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ABSTRACT

Indices and manifestations of quality in undergraduate education are considered and a four-part framework is developed. Context indices represent institutional characteristics that remain relatively stable over time (e.g., expenditures per student and size of student body), while input indices reflect characteristics of entering students (e.g., ability and aspirations). Manifestations of quality are evidenced by involvement and outcome indices; the former characterize interactions between and among students and faculty, such as satisfaction and frequency of contact, and the latter reflect intended products or unintended effects associated with college attendance, such as persistence, academic achievement, and alumni attainments. Commonly used context indicators of quality include size (number of undergraduate students), clarity and consistency of institutional purpose, student living environments, salaries, and decision-making strategies. The following input indices have been used to indicate quality: student ability, biographical characteristics of students, and nonintellective characteristics. Commonly used involvement indices have been instructional activities and informal student teacher interaction. The most often used outcome indices as manifestations of quality have included persistence, student achievement, intellectual and social/emotional development of students, and alumni achievements. Both quantitative and qualitative methodological approaches to quality assessment and societal trends influencing the need for quality indicators are briefly reviewed. These trends include declining enrollments and financial constraints. A bibliography is appended. (SW)

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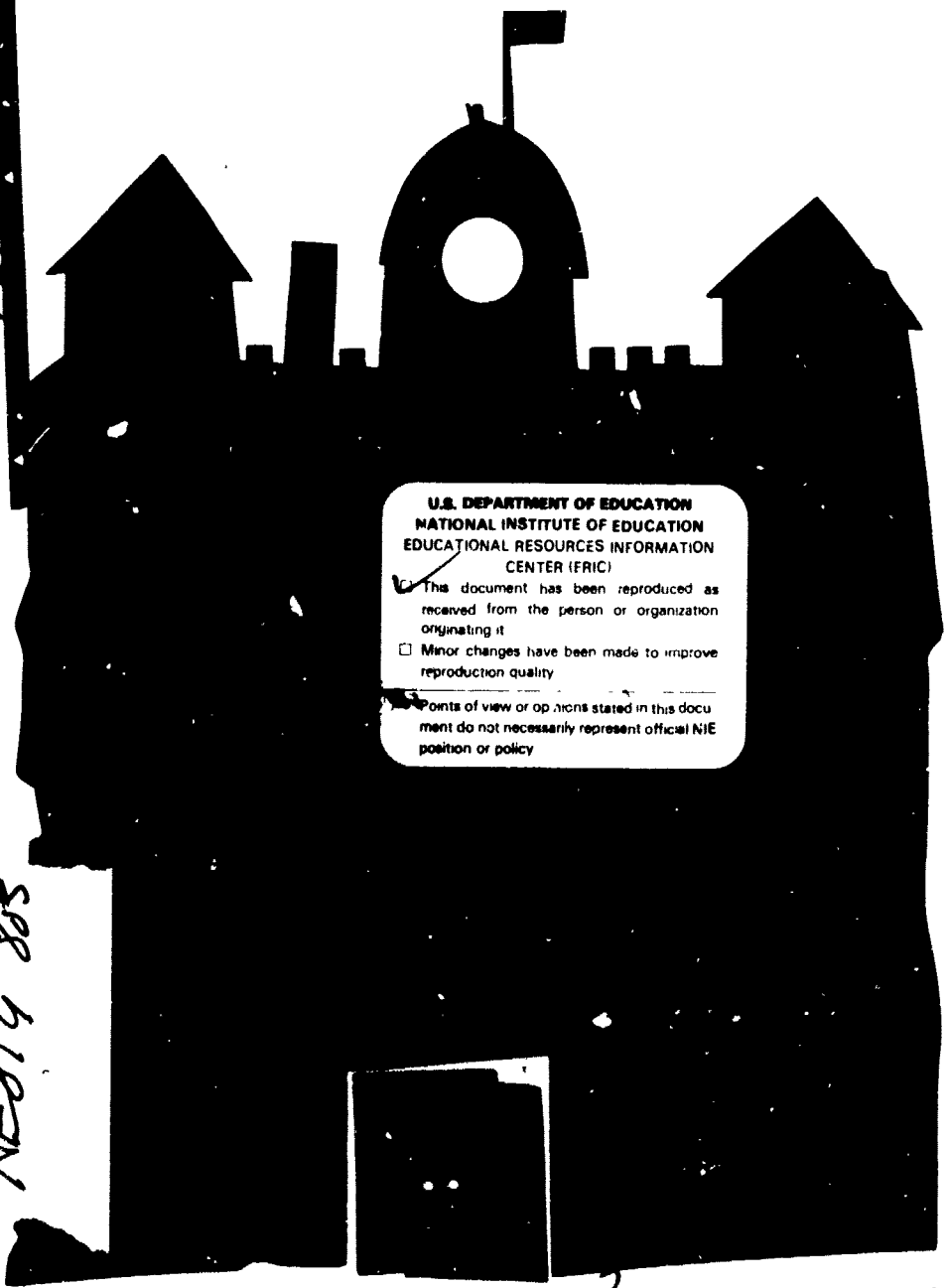
Indices of Quality in the Undergraduate Experience

George D Kuh



Indices of Quality in the Undergraduate Experience

George D. Kuh

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George D. Kuh
Bloomington, Indiana
July 29, 1981

Foreword

Defining and measuring quality in general and the quality of student experience in particular has been elusive This is true in part because quality is a relative term Something is perceived to be of high quality if it meets certain idealistic standards, or if it fulfills better than something else certain specified needs If everyone had the same perceptions, defining quality would be easy But since standards and needs vary according to the individual and the situation, the definition of quality necessarily varies

Because the concept of quality is relative, there is also a problem in quantifying the concept Not only is the process of precisely measuring quality hindered by a lack of a universally accepted definition, it is also hindered because the whole is usually different from the sum of the individual parts That is, an institution may appear to have only average parts (faculty, students, academic environment, etc) but the end product (research, academic and career achievements) may be considered of high quality or conversely

In this monograph, George D Kuh, associate professor, School of Education, Indiana University, has helped to develop greater clarity in defining quality of student experience by identifying and reviewing specific indices of quality In doing this, he has analyzed the literature that addresses three important areas (1) the multiple properties of quality, (2) the utility of different methodological approaches to quality assessment, and (3) the opinion and empirical research about quality in the undergraduate experience Through this analysis he has developed a four-part framework that will greatly aid institutions in their evaluation of the undergraduate experience

Jonathan D. Fife
Director
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Overview

At various times during the past 20 years, different themes have influenced policies and practices in institutions of higher education. Excellence in the early 1960s, access in the late 1960s, and egalitarianism in the 1970s were issues that challenged administrators and faculty alike. One of the salient themes of the 1980s promises to be quality.

Instead of steady and, at times, seemingly exponential expansion, colleges and universities have been preparing for fewer students with more diverse learning abilities and educational goals. Concurrently, federal and state agencies have reduced financial support as a result of the sluggish economy, and state boards of higher education have become more involved in matters of curriculum. In response, institutions of higher education have begun to develop self-regulatory procedures to monitor the "quality" of the educational experience, particularly at the undergraduate level. Therefore, the identification of appropriate indices of quality is of current interest to many.

Indicators such as institutional resources or student ability have been used most often to estimate quality. To be valid, indicators should predict manifestations or after-the-fact attributes of quality such as achievements resulting from a college education or the degree and kind of effort students invest in the learning process. Although quality is often addressed in the literature, few detailed discussions of what connotes quality in the undergraduate experience have appeared. Most observers have agreed that quality is a multidimensional concept that eludes a succinct, operational definition. But to assess quality, the properties of the concept require some level of description.

Most approaches to assessing quality in the undergraduate experience have been quantitative in nature, using scores on entrance examinations (student ability), faculty salaries, library holdings, and so on. Qualitative approaches represent an equally valid paradigm for assessing quality and extensively use inquiry methods common to case studies, such as interviews and observations. Because quality is a multidimensional property, an eclectic or holistic perspective on estimating quality that encompasses elements of both quantitative and qualitative approaches was considered valuable in analyzing various indices of quality previously reported in the literature.

To organize the discussion of quality indicators and manifestations, a four-part framework was developed. *Context* indices represent institutional characteristics that remain relatively stable over time, such as expenditures per student and size of student body. *Input* indices reflect characteristics of entering students, such as ability and aspirations. Manifestations of quality are evidenced by *involvement* and *outcome* indices, the former characterize interactions between and among students and faculty, such as satisfaction and frequency of contact, and the latter reflect intended products or unintended effects associated with college attendance, such as persistence, academic achievement, and alumni attainments.

Commonly used context indicators of quality include size (number of undergraduate students), clarity and consistency of institutional purpose, organizational processes such as decision-making strategies and grading

practices as well as informal systemic properties such as faculty norms and morale, financial resources such as salaries and library collections; and student living environments. Four context indices seem particularly useful in estimating quality: size, purpose, student living environments, and informal organizational properties.

The following input indices have been used to indicate quality: student ability, biographical characteristics of students, and nonintellective characteristics, such as aspirations and interests. In general, input indices have not been particularly useful in predicting quality.

As manifestations of quality, commonly used involvement indices have been instructional activities provided by faculty, informal interaction between students and faculty, and the degree and kind of effort both students and faculty invest in their respective roles. Involvement indices make up one of the most important and perhaps accurate ways of assessing quality and deserve further attention by assessors of quality.

The most often used outcome indices as manifestations of quality have included persistence, student achievement (usually measured by Graduate Record Examination scores), intellectual and social/emotional development of students, and alumni achievements, such as income and community service. For the most part, outcome indices have not reflected value-added increments in terms of student achievement. Alumni manifestations have been underemphasized but represent perhaps the most powerful evidence of quality in the undergraduate experience.

Based on a synthesis of the findings from this framework, the following conclusions seem warranted:

1. *Certain conditions contribute to a higher quality undergraduate experience.* For example, quality appears to be mediated by the size of the institution or the living-learning unit and by the involvement on the part of students and faculty. Another mediating variable is continuity, the degree to which dramatis personae remain relatively constant over a relatively long period of time. Continuity contributes to generativity, the capacity of those frequenting the environment to be supportive, caring, and sharing of their experiences with one another. Quality is also enhanced by the degree and kind of energy students invest in their learning and social activities. Faculty also influence quality through the selection of instructional approaches. Most important, quality is a function of a clear, coherent institutional purpose that lends direction to student and faculty efforts toward acquiring an integrated system of knowledge, values, and behaviors.

2. *When one or more of these conditions is absent, quality is less likely to be evident.*

3. *Quality is probably beyond the direct influence of only a few institutional agents such as the president or key faculty; for institutional quality to be evident, the commitment and active involvement of administrators, faculty, students, and others are required.*

4. *Both qualitative and quantitative assessment methods must be used in concert to accurately estimate quality.*

The Meaning and Measurement of Quality

Although quality in American higher education has been an enduring concern for over 200 years (Stauffer 1981), the correct level of interest in the quality of practices and procedures in institutions of higher education may be greater than ever before. In 1980, for example, the two largest higher education associations used "quality" as the theme of their respective conventions (Benezet 1981), and noted spokespersons such as Ernest Boyer (Bonham 1978), Harold Hodgkinson (1981), and Shirley Hufstedler (Connell 1980) have identified quality as an important matter for institutions of higher education in the decade ahead.

Quality is irrevocably related to higher education enterprise:

> *Quality is inextricably tied to such issues as equality of access and choice, postbaccalaureate employment and the value of a college degree, curriculum structure, and student development and outcomes. Only by understanding how quality has been assessed can we know how and in what contexts it should be measured and which interventions should yield improvement (Lawrence and Green 1980, p. 3).*

Various indices can be used to estimate the quality of the undergraduate experience in American higher education. This report focuses on the ways in which the concepts undergirding quality ratings are defined and assessed, particularly emphasizing quality as experienced by undergraduate students.

The Case (and Need) for Quality

Concern for quality is not unusual in times of diminishing financial resources. After decades of expansion, the American system of higher education will likely have to endure a period of maintenance level economic support. As pressures to economize mount during this period, institutional decisions are likely to be influenced by the politics of survival. Therefore, quality assessments may be used to help determine which institutional programs and services are to be retained and which curtailed or terminated (Kuh 1979; Straumanis 1981).

At least four societal trends and their interactions have underscored the importance of quality: (1) declining enrollments, (2) changing student characteristics, (3) changing societal expectations for higher education, and (4) national and local economies.

Declining enrollments. The system of American higher education is about to experience the leading edge of the "baby bust" (Weathersby 1979), i.e., fewer college students of the traditional age. Prognosticators disagree, however, as to the impact of fewer 18-year-old freshmen. For example, Froomkin and Dresch (1974) predicted a 25 percent decline in enrollments from 1975 levels by 1985. Later, Crossland (1980) forecast a 15 percent decrease between 1982 and 1995. A more optimistic prediction is an increase in postsecondary enrollment to unprecedented levels by 1990, about 3.5 percent higher than in 1980 (Frances 1980).

The prediction of declining enrollments coupled with other factors such as faltering local economies (those linked with the automobile industry, for example) have forced legislators to reduce funding for state-supported services, including colleges and universities. In response, higher education lobbyists have argued that institutions can increase the quality of delivered services by maintaining or slightly increasing support during a period when fewer students must be accommodated (Weathersby 1979). Smaller classes and freer access to libraries and other materials and activities could stimulate both students and faculty to higher levels of achievement.

As enrollments decline, the competition for new students will increasingly force institutions to make difficult but important decisions. For example, some institutions may lower entrance standards to admit the number of students necessary to remain open, with educational quality suffering as the result. Institutions that can successfully identify, document, and articulate what makes their respective college or university a "better" educational environment may have an advantage in attracting students and in increasing or maintaining "quality."

Changing student characteristics. Increasing proportions of undergraduate students are pursuing major fields with applied or vocational emphases such as business and computer science (Astin, King, and Richardson 1979). Increasing numbers of older students with different learning styles and expectations for college are populating campuses (Chickering and Havighurst 1981; Cross 1976). At the same time, prospective students of traditional college age appear less academically able as evidenced by declining scores on entrance examinations and inadequate reading and study skills. Some observers have suggested that the influx of "new" students with nontraditional characteristics, a product of the egalitarian movement, has threatened the level of quality in American higher education (Cross 1972; Mayhew 1977; Meyerson 1975). At the least, traditional evaluative criteria for quality general education curricula will be less useful and perhaps less accurate when applied to students with nontraditional characteristics (see Gaff 1980).

Changing societal expectations. Expectations that educational institutions can alleviate society's problems such as racism, unemployment, and inflation have remained perhaps unrealistically high, and policy makers may have finally recognized that schools cannot solve society's ills. Employers may no longer be satisfied with a credential such as a diploma but rather will expect other evidence of accountability or quality control (Drucker 1981). For example, the increased demand for better pupil performance in elementary and secondary school systems may force some postsecondary institutions to describe their purposes more specifically and to develop devices to assess how well they have achieved their objectives (see, for example, Wise 1979).

In institutions of higher education, accreditation reviews are thought to adequately monitor quality (Harcleroad and Dickey 1975; Thrash 1979; Young 1976). The influence of accreditation on institutional functioning has

been questioned however (Benezet 1981), particularly concerning the degree to which students are receiving adequate and accurate information (Levine 1980)

National and local economies. Declining enrollments, students' changing characteristics, and society's changing expectations are all influenced to varying degrees—and not necessarily in the same direction—by the state of national and local economies. On the one hand, if the gross national product increased substantially, less attention would perhaps be given to ascertaining whether college graduates can indeed perform as promised because the tolerance for error is greater in an expanding market On the other hand, economic downturns traditionally have been linked with increasing enrollment Recent evidence suggests that enrollments may indeed be increasing at present, postponing the predicted decline in numbers of students (Magarell 1981) and therefore the increased interest in quality resulting from fewer students

The Meaning of Quality

Quality is judged every day in the comparison of institutions (Astin 1980a, Jenny 1979; Young 1976). With few exceptions however, (Heath 1968, for example), the quality of the student experience as such is not treated in any depth or with any detail in the literature At least two reason for this omission are possible

1 Few categories of events common to institutions of higher education are evaluated by and reported in the literature from the undergraduate student's perspective The evaluation of instruction is an obvious exception although faculty question the accuracy and validity of this perspective (Blackburn et al 1980, Reed 1981).

2 Estimates of the quality of the undergraduate student experience have generally relied on surrogate or proxy *indicators* thought to predict *manifestations* of quality That is certain valued variables or characteristics (indicators) have been identified, and the degree to which the characteristic is exhibited by students or institutions has served as an approximation of the quality of the educational experience Manifestations or after-the-fact attributes of quality, such as a high degree of interaction between students and faculty outside class, have received less attention in the literature To be valid and useful, indicators must be empirically related to manifestations of quality (Straumanis 1981)

For the most part, the information considered in the following pages is based on applicable surrogate indicators of *institutional* quality rather than students' manifestations of quality Where appropriate, inferences about the quality of the student experience are made from the surrogate indices The terms "index" and "indices" are used in a generic sense and embrace both indicators and manifestations of quality

Guiding assumptions. Two a priori assumptions concerning quality guide the search for the meaning of quality in the undergraduate experience

1 The quality of students' experience is related to a variety of factors and *not* the extent to which one or two variables (such as student ability or expenditures per student) are present (Bever and Snipper 1974, Olscamp 1978, Pace 1979, Palola 1976, Solmon 1981, Stark and Lowther 1980, Straumanis 1981)

2 Quality is a function of purpose in that the relative value of a student's experience is related to various factors such as the student's expectations for college, the institution's mission, and the behavior of faculty and significant others in the institution (Harshman 1979, Keeton 1974)

> *One way to see how difficult [quality] is to grasp is to consider what might be commonly agreed to as the ten principal "indicators of quality" We can list 4,000 different academic courses, thirty kinds of institutional facilities, forty student services, the background of the faculty members, the numbers (even kinds) of books in the library, the professorial pay scale, the character of the institution's neighbors, the SAT's of its students, the size and wealth of its alumni body, and its income per FTE student, and we still do not know whether the institution is a good one or not Even if we know the courses were all taught splendidly, the facilities were in superior condition, the student services tailored to the students' needs, and so on, we still have not established the institution as one of superior quality in the eyes of all on whom it may depend for its well-being Parents, students, alumni of various sorts, faculty members here, faculty members elsewhere, legislators, foundation officials, the Office for Civil Rights, the jury in a law suit, the policeman who handles rush hour traffic—all will have different views And even when two institutions have all the listed things in common, their evaluators may rate one institution better than the other because the match between its elements and its professed purposes is clear and the corresponding match of the second institution is faulty (Furniss 1978, p 21)*

The salience of the institution's purpose is important (Keeton 1971) An institution's purposes follow from philosophical guideposts suggested by its commitment to a particular religious, ideological, or cultural perspective

> *Lacking an agreement on purpose, there cannot be clear criteria as to whether the outcomes of the program are good in the ways intended Given an agreement on purpose, there may still be disagreement as to the best ways to pursue [quality], but at least the merits of the methods can be argued in the light of objectives that are supposed to be served (Keeton 1974, p 1)*

Lawrence and Green (1980) suggested that quality should be referenced to stated departmental or institutional goals and objectives (see also Scott 1981) While such statements can serve to clarify central purposes of a program or institution, exclusive attention to goals and objectives can divert attention from the process through which students learn and develop and

focus only on outcomes or lasting manifestations of the experience. In addition, assessing the degree to which goals and objectives are attained generally results in the use of quantitative indices of quality. While such indices are not to be overlooked, qualitative approaches may also be helpful in estimating quality (Stark and Lowther 1980).

Adequacy, excellence, and quality. The concepts of quality, adequacy, and excellence discussed in the literature have similar connotations, but they are not interchangeable. Therefore, unless these terms are carefully defined, considerable confusion can result in the search for useful indices of quality.

These three concepts require comparison with some predetermined criteria to assess the attainment of a particular purpose or requirement. The shades of distinction between these terms are associated with the degrees to which merit and worth are important considerations in the respective comparison. Lincoln and Guba (1979) have argued that merit represents an intrinsic, context-free value, "independent of any requirements of applicability or use" (p. 1). For example, certain scientific discoveries may be meritorious because scientists appreciate an important addition to knowledge for its own sake. If a discovery were without theoretical significance (without merit) but had utility in a practical context, the discovery would be worthwhile. In other words, worth is an extrinsic, context-specific value. (See Lincoln and Guba for a thorough discussion of the distinction between merit and worth.)

Adequacy suggests a level of sufficiency for certain persons in a specific context or setting and embodies the elements of worth but not necessarily of merit (McCarthy 1981, Wise 1976). *Excellence* intimates an absolutely superior standard of attainment, standards that are not bound by time or context and are good in their own right, therefore, the criteria for merit are met but not necessarily those for worth. The concept of *quality* embodies elements of both merit and worth, that is, a high (but not necessarily superior) level of attainment is required that also has utility or worth for those who take part in the experience.

Methodological Approaches to Quality Assessment

In general, methodological approaches to quality assessment can be divided into two categories: quantitative and qualitative. Various terms are used to describe these approaches. For example, quantitative quality assessments are often grounded in the tradition of the agricultural-botany and psychometric paradigms (Sherman 1981) and rely almost exclusively on "operationally" defined (Astin 1980a) and "objective" measures (Astin and Solmon 1979). By contrast, qualitative inquiry is sometimes referred to as naturalistic or ethnographic and typically embraces a variety of more subjective assessment tools (see Guba 1978, Wilson 1977, and Wolf 1979 for detailed discussions of naturalistic inquiry methods). In practice, efforts to assess quality within an institution usually incorporate elements from both paradigms. Nevertheless, these two approaches are separated here for two reasons. First, adherence to one approach to the exclusion of the other

substantially influences what is assessed and the assessment strategies employed, and second, quantitative methods have dominated quality assessments for a considerable period of time, and it therefore seems appropriate to illuminate the advantages, limitations, and relative utility of various approaches (Stark and Lowther 1980). A third approach, the holistic perspective, combines elements of the quantitative and qualitative methods.

Quantitative methods. Attempts to estimate the quality of undergraduate student experiences using quantitative methods tend to focus on factors related to the institution about which objective data exist or can be gathered. Objective, standardized measures are preferred because (1) they permit comparisons within and across institutions over time, (2) they are amenable to traditional computer-assisted analytic procedures, and (3) they are consistent with the dominant psychometric paradigm of the social sciences as well as the values of many institutional researchers. Although multivariate procedures can assimilate more than one set of measures at a time, quantitative approaches tend to emphasize unidimensional perspectives, resulting almost exclusively in indicators rather than manifestations of quality. Examples of indices often used in quantitative assessments of quality are aptitude or achievement scores in examinations like the Scholastic Aptitude Tests, rank in high school class, expenditures per student, proportion of faculty with doctorates, faculty salaries, library collections, and number of fellowships awarded to seniors.

Qualitative approaches. If the "quality" of an experience is to be estimated, those involved in the process must be afforded "an opportunity to describe their experience, assess the quality thereof, and comment on the meaning of those experiences for them" (Wolf 1979, p. 1). The qualitative assessment paradigm emphasizes manifestations of quality (e.g., student involvement or student-institution interactions and outcomes) and recognizes the importance and validity of multiple interpretations of reality.

In qualitative quality assessments, objectivity is emphasized less and case study methods such as interviews, observations, and analyses of existing documents are used extensively (Sherman 1981). Naturalistic or ethnographic methods are generally considered less reliable when used to evaluate differences between institutions or even within institutions. This is not to say that qualitative methods cannot be used to compare institutions. For example, consider the rich descriptive comparisons between the University of Massachusetts, Boston College, and San Francisco State College made by Riesman and Jencks (1962). However, ethnographic approaches are sometimes challenged on the grounds that institutional differences in purposes, students, and resources are so great that evaluative comparisons are meaningless (see Campbell, Converse, and Rogers 1976 for a discussion of the issues associated with descriptive and evaluative uses of quality assessments).

Sources of information available for qualitative assessments of the quality of the student experience include student reports of satisfaction with

various aspects of the institution, faculty reports of satisfaction with student performance, observations of students' behavior in class and out of class vis-a-vis the institutional mission and purpose, records of students' participation in extracurricular activities (see Brown and Citrin 1977), and records of library use.

The holistic perspective. Quality in higher education is not a unidimensional concept (Kuh 1980a, Lawrence and Green 1980, Palola 1976, Webster 1979). Therefore, exclusively using either a qualitative or quantitative approach to assess quality in the undergraduate experience will likely overlook important elements in the experience that could markedly influence conclusions about quality and, perhaps more important, what can be done to improve the present level of quality (Astin 1980a). A holistic, eclectic perspective of quality assessment recognizes the validity and importance as well as the limitations of contrasting inquiry methods and the different kinds and sources of information typically considered important in the quantitative and qualitative paradigms (Stark and Lowther 1980). In holistic quality assessments, the methods used to gather data are dictated by students' characteristics, the institution's mission, and the purposes of the quality assessment. Usually more than one form of data gathering is required to illuminate the various aspects of the students' experience (see Parlett and Hamilton 1976 for a detailed discussion of holistic "illuminative" strategies).

Quality in Review

Several conceptual frameworks describe the various elements contributing to institutional quality. Most of them have resulted from essentially unidimensional assessments relying extensively on quantitative indicators such as student ability or library resources (see Lawrence and Green 1980 for a detailed summary of these approaches). However, multiple dimensions of an experience must be considered to estimate the degree to which quality is present in the undergraduate years (Epstein and McPartland 1976, Kuh 1980a, Palola 1976).

Astin (1977; 1980a) has described an *input-environment-output* model, perhaps the most popular multidimensional approach to assessing quality. *Input* represents what students bring with them to college (ability, interests, etc.), *outcomes* are measures of cognitive and affective changes associated with college attendance; and *environment* includes both interactions between students and others (faculty, peers, etc.) and actual institutional resources such as library holdings, expenditures per student, and so forth. Student interaction or involvement and institutional resources—Astin's "environment"—make conceptually distinct contributions to quality. The former are manifestations of student effort, the latter are made up of institutional indicators. Therefore, these two sets of factors have been separated in this report to more clearly describe the elements that contribute to quality in the undergraduate experience. The four structual components of a popular evaluation model (Stufflebeam et al. 1971) have been redefined to enable a comprehensive analysis of the factors related to quality in the undergraduate experience. The result is an organizational framework with four clusters of variables: *context, input, involvement,* and *outcome*.

Context indices of quality are those characteristics of an institution's environment that are relatively stable over time, such as expenditures per student, size of student body, proportion of faculty with doctorate, and so on. These indicators have been relatively easy to produce, usually by traditional quantitative methods. Context variables may interact with as well as mediate input and involvement variables to subsequently influence the behavior of students and others in the institution.

Input indices are those characteristics of entering students such as intellectual ability, interests, aspirations, and biographical characteristics (e.g., size of high school graduating class, sex). Input variables interact with and often mediate involvement variables and subsequently influence the behavior of students and others in the institution. Like context variables, most input variables serve as indicators of quality and have been assessed using traditional quantitative methods.

Involvement indices are those interactions (manifestations) that characterize the environment in which students live and learn, such as the amount, type, and opportunity for informal interaction between students and faculty, students' satisfaction with the institution, and students' effort invested in curricular and cocurricular activities. These indices tend to be more subjective in nature that the other variables and often must be assessed by qualitative methods.

Outcome indices are those intended products or unintended effects (manifestations) associated with college attendance such as retention rates achievement levels (e.g., Graduate Record Examination scores, postgraduate fellowships), measures of student development (cognitive, affective, and psychomotor), and alumni achievements (e.g., income and community service). These variables are often estimated through quantitative methods, although qualitative approaches may be more appropriate for some variables (personal growth measures, for example). Outcome indices are thought to result from interactions between context, input and involvement variables.

The distinctions between clusters are not pure. For example, whether systemic properties of institutions such as norms and decision-making strategies are most appropriately placed in the context or the involvement cluster is difficult to determine. What is most important is not *where* the variables are placed but *whether* the variable is included and whether it illuminates how quality in the student experience can be assessed.

Context Indices

When considered as correlates of quality, context indicators are often thought of as "environmental factors" (Astin 1977) or "resources" (Scott 1980–81).

Institution size. Students at high cost, smaller institutions have been found to achieve (as measured by GREs) at higher levels than their counterparts at larger institutions (Rock, Centra, and Linn 1970). Yet in another study, the size of the institution was found to be unrelated to academic achievement (Astin 1968a). However, cocurricular achievement (e.g., student government offices, athletics, etc.) has been negatively correlated with size, that is, students at smaller institutions tend to exhibit more cocurricular achievements (Astin 1977, Chickering 1969).

Meeth (1974) suggested that size of department could be related inversely to quality. That is, as the department increases in size (number of courses), faculty usually have heavier teaching loads, resulting in less time available to spend with more students. Conversely, Millett (1979) warned that a college can perhaps be too small to ensure quality and posited that at least four faculty members are required to adequately provide a major degree of study.

At the least, size seems to be related to perceived reputation and prestige of the institution.* "Preoccupation with the numerical size of a college obscures the real significance of the issue of size, which is the *experience of belongingness*" (italics added) (Heath 1968, p. 241). Chickering (1969) posited that as the size of the institution increases, the opportunities decrease for students to assume positions of leadership in institutional government and social organizations (see also Pace 1981). He suggested larger institutions be subdivided into smaller living-learning clusters to

*Alexander Astin, personal communication.

increase the opportunities to become actively involved in the life of the institution. After a review of the research and opinion relating size and student outcomes, Bowen (1977) concluded that "smallness is associated with educational advantage" (p. 248).

Institutional purpose. Numerous writers have linked quality of student experience with salience and clarity of institutional purpose (Chickering 1969, Astin 1980a; Meeth 1974, Keeton 1971). Institutions with numerous missions and purposes send mixed messages to students and faculty that tend to distort the sense of community considered important for a "developmentally powerful" experience (Chickering 1971). Heath (1968) has eloquently underscored the importance of a salient institutional purpose to quality of experience:

> *A college community that has an ideal or vision has, in effect, expectations of what its members are to become. Such ideals or expectations, so out of fashion nowadays, may be more silent than vocal, they may work their effects out of awareness; they may constitute the invisible college... And when such expectations are consistently expressed in all structures and activities of the institution, then different communal experiences may mutually reinforce one another. It is rare that a specific type of educational experience is very significant... Rather, it is the coherence, the consistency, the "atmosphere"... that makes its impact on development (p. 243)*

In most of the empirical studies related to institutional purpose, quality has not been operationally defined; rather, subjective impressions of institutional contributions to students' development have been used as the dependent variable. Concluding that salient institutional purposes are positively related to high-quality student experiences is a product of deductive reasoning. For example, the degree to which institutions are able to articulate their purposes is thought to be related to a more informed college selection process (Kuh 1977). That is, students themselves select an institution with a mission congruent with what the students and other influential people (e.g., parents) expect from college. Therefore, students are more satisfied with their experiences, are able to work harder with greater satisfaction toward their goals (that by definition are consistent with the institution's goals), and remain in school until they attain their educational aspirations.

Formal and informal organizational properties. Troutt (1979) suggested that of the eight evaluative criteria often used by accreditation teams, the formal organizational structure of the institution is one of three criteria *not* related to quality. Conversely, others have argued that the degree to which students understand how the institution is supposed to function (e.g., lines of authority, sources of funding, levels of decision making, etc.) is related to students' satisfaction and that as many students as possible should under-

stand the institution's organization (Benezet 1981, Berdie 1972) Further, students' roles in institutional decision making have been conceptually linked to reduced rates of attrition and therefore have been inferentially associated with higher quality learning experiences (Bean 1981) While the latter arguments have some intuitive appeal, empirical evidence does not exist to support a conclusion that certain formal administrative or organizational structures are more closely linked with quality than other structures (Bowen 1979) In fact, whether formal organizational structures explain much of what happens most of the time in institutions of higher education has been questioned The "alternative organizational perspectives" illuminating how institutions actually function as opposed to how they are supposed to function (i e , the Weberian bureaucratic model) may have heuristic value for better understanding the relationship between quality and college and university management (see Cohen and March 1974, Weick 1979)

Whether grading practices are related to quality is unclear Wilson (1970) reported that grade point averages actually declined during the 1960s, a time when the average ability (as measured by entrance examinations) of students markedly increased However, during the latter 1960s and the 1970s, grade inflation was widespread throughout higher education (Birnbaum 1977) During the same period, entrance examination scores declined (College Entrance Examination Board 1977) One explanation for the higher grades awarded during the 1970s suggests that grade inflation was faculty's delayed adjustment to the increased "quality" (ability) of students in the late 1960s It is also possible that some professors, particularly those in departments with few majors, may have felt threatened by predicted and sometimes real enrollment decreases and awarded higher grades to "encourage" students to take their courses (see Birnbaum 1977 for additional explanations of the grade inflation phenomenon) Astin (1977) has argued that grades are an important source of feedback for students and may serve to motivate and reinforce certain valued behaviors like studying and interaction with faculty On balance, however, the literature is unclear as to the relationship between grading practices and quality

Pascarella (1980) and Webster (1980) have suggested that quality is related to the amount of time that faculty spend teaching, advising, and informally interacting with students Faculty act as important socializing agents

> *The interaction between the faculty and students formally and informally serves as the basis for the transmission of attitudes and values from the professional to the neophyte. The most successful socialization, measured in terms of congruence between the profession's goals and the existing neophyte's identity, is a product of a successful coaching relationship, a consensus among faculty of the goals to be achieved, and a perception of the collegiality or acceptance on the part of the student Both formal and informal interaction contribute to these conditions* (Pascarella 1976, p 26)

A student-oriented norm or expectation probably exists in those institutions (usually smaller private colleges) in which the degree of student-faculty interaction is fairly high. It has been suggested that the faculty reward system be restructured to encourage more interaction with students—that is to deemphasize inquiry and external service contributions and to emphasize teaching and campus service contributions to students and others—which will in turn increase quality (Student Task Force on Education at Stanford 1973). Gaff and Gaff (1981), for example, believe such a norm can be supported through a formal reward system. Certain environments—such as small colleges that emphasize the importance of the teaching mission or cluster colleges in which students and faculty with similar interests are more likely to interact—seem to create the conditions that foster productive relationships between students and faculty (Wilson et al. 1975).

Whether a relationship exists between faculty morale as a socializing agent and quality in the undergraduate experience has not been empirically established. Nevertheless, it seems logical to expect that faculty with high morale would be more enthusiastic about their work and therefore would be more efficacious role models than faculty with low morale (see Clark and Kuh 1981 for a discussion of the relationship between systemic organizational properties and faculty morale).

Financial resources. The literature concerning the relationship of quality to cost is not definitive. On the one hand, Troutt (1979) considered an institution's financial resources to be positively related to quality. Rock, Centra, and Linn (1970) found that institutional income per student was related to higher GRE scores. Adams and Krislov (1978) reported significant correlations between a faculty salary dispersion index and both the Gourman Rating Index (a specious index of institutional quality—see Webster 1980 for a critique of the methodology used to develop the Gourman Rating Index) and selectivity indices popularized by Astin (1968a). In addition, Solmon (1972, 1975) reported statistically significant relationships between faculty salary and the subsequent incomes of a sample of college-educated persons. According to Solmon (1972), the use of faculty salary as a surrogate indicator of quality is based on the assumption that more competent faculty make more money. However, faculty salary indices tend to militate against certain institutions—usually smaller, church-related institutions—that do not have graduate programs because graduate school faculty tend to make higher salaries and therefore inflate the salary index.

On the other hand, both Meeth (1974) and Millett (1979) have argued that costs and quality are not necessarily perfectly related. In his study of liberal arts colleges, Meeth found that the cost per student was not correlated with institutional size and concluded that "higher cost colleges do not necessarily produce better quality graduates" (p. 97).

Using student achievement as a manifestation of quality, Astin (1960a) reported that the traditional indicators of financial resources, such as size of library collection and expenditures per student, did not contribute or "add

value" to students' achievement as measured by GRE scores, however, ability of entering students and expenditures per student were related to the perceived affluence or prestige of an institution (Astin and Panos 1969)

The evidence appears equivocal enough to preclude inference that a direct, causal link exists between cost and quality Nevertheless, it is tempting to resolve the question of whether financial resources are related to quality by relying on the

> *universal tendency to judge institutional results or quality in terms of inputs . . and to assume without evidence that more [resources] somehow will inevitably produce commensurately greater or better results . . There is a serious logical problem, however, in declaring that cost differences are due to differences in program. It is by no means clear whether expensive programs are a result or a cause of high costs (Bowen 1981, pp 24-25)*

Student living environments. Perhaps as much as 75 percent of a resident student's time during college is spent participating in activities unrelated to the formal academic curriculum (DeCoster and Mable 1974) Wilson (1966) estimated that perhaps as much as 70 percent of what students learn during college results from out-of-class experiences The living environment is a critical factor that must be considered when assessing the quality of the undergraduate student experience, particularly for resident students of traditional age "When unplanned, this learning may be either positive or negative In the past, it has been largely uncoordinated with other learning occurring elsewhere. ."(Riker 1981, p 672)

Brochures describing campus life are replete with statements underscoring the importance of the environment to a quality educational experience (see DeCoster and Mable 1980). Considerable research has been conducted to estimate the degree to which certain college living environments—residential versus commuting (Chickering 1974, Astin 1977) and fraternity and sorority housing (Feldman and Newcomb 1969)—are related to personal development outcomes In addition, Williams, Reilley, and Zglczynski (1980) have summarized the relationships of different living arrangements within various kinds of residence hall environments, for example, coeducational living units and resident hall floors comprising students with the same major They concluded that "students living in residence halls make better grades, are more motivated to complete degree programs, have better attitudes about their college or university and are more involved in social and academic activities on campus" (p 314)

A variety of instruments exist for estimating the quality of student living environments, and several have received extensive use College University Environment Scales (Pace 1969), University Residence Environment Scales (Gerst and Moos 1972), College Characteristics Index (Stern 1963 Stern 1970) Baird and Hartnett (1980) have summarized more than 20 instruments of environmental assessment that can be used to monitor the quality of students' living environments

Summary. Most of the empirical studies relating quality to context variables have correlated unidimensional, quantitative *manifestations* of quality (for example, achievement scores and postcollege income) with quantitative *indicators* of context (for example, expenditures per student and faculty salaries). Size of institution and its clarity of purpose have appeared functionally related, and both have been found to be correlated with quality. expenditures per student have not necessarily been tied directly to commensurate degrees of quality. Opinion has been divided as to whether formal and informal organizational properties are related to quality. While norms supporting faculty interaction with students seem important, grading practices have not been related to quality. Various kinds of living environments have been linked to quality, particularly for traditional-age students. Whether a relationship exists between living environments and quality of the undergraduate experience for older, part-time students has not been determined.

Input Indices

Input measures are considered the most popular method of estimating quality (see, for example, Bowen 1981, Maher 1974, Millett 1979) and have almost always taken the form of quantitative indicators.

Ability. Most institutions have used students' rank in high school class as a surrogate indicator of quality (Kuh 1977, Watts 1977). High school rank has rarely been used in studies involving several institutions, however, because of the variations in grading standards and students' ability believed to exist across high schools.

Scores on entrance examinations such as the Scholastic Aptitude Test or the American College Testing Program are the indicators most often used to infer quality. For example, Astin (1968a) and Astin and Panos (1971) reported that the average academic ability of entering students was related to quality (defined as perceived affluence or prestige) of the institution; this relationship has apparently remained fairly stable over time (Astin and Solmon 1979). Some have periodically questioned whether open or lowered admissions standards have a debilitating influence on quality (Agnew 1970, Meyerson 1975, Tonsor 1971). At some institutions, up to 75 percent of entering college students have been judged to be ill prepared for college work and to require some sort of remedial assistance. Critics of open admissions say that such large numbers of students with serious deficiencies "reduce educational quality for everyone" (Flagler 1981, p. 1). Empirical data are lacking to support such assertions, however (see Lavin, Alba, and Silberstein 1979).

Few would argue that student ability is completely unrelated to educational quality. Exclusive reliance on measures of ability as a reliable indicator of quality is probably myopic in the absence of additional evidence documenting whether students use their talents to good advantage. It is not surprising therefore that most attempts to determine "quality" have linked ability with certain outcome variables, usually achievement.

Biographical characteristics. Various biographical variables have been inferentially linked to quality, depending on the purposes and mission of the institution under study. For example, gender is obviously important if the institution is a single-sex college with a mission to prepare its students for leadership in education, business, and industry (Astin 1977). College catalogs often imply that because a number of students from foreign countries or from different states attend the institution, the quality of the educational experience will be enhanced because of the diverse cultural backgrounds to which the undergraduate student will be exposed. How these students are integrated into the social system of the institution is probably more closely tied to quality than the number of students in attendance.

Whether such variables are indeed important or even related to quality, however defined, has not been demonstrated empirically, however. It is unlikely that biographical indicators, with the possible exception of gender, are related to quality (see Astin 1977).

Nonintellective characteristics. The importance of nonintellective indicators such as participation in extracurricular activities in high school, interests, and aspirations is often underscored by admissions personnel seeking a "rich mixture" of students (Kuh 1977). Such a mix is thought to enhance the opportunity for a personally liberating college experience and therefore contribute to a higher quality educational experience (Willingham 1980). In highly selective institutions where a large number of qualified applicants compete for a limited number of places in the entering class, decisions on admissions sometimes are based on nonintellective variables (see *Chronicle* 1981).

Institutional environments congruent with entering students' characteristics and expectations result in students' greater satisfaction with the institution and therefore a quality educational experience (Moos 1979, Pace 1969, Pervin and Rubin 1967, Stern 1970). The environment is, to a large extent, what people perceive it to be. Many of the instruments summarized by Baird and Hartnett (1980) for use in assessing the "quality" of the college environment—the College Characteristics Index, for example—are grounded in perceptual theory.

From the characteristics and preferences of a large number of entering students, Astin (1968b) identified six nonintellective factors—intellectualism, aestheticism, status, leadership, pragmatism, masculinity—that differentiated between various kinds of institutions. For example, technological institutes like M.I.T. have been found, based on the characteristics of entering students, to differ from liberal arts colleges like Oberlin or Grinnell on the factors of aestheticism, pragmatism, and masculinity. Presumably students with characteristics consistent with the dominant factors of a given campus will "fit" better and therefore be more satisfied.

The fit of students and environment can be a two-edged sword, however. On the one hand, students can become acclimated so easily to a college's environment that few challenges are presented to students' preferred ways of thinking and behaving. In this instance, students' development may be

stunted. On the other hand, students who are repeatedly challenged and are without appropriate sources of support may become so dissatisfied that they leave the institution. In general, development seems to be encouraged in an environment that requires a reasonable amount of adaptation (Snyder 1971) and a number of new responses from the student. That is, curricular and cocurricular challenges that upset students' equilibrium and encourage them to greater degrees of differentiation and personal integration are considered necessary to encourage development of the "whole person," a goal to which most institutions subscribe (see Knefelkamp 1980; Perry 1970, Sanford 1962).

Summary. Although measures of ability have been the most often used input indicators of quality, exclusive use of ability measures does not reflect the institution's or students' purposes for higher education, the effort students make to attain personal or institutional objectives, or the degree to which students benefit in various ways (acquisition of information, social-emotional maturation, critical thinking) from attending the institution. For these reasons, ability measures have often been linked with context indicators and outcome manifestations to infer quality. Biographical variables have often been logically linked with quality, but empirical evidence has not been reported to substantiate the validity of the inference. The degree to which students' nonintellective characteristics are consistent with the dominant environment of the institution has been inferentially related to quality because of the empirical relationship between congruence of certain characteristics of students and their environment and students' satisfaction with the institution.

Involvement Indices

Astin and Scherrei (1980), Pace (1980), and Scott (1980–81) have provided the rationale for emphasizing involvement variables in quality assessments. Quality is more a function of what students do with an institution's resources (context variables) than of the resources themselves. Involvement indices have been used less than other quality indices for at least two reasons: (1) recognition of the importance of active involvement of faculty and particularly students in effecting quality in higher education has only recently been underscored (Astin 1977, Pace 1980); and (2) involvement measures have not usually been included as part of institutional management information systems (Astin 1979, Astin and Scherrei 1980). As a result, involvement indices reflecting manifestations of quality are not readily available.

Involvement with peers. The degree to which students are involved and are satisfied with their involvement with other students has been correlated with quality (Astin and Scherrei 1980; Feldman and Newcomb 1969). Participation in almost any extracurricular activity seems to be positively related to persistence, certain desirable changes in personal development (see Astin 1977 for differences in degree of change related to involvement in inter-

personal, academic, and athletic activities), attaining career objectives, and general satisfaction with the undergraduate experience (Astin 1977, Kegan 1978).

Chickering (1974) underscored the importance of the peer group to a quality educational experience. "Once a person identifies himself with a group that group becomes an anchor and a reference point. The values and behaviors approved by the group provide a background for developing individual attitudes and behaviors." (p. 88)

The influence of the peer group on the quality of the undergraduate experience may be a function, in part, of the amount of time available to and used by students to interact with each other. For example, Wilson estimated that over 70 percent of what a student learns in college results from out-of-class experiences (1966). If, in fact, students do spend the majority of their time in college with peers, the importance of the peer group is clear, particularly for resident students. Chickering (1974) reported that the development (as reflected by a variety of attitudinal and value-oriented scales from the Omnibus Personality Inventory) of students living in campus housing was accentuated compared with their counterparts living at home. The differences in personal development have been attributed to the relatively fewer opportunities commuter students have for peer interaction (Bragg 1976).

However, involvement with certain peers can be debilitating. For example, students involved in peer groups with different or less positive orientations to college may reinforce behaviors inconsistent with the aims of the institution (see Stern 1962), thereby becoming less satisfied and perhaps leaving the institution.

Instruction. The literature on quality of instruction can be divided into two areas: intended learning outcomes, and teaching methods consistent with students' characteristics such as learning style and intended instructional outcomes (Menges 1981). Menges analyzed the conditions required for attaining each of five categories of outcomes: (1) psychomotor learning—skeletal-muscular reactions mediated by cognitive knowledge, such as playing a musical instrument or persuasive oral communication, (2) memory—minimally complex verbal recall typically requiring repetition, (3) complex cognition—classification, analysis or synthesis of recalled knowledge in different contexts, such as developing principles or the relationships between concepts, (4) nonlinear cognition—holistic and expansive processes rather than the analytical, reductionistic processes connoted by complex cognition more typical of "creative" persons (see Heist 1968), such as the capacity to dream and meditate, and (5) emotional learning—identification and expression of one's own and awareness of others' feelings. (See Gagne 1977 for another taxonomy of learning outcomes.) Menges posited that students should be able to demonstrate competence in each of these five learning categories for the aims of liberal education to be realized.

A variety of different conceptual frameworks have been put forward to better understand characteristics of learners. Cross (1976), Knefelkamp (1980), Kolb (1981), Messick et al. (1976), Perry (1970), and Witkin et al.

(1977) have underscored the importance of learners' characteristics to learning and development of the intellect. Knefelkamp in particular has articulately encouraged faculty to use concepts from human development theory to improve the quality of instruction. However, relatively little is known about the instructional preferences or styles of faculty (Kolb 1981 is a notable exception).

A considerable amount of research has been conducted on the relative effects of various instructional methods (see Gage and Berliner 1979, McKeachie 1978). Although the lecture format is used most often, few advantages to learners have been associated with this teaching method. Menges (1981) has summarized the relative strengths of other instructional techniques, given the intended outcomes:

> *To achieve memory outcomes, the learner must rehearse verbal association and verbal change. Listening to a lecture is passive, but recitation or computer assisted drill ensures rehearsal. To achieve the mastery of emotions necessary for accurately perceiving emotional messages from others, learners must receive real messages from other persons. A book of case studies is not sufficient for such learning, but group exercises may be. (p. 579)*

From an extensive review of the literature, Menges concluded, that

> *choice of instructional method should be a function of both intended learning outcomes and the setting in which learning occurs (conveniently represented by group size), with due regard for learner and teacher characteristics. The major criterion for assessing appropriateness of method is the extent to which the method ensures that learners practice tasks essential to the desired outcomes (pp. 578-79).*

Instructional behavior has also been related to frequency of informal contacts with students out of the classroom:

> *Differences in faculty accessibility to students outside of class appear to be related to individual characteristic more complex than the conventional clustering of academic disciplines. . . . [T]hose faculty most accessible to students beyond the classroom appear to share an interrelated set of norms, assumptions, and values about the processes of teaching, learning and student development of which frequent informal contact with students outside of class would seem to be a natural extension (Pascarella 1980, p. 562).*

Faculty behavior related to quality instruction goes beyond formal course syllabi and class assignments. In what Snyder (1971) has termed the "hidden curriculum," faculty communicate in subtle ways to students what behaviors are rewarded. At times, such behavior is actually inconsistent with the formal verbalized requirements stated by professors.

I observed the professor in one class beginning the term by explaining that the students were expected to be creative and involved, in short, they were to be engaged. They would have the opportunity to take intellectual risks, to make mistakes. Five weeks later the first quiz was given. The students found that they were asked to return a large amount of information that they could only have mastered by memorization. There was a considerable discrepancy between the students' expectations for the course and what they were in fact expected to learn in order to pass the quiz. In spite of the professor's opening pronouncement, the hidden but required task was not to be imaginative or creative but to play a specific, tightly circumscribed academic game (Snyder 1971, pp. 16-17).

For some students, the discrepancy between what is stated and what is actually required creates considerable dissonance and frustration, sometimes culminating in attrition.

Informal faculty-student interaction. The Student Task Force on Education at Stanford (1973) identified informal student-faculty interaction as one of the most important components of a quality undergraduate education (see also Sanford 1967, Trow 1975). Students who report higher levels of interaction with faculty also report more satisfaction with college (Pascarella 1980), evidence higher degrees of achievement as reflected by standardized tests (Centra and Rock 1970), are less likely to drop out (Bean 1981), and are more likely to ask advanced degrees (Thistlethwaite 1959).

In addition, "the faculty member can be a role model of successful adult behavior. He can be a source of motivation, a critic or a judge, or a 'catalyst' in the students' reorientation of his value system" (Feldman and Newcomb 1969, p. 251). "The feedback he gives influences the student's self image as a learner and as a human being" (Bragg 1976, pp. 34-35).

The empirical evidence seems unequivocal. Faculty-student interaction is an important part of a quality undergraduate experience. Yet to be addressed is whether students can successfully be encouraged to will-not-fact become more involved with faculty and vice versa.

Student effort. The importance of student effort or initiative in making the most of institutional resources is not a new concept (see Brown 1937), but it has recently been underscored again (see Pace 1980). In fact, "a large body of evidence (Bloom 1974, Gagne 1977, Kulhavy 1977) shows that students learn best when they invest time and energy in the learning task" (Astin 1980b, p. 5). When commenting on the woeful lack of direct contact between students and faculty, the Student Task Force on Education at Stanford (1973) blamed both the systemic properties of the institution (norms, reward system, etc.) and the lack of student effort in taking advantage of existing opportunities for such interaction. The Task Force recommended that undergraduate students be made aaware of the importance of and their shared responsibility for participating in these kinds of activities.

Pace (1979, 1980, 1981) has called attention to an important distinction

between the amount of time students are involved in an activity like studying and the quality of time invested in the activity. For example, outlining required readings or interpreting major points to another requires more effort and is more educative "than merely underlining passages in a textbook" (Pace 1980, p. 10). Based on the findings from a study of 13 colleges and universities, Pace reported, "the higher the quality of intellectual effort, the higher the grades" (p. 14), and the more time spent on academic matters, the higher the quality of effort likely to be invested in taking advantage of other opportunities available on campus. Apparently, "what counts most is not who you are or where you are but what you do" (p. 16).

Whether faculty or others like student affairs staff and academic administrators can successfully encourage students to increase "quality" of effort is not known. Also unclear is whether students who expend considerable effort during the undergraduate years may be different in important ways (like motivation and ability) from peers who invest less effort. The evidence to date has suggested that highly involved students are different from their less involved counterparts. The former come from educated and relatively affluent families, earn higher grades in high school, and score higher on college entrance examinations (Astin 1977).

Current methods for assessing the quality of student effort are quantitative and rely exclusively on students' reports about themselves. While the "quality of effort" scales appear to have heuristic value, they have not been validated by other measures such as observations, interviews with roommates, and so forth. In spite of these limitations, "quality of effort" is a rich perspective from which to better understand quality in the undergraduate student experience.

Summary. The frequency of students' interactions with significant others (e.g., peers, faculty, student affairs staff) in the institution has not been used very often as a manifestation of quality. This lack is surprising, given the overwhelming empirical evidence and opinion linking peer interaction and student faculty interaction with a variety of surrogate manifestations of quality like student satisfaction, achievement, and persistence. The quality of effort both students and faculty put forth in their interactions provides an additional and perhaps richer and more powerful descriptive perspective on quality. Qualitative strategies may help ameliorate the apparent limitations of current methods to assess quality of effort.

Outcome Indices

Outcome variables appear to be second to inputs in frequency of use as surrogate measures of quality and are usually assessed with traditional quantitative methods. Outcomes are often considered "better" than other indices of quality because they potentially represent the "value added" by the undergraduate experience (Hodgkinson 1981, Millett 1979).

> *The basic argument underlying the value added approach is that true quality resides in the institution's ability to affect its students favorably to*

make a positive difference in their intellectual and personal development. The highest-quality institutions, in this view, are those that have the greatest impact—add the most value—to the student's knowledge, personality, and career development (Astin 1980b, pp. 3–4).

Persistence. An important and relatively easy to produce estimate of whether institutions are meeting students' expectations is rate of retention (Astin 1979). For example, Gruson, Levine, and Lustberg (1977) have contended that the degree to which students persist to the completion of their degree objectives is a valid index of the quality of the undergraduate experience. Both the institution and the students are thought to benefit because persistence is linked with a stable enrollment, which is related to a stable financial base (a popular context indicator of quality), and students' satisfaction with college, suggesting that they are receiving adequate preparation for vocational, civic, and family responsibilities. Student persistence has also been correlated with (1) the frequency (Pascarella 1980, Pascarella and Terenzini 1977, Rossmann 1967, Spady 1971) and "quality" (Pascarella and Terenzini 1977) of informal student-faculty interactions, (2) involvement with peers and institutional activities such as social organizations, honor societies, and athletics (Astin 1975, Astin 1977, Blake 1971, Siebel 1973), (3) general satisfaction with the institution (Kegan 1978), (4) self-esteem, and (5) undergraduate grade point average (Astin 1975, Astin 1977).

The apparent conceptual link between persistence and quality may be spurious for those students who do not "fit" at one institution or who require a more "developmentally powerful" environment, that is, an institution providing optimal challenges that encourage students' development (Chickering 1971). For example, Heist (1968) reported that highly creative students, many of whom are among the most academically able at their respective institutions, are disproportionately represented among dropouts or transfers. Reducing the number of these creative people who leave college continues to be a major challenge. However, an institution of higher education cannot be all things to all people. Assisting students in the transition from one institutional environment to another more suited to their needs may well be an earmark of a quality institution (Kuh 1972).

Achievement. "The overwhelming weight of evidence is that, on the average, students make gains in substantive knowledge during the college years" (Bowen 1977, p. 68; see also Learned and Wood 1938, Lenning, Munday, and Maxey 1969). Whether grades and quality are related has been difficult to determine for a variety of reasons. For example, grading practices may differ between and within institutions, students majoring in the sciences may receive lower grades even though they tend to be as intellectually able or more able compared to their counterparts in other major fields (Astin 1977, Hood and Swanson 1965). In addition, grades are relative only to other students at the respective institution at a given time and do not reflect what a student has learned (Astin 1974).

It is not clear whether certain factors are related to levels of achievement different from those predicted by students' entrance examination scores.

> *Achievement (as measured by the three area tests of the Graduate Record Examination administered during the senior year in college) is neither improved nor impaired by the intellectual level of classmates or by the level of academic competitiveness. Differences among students in their achievement . . . are much more closely linked to variations in ability that existed prior to the student's entrance than to any characteristic of the undergraduate institution (Astin and Panos, 1969, p. 145).*

Although others have reported similar findings (Nichols 1964), more recent data suggest that undergraduate grade point average is negatively related to institutional selectivity (i.e., academic ability) of entering freshmen (Astin 1977).

In a study of 95 institutions, Rock, Centra, and Linn (1970) concluded that the only institutional variables linked to achievement (as measured by GRE scores) were expenditures per student and proportion of faculty with doctorates. Smaller institutions with higher revenues per student seem to have had an accentuating influence on students' achievement.

Students who are high achievers also are more likely to informally interact with faculty, be involved in campus activities, and so forth. Pascarella (1980) has warned, however, that causal direction is not clear. "Does informal interaction with faculty positively influence academic performance, or is it initial perceptions of academic success which eventually lead students to seek contact with faculty beyond the classroom?" (p. 558).

Prestigious awards for graduate study may be more a function of student ability (inputs) than a manifestation of a quality undergraduate experience. For example, Rock, Centra, and Linn (1970) did not find a relationship between proportion of students seeking advanced degrees and institutional (context) variables. Astin (1977) reported mixed findings. For example, graduates of selective institutions were less likely to attend law school, although the chances of attending medical school were increased slightly.

When implementation of occupational or graduate school plans are considered, the quality of the undergraduate institution as measured by students' ability seems to have minimal impact (Sharp 1970).

Intellectual and social emotional development. Many researchers have concluded that on the average college students tend to become more liberal and sophisticated in their political, social, and religious views and to evidence more complex and autonomous thought processes (Ellison and Simon 1973, Trent and Medsker 1968). These changes were apparently a function of both maturation and college attendance. At the least, college attendance has seemed to have an accentuating influence (Trent and Medsker 1968). The data have been equivocal as to whether context indicators like size or expenditures per student are related to differential degrees of change. For example, Chickering, McDowell, and Campagna (1969) concluded from

their study of 13 colleges that average changes on intellectual (e.g., autonomy, theoretical orientation, complexity) and social emotional (e.g., social extroversion, impulse expression altruism, anxiety) scales of the Omnibus Personality Inventory were consistent regardless of the institution's stated mission or purpose. Clark et al. (1972) and Trent and Medsker (1968) reported similar findings using comparable forms of the same instrument administered to different populations.

Alumni. A number of researchers have studied the economic benefits associated with college attendance. In general, individual (private) rate of return on the investment in a college education ranges from about 15 percent to 18 percent more than that on a high school investment, depending on the assumed relationships between learning capacity and income used to compute rate of return (Alexander 1976, Becker 1960, Raymond and Sesnowitz 1975, Witmer 1976). In studies specifically designed to determine whether rate of return varies by specific kind of postsecondary institution attended, quality has usually been defined as an attribute of the institution that increases earnings in later life. Using variables like student ability at entrance, faculty salaries, and the Gourman Index as quality indicators, Solmon (1975) found that attendance at high "quality" institutions resulted in greater economic returns. The rate of return seemed to increase with experience in the labor force, that is, after being out of college for some time (see also Solmon 1973, Wachtel 1975).

> *Most studies confirm that students who go to colleges of higher quality earn more money, are more successful in graduate study, than students of equal ability and backgrounds who go to colleges of lesser quality. The monetary return on investments in college quality appear to be on the order of 7% to 8% per cent.* (Bowen 1977, p. 256)

A number of income indices have limitations that are serious enough to question their use as manifestations of quality. For example, the validity of the Gourman ratings and faculty salary as indicators of quality has been questioned.

When alumni are questioned directly concerning the impact of the undergraduate experience on their social and political beliefs, most report that college had a significant impact (see Heath 1968, Kuh 1976). When compared with colleges of similar genre, certain institutions seem to have distinctive impacts as evidenced by alumni's attitudes toward social issues, community service, and benefits of education (Pace 1974). Smaller institutions seem to have somewhat greater "impress" capacities (Pace 1979), that is, alumni report changing in more profound ways *as a result* (causal direction inferred) of attending college.

In most studies of alumni, relationships between quality indicators like student ability and manifestations like postcollege activities have been rather weak, usually falling short of statistical significance (see Hoyt 1966). For example, the correlation between institutional "quality" and interest in

the arts reported by Spaeth and Greeley (1970) was .14 but dropped to almost .00 when sex, socioeconomic status, and religion were held constant. From their own study of alumni and a review of the literature, they concluded that "attempts to show that specific institutions have specific effects on their students have usually failed. . . . It seems to matter less what college one attends than that one attend college" (p. 126).

Chickering (1969) and Bowen (1977) have warned that interpreting outcome results as conclusive evidence of insignificant differences between various institutions' impacts may be misleading. Such conclusions are usually drawn from aggregated data; therefore, the averaging methods used tend to obscure rather than illuminate diversity of impact or change among students (Feldman 1972). Further, involvement factors have not usually been considered in these analyses. Therefore, attempts on the part of individual institutions to enhance the potential influence of factors thought to be related to quality should not be discouraged (Bowen 1977).

Summary. Persistence has been related to a variety of proxy manifestations of quality like satisfaction, achievement, and involvement in campus activities. Whether students transfer or voluntarily withdraw from an institution has often been interpreted as a manifestation of poor institutional quality. When student ability is controlled, the majority of institutions have not positively influenced achievement. Students' personal development has also appeared to be independent of the particular institution attended. Post-college economic returns have been related to several (some of them specious) proxy quality indices. Although the lasting influence of college has appeared moderate across institutions, this finding may be more a product of the outcome assessment methods employed and variables studied than an accurate estimate of the quality of the undergraduate experience for individual students.

Summary and Conclusions

Salient Indices of Quality

Context. Four context indices may be worthwhile indicators of quality at many institutions. Many positive indicators and manifestations of quality have been associated with institutional size. For example, in smaller institutions a greater sense of community is often fostered among students, and opportunities for assuming leadership positions in cocurricular activities like student government and informal contact with faculty tend to increase. Of course, the size of an institution does not *cause* these things to happen, rather, size *encourages* their occurrence.

Clarity of institutional purpose has been referred to repeatedly as an earmark of a high quality institution. Large universities have multiple purposes and missions to satisfy those competing, diverse audiences that have a stake in them (e.g., trustees, taxpayers, students, alumni). Therefore, such institutions rarely are able to project a clear purpose.

Student living environments appear functionally linked to quality. Students spend a disproportionate amount of time during the undergraduate years engaged in nonclassroom activities. Therefore, the degree to which students are challenged by and satisfied with their living environments is worthy of renewed emphasis in the search for quality.

Formal systemic properties such as administrative structures and decision-making strategies have not been empirically related to quality. However, the informal organization that encourages or hinders faculty involvement with students and the extent to which students feel and act as though they are members of the academic community seems to be a particularly promising area of inquiry.

Input. Although they have often been used, input indicators have not been powerful predictors of quality manifestations. Various inquiries with slightly different foci have been unable to document whether student ability, the most often used indicator of quality, is positively related to the quality of the experience. Perhaps case study portrayals of students with varying levels of ability in institutions with different purposes could help fill the apparent void in the knowledge about the relationship between student ability and quality in the undergraduate experience.

Involvement. The degree to which students are involved during the undergraduate years is one of the most important and perhaps accurate manifestations of quality. Involvement is related to a variety of other indicators and manifestations often empirically or logically associated with quality: institutional size, general satisfaction with the institution (including satisfaction with the living environment and academic pursuits), persistence to completion of degree objective, postcollege community service, and income.

The degree to which faculty expend effort in instruction or involved with students out of the classroom has been positively related to many manifestations of quality. Identification of the factors related to student and faculty involvement (e.g., morale, salience of institutional purpose) seems a promising line of inquiry.

Outcomes. Like institutional size, persistence enables students to take advantage of a variety of other opportunities related to quality—for example, interaction with faculty and peers and participation or perhaps leadership in institutional governing processes. Yet persistence may have a pernicious influence as well. Some students probably persist to graduation without being encouraged to critically examine their attitudes, values, and behavior, which is more likely to be true for the increasing number of part-time commuting students.

The search for increased value resulting from a college education has met with little success. Problems associated with aggregation techniques and measuring change have often been cited as factors contributing to insignificant findings. Interestingly, those few researchers (e.g., Cottle 1973, Heath 1968, Perry 1970, White 1966) who have conducted intensive studies of small samples of students and alumni have reported provocative accounts of what happens to students during and after college. Like quantitative assessments of the same phenomena, these approaches also have limitations, but the insights they may provide (in terms of depth, realization of individual potential, etc.) seem to be worth the limits of generalization associated with them (see Trow 1975).

Studies of alumni are thought to be the potentially richest source of information about college quality (Boulding 1975, Freedman 1962, Pace 1979). Bowen (1979) has suggested that many important outcomes of college cannot be documented at commencement because the impacts or changes will not be manifested until some years later.

> *The residue of a college education—after the initial forgetting of detail—is a virtual mystery. Moreover, we should be interested in the values and attitudes of alumni, their interests, their citizenship, their family life, and their careers as these may have been affected by their college experiences* (p. 25).

Quantitative and Qualitative Contributions to Quality Assessment

Quality is a multifaceted concept. After a study of the available literature on quality in the undergraduate experience, it is easier to understand why few efforts to describe the multiple properties of quality have been mounted and why most "quality assessments" rely on quantitative indicators of quality.

Without taking into account the purposes of the institution and the students' personal goals, the degree to which quality is present cannot be determined. Quantitative approaches in particular tend to underestimate the tremendous diversity that exists within and between institutions of higher education. In fact, quantitative methods often are used to reduce the diversity by identifying the smallest number of variables that seem to account for differences between institutions. While the results of such efforts make interesting reading, they offer little assistance to faculty and staff responsible for determining and subsequently modifying programs to enhance quality. In addition, quantitative measures are usually insensitive to positive unintended outcomes and are less likely than qualitative

approaches to record the range and depth of affective responses to college experience such as disappointment and boredom

Qualitative assessments are usually rich in detail For purposes of making single institutional policy decisions and monitoring quality, qualitative methods hold great promise, particularly if the reports of persons frequenting the environment are valued. Naturalistic inquiry strategies tend to be sensitive to unintended effects and outcomes because faculty and students are encouraged to candidly report their experiences in detail, therefore, the data collection is not limited to information related to institutional goals

However, qualitative approaches tend to be labor-intensive and typically result in profiles of one or a small number of institutions, programs, or students For these reasons, researchers have not used them extensively for quality assessments across many institutions

Both quantitative and qualitative approaches have limitations Because quality is a multidimensional concept, data gathering techniques characteristic of both approaches are required to accurately estimate the degree to which quality is present (Solmon 1981) The results from holistic quality assessments may be less valid for comparisons across institutions, however, they will be extremely valuable to institutional agents interested in how to increase the quality of events on their campus

Conclusions

The following conclusions seem warranted by the review of the literature pertaining to commonly used indicators or manifestations of quality in the undergraduate experience

Quality in the undergraduate experience can be expected under certain conditions

- Quality is mediated by size At a time and in a nation of mass higher education, this conclusion—if interpreted as a policy recommendation—may seem sophomoric Over a decade ago, Chickering (1969) came to a similar conclusion and suggested, as have others, that large institutions be subdivided into small, quasi-autonomous learning and living units The reorganization of administrative structures that were often associated with attempts to reduce size may not be necessary, however For example, staff on major university campuses have had some success in instilling loyalty and a sense of community within students grouped by resident unit This sense of community seems to be particularly important in encouraging persistence beyond the first year or two of college While students are more likely to be involved in various activities in smaller institutions, the relationship between size and quality may be curvilinear and mediated by other variables (e g , degree and kind of student faculty interaction, institutional purpose), that is, below a certain size, curricular and personal development opportunities may fall below a tolerable level
- Quality is mediated by continuity If students remain associated with the college environment for only an abbreviated period of time, it is unlikely they will benefit from the liberalizing potential of the college experience

Therefore, neither the students' objectives nor the institution's purposes can be attained However, not all students can be expected to nor should persist through graduation from the original institution Some students' needs and personal objectives may be better met at another institution or environment Therefore, quality may not be adversely affected by attrition per se If however, substantial numbers of students or faculty sharing personal goals ostensibly consistent with the institution's purposes leave the institution, quality may be threatened In this sense, persistence is more than the proportion of students or faculty that return each fall The continuity of participants contributes to the support and commitment to attaining the institution's and students' purposes, therefore, continuity seems to be a bridging variable between size, involvement, and generativity

- Quality is mediated by involvement on the part of both students and faculty Students who are more involved in both curricular and cocurricular activities seem to benefit more in different ways than their less involved counterparts They are happier, are more likely to persist to graduation, and exhibit higher levels of achievement and personal development Comparable information on faculty is lacking, although the sociopsychological tenets that account for students' satisfaction with the institution should also generally apply to faculty
- Quality is enhanced by a generative learning community This conclusion is based not so much on the weight of the empirical evidence as on the clarity and cogency of arguments offered by learned observers of higher education across decades A generative learning community is characterized by supportive, caring people who mix freely with each other in active pursuit of ideas, principles, and values (Knefelkamp 1980, Newman 1852) Heath (1968) observed that the role of faculty was most influential when "they knew both their students and each other intimately and also when they shared an 'intercommunion' (not just 'intercommunication') with each other (p 247) The members of this community willingly share the meaning of their experience with others and are committed to ensuring that the next generation will benefit from what has been learned and endured (Browning 1973) In sum, a generative learning community maintains links with the past present, and future, thereby fulfilling the basic aims of the academy preserving, transmitting, and enriching the culture (see Knefelkamp 1980 for a "generativity checklist")
- Quality is enhanced by 'quality' of student and faculty effort Pace (1980) has underscored the importance of the kind as well as the degree of involvement While time on task (which is conceptually similar to involvement—see Astin 1980b) is necessary, it is not sufficient to produce quality In other words, students must be engaged in an activity in a way that contributes something to as well as takes something from the experience Faculty also manifest quality of effort through their use of instructional strategies For example, structuring class activities appropriate to the desired learning outcomes (see Menges 1981) consistent with the purpose(s) of the institution and students' objectives requires higher levels of involvement from both instructors and students

• Quality is a function of a coherent and consistent purpose Chickering (1969), Heath (1968), Keeton (1971, 1974), and many others have underscored the powerful socializing influence of a salient institutional purpose on students' development of an enlightened and integrated system of knowledge, values, and behaviors. Too often overlooked, however, is the direction a clear, coherent institutional purpose provides for faculty and staff behavior Without purpose, whether faculty make exemplary or even acceptable instructional contributions is difficult to determine The extent to which students' learning and personal development goals are in tacit agreement with the institutional purpose is probably related to persistence and, more importantly, to continuity This tacit agreement is often manifested by students as "general satisfaction" with the institution

Standing alone, no one of these conditions is sufficient evidence of quality in the undergraduate experience Because quality is a multidimensional property, the conditions cited above, with the possible exception of size, are required in some degree before quality can be expected Frequent interactions between and among students and faculty may be the best single index of quality, but without purpose, continuity, and generativity, such interactions may be stripped of their developmental and educative power

Quality cannot be directly manipulated by certain institutional agents but requires the willing cooperation and commitment of various groups that hold a stake in the institution The influence of rationality in institutions of higher education supports the belief that students' acquisition of knowledge is a process over which the institution's agents (faculty and staff) have considerable control. In the past, the search for indices of quality has been colored by this belief, as evidenced by the reliance on quantitative measures of context and input variables as indicators of quality In reality, institutions have little "control" over how students and faculty behave Certain policies and procedures may encourage student and faculty involvement, but, like human development, quality cannot be "programmed" or even perhaps "facilitated" (see Perry 1981). Quality is a product of the interaction of certain individuals (e g , willing students and competent, dedicated faculty) under certain conditions (e g , in smaller institutions or in academic units with salient purposes)

Neither quantitative nor qualitative methods of assessment alone are satisfactory for adequately and accurately estimating quality A holistic perspective on quality assessment that integrates appropriate data gathering strategies from both quantitative and qualitative inquiry paradigms will provide the most useful and relevant information for institutional policy makers Quality is a by-product of the human experience and is therefore subject to multiple realities Nothing short of a holistic approach characterized by multiple data sources, triangulation or cross-validation methods, and solicitation of student and faculty reports can be afforded if accurate and useful estimates of quality are expected

Quantitative context and input variables have not proved particularly helpful in estimating quality, largely because they rarely have been functionally related to manifestations of quality (institutional size is a notable exception). However, few studies exist that focus on what students do with institutional resources or vice versa, i.e., manifestations resulting from the interactions between students and institutional agents and resources. Particularly lacking are empirical investigations into dimensions of quality associated with nontraditional students or learning environments (see Harshman 1979; Keeton 1974). Therefore, assessors of quality would do well to redirect their energies from reductionistic efforts to identify several easily quantifiable variables and to focus instead on the development of quality monitoring strategies that are sensitive to the manifestations of quality described above. Astin (1979, 1980b), Bowen (1979), Knefelkamp (1980), and Lawrence and Green (1980) have offered pithy suggestions for institutional policies and procedures consistent with these conclusions.

Quality in the undergraduate experience is not a "mysterious" concept as some wish to believe (see Astin 1980b), and the technology is available to estimate the extent to which quality is manifested. The utility of many previously identified indicators of quality has been reduced because of the lack of a clear definition of quality as an independent variable. Therefore, the major challenge ahead is to fashion context-relevant definitions of the concept to guide institutional policy studies designed to enhance quality.

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