished need more explicit examination.

Despite apparent plausibility, much in the preceding paragraphs is speculative. We know that students graduating from different colleges or universities have spent comparable periods of time in classes that were probably similarly structured. We know that graduates in the same field of

study have a reasonably common core of knowledge on which they have expanded in one of perhaps four to ten alternative patterns (Warren, 1975, 1976(b), 1977). We don't know, however, what faculty members, who participated in a complex but informal information network, actually presented to their students—what range of content and procedures and what levels of expectation the students encountered, or what elements of learning were reasonably common. Little, if any, information exists on what the collective behavior of the faculty members produced in student learning. We continue to operate, as Bowen pointed out, on intuitive judgments, wishful thinking, and empty rhetoric.

Intuition and wishful thinking both lead to the belief that the American higher education curriculum, as it applies to the education in some depth of students in their major fields, is a successful blend of consensus and diversity. Achievement of the broad goals of higher education intended to be the purpose of general education is more questionable (Carnegie Foundation, 1977; Warren, 1975). Both beliefs—the success of specialized education and the failure of general education—are capable of documentation if the extent and dimensions of the diversity that exists are defined, if the areas and degree of consensus within that diversity are identified, and if student learning is evaluated in ways that take account of diversity and consensus. None of these contingencies is out of reach.

Evidence of student learning

Defensible evidence of the effects of college teaching on student learning is difficult to find, as has been repeatedly pointed out. The most widely used standardized tests of college achievement, the Advanced Tests of

the Graduate Record Examinations, permit comparisons of the achievement of graduate school applicants from year to year, and institutions may compare the performance of their graduates who take the GRE Advanced Tests (as opposed to the Verbal, Quantitative, and Analytical Aptitude Tests) against the performance of students nationally. Several characteristics of the GRE tests, however, limit the usefulness of those comparisons.

Changes from year to year in the achievement of graduate school applicants are interesting but difficult to interpret, primarily because the nature of the students taking the different tests changes in unknown ways as different graduate fields of study shift in their attractiveness to students. From the mid-60's to the mid-70's, for example, Advanced Test scores of graduate school applicants in some of the physical sciences increased while those in the social sciences declined and those in the humanities stayed about the same. The numbers of applicants taking the various tests increased dramatically in some fields, such as biology and geology, while declining sharply in others, such as engineering and history. These changes in numbers of applicants, however, were not related to changes in mean test scores. Increases and declines in test scores occurred with changes in both directions in the numbers of persons taking the test.

Institutions examining changes in the Advanced Test scores of their own graduates, or comparing their graduates with the most recent norms, face other interpretive difficulties. The most serious is the nature of the content covered by the Advanced Tests. Test content is determined by committees of faculty members who see that each test keeps pace with changes in its field while including content likely to have been encountered by most students majoring in that field. The tests range in numbers of items from

about 100 to 200, with most having at least 150 items. That number of items can sample a wide range of content and provide an acceptable assessment of a student's grasp of a field in general. Even 200 items, though, is not enough to allow for differences in patterns of emphasis within a field.

The Advanced Test in Political Science, for example, has 170 items, 30 to 35 percent of them on the U.S. government and another 20 to 25 percent on comparative political systems. The rest of the items are spread roughly equally among international relations, political theory, history of political thought, and methodology. Students majoring in political science, though, often do not arrange their programs to match that balance of content. Institutions differ in the various patterns of content their majors follow. Some political science departments stress quantitative methods while others do not. Transcripts of graduates from 10 political science departments showed seven clearly distinct patterns of content, with additional minor variations (Warren, 1976b). One common pattern gave primary emphasis to political theory and secondary emphasis to international relations and economics. Another showed heavy concentrations in the federal government and the political process, with organizational theory, political theory, and economics playing secondary roles. Students who followed this second pattern in their undergraduate studies would probably perform better than students from the first pattern on the political science Advanced Test, other things being equal.

A test designed to represent the content that is most common to the departments in a given field across the country cannot adequately represent the learning of graduates from individual departments. The GRE Board recognizes this problem, as indicated in their bulletin describing the

Advanced History Test.

> The problem of content coverage in a single history test is complex. It is almost impossible to delimit the field of history in area, in time, and in scope. Moreover, no common core of knowledge is required of all history majors in all colleges (A Description of the Advanced History Test, 1979).

The test is limited to United States and European history, excluding Asia and Latin America. It concentrates on political and diplomatic history, gives secondary attention to economic history, and puts social, cultural, and intellectual history in minor roles. The questions on U.S. history refer predominantly to the period after 1800, and the majority of those on European history follow the Industrial Revolution. History before the Middle Ages is entirely neglected. As with political science, the course patterns of history majors vary widely among themselves as well as departing from the pattern on the test.

For the primary purpose of the GRE, these acknowledged limitations are minor. The tests are to assist graduate schools in evaluating the preparation of their applicants. Most of the content of the history test will have been encountered by most history majors even when their emphases are elsewhere--on ancient history or Latin American history, for example. A history department that uses the GRE Advanced Test to evaluate its program, though, may find its particular strengths and many of its upper-division courses inadequately represented. Yet the GRE Advanced Tests provide virtually the only information based on student learning now available to departments for determining the quality of the education they offer.

The most recent evaluations of the accomplishments of colleges and universities in furthering student learning or development continued to

neglect the substantive, course-related learning toward which the resources of higher education are overwhelmingly directed. Astin (1977) summarized data from a series of longitudinal studies involving a total of more than 200,000 students in more than 300 colleges and universities. He reported changes in students' attitudes, interests, career plans, and extracurricular activities. His indicators of academic accomplishment were grades, persistence in college, and academic honors. These measures distinguished the more successful from the less successful students. They gave no information on what the more successful students learned that distinguished them from those who were less successful, or on what students learned regardless of their level of success. That information would, of course, be extremely complex, varying with field of study, institution attended, and the educational purposes and expectations of the various faculty members who assigned the students' grades. Complex as it is, however, information on what students at every level of success have accomplished in college, as well as on the maximum levels of accomplishment reached by the most successful students, is essential to any clear assessment of educational quality.

Bowen (1977) searched for whatever evidence he could find of the effects of higher education, on society as a whole as well as on individual students. The components of individual student growth for which he found evidence were classified, much like Astin's, as cognitive or intellectual, affective or attitudinal and emotional, and practical. Drawing on the entire body of literature on higher education, rather than on the variables of a single though comprehensive series of studies as Astin had, Bowen found some evidence of student growth in broad intellectual skills, substantive knowledge, dispositions toward intellectual and esthetic activities, and

intellectual tolerance. The broad intellectual skills were measured by verbal and quantitative tests such as the GRE Aptitude Tests, and the substantive knowledge by tests like the GRE Advanced Tests. As pointed out earlier, tests such as these are too heavily influenced by whatever is commonly taught in all types of colleges to be sensitive to the accomplishments of successful students in the more selective colleges or to the variations in accomplishment across the great variety of colleges that make up the American higher education system. The intellectual dispositions, while valued by many faculty members and indicative of intellectual growth, represent only minimally the broad intellectual objectives of most faculty members.

While Sanford's 1962 volume brought to wide attention the inevitable interplay between higher education and the psychological development of students, Chickering's 1981 volume makes a direct argument for giving to human development in its broadest sense the central, organizing role in higher education. "We propose that the values and aims of human development be taken as unifying purposes, as organizing frameworks for all institutional efforts. . ." (Chickering, 1981, p. 11). Faculty members generally support such a view. From 60 to 80 percent of the faculty members polled by the Carnegie Commission in 1969, depending on the type of institution in which they taught, agreed that undergraduate education would be improved if more attention were paid to the emotional growth of students (Trow, 1975). If "emotional growth" were replaced with a term like "broad intellectual, moral, and personal development," the percentages of faculty members endorsing that statement would almost certainly be overwhelming.

Two years after the Carnegie survey, about 300 faculty members representative of the faculties in 15 diverse California institutions were asked to locate their views of educational purposes on a dimension defined by the following somewhat disparate statements:

> Colleges and universities have important responsibility in furthering students' psychological growth and personal maturity.
>
> Colleges and universities carry out their responsibilities best by limiting their concerns to the intellectual growth of students.

Fifty percent of the faculty members placed their views closer to the first statement than the second, and another 23 percent called the two statements equally supportable. Only 8 percent allied themselves definitely with the second statement even though it permits a broad interpretation of intellectual growth (Warren, 1972).

The concern of Chickering and the writers he brought together for all aspects of human development as explicit educational objectives should find a receptive audience. In fact, Astin and Bowen found more evidence of college effects in attributes like intellectual curiosity, tolerance, esthetic sensibility, and personal satisfaction than in some of the more explicit educational objectives of the disciplines, such as the ability to solve problems. The evidence for college effects on student growth in those aspects of development that are closely related to course and curricular objectives, excepting only the limited aspects of subject-matter knowledge represented by standardized achievement tests like the Graduate Record Examinations, is, in Bowen's terms, "spotty, partly obscure, and incomplete" (Bowen, 1977, p. 97).

The primacy of the classroom

The primary investments of colleges and universities are in their faculty, their courses, and in the classes through which the courses are taught. Whatever learning is most valued by the administration and faculty must be carried out through faculty-directed courses. Other important kinds of learning, intellectual as well as social and psychological, occur outside the classroom and outside the direction of faculty members. The total development of students that Chickering would put at the core of higher education probably cannot be separated from all aspects of higher education--classroom and laboratory, extracurricular, residential, and interpersonal. But the accomplishments of higher education that are highest in importance in terms of student learning as opposed to research and public service must be brought about primarily in the classroom. If faculty, administrators, trustees, legislators, or other institutional constituencies place a high value on a particular form of student development, perhaps growth in interpersonal skills, it must be addressed in the classroom if it is to be given attention appropriate to its importance. The primary goals and accomplishments of higher education appear in what faculty members and students give their attention to in the classroom.

If that apparently obvious assumption can be accepted, two useful inferences follow. First, the network of influences that shapes the organization and presentation of courses by individual faculty members--prior experiences, textbooks, professional associations, professional journals, faculty committees, accrediting teams, and informal contacts with colleagues--provides an important mechanism through which educational quality is shaped. The interconnections among those influences provide stability

and some uniformity, but also the potential for change. A shift in any one of the influences may not have much effect. Complementary shifts in several of the influences—as when a core of faculty members at several institutions devises a new approach to teaching some component of their discipline or a cross-disciplinary component of learning, and that approach is discussed in professional meetings, appears in journal articles, and is developed in a new text—give new departures from former practice a moderate probability of persisting and spreading. As faculty members and students get exposed to a new procedure, it may continue to spread, with modifications; or it may have a brief period of wide acceptance and then die back; or it may persist in some portion of the higher education community as an alternative approach to an area of learning, contributing to the diversity of the system. A heavy emphasis on quantitative methods in political science may be such a persistent alternative that fails to spread to the field as a whole.

The second inference from an assumption of the primacy of the classroom is that any comprehensive body of evidence of student learning, or of educational excellence, must be aggregated from evidence taken at the level of individual courses. The diversity of courses from institution to institution in the same field is great enough, despite the external influences to which faculty members are exposed, that standardized test scores, grade-point averages, persistence to a degree, and proportions of graduates admitted to graduate schools are all too coarse to provide sufficient information on the educational quality of a school or department. None of those indicators reflects the variety of accomplishments, understandings, appreciations, and insights that students may draw from the courses faculty members present. The aggregation of course-based information, however, can

define the components of learning that are common to more than one course and more than one institution, or even to the great majority of institutions, while identifying those kinds of learning that occur only in a small segment of the higher education community. Some forms of undergraduate learning in the physical sciences and mathematics, for example, may be found only at Cal Tech, MIT, Harvey Mudd College, Rice Institute, and perhaps five or six other institutions across the country. Other patterns of learning that are limited to comparatively small groups of institutions can almost certainly be found in all disciplines and in interdisciplinary courses, in advanced courses designed for majors in a field and in general education courses planned for nonmajors.

Aggregating information from courses

If most of the learning in higher education is organized in courses, the effects of higher education on students can usefully and accurately be described in terms of the aggregated effects of those courses. Aggregation in a simple form is well established in higher education. Units are added to units to determine a student's progress toward a degree; courses are added to courses to assure that each student follows an appropriate pattern of courses; grades are converted to numbers and averaged for an indicator of overall student success. Lost in all these forms of aggregation is the substance of the learning.

Several ways of aggregating indicators of educational success that retain the substance of what has been learned are feasible. The reason for their neglect may be the almost exclusive concern with assessing the achievement of individual students rather than that of selected groups of students,

such as those completing different sequences of courses in a field. The level of aggregation can be selected to suit the purpose of the assessment, such as whether interest is on the achievement of all the history majors in an institution over the past five years or in the achievement of the history majors who have just completed a new sequence of courses in historical method. The level of aggregation may also vary according to the generality of the content, from very specific knowledge about the Italian Renaissance, for instance, to a broad understanding of the interplay of politics and religion in 15th century Europe, and may involve general abilities like skill in historical inquiry. With higher levels of aggregation, some information is lost. The learning that is characteristic of all senior history majors in an institution, for example, will only be described at the expense of more detailed information about the effects of a particular sequence of history courses.

An example of one form of aggregation across the graduates of a group of institutions in a single discipline is provided by an examination of the transcripts of five graduates in English at each of 11 institutions. The data were collected in the conduct of a larger study supported by the Fund for the Improvement of Postsecondary Education (Warren, 1975, 1976a, 1976b, 1977).

The usual information on the educational accomplishments of an English department consists of the number of its graduates, perhaps the proportion admitted to graduate school, and perhaps the mean scores on the GRE Advanced Literature in English Test. But English departments vary in their strengths, emphases, and faculty and student predilections. Students' programs within a department vary as well. A more revealing indicator of an English

department's accomplishments would therefore be a description of the patterns of courses completed by its graduates. Grades would not be informative since they refer to students' comparative achievement within the department, but mean scores on the GRE and proportions of graduate school applicants admitted to their first choice of graduate schools would add some supplementary information.

The 55 transcripts selected randomly from the English graduates of 11 institutions provided a list of the English courses each graduate had completed. College catalogs provided descriptions of the content of each course. Four to eight elements of content from each course description were listed to augment each student's transcript, providing more descriptive information than the course titles alone. The graduates, or more precisely, the augmented transcripts, were then grouped according to the similarities in the patterns of content that had been studied.

The five transcripts from one moderate-sized state university showed more than the usual emphasis on drama, the writing of plays, novels, and short stories, and literary criticism. Comparatively brief treatments were given to English literature in the several periods from Chaucer to the present, and little time was spent with American literature. Shakespeare was treated as part of the English Renaissance. In contrast, the transcripts from a small private college showed a methodical and comparatively detailed progression in the study of literature from the medieval period through the Victorian Age with brief excursions into modern European literature, the analysis of poetry, and modern grammar. The limited study of writing was wholly expository.

A large public university showed more varied patterns of study that differed from both the first two. All five of its transcripts showed the study of Shakespeare, English literature in the Romantic and Victorian periods, the modern American novel, expository writing, and modern grammar. In addition, three of these graduates had studied the novel in England and America in some depth plus several modern genres, structural linguistics, transformational grammar, and semantics. The other two transcripts were more similar to those of several other institutions, showing extensive study of English, American, and world literature without notable departures into drama, expository or creative writing, or linguistics.

The content common to all 55 transcripts studied was quite limited. All included the study of Shakespeare and the Romantic and Victorian periods in England. Most but not all included some modern American literature. Beyond these areas, little could be found that was common to more than small clusters of transcripts. If such an analysis were to be carried out on the transcripts of all the English graduates of a single institution over several years, the variability would probably not be as great, but clearly defined patterns would no doubt appear that would differ substantially from the similarly determined patterns at other institutions. Some of the distinctions would be expected and valued; others might be neither. Whatever value the faculty, department head, and dean might place on a description at that level of detail of the patterns of learning the department's graduates had taken with them, they would be in a sound position to evaluate what they were accomplishing as a department.

Different levels of aggregation would serve other purposes. Several major components could be examined in more detail--Shakespeare, the Victorian

period, the modern American novel, for example--to determine the scope and depth with which each was being treated. At a more general level, the broad aspects of the major field might be combined with the components of studies outside the major, giving a picture of the areas of study common to most graduates and of the variety of ways students elaborated on that common core. What it is English departments do would be somewhat clearer.

Information of the type illustrated above can be used to describe the similarities and differences in the studies college students undertake within a single department in a single institution or across all fields in large numbers of institutions. As the domain of interest is broadened, the descriptions will necessarily become more diffuse and varied, but elements common to groups of institutions will appear, reflecting the influence of the faculty network that extends across institutions.

Faculty expectations for general learning

The aggregation of course information from transcripts and catalogs can provide valuable information on the substance of the courses students encounter in moving through college. But course content is not the only kind of learning faculty members expect of their students, and some, even in practically-oriented fields like engineering, view course content as secondary to the development of more general intellectual capabilities--the ability to identify the critical elements in an idea, argument, or problem; to review a topic as a whole and gather and organize relevant information; to integrate the new information into an existing framework, or to use it to restructure the existing framework. Teaching objectives such as these are less often and less clearly articulated than the elements of content that

appear in course syllabi or catalog descriptions. Yet they too can be described and aggregated to show the educational objectives of a small group of faculty members in a single institution or the collective objectives of faculty members at large, revealing the areas of broad consensus and the nature of the differences.

This kind of aggregation can be illustrated with information from faculty descriptions of outstanding students (Warren, 1972, 1976a). A random sample of 311 faculty members in 15 California colleges and universities wrote a paragraph or two describing how one of their outstanding students differed from the ordinary students in one of their classes. Those descriptions produced a list of about 100 descriptive phrases, such as "sees several ways to solve difficult problems" and "is sensitive to the nuances of language," that were assumed to represent explicit kinds of intellectual performance valued by faculty members. Some of the phrases were oriented toward content, such as "knows the technical vocabulary." Most, however, were more general, applicable to a wide range of content.

Several years later, a new group of about 500 randomly selected faculty members at another group of 15 California colleges and universities judged the degree of similarity among the phrases. They judged, for example, that calling a student "perceptive" was very similar to saying he or she "has insight." These two phrases and others like "differentiates the general from the particular, the important from the unimportant" and "alert for discrepancies, inconsistencies" were all judged to be mutually similar, forming a general quality of being critical or analytic. Other phrases clustered into concepts like inquiring, integrative, expressive, original, and simply academically competent in the sense of doing well on exams.

Fourteen such clusters of descriptive phrases appeared, defining in broad but distinct terms the kinds of intellectual abilities faculty members want their students to bring to bear on the substantive knowledge around which courses are typically organized. Any complete assessment of educational excellence would describe the areas of knowledge, understanding, or appreciation the graduates of a program had encountered and the kinds of intellectual skills they had been called on to exercise in dealing with that substantive content. The skills as well as the content will vary with fields of study, institutions, departments, and faculty members. That variation should be conscious and purposeful, though, with decisions to focus on one area to the neglect of another made deliberately and with knowledge of similar decisions and their consequences elsewhere.

The faculty judgments used to classify phrases into groups suggested one decision that may have been reached implicitly without conscious deliberation. A phrase that describes general intellectual competence--"capable, bright"--was grouped with the phrases that defined analytic, critical thinking. The integration or synthesizing of ideas was described separately. One inference might be that many faculty members associate being capable and bright almost entirely with analytic processes, with little regard for integrative skills. Some support for this interpretation is found in the reports of faculty committees reviewing general education requirements, in which analysis--philosophical, historical, literary, scientific, and other forms--appears more frequently than synthesis or integration as an educational concern. The apparent emphasis on analytic at the expense of integrative thinking seems not to have been a deliberate decision, yet present curricula have that bias.

A faculty-based assessment system

The individual course, as presented by largely autonomous faculty members in their classes, is at the center of learning in American higher education. The constraints on faculty members that provide structure to the learning that occurs come from an informal network of influences that are largely self-generated by the faculty they constrain. Individual courses are given similar content and purposes and produce comparable results, even though taught at widely separated institutions by faculty members who have no direct contact with each other, through that faculty network. A reversal of that process can serve to demonstrate the level of excellence reached by American higher education by aggregating the learning produced in individual courses at successively more comprehensive levels.

The knowledge of content, understanding of general issues, and exercise of intellectual skills that constitute undergraduate learning are almost wholly associated with individual faculty members and their courses. Yet among all those courses, individually planned and presented though they may be, are common elements of content, understanding, and skill that can be aggregated to describe learning more general than that associated with a single course. Many lower-division courses in American history, for example, study the conflicting political philosophies of Hamilton and Jefferson and their partial integration by Madison. Knowledge of that constitutional controversy could be expected in students completing those courses. Some understanding of the interplay of the political, social, and economic issues that influenced the framing of the constitution, and of the processes of negotiation and compromise that permitted their resolution, could be expected in students completing those and other courses. The ability to

generalize usefully and with appropriate caution from historical events to current issues that are in some ways similar could be expected of still larger groups of students. Each of those increasingly general kinds of learning, and others, could be assessed in individual courses, with the results aggregated across the appropriate range of courses.

The proper selection of a group of courses and assessment in them of the pertinent intellectual capabilities would provide evidence of educational accomplishment at whatever level of aggregation was desired--several sections of the same course at one institution, all the lower-division courses in a single department at one institution, all of a given group of courses, say the American novel, at several neighboring institutions, all the courses taken by the graduating seniors in a given field in a statewide univesity system. Assessment would have to be in the individual courses, using common measures across the courses to be aggregated. If that assessment were made an integral part of the course examinations it would require comparatively little additional cost, primarily that associated with the development and acceptance of common examination questions for the pertinent courses. At the highest level of the higher education system as a whole, results from such assessments could be used to describe the kinds of learning produced in various fields of study, the kinds attributed to general education or curricular breadth, the degree of variability in scope and level of learning across the system as a whole and within selected subsystems, and others.

A precedent for this kind of general assessment is found in the National Assessment of Educational Progress (NAEP), in which nationally representative samples of students at various age levels as well as young

adults complete tests of general kinds of learning. That program requires an extensive special administration of tests devised centrally by the NAEP. Similar results could be obtained with examination questions developed and administered by local faculty but shared with other faculty members. The costs would be limited to two processes--(1) coordination among the faculty members involved and (2) interpretation of the aggregated results.

A major aspect of any assessment process is the interpreation of the information it provides for the desired purposes. Grades, for example, are difficult to interpret across institutions. Standardized tests provide information that is comparable across institutions in the assessment of students' current knowledge but that may not be appropriate for the evaluation of institutional effects. The aggregation of results from selected groups of courses can permit program and institutional self-assessment that is pertinent to local curricula and objectives and that can be interpreted in relation to several explicitly defined reference groups.

The quality of higher education in the United States need not remain the mystery it has been despite decades of study. Its accomplishments can be described directly in terms of the widely diversified intellectual capabilities its graduates take with them. Components at various levels within the system can also be examined for direct indications of educational quality. Continued reliance on intuition, wishful thinking, and unsupported rhetoric is indefensible.

REFERENCES

Astin, A. W. Four critical years: Effects of college on beliefs, attitudes, and knowledge. San Francisco: Jossey-Bass, 1977.

Bowen, H. R. Investment in learning: The individual and social value of American higher education. San Francisco: Jossey-Bass, 1977.

Bowen, H. R. Goals, outcomes, and academic evaluation. Evaluating educational quality: A conference summary. Washington, D.C.: Council on Postsecondary Accreditation, 1979.

Bruner, J. The process of education. Cambridge, MA: Harvard University Press, 1960.

Bungum, J. L. Institutional domination in the economics profession: The case of textbook writers. Journal of Economic Education, 1980, 12, 51-53.

The Carnegie Commission on Higher Education. The purposes and performance of higher education in the United States: Approaching the year 2000. New York: McGraw-Hill, 1973.

The Carnegie Council on Policy Studies in Higher Education: A summary of reports and recommendations. San Francisco: Jossey-Bass, 1980.

The Carnegie Foundation for the Advancement of Teaching. Missions of the college curriculum: A contemporary review with suggestions. San Francisco: Jossey-Bass, 1977.

Centra, J. A. Faculty development practices. In J. A. Centra (Ed.) Reviewing and evaluating teaching. New Directions for Higher Education, No. 17. San Francisco: Jossey-Bass, 1977.

Centra, J. A. Faculty development in higher education. Teachers College Record, 1978, 80, 188-201.

Cheit, E. F. The useful arts and the liberal tradition. New York: McGraw-Hill, 1975.

Chickering, A. W. (Ed.) The modern American college. San Francisco: Jossey-Bass, 1981.

Committee on Professional Training. Undergraduate professional education in chemistry: Criteria and evaluation procedures. Washington, D.C.: American Chemical Society, 1978.

Dawson, G. G. Economics. In A. W. Chickering (Ed.) The modern American college. San Francisco: Jossey-Bass, 1981.

A description of the Advanced History Test. Princeton, NJ: Educational Testing Service, 1979.

Doty, P., and Zinberg, D. Science and the undergraduate. In C. Kaysen (Ed.) Content and context: Essays on college education. New York: McGraw-Hill, 1973.

Dunham, E. A. Colleges of the Forgotten Americans: A profile of state colleges and regional universities. New York: McGraw-Hill, 1969.

Enyeart, M. A., Baker, D., and Van Harlingen, D. Correlation of inductive and deductive logical reasoning to college physics achievement. Journal of Research in Science Teaching, 1980, 17, 263-267.

Feldman, K. A. and Newcomb, T. M. The impact of college on students. Vol. I. An analysis of four decades of research. San Francisco: Jossey-Bass, 1969.

Gaff, J. G., and Wilson, R. C. The teaching environment. AAUP bulletin, 1971, 57, 475-493.

Grambsch, P. V. Business administration. In A. W. Chickering (Ed.) The modern American college. San Francisco: Jossey-Bass, 1981.

Griffith, D. E. Engineering. In A. W. Chickering (Ed.) The modern American college. San Francisco: Jossey-Bass, 1981.

Hirst, P. Knowledge and the curriculum: A collection of philosophical papers. London: Routledge & Kegan Paul, 1974.

Hodgkinson, H. L. Institutions in transition: A profile of change in higher education. New York: McGraw-Hill, 1971.

Ladd, E. C., Jr., and Lipset, S. M. The divided academy: Professors and politics. New York: McGraw-Hill, 1975.

Lamdin, L., and Fowler, L. J. English. In A. W. Chickering (Ed.) The modern American college. San Francisco: Jossey-Bass, 1981.

Levinson-Rose, J., and Menges, R. J. Improving college teaching: A critical review of research. Review of Educational Research, 1981, 51, 403-434.

Lindquist, J. Professional development. In A. W. Chickering (Ed.) The modern American college. San Francisco: Jossey-Bass, 1981.

McDonald, D. A six million dollar misunderstanding. The Center Magazine, September/October, 1973.

McMillan, J. H. The impact of instructional improvement agencies in higher education. The Journal of Higher Education, 1975, 46, 17-23.

Milton, O. Alternatives to the traditional. San Francisco: Jossey-Bass, 1972.

National Research Council. The mathematical sciences: Undergraduate education. Washington, D.C.: National Academy of Sciences, 1968.

Niblett, W. R. A view from abroad. Change, 1973, 5(9), 38-44.

Parsons, T., and Platt, G. M. The American university. Cambridge, MA: Harvard University Press, 1973.

Peterson, D. G. Accrediting standards and guidelines. Washington, D.C.: Council on Postsecondary Accreditation, 1979.

Riesman, D., Gusfield, J., and Gamson, Z. Academic values and mass education: The early years of Oakland and Monteith. New York: Doubleday, 1970.

Sanford, N. (Ed.) The American college: A psychological and social interpretation of the higher learning. New York: Wiley, 1962.

Smelser, N. J. The social sciences. In C. Kaysen (Ed.) Content and context: Essays on college education. New York: McGraw-Hill, 1973.

Trent, J. W., and Cohen, A. M. Research on teaching in higher education. In R. M. W. Travers (Ed.) Second handbook of research on teaching. Chicago: Rand-McNally, 1973.

Trow, M. Teachers and students: Aspects of American higher education. New York: McGraw-Hill, 1975.

Trow, M. Aspects of American higher education, 1969-1975. Berkeley, CA: Carnegie Council on Policy Studies in Higher Education, 1977.

Veysey, L. Stability and experiment in the American undergraduate curriculum. In C. Kaysen (Ed.) Content and context: Essays on college education. New York: McGraw-Hill, 1973.

Ward, P. History. In A. W. Chickering (Ed.) The modern American college. San Francisco: Jossey-Bass, 1981.

Warren, J. R. Varieties of academic performance. Berkeley, CA: Educational Testing Service, 1972.

Warren, J. R. The content of general education. Paper presented at meeting of the Northwest Association of Schools and Colleges, the Western Association of Schools and Colleges, and the Western College Association, Reno, December 1975.

Warren, J. R. Describing college graduates in 87 phrases or less. Findings, 1976, 3(2), 5-8. (a)

Warren, J. R. Patterns of learning: Undergraduate political science programs. DEA News, 1976(11), 6, 15-17. (b)

Warren, J. R. Content and achievement in bachelor's degree programs in mathematics. Unpublished report. Educational Testing Service, Berkeley, CA, June 1977.

Warren, J. R. Evaluation of criteria for recognition of accrediting and state approval agencies. Part I. Reliability, validity, impact, and suggestions. Berkeley, CA: Educational Testing Services, 1980.

White, K. M., and Ferstenberg, A. Professional specialization and formal operations: The balance task. Journal of Genetic Psychology, 1978, 133, 97-104.

Wilson, R. C., Gaff, J. G., Dienst, E. R., Wood, L., and Bavry, J. L. College professors and their impact on students. New York: Wiley, 1975.