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ABSTRACT

The relative power of college culture, school functioning, and mission in explaining student performance outcomes was examined. The relationship between institutional attributes/cultures and undergraduate instructional effectiveness as perceived by faculty and administrators was studied with 320 four-year colleges. Respondents completed the Assessment of the Performance of Colleges and Universities survey in 1983. Instructional effectiveness variables included: student educational satisfaction, academic development, career development, and personal development. Institutional characteristics included: full-time equivalent enrollment, percentage of professional degrees, percentage of part-time headcount, percentage of undergraduate headcount, student selectivity, and institutional control and type. Also considered were: four institutional mission and mission agreement variables (special identity, distinctive purpose, mission reflected in academic programs, and shared definition of mission); four institutional culture variables (clan, emergent environment, hierarchy, and market orientation); and four institutional functioning variables (level of trust, recognition and rewards received, amount of information or feedback, and student-faculty relationships). Associations were analyzed using stepwise multiple regression. Appended are (1) a Correlation Matrix, and (2) a basic statistical breakdown on all study variables. Fifty-two references are listed. (SW)

Linking Outcomes and Institutional Characteristics: The Importance of Looking Deeper

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National Center for Higher Education Management Systems

Linking Outcomes and Institutional Characteristics:

The Importance of Looking Deeper

Introduction

Assessing and improving the effectiveness of undergraduate instruction has recently taken on a new urgency in public dialogue. National reports such as NIE's Involvement in Learning (1984), AAC's Integrity in the College Curriculum (1985), and NEH's To Reclaim a Legacy (1984) have not only directed attention toward undergraduate instruction, but have also raised many questions about how "effectiveness" is to be defined and attained. Such attention, of course, is not new. Indeed, it is one of the features of American higher education to periodically raise and wrestle with such questions. But a key aspect of the current discussion is that it is largely founded upon actual research about what works and what does not in promoting effective undergraduate instruction. This study attempts to further this discussion.

Two quite different streams of research have contributed to recent debates about effectiveness in higher education. Both are important as guides to action. The first line of inquiry concentrates on actual student learning and development, and poses as its research question the degree to which particular outcomes can be associated with particular combinations of institutional characteristics, environments, and instructional strategies. Here the analytic focus is placed quite clearly on the individual student--the object being to explain patterns of individual growth and behavior in terms of clusters of external factors. The second approach to defining and promoting "effectiveness," in contrast, takes the institution as its unit of analysis. Here, the major research question is the degree to which organizational

functioning and survival can be explained in terms of patterns of structural organization, of culture, and of adaptation in the context of a changing external environment.

Both of these traditions of research have a rich literature, but their implications for practice have rarely been linked. The first tradition, for example, suggests many empirical connections between such factors as institutional size, control, and selectivity on the one hand, and student learning and development on the other. But this research can rarely demonstrate the behavioral mechanisms responsible for the association. More importantly, there are many individual exceptions to the expected relationships (Bowen 1978): some institutions do much better than others that share similar structural characteristics. At the same time, the second tradition has but rarely examined actual changes or perceived changes in teaching effectiveness as a function of organizational culture. Findings from this literature, however, suggest that such factors as substantial agreement on mission, a close-knit pattern of belief and communication, and active modification of programs and services to fit the needs of new student clienteles all may have an impact on instructional effectiveness.

Together, these two sets of findings suggest some useful connections. First, if possible, variables on organizational culture should accompany institutional characteristic variables in explaining patterns of student learning and development--even if the actual measures of outcomes must be indirect (as they are in the current study). Secondly, faculty and administrator perceptions of undergraduate outcomes are important in their own right, as indicators of the priority and commitment accorded these outcomes in particular organizational settings. Changing perceptions and commitments may be a critical step in

accomplishing more basic shifts in student performance and satisfaction. And if cultural factors emerge as important in explaining such perceptions, traditional remedies for improvement based solely upon curriculum content, instructional technology, and the physical structure of the learning enviroment will need to be tempered.

Student Outcomes and Their Correlates

Systematic studies of the impact of college on students have a long history, and have been directed at many facets of student experience (Pace 1979). Findings of this research have been diverse, but generally cluster around two basic themes. First, most studies find substantial differences in the determinants of cognitive and non-cognitive development. For example, Bowen (1977) notes considerable difficulty in establishing clear connections between institutional characteristics and actual cognitive growth. This literature, however, has established many linkages between attitudinal and personal growth and the physical characteristics of institutions (for example, Chickering 1969, Feldman and Newcomb 1969, Pace 1972, Astin, Panos and Kreager 1967, Astin 1977, Astin and Lee 1972). All these findings, however, are conditioned by the fact that students are not randomly distributed across institutions. Rather different types of students tend to cluster in different types of institutions because of institutional and self-selectivity.

Secondly, most studies have documented considerable differences in the impacts of institution-level characteristics (for example institutional size, control, and selectivity), and more circumscribed elements of the teaching/learning environment within the institution (for example student-faculty contact, class size, teaching technology, and student involvement). Indeed, one of the main difficulties of actually doing student impact research is to decide what level

of analysis constitutes the relevant environment for student development (Baird 1976, Hartnett and Centra 1977, Hartnett 1976, Gray, Weldon, and Romney 1979, Ewell 1984). In some settings the relevant environment will be the institution as a whole, in others, the department or school, and in still others, the residence hall or social group. Finally, different students may undergo quite similar experiences, but react to and learn from them differently because of different goals, aspirations, and learning styles (Gamson and Associates 1984, Katchadourian and Boli 1985).

Despite these difficulties, a number of patterns have been established. Among the institutional factors linked to outcomes--particularly noncognitive outcomes--three consistently emerge as important. First, the total size of the institution, unless mitigated by environmental strategies to create a smaller "effective size", is generally shown to have a negative effect on student development (Astin 1977, Chickering 1975, Astin, Panos and Creager 1967). Secondly, institutional control--particularly for private independent, and religiously affiliated institutions--has been shown to have distinctive effects on student personal and attitudinal development (Astin 1977, Pace 1972, Pace 1974, Astin and Lee 1972). Finally, institutional selectivity has been positively linked with both cognitive and affective development while in college (Bowen 1977).

In addition, a number of elements of the educational environment have been positively linked to particular student outcomes. Among the most important of these is student-faculty interaction and contact--particularly outside the classroom (Astin 1977, Feldman and Newcomb 1969, Terenzini and Pascarella 1977). Linkages between student development and full-time attendance, on-campus residence, and a balanced set of campus activities have also been

well established (Astin 1977, Astin 1985). At the same time, there are indications that student noncognitive development can be linked to both curricular a. ! extracurricular activities that stress the distinctiveness of a particular college or university (Baird 1976). Most of these findings can be usefully summarized in terms of two basic themes: students learn and develop more (1) when they are actively involved in the curriculum, the campus and the learning process (Astin 1984, Astin 1985), and (2) when they are able to make maximum use of available campus resources and facilities (Pace 1984, Friedlander 1980).

Organizational Culture and Institutional Effectiveness

While the literature on student outcomes takes for granted that a primary element of college and university success is that students learn and develop while enrolled, a quite different tradition examines the notion of institutional effectiveness on a considerably broader front. In fact, one prominent feature of this tradition is the inability to consistently define effectiveness; indeed, some within this tradition have suggested that the concept itself should be dropped (Cameron 1981). For example, in reviewing this literature, Krakower notes four distinct approaches to the concept of effectiveness (1985). Goal achievement is the most traditional notion of effectiveness, and refers to the ability of organizations to actually accomplish what they claim to be in business for; for colleges and universities all forms of student outcomes fall within this category. A second type of effectiveness is managerial process; within this rubric, an effective organization is one that engages in certain kinds of desired practices--for example careful planning, efficient delegation, clear communication, explicit evaluation of results, and so on. A third area of effectiveness is

organizational climate; from this point of view, effective organizations primarily serve the individual needs of those who regularly inhabit them by emphasizing working together, by articulating shared values and common symbols, and by providing other kinds of rewards. A final approach to effectiveness examines the ability of the organization to adapt to changes in its operating environment; in this case organizational survival is paramount, and the most effective organizations may be the ones that can respond to a shifting environment by creating new goals to seek and discovering new constituencies to serve.

Each of these approaches has been extensively employed as a template for assessing the "effectiveness" of colleges and universities. Goal achievement, of course, has been a primary concern for those examining institutional outcomes and return on investment--both at the societal and the institutional levels of analysis (Bowen 1977, Lenning 1977). Managerial process has received equal attention from practitioners--particularly in the areas of planning, resource allocation, control and communication, and management information (Baldridge and Tierney 1979; Weick 1978). Organizational climate has been one of the most recent but fruitful areas of investigation--stressing the distinctive "cultures" of higher education, disciplinary and institutional (Clark 1983, Masland 1985), the role of common myths, rituals and symbols (Clark 1972, Tierney 1985), and the role of leadership in articulating shared values and interpretations of the environment (Chaffee 1984). Finally, the adaptational approach has been used to explain patterns of institutional failure and decline (Zammuto 1983), and responses to decline--particularly in the threatened small independent college sector (Parker and Zammuto 1985, Anderson 1977, Finkelstein, Farrar and Pfnister 1984). As Krakower (1985) argues, the choice of which notion to choose depends upon where one sits, the

kinds of criteria one applies, the unit or level analysis to be employed, the time frame of the investigation, and the kinds of data used.

What does this broader literature have to contribute to those who concentrate on the means for improving undergraduate instruction? To begin with, it reminds us that the process of changing practice in complex organizations is itself complex. Simply tinkering with effective size, with curriculum structure, and with the instructional environment will probably not be enough to alter outcomes, unless there is much fuller understanding about how change occurs at the institution in question, about what shapes participant perceptions and beliefs, and about what is valued and rewarded. Secondly, this line of investigation highlights the importance of intangible factors and assets, which can themselves be "managed" by institutional leaders. If distinctive elements of institutional culture are important in maintaining effectiveness, steps can be taken to continually articulate and preserve them. Similarly, institutional leaders can take care that changes in curriculum and management structure are consistent with powerful existing patterns of belief and behavior.

In general, three themes from the literature on organizational effectiveness will be particularly relevant. The first has to do with the role of institutional mission and agreement on mission in determining effectiveness. Findings here suggest that mission distinctiveness is a good thing, provided that the institution simultaneously remains competitive and adaptive (Chaffee 1984b). Similar findings suggest that agreement on mission is a key correlate of perceived effectiveness (Finkelstein, Farrar and Pfnister 1984). Indeed, lack of both mission distinctiveness and agreement is often cited as a weakness among some types of institutions--particularly public comprehensive universities (Birnbaum 1984). This leads to a second theme--one that

emphasizes the distinctive cultural attributes of different kinds of institutions. Small private colleges in particular are consistently noted for their distinctive commitments, histories, and patterns of interactions (Martin 1982, Pfnister 1985)--attributes which are magnified in colleges with a unique religious tradition or value orientation (Pace 1972). A final theme emphasizes the importance of patterns of belief and interaction independent of mission, size, and control. Educational organizations have been variously described as "organized anarchies" (Baldridge and Deal 1983), as "loosely-coupled systems" (Weick 1976), or as "clans" or families (Masland 1985). Each analogy has proven appropriate to a particular range of circumstances, and each helps to explain how participants view and value different types of effectiveness.

Some Hypotheses

Taken together, these two bodies of research suggest a number of potential associations between institutional attributes and cultures, and undergraduate instructional effectiveness--particularly as the latter is perceived by faculty and administrators in different institutional settings. Among the factors expected to have an impact on effectiveness in promoting student learning and development are the following:

- Institutional Characteristics. These include such concrete factors as size, type, control, and selectivity. Hypothesized relationships follow directly from the literatures mentioned above. Total institutional size is expected to be negatively related to noncognitive student development, to be [illegible]tially unrelated to cognitive development, and to have mixed relationships with student satisfaction, depending upon student career orientation. Institutional type and control are expected to show distinctive contributions to noncognitive

development for private independent colleges, and for religious institutions. Public general baccalaureate and comprehensive institutions are expected to place high in job preparation, but are otherwise expected to be of low instructional effectiveness. No systematic relationships are expected between institutional type and control, and student cognitive development. Selectivity is expected to be strongly related to achievement, but unrelated to student personal and career development.

- Institutional Mission and Mission Agreement. All factors that suggest a distinctive mission for the institution are expected to be positively related to noncognitive development, but are expected to be essentially unrelated to cognitive growth. Student satisfaction is expected to be slightly related to mission distinctiveness, on the premise that students select themselves into the institutions they attend, and that the best "matches" between student expectations and institutional environments occur at colleges and universities of strong personality. Each of these relationships is expected to be also present for mission agreement--the degree to which a range of faculty and administrators at the institution concur on the content and distinctiveness of the institution's mission.

- Institutional Culture. Institutions characterized by a "clan," "tribe" or "family"-like culture are expected to be strongly related to noncognitive development, and somewhat related to student satisfaction. Institutions with hierarchical or indeterminant cultures are expected to be slightly negatively related to student satisfaction. Cultural variables are not expected to show systematic relationships with

cognitive development. As above, agreement on culture among a range of faculty and administrators at the same institution is expected to have similar effects as agreement on mission.

- Institutional Functioning. These variables constitute a somewhat different perspective on organizational climate. Rather than concentrating on aspects of the culture as a whole, they highlight certain elements of administrative behavior that reveal underlying values and incentives. Four such factors are included in this study--the perceived level of trust throughout the institution, the amount of public recognition and reward individual faculty and administrators feel they receive, the amount of information and feedback on performance received on a regular basis and the strength and quality of student/faculty interaction. Weak but independent associations are expected between each of these factors and student noncognitive development. Close student faculty relationships are expected to have a strong impact on all outcomes variables except career development.

Interrelations among each of these clusters of variables are expected to be strong, but each association mentioned is expected to be essentially independent. Clusters are arranged in loose hierarchy of expected association, but the relationships among predictive factors are expected to be sufficiently complex that a causal modeling approach that attempts to establish formal hierarchies among variables and documents paths of indirect association would be unwise. Several studies, for example, have suggested that factors such as size and control are responsible for attributes like mission distinctiveness and clan culture. But this is a risky assumption given the fact that many

institutions have quite consciously controlled such haracte'stics as size and selectivity in order to maintain a mission or a cult're (Bowen 1977, Martin 1982). Indeed, there is some evidence for small colle'e' n p rticular, that the discipline needed to keep to such a course of actic has c nsiderable payoff in the long run (Anderson 1977, Chaffee 1984).

A summary of the expected pattern of relationships between ctional effectiveness and each of these factors is presented in F' 1. Discussic of actual results will follow the logic of this figure.

Research Method

The following description of method covers instruments and sources of data, sampling and procedures for h dling missing or incomplete data, definitions of variables, and the regression techniques used to estimate relationships.

Instruments and Sources of Data

Perceptual variables on the effectiveness of instruction, on mission and mission agreement, on institutional culture, and on elements of perceived organizational functioning were drawn from items included in the Assessment of the Performance of Colleges and Universities (APCU) survey. The APCU survey is a 183-item questionnaire developed by the Organizational Studies program of the National Center for Higher Education Management Systems for the purpose of examining a variety of participant perceptions in higher education institutions. These perceptions have been related in past studies to one another, to institutional response to decline (Parker and Zammuto 1985), and to a number of other aspects of institutional performance. The instrument itself has been subjected to extensive review to determine its validity, reliability, and statistical properties (Krakower and Niwa 1985).

Figure 1

Hypothesized Pattern of Relationships Among Variable Blocks

Institutional Variables	Student Satisfaction	Student Academic Development	Student Career Development	Student Regional Development
Institutional Characteristics:				
Size	-			-
Public Control	+/-			-
Religious				+
% Part-Time		-	+	-
% Profesional	+/-		++	-
High Selectivity		++		
Mission:				
Distinctive Mission	++		+	++
Mission Agreement	++			++
Institutional Culture:				
Clan	++			++
Hierarchy	-			-
Emergent				
Market				
Institutional Functioning:				
High Trust	+			+
High Reward	+			+
High Feedback	+	+		+
Student/Faculty Relation	++	+		++

++ = strong positive relation
+ = weak positive relation
+/- = high inter-rater variance
- = weak negative relation
-- = strong negative relation

The APCU questionnaire was field tested, revised, and administered to samples of faculty, administrators, and trustees at 334 institutions in 1983. Institutional participation in the survey was initially approved by the president or chancellor. APCU surveys were sent directly to 4-5 top administrators and to 4-5 faculty representatives selected randomly from among lists provided by each of the institutions. Administrators and faculty were chosen as the focal groups of the survey because of the expectation that their positions in institutions were central to the decisionmaking process.

The APCU questionnaire is divided into eight substantive sections, each of which elicits information about a specific aspect of the institution's environment. The first three sections ask respondents to describe recent changes in the institution's external environment, in terms of patterns of enrollment, and finances. Section 4, titled "Institutional Characteristics", contains a variety of items on mission distinctiveness and mission agreement, on organizational structure, and on types of managerial activities undertaken. This section contains the items on mission distinctiveness and congruence used in this study. Section 5 examines institutional culture and leadership characteristics; this section is the source of the institutional culture items used in this study. Section 6 examines actions taken in response to the environment, and Section 7 examines particular types of institutional decision processes. No items from these sections were included in the study. Section 8 contains 32 items on perceived institutional performance. These were originally used by Cameron (1978) to construct nine perceived effectiveness scales--student educational satisfaction, student academic development, student career development, student personal development, faculty and administrator employment satisfaction, professional development and quality of the faculty, system openness and community interaction, ability to acquire resources, and

organizational health. Twelve items from the first four of these scales were used to operationalize perceived instructional effectiveness. Three items from the final scale, organizational health, and one additional item from the community interaction scale were used to operationalize aspects of institutional functioning.

For institutional characteristics variables, several external sources of information were used. Higher Education General Information Survey (HEGIS) files were tapped for information on institutional size, type, control, enrollment characteristics (percent undergraduate and percent part-time), and degree program emphasis (percent professional degrees granted). Data on institutional selectivity was provided by the test scores of entering freshmen reported by the institution as part of the Cooperative Institutional Research Program (CIRP), or as listed in a standard guidebook for the appropriate year such as Barron's Profiles of American Colleges or The College Guide.

Sample

The sample for this analysis consists of 320 four-year institutions of higher education completing the APCU questionnaire in 1983. This group is part of a slightly larger full sample of 334 colleges and universities that participated in the study. The 334 sample institutions were drawn from the complete universe of institutions listed in the HEGIS data base that had at least a four-year educational program and enrollments of between 200 and 20,000 students in 1981-82 (N=1317). This population was stratified to produce a maximally diverse sample representative on four variables: institutional size, control (public vs. private), net change in enrollment from 1979 to 1982, and baccalaureate-only versus institutions with graduate programs. Overall, the sample is representative of the parent population within the limits set by the

selection criteria. The stratification process produced 334 potential institutional participants, and all 334 returned at least five useable questionnaires. Overall response rate for the total sample was 70.6% for administrators and 61.9% for faculty respondents. This response rate is somewhat better than the 40-50% response rates typical for surveys of this sort (Kerlinger 1972).

For the purposes of this study, only responses for faculty and administrators were included in the analysis. For estimating both instructional effectiveness and elements of institutional culture and functioning it was felt that trustee responses were too far from the actual situation to provide meaningful information. Indeed, past analyses using this database, and subsequent administrations of an essentially similar survey, the Institutional Performance Survey (IPS), have found that trustee responses can vary markedly from faculty and administrator perceptions (Krakower and Niwa 1985). When trustee respondents were excluded from the analysis, nine institutions dropped below the minimum of five respondents per institution required for meaningful analysis, and were therefore excluded.

A further five institutions were dropped from the analysis because meaningful data on selectivity could not be obtained. Initial analyses were performed on 326 institutions without the selectivity variable, but the results indicated that the resulting regression models were badly misspecified--particularly for models directed toward explaining student cognitive development--if a measure of student selectivity was not included.

The cross-section of institutions in the sample is broadly representative of categories of four-year baccalaureate institutions and above. Approximately a third are public, a quarter independent religiously affiliated, and the balance

private independent institutions. Over 80% are comprehensive or general baccalaureate, with about 10% major doctoral institutions. Average FTE enrollment of institutions in the sample is 3800. The vast majority grant some professional degrees, and the average percentage of such degrees is over 60%. Similarly, most institutions in the sample enroll part-time students, with the average part-time enrollment being just over a quarter of headcount. Finally, student selectivity varies considerably around a mean combined SAT verbal and math score of 941 for the sample.

Variables

Instructional Effectiveness. As noted above, instructional effectiveness variables were operationalized in terms of items drawn from Section 8 of the APCU. They include twelve items used to build effectiveness scales on student educational satisfaction, student academic development, student career development, and student personal development. All twelve questions used a 5-point Likert-type response format. The items used, grouped under their respective scale headings, are as follows:

Student Educational Satisfaction

- There seems to be a feeling that dissatisfaction is high among students at this institution (Item 805).
- There have been relatively large numbers of students who either drop out or do not return because of dissatisfaction with their educational experience here (Item 806).
- I am aware of a large number of student complaints regarding their educational experience here as registered in the campus newspaper,

meetings with faculty members or administrators, or other public forums (Item 807).

Student Academic Development

- Think of last year's graduating class at this institution. Please rate the academic attainment or academic level achieved by that class as a whole (Item 812).

- Estimate what percent of the graduates from this institution go on to obtain degrees in graduate or professional schools (Item 813).

- How many students would you say engage in extra academic work (e.g., reading, studying, writing) over and above what is specifically assigned in the classroom (Item 814)?

Student Career Development

- What proportion of the students who graduated from this institution last year and entered the labor market obtained employment in their major field of study (Item 815)?

- How many students would you say attend this college to fulfill definite career or occupational goals as opposed to attending for social, athletic, financial, or other reasons (Item 816)?

- Of those students who obtained employment after graduating from this institution, for how many of them was career training received at this institution important in helping them obtain their jobs (Item 817)?

Student Personal Development

- One of the outstanding features of this institution is the opportunity it provides students for personal development in addition to academic development (Item 801).

- There is a very high emphasis on activities outside the classroom designed specifically to enhance students' personal, nonacademic development (Item 808).

- Students develop and mature in nonacademic areas (e.g., socially, emotionally, culturally) to a very large degree directly as a result of their experiences at this institution (Item 810).

Original analyses using the APCU database explored scale values rather than individual items. Although respectable alpha values for scale reliability were obtained on the four student performance scales (for example, Krakower and Niwa report factors loadings from .68 to .85 for these items), some individual item values were sufficiently low as to cause suspicion that each item may tap a distinctive dimension of response when compared to its companions. Inspection of the texts of many items also raised questions about subsuming them under a common heading. As a result, in this study seperate regression models were estimated for each of the twelve instructional items.

Institutional Characteristics. As noted above, data on institutional characteristics was drawn from outside the APCU survey--primarily from the Higher Education General Information Survey (HEGIS). A total of seven variables were created within this block, defined as follows:

- FTE. This variable reports the total full-time equivalent enrollment for the institution in 1983, as reported in HEGIS.

- % Professional Degrees. This variable reports the proportion of all degrees granted in 1982, as reported in HEGIS, that were in a designated professional field.

- % Part-Time Headcount. This variable reports the total proportion of 1983 headcount enrollment at the institution enrolling for fewer than fifteen hours at the undergraduate level and twelve hours at the graduate level, as reported in HEGIS.

- % Undergraduate Headcount. This variable reports the total proportion of 1983 headcount enrolled at the undergraduate level, as reported in HEGIS.

- Student Selectivity. This variable reports the average combined SAT verbal and math score (or its converted ACT equivalent) of incoming freshmen at the institution in 1977, as reported in the annual Cooperative Institutional Research Program survey of incoming freshmen, or in such publications as Barron's Profiles of American Colleges or the College Guide.

- Control. This variable was dummy coded to reflect three categories--(1) public, (2) private independent, and (3) private with a religious affiliation.

- Institutional Type. This variable was dummy coded to reflect the following types of institutions: (1) major doctoral, (2) comprehensive, (3) general baccalaureate, and (4) specialty.

Institutional Mission and Mission Agreement. These variables were drawn from four items in Section 4 of the APCU. All items were based on a 5-point Likert-type response format from "strongly disagree" to "strongly agree". The individual items are as follows:

- This institution has a special identity, unlike any other in higher education (Item 403).
- There is a general sense that this institution has a distinctive purpose to fulfill (Item 404).
- The academic programs offerred here reflect the mission of the institution (Item 405).
- People associated with this institution share a common definition of its mission (Item 406).

Exploratory analysis directed at the scalability of these items resulted in an overall coefficient alpha of .77. Once again, however, the dimensions of response tapped by individual items (particularly item 3) were felt to be sufficiently independent to warrant inclusion of each of the four items separately in the analysis.

Institutional Culture. Section 5 of the APCU contains four items that require repondents to apportion 100 points among four statements about the institution on the basis of which statement most closely describes the respondent's institution. Prior use of the APCU database indicated that there was a close correspondence among the four items, and suggested that using the first item of the series as a predictive variable yielded results comparable to using a scale value based on all four items (Krakower and Niwa 1985). Because results for a

single item are more easily interpretable than for a multi-item scale, this procedure was used. The item chosen contains four broad statements about the institutional environment. Each of these statements is associated with a particular conception of institutional culture. "Clan" cultures are highly personal and informal, emphasizing family-like ties among members and considerable loyalty and tradition. "Emergent" cultures are dynamic and entrepreneurial, emphasizing development, progress, and innovation. "Hierarchy" cultures are formalized and tightly structured, emphasizing formal rules, efficiency and stability. Finally, "Market" cultures are production-oriented and task-oriented, emphasizing competetion and achievement. The text of each of the four statements defining these cultures in the APCU is presented below:

- Clan. Institution A is a personal place. It is like an extended family. People seem to share a lot of themselves.

- Emergent. Institution B is a very dynamic and entrepreneurial place. People are willing to stick their necks our and take risks.

- Hierarchy. Institution C is a very formalized and structured place. Bureaucratic procedures generally govern what people do.

- Market. Institution D is very production oriented. A major concern is with getting the job done. People aren't very personally involved.

Weightings assigned to each statement by each respondent were included as discrete variables in the analysis.

Institutional Functioning. These factors were operationalized using four distinct items from Section 8 of the APCU. Although three of these items were

originally designed to be part of a single organizational health scale, they appear to tap quite different elements of institutional functioning. (Krakower and Niwa report an overall coefficient alpha of .83 for this scale, but obtained individual factor loadings as low as .55 for these variables.) As a result, each item was included separately as a predictor variable. All four items were scored as a five-point Likert-type scale anchored on opposing statements about the attribute. Texts for the four items used are given below:

- General Level of Trust. High Suspicion, fear, distrust, insecurity vs. high trust, security, openness (Item 829).

- Recognition and Rewards Received. Recognition received for good work, reward for success vs. no rewards for good work, no one recognizes success (Item 831).

- Amount of Information or Feedback. Feel informed, in-the-know, information is always available vs. feel isolated, out-of-it, information is never available (Item 832).

- Student-Faculty Relationships. Unusual closeness, lots of informal interaction, mutual personal concern vs. no closeness, mostly instrumental relations, little informal interaction (Item 826).

Analytic Procedures

Data were analyzed using a stepwise multiple regression procedure with forward inclusion of specified blocks of variables. Separate regressions were performed for each of the twelve student performance variables, and the results compared. Institutional Structural variables were introduced as the first block, followed by Mission variables, Institutional Culture variables, and

Institutional Functioning variables. Under forward inclusion, variables are included in the model at each step if they meet a specified significance level (in this case p = .05), and once included in the model, are carried through subsequent steps regardless of changes in their power as explanatory variables once other factors are introduced. This procedure allows some of the structural relationships among explanatory variables to be explored as the regression procedure unfolds.

This method was chosen for several reasons. As noted above, separate models were estimated for each of the twelve student performance items, because each item seemed to be tapping a somewhat different dimension of impact. Although the items scaled reasonably well, some clearly asked for elements of institutional impact, while others asked for areas of emphasis or intended impact, or for the reasons why students were selected or attracted to the institution. Because of these differences, each item was considered representative of a somewhat different effect.

Secondly, a stepwise procedure was employed to observe patterns of relationship among the four explanatory blocks of variables. As emphasized previously, a completely specified causal model was not attempted because of uncertainties over causal direction. While it has been often argued that such factors as size, control, and program array are prior to such factors as mission distinctiveness, mission agreement, and culture, it can be equally well maintained that the reverse is true: institutions may stay small, may offer certain programs, and may maintain selectivity precisely because of a strongly held mission or institutional culture. Nevertheless, the degree to which such factors independently or jointly contribute to student performance is important, and the stepwise procedure allows it to be observed.

Results

For the most part, results of the regression analysis confirmed hypotheses as expected. Some relationships, however, were not as strong as hypothesized, and other expected relationships were absent. Detailed results for each block of student performance variables are presented in Tables 1 through 4. For each block, results of applying the regression model to variances in student performance variables are also displayed.

In each table, results are reported in terms of standardized regression coefficients (Beta-Coefficients) obtained when all significant variables are included in the model. Coefficients enclosed by parentheses in these tables are below the .05 inclusion criterion for significance at the final stage of the step-wise regression procedure, but are included in the model because at an earlier step, they met the inclusion criterion. Finally, the total amount of variance explained (R2) at each step of the regression procedure is included in brachets. Results for each block of variables are disucessed in separate sections below. A final section discusses the results of regressing institutional characteristic variables on selected institutional functioning variables that prior analyses had shown to be well correlated with student performance.

Student Satisfaction

The strongest associations with student educational satisfaction items were expected from (1) mission distinctiveness and agreement, (2) a clan-like institutional culture, and (3) strong patterns of informal student/faculty contact. As shown in Table 1, these patterns indeed held true for the sample, but in somewhat different ways.

Table 1

Results for Student Satisfaction Variables

	(805) High Dissatisfaction	(806) High Dropout	(807) High Complaint
Institutional Characteristics:			
Size	-.154	-.194	
Public Control	-.209	-.165	-.272
Private Independent	.101		
Comprehensive	-.186		
% Part-Time			
% Professional		-.167	
% Undergraduate			
High Selectivity (SAT)	-.105	-.316	
[R2 Step 1]	[.049]	[.100]	[.020]
Mission:			
Special Identity (403)			.171
Distinctive Purpose (404)			-.171
Programs Reflect Mission (405)			-.080
Shared Definition of Mission (406)	-.099	-.225	
[R2 Step 2]	[.201]	[.218]	[.166]
Institutional Culture:			
Clan	(-.056)	(-.051)	-.137
Emergent			(-.067)
Hierarchy	.204	.096	
Market			
[R2 Step 3]	[.269]	[.231]	[.196]
Institutional Functioning:			
High Trust (829)	-.212		-.190
High Reward (831)			
High Feedback (832)	-.128	-.117	-.127
High Student/Faculty Contact (826)	-.235	-.231	-.195
[Total R2]	[.643]	[.302]	[.311]

N = 320

All coefficients represent unstandardized regression coefficients in the final model. (Beta coefficients in parentheses were not significant in the final model, but were significant at an earlier stage of the step-wise regression procedure.)

High levels of student dissatisfaction (Item 805) were strongly associated with non-public control, with a hierarchical institutional culture, with low levels of trust in institutional functioning, and with infrequent student/faculty contact. Somewhat surprisingly, dissatisfaction was moderately associated with small size and with private independent control. It is likely that these results are due to the inability of many small independent institutions to deliver effectively in the areas of career preparation and academic quality for students who are instrumentally motivated. Many such students may attend small institutions for the wrong reasons, and are disappointed as a result.

As noted in much of the literature on student retention (for example Lenning, Beal, and Sauer 1980; Beal and Noel 1979), the factors associated with dropout are not necessarily those associated with satisfaction or with academic success. These results indicate high dropout (Item 806) to be strongly associated with low selectivity, with infrequent student/faculty contact, and with institutions which lacked agreement on mission definition. Each of these relationships is paralleled by findings in behavioral research on student persistence (Terenzini and Pascarella 1977). As above, however, it is interesting to observe that public control and size, as well as percent professional degrees, are negatively related to dropout with other factors held constant. This suggests as well that student persistence may well be a function of both the "integration" of the student with the campus--as suggested by most retention models (Tinto 1975)--but may also be related to the ability of the institution to "deliver the goods" in terms of competitive programs that provide good job opportunities.

Complaint, like dropout, is a form of behavior that embodies dissatisfaction. Unlike dropout, however, it depends upon there being a public opportunity to

express dissatisfaction, and upon a motivation to communicate rather than to withdraw. Indeed, it can be argued that high levels of dialogue--even if they are oriented toward criticism--may themselves be integrative. Results on the High Complaint item (Item 807) in many ways parallel those on the other two student satisfaction items, but seem more to depend on mission and culture factors than do the others .

On all three items, the pattern of variance explained by successive steps of the regression process is revealing. In each case, institutional characteristics variables, though important, alone explained very little of the variance in student satisfaction. For dissatisfaction (Item 805), considerable gains in explanatory power come largely with mission and institutional functioning factors. For dropout (Item 806) and for complaint (Item 807) this pattern is also true, although the particular independent items that emerge as significant predictors are different, and the total amounts of variance explained by the regression model differ considerably. At minimum, however, this pattern of successive results demonstrates the additional power of including cultural and organizational functioning variables in analyses of this dimension of performance.

Student Academic Development

Hypothesized relationships on student academic development factors were few and concentrated. High academic gains were expected to be strongly associated with institutional selectivity, and were expected to be moderately associated with frequent student/faculty contact and with high information and feedback. Previous work also suggested a moderate negative relation with part-time attendence.

As indicated in Table 2, selectivity indeed proved dominant for all three items of student academic development. As expected, part-time attendance was related to achievement in a moderate and negative fashion. A similar finding involved moderate and negative relationships between professional orientation and acceptances in graduate schools, and student willingness to engage in extra academic work beyond classroom assignments. Interestingly, however, the presence of a graduate school exerts, if anything, a positive effect on total achievement levels--a finding consistent across all three items on this dimension.

Parallel results on all three items are also apparent in the area of mission. Here it seems clear that distinctiveness of purpose, per se, has little to do with achievement levels, but that the match between actual program delivery and intended purpose, and the fact that people agree on mission are important. Inspection of stepwise regression results, however, reveals that in contrast to satisfaction variables, mission variables do not account for a great deal of variance in student achievement independent of institutional characteristics.

Although some relationships between institutional functioning variables and student achievement were identified, these were surprisingly weak. The most prominent was that between high student/faculty contact and students engaging in extra academic work beyond the classroom (Item 814). Engaging in additional unassigned academic work appears to be a somewhat distinctive dimension of academic performance--a conclusion reinforced by the fact that this item is less strongly associated with initial selectivity than the other two. This item is also characterized by a unique negative association hierarchical institutional culture. Unlike Items 812 and 813, work outside the classroom reflects the "value added" developmental notion of undergraduate teaching

Table 2

Results for Student Academic Development Variables

	(812) Student Achievement	(813) % Professional/ Graduate	(814) Extra Academic Work
Institutional Characteristics:			
Size			
Public Control			
Private Independent			
Comprehensive			
% Part-Time	-.150		
% Professional		-.164	-.159
% Undergraduate	-.169	-.135	-.195
High Selectivity (SAT)	.621	.521	.379
[R2 Step 1]	[.524]	[.448]	[.313]
Mission:			
Special Identity (403)		.140	.127
Distinctive Purpose (404)			
Programs Reflect Mission (405)	.136		.157
Shared Definition of Mission (406)	(.069)	.152	
[R2 Step 2]	[.591]	[.505]	[.396]
Institutional Culture:			
Clan			
Emergent			
Hierarchy	(-.057)		-.133
Market			
[R2 Step 3]	[.596]	[.505]	[.409]
Institutional Functioning:			
High Trust (829)	.106		
High Reward (831)			
High Feedback (832)			
High Student/Faculty Contact (826)			.128
[Total R2]	[.603]	[.505]	[.440]

N = 320

All coefficients represent unstandardized regression coefficients in the final model. (Beta coefficients in parentheses were not significant in the final model, but were significant at an earlier stage of the step-wise regression procedure.)

(Astin 1977). Not all institutions can be selective. These findings provide some grounds for believing that additional increments in student academic performance can be attained by influencing patterns of culture and institutional functioning. The strength of the findings, however, suggest that that such gains may be relatively small when compared to differences in achievement resulting from different levels of aptitude in the incoming student body.

Student Career Development

Like academic achievement, student career development was expected to exhibit stronger patterns of association with institutional characteristics variables than with institutional culture and functioning variables. Strong relationships were expected between student career development and such characteristics as professional orientation and percent part-time. Moderate relationships were expected with mission and institutional functioning factors in so far as institutional purpose was oriented toward occupational development, and in so far as programs actually reflected this purpose.

Inspection of Table 3 indicates that for the most part these expectations were met in the analysis. For all three items on this dimension, very few factors emerged as important beyond those mentioned. Percent professional degrees is of considerable importance for all three career development items, and percent part-time attendence is important in two of the three. It is interesting to note that the profile of Item 816 is somewhat different from other career development items because it is not a true performance factor. Most part-time students attend with an occupational goal in mind. But seeking a primarily occupational goal in the first place is quite different from actually attaining job placement and success as a result of college.

Table 3

Results for Student Career Development Variables

	(815) Job in Field	(816) Job is Goal	(817) Preparation for Job
Institutional Characteristics:			
Size			
Public Control			
Private Independent			
Comprehensive			-.085
% Part-Time		.337	.107
% Professional	.577	.339	.632
% Undergraduate			
High Selectivity (SAT)	.161	.166	
[R2 Step 1]	[.265]	[.260]	[.411]
Mission:			
Special Identity (403)			
Distinctive Purpose (404)			
Programs Reflect Mission (405)	.224	.306	.261
Shared Definition of Mission (406)			
[R2 Step 2]	[.333]	[.349]	[.485]
Institutional Culture:			
Clan			
Emergent			
Hierarchy	-.185		
Market			
[R2 Step 3]	[.357]	[.349]	[.485]
Institutional Functioning:			
High Trust (829)			
High Reward (831)			
High Feedback (832)			
High Student/Faculty Contact (826)			
[Total R2]	[.357]	[.349]	[.485]

N = 320

All coefficients represent unstandardized regression coefficients in the final model. (Beta coefficients in parentheses were not significant in the final model, but were significant at an earlier stage of the step-wise regression procedure.)

In the area of mission, the fact that programs delivered actually reflect mission emerges as strongly related to all three student career development items. It can, of course, be reasonably assumed that both the programs and mission referred to are occupational. What is interesting here is the fact that effectiveness is related not so much to mission distinctiveness, but rather to consistency in carrying out a mission even though the mission itself may be generally perceived to be a common one.

Student Personal Development

As suggested by past studies, patterns of student non-academic development were expected to be strongly related to institutional mission, culture and functioning. Strongest among these expected relations were distinctive mission and mission agreement, a "clan-like" institutional culture, and strong patterns of student/faculty contact. Institutional characteristics such as public control, size and percent part-time were expected to be negatively related to student personal development, though at a moderate level.

As Table 4 indicates, this pattern of relationships was indeed the case, and there was considerable consistency in the results obtained for each of the three items that constitute this dimension. The only major difference from hypothesized relationships was the fact that institutional characteristics proved more powerful than initially expected. Both public control and percent part-time emerged as consistently important factors on all three student personal development items. Similarly, high levels of student/faculty relations were consistently important across all three items.

Mission and institutional culture factors, however, showed mixed results. Clan culture was indeed associated with personal development for all three items,

Table 4

Results for Student Personal Development Variables

	(801) Personal Development	(808) Emphasize Non-Academic	(810) Non-Academic Development
Institutional Characteristics:			
Size			
Public Control	-.184	-.234	-.181
Private Independent		(.089)	
Comprehensive			
% Part-Time	-.177	-.386	-.338
% Professional		.201	
% Undergraduate			
High Selectivity (SAT)			
[R2 Step 1]	[.328]	[.351]	[.321]
Mission:			
Special Identity (403)	-.132	.175	
Distinctive Purpose (404)	.194	(.146)	
Programs Reflect Mission (405)			.142
Shared Definition of Mission (406)		(.027)	
[R2 Step 2]	[.367]	[.380]	[.373]
Institutional Culture:			
Clan	.216	(.087)	(.067)
Emergent			
Hierarchy			
Market			
[R2 Step 3]	[.459]	[.397]	[.400]
Institutional Functioning:			
High Trust (829)			
High Reward (831)		.112	
High Feedback (832)	.096		.103
High Student/Faculty Contact (826)	.307	.255	.211
[Total R2]	[.540]	[.453]	[.426]

N = 320

All coefficients represent unstandardized regression coefficients in the final model. (Beta coefficients in parentheses were not significant in the final model, but were significant at an earlier stage of the step-wise regression procedure.)

but only in the case of Item 801 did the relationship persist when institutional functioning factors were introduced into the model. Mission factors showed a variety of patterns, none of them strong. And as seen in the results of the step-wise regression procedure, mission factors explained relatively little unique variance in student personal development items.

Institutional Functioning as a Mediating Variable

As mentioned in the discussion of methodology above, attempting to specify a causal model for institutional characteristics, cultures, and performance factors is a tricky exercise because of many uncertainties about the true nature of causal direction. A rigorous causal estimation procedure such as LISREL was therefore not used in this study. Nevertheless, patterns in the regression results that indicated the power of such institutional functioning items as student/faculty contact (Item 826) and high levels of organizational information and feedback (Item 832) in explaining some elements of student performance suggested investigation of these items as mediating factors in explaining student performance. Furthermore, a basic thrust of major recent national reports, most notably that of the NIE Study Group on the Conditions of Excellence in American Higher Education (NIE 1984), is that increased student involvement and feedback are important ingredients in actually improving student performance. For this reason, exploring the role of student/faculty contact and of organizational information and feedback as policy levers for improving performance was additionally compelling.

Because of the stepwise regression process employed above, it was possible to examine results on all twelve student performance items without including student/faculty contact and information and feedback. Results indicated that inclusion or exclusion of these items considerably changed the pattern of

coefficients on other items--particularly for those factors having to do with mission and culture. These differences were strongest for student satisfaction and personal development items, and were least strong for student career development items.

To supplement these results, separate regressions were run on student/faculty contact (Item 826) and on levels of organizational information and feedback (Item 832) using institutional characteristic, mission, and institutional culture variables as predictors. The intent of this analysis was exploratory--to see if institutional characteristic, mission and institutional culture factors might be predictively linked to these items, which might in turn operate as mediators of student performance.

Results of these further regressions are presented in Table 5. First, a considerable amount of the variance in student/faculty contact can be explained in terms of prior characteristics. The strongest factors associated with student/faculty contact are institutional size and percent part-time--both negative associations. It is interesting to note that public control and private independent status both enter the analysis strongly associated with student/faculty contact, but the association evaporates when mission and cultural variables are introduced into the model. It is also interesting to observe that it is not mission distinctiveness that is related to student/faculty contact but instead agreement on mission. Finally, student/faculty contact is strongly related to patterns of culture--positively to a "clan-like" environment, and negatively to a "hierarchical" environment.

The pattern of results for information and feedback shows a somewhat different picture. In this case, institutional characteristics account for almost none of the variance in this area of functioning, and the only factor significantly

Table 5

Results for Selected Institutional Functioning Variables

	(832) High Feedback	(826) High Faculty/ Student Contact
Institutional Characteristics:		
Size		-.220
Public Control		(.008)
Private Independent		(-.074)
Comprehensive		
% Part-Time		-.110
% Professional		
% Undergraduate		
High Selectivity (SAT)	.102	
[R2 Step 1]	[.024]	[.393]
Mission:		
Special Identity (403)	-.243	
Distinctive Purpose (404)		
Programs Reflect Mission (405)	.279	
Shared Definition of Mission (406)	.252	.106
[R2 Step 2]	[.234]	[.459]
Institutional Culture:		
Clan		.426
Emergent	.197	
Hierarchy		-.166
Market		
[R2 Step 3]		
[Total R2]	[.271]	[.608]

N = 320

All coefficients represent unstandardized regression coefficients in the final model. (Beta coefficients in parentheses were not significant in the final model, but were significant at an earlier stage of the step-wise regression procedure.)

related is institutional selectivity. Mission variables, however, are strongly related to information and feedback--particularly those that have to do with actual delivery on mission rather than mission distinctiveness.

Taken together, these results are suggestive that increased student/faculty contact can be fostered in a variety of institutional circumstances, primarily by operating on mission agreement and institutional culture variables.

Implications

Findings of this research have several successive layers of implications. At the most general level, these results caution researchers against the dangers of attempting to directly link observable attributes of colleges and universities--for example size, control, and selectivity--with particular patterns of educational outcomes. Indeed, these results suggest that the presence or absence of particular cultural or institutional functioning factors may have a great deal to do with both the kinds and levels of outcomes produced. At a somewhat different level, these findings also suggest that mission differentiation and agreement are important elements in achieving effectiveness: "generic" outcomes are rare in higher education, and different types of institutions are better equipped than others to deliver on particular performance dimensions. Finally, these results show the potential efficacy of some particular policy levers available to most institutions. Indeed, results suggest that some structural factors that are often held to be insurmountable obstacles to improving undergraduate instructional quality may not be so intractable as is often maintained. All such implications, however, are suggestive, and reinforce a call for further inquiry.

"Non-Material" Determinants of Effectiveness

One purpose of this study was to explore the relative power of cultural, institutional functioning, and mission variables in explaining different patterns of student performance outcomes. While past literature on organizational effectiveness makes extensive use of such concepts as potential determinants of organizational performance, the concept of effectiveness employed is a very broad one. Empirical studies of student outcomes, in contrast, have concentrated on explaining a highly circumscribed dimension of institutional performance, but have tended to use as explanatory variables only such factors as institutional size, type, control, program array and selectivity.

Results of this study provide considerable grounds for arguing that "non-material" factors such as mission direction and specification, a "clan-like" or hierarchical institutional culture, and such elements of the organizational environment as reward and recognition for achievement, high information and feedback, and close contact between faculty and students may be important independent determinants of student performance. On each of the four basic dimensions of student performance investigated, such factors made significant unique contributions to explained variance. Furthermore, in most cases, each of the three additional blocks of "non-material" variables (mission, institutional culture, and institutional functioning) made a unique contribution to variance explained.

For the most part, the relative power of "non-material" variables on individual dimensions of student performance were consistent with current discussions in the literature on student learning and development. Unique contributions attributable to "non-material" factors were least for student career

development and academic achievement, and greatest for student satisfaction and non-academic development. More importantly, for those outcomes areas that actually reflect student change or "value-added"--for example, engaging in additional academic work beyond classroom assignments--"non-material" factors were relatively more important as predictive variables.

A major argument often advanced against attempting reforms in undergraduate instruction rests on the premise that immutable structural factors prevent the kinds of strategies known to be effective from being generalized from a very specific range of settings. Because innovative instructional approaches are often drawn from small colleges, administrators at larger institutions tend to automatically dismiss them as irrelevant or, from an implementation standpoint, impossible. The fact that "non-material" factors such as student/faculty contact accounted for notable differences in outcomes, even after controlling for differences in setting, tends to indicate that such contentions are unfounded. If "non-material" factors are appropriately attended to, important additional gains in effectiveness seem quite possible.

Effectiveness and Mission Specificity

One major implication of recent work on institutional effectiveness in higher education is that agreement on mission, and consistency in carrying out the concrete implications of institutional mission are important elements in developing effective strategy. For example, Chaffee (1984) documents the cases of several small colleges that developed effective "turnaround" strategies by ensuring that adaptational response to shifts in the environment were consistent with well-articulated and strongly held notions of mission. Institutions that ignored the need for such consistency were less effective in their adaptational efforts.

The results of the present study suggest that there is indeed a connection between strongly held and articulated missions, and institutional performance. They suggest further that different types of institutions seem to achieve and to value quite different kinds of outcomes. First, mission variables emerged as significant predictors for all twelve student performance items--a fact not true of any other block of variables with the exception of institutional characteristics. Secondly, mission variables were of two types, and each type tended to have a somewhat different kind of impact on student performance. Items 403 and 404 tap the distinctiveness of an institution's mission--the degree to which respondents perceived the institution's purpose to be special, unique, or at least differentiable from that of other institutions. These items appeared to be most related to student satisfaction and non-academic development--a finding that reinforces general perceptions that institutions that emphasize their distinctiveness tend to do so in non-academic areas (for example, Martin 1982, Astin and Lee 1972). Items 405 and 406, on the other hand, stress the level of agreement on mission, and the consistency with which the institution is actually delivering programs in line with its stated mission. These items seem most related to career development and to academic achievement. It is particularly interesting to note that both types of mission items are important in determining such "value-added" performance criteria as undertaking additional unassigned academic work and placements in graduate or professional schools.

Although far from conclusive, this pattern of results implies that (1) diversity of mission seems related to important differences in non-academic student development, and (2) consistency in articulating and carrying out institutional mission--whatever the institution's basic thrust--is important for achieving both academic and non-academic results. Institutions that lack

focus in their missions, regardless of mission content, may thus be at a disadvantage in delivering effective student performance.

Some Policy Levers for Change?

Recent national reports that call for improvement of undergraduate instruction have pointed to a number of factors that are expected to positively impact student learning and development. Two of the most important of these factors are increased involvement in the curriculum, and consistent feedback on performance (NIE 1984, AAC 1985). Furthermore, these reports have emphasized that involvement and feedback should be institution-wide phenomena: they should be as true of administrative behavior as of behavior in the classroom.

The results of this study provide some support for these policy directions. Both student/faculty relations (Item 826) and an administrative environment that provides substantial information and feedback (Item 832) were consistently and positively related to non-academic development and student satisfaction. Such factors, however, were not significant in accounting for student academic achievement or career development.

If institutional functioning factors such as these are indeed instrumental in producing certain desirable outcomes, the question arises as to how they themselves can be induced. Study results indicate that both factors are remarkably independent of predetermined institutional characteristics. For student/faculty contact, the results indicate strong zero-order linkages with public control, with total enrollment, and with the percentage of students enrolled part-time--all of which are consistent with commonly held perceptions. But when institutional culture and mission factors are introduced, these relations are considerably modified, and "non-material" factors account for

considerable additional variance. In the case of administrative functioning that stresses information and feedback, institutional characteristics alone account for almost no variance. The bulk of the explainable variation in this factor is attributable to mission and culture variables.

The implication of all these findings taken together tends to break the presumed direct linkage between an institution's physical environment and the kinds of outcomes that it is capable of producing. Rather than dismissing strategies developed in other settings, institutional administrators should be made aware of the many significant gains in student outcomes that can be made by shaping and sharpening institutional mission and by refining the institutional culture within which instruction takes place.

Appendix 1

Correlation Matrix

* * * * MULTIPLE REGRESSION * * * *

CORRELATION

	PUBLIC	PRIVIND	FTE83	PPROF82	PPTHC83	PUGHC83	MAJDOC	COMPR	GBA	SATVM77	M51A	M51B	M51C
PUBLIC	1.000	-.434	.462	.203	.143	-.051	.149	.308	-.364	-.235	-.499	-.041	.451
PRIVIND	-.434	1.000	-.076	-.118	.012	-.148	.059	.003	-.127	.341	.037	.203	-.186
FTE83	.462	-.076	1.000	.226	.131	-.339	.685	.202	-.532	.195	-.557	.132	.437
PPROF82	.203	-.118	.226	1.000	.380	-.209	.072	.241	-.395	-.419	-.186	-.002	.153
PPTHC83	.143	.012	.131	.380	1.000	-.610	-.025	.226	-.230	-.262	-.217	.089	.126
PUGHC83	-.051	-.148	-.339	-.209	-.610	1.000	-.278	-.315	.510	-.053	.267	-.158	-.153
MAJDOC	.149	.059	.685	.072	-.025	-.278	1.000	-.239	-.295	.284	-.338	.229	.164
COMPR	.308	.003	.202	.241	.226	-.315	-.239	1.000	-.737	-.044	-.218	-.092	.223
GBA	-.364	-.127	-.532	-.395	-.230	.510	-.295	-.737	1.000	-.102	.382	-.043	-.293
SATVM77	-.235	.341	.195	-.419	-.262	-.053	.284	-.044	-.102	1.000	-.089	.223	-.070
M51A	-.499	.037	-.557	-.186	-.217	.267	-.338	-.218	.382	-.089	1.000	-.256	-.663
M51B	-.041	.203	.132	-.002	.089	-.158	.229	-.092	-.043	.223	-.256	1.000	-.350
M51C	.451	-.186	.437	.153	.126	-.153	.164	.223	-.293	-.070	-.663	-.350	1.000
ICC1ADJ	-.473	.039	-.430	-.212	-.144	.189	-.203	-.247	.353	.048	.800	-.174	-.532
M403	-.200	.131	-.126	-.158	-.193	.037	.067	-.236	.112	.219	.219	.194	-.249
M404	-.175	.005	-.133	-.169	-.259	.087	-.005	-.185	.139	.177	.286	.197	-.308
M405	-.015	-.004	-.040	-.040	-.212	.136	.010	-.059	.043	.107	.160	.225	-.279
M406	-.275	.021	-.257	-.156	-.271	.169	-.078	-.201	.213	.099	.463	.129	-.454
M829	-.139	.051	-.047	-.052	-.104	.014	.002	-.068	.106	.116	.344	.279	-.443
M831	-.034	-.063	-.193	.126	.150	.029	-.278	.008	.101	-.268	-.017	-.268	.106
M832	.010	-.035	-.054	.093	.126	-.099	-.082	.068	-.032	-.153	-.150	-.248	.249
M801	-.446	.065	-.353	-.234	-.373	.247	-.142	-.174	.271	.056	.610	-.053	-.470
M805	-.086	.113	-.036	-.026	.029	-.032	.036	-.123	.097	-.095	-.256	-.161	.336
M806	.008	.010	-.118	.019	.139	.014	-.119	-.030	.099	-.275	-.154	-.149	.235
M807	-.099	.142	-.008	-.066	.029	-.037	.045	-.054	.010	-.020	-.235	-.106	.255
M808	-.347	-.031	-.265	-.082	-.462	.285	-.125	-.146	.258	-.020	.450	-.085	-.301
M810	-.349	.031	-.235	-.240	-.480	.290	-.067	-.170	.257	.126	.421	-.018	-.320
M812	.222	-.249	-.121	.345	.275	.070	-.251	.075	.048	-.707	-.043	-.246	.210
M813	.271	-.245	-.067	.389	.225	.085	-.187	.053	.052	-.643	-.078	-.142	.134
M814	-.127	.243	.129	-.302	-.131	-.142	.231	-.037	-.080	.538	.059	.268	-.227
M815	-.013	-.008	.029	.472	.129	-.105	.057	.016	-.152	-.043	.008	.204	-.170
M816	.109	.028	.183	.400	.397	-.329	.116	.112	-.247	-.041	-.164	.180	-.007
M817	.137	-.065	.085	.641	.272	-.193	.050	.075	-.210	-.277	-.074	.124	-.039
M826	.394	.013	.562	.264	.281	-.320	.337	.224	-.405	.051	-.725	.086	.589

**** MULTIPLE REGRESSION ****

	ICC1ADJ	M403	M404	M405	M406	M829	M831	M832	M801	M805	M806	M807	M808
PUBLIC	-.473	-.200	-.175	-.015	-.275	-.139	-.074	.010	-.446	-.086	.008	-.099	-.347
PPIVIND	.079	.171	.005	-.004	.021	.051	-.067	-.035	.065	.113	.010	.142	-.031
FTE23	.430	-.126	-.173	-.040	-.25	-.017	-.137	-.054	-.358	-.036	-.118	-.008	-.265
PPPOP82	-.212	-.158	-.169	-.040	-.156	-.052	.126	.093	-.234	-.026	.019	-.066	-.082
PPTHC82	.144	-.193	-.259	-.212	-.271	-.104	.150	.126	-.373	.029	.139	.029	-.462
PUGHC82	.154	.077	.087	.136	.169	.014	.029	-.099	.247	-.032	.014	-.037	.285
MAJDUC	.207	.067	-.005	.010	-.073	.002	-.278	-.082	-.142	.036	-.119	.045	-.125
COMPP	-.217	-.236	-.185	-.059	-.201	-.062	.008	.068	-.174	-.123	-.030	-.054	-.146
GBH	.353	.112	.139	.043	.213	.106	.101	-.032	.271	.097	.099	.010	.258
SHTVM22	.049	.219	.177	.107	.099	.116	-.268	-.153	.056	-.095	-.275	-.020	-.020
M51A	.300	.219	.286	.160	.463	.344	-.217	-.150	.610	-.256	-.154	-.235	.450
M51B	-.174	.194	.197	.225	.129	.279	-.268	-.243	-.053	-.161	-.149	-.106	-.085
M51C	-.532	-.249	-.308	-.279	-.454	-.443	.106	.249	-.470	.336	.235	.255	-.301
ICC1ADJ	1.000	.278	.275	.187	.442	.342	-.046	-.182	.470	-.189	-.122	-.174	.342
M403	.278	1.000	.732	.477	.567	.223	-.229	-.126	.212	-.113	-.199	-.084	.128
M404	.275	.732	1.000	.677	.744	.425	-.337	-.328	.363	-.311	-.348	-.287	.285
M405	.187	.477	.677	1.000	.694	.434	-.346	-.416	.262	-.349	-.337	-.329	.205
M406	.442	.567	.744	.694	1.000	.544	-.316	-.395	.426	-.366	-.355	-.300	.365
M829	.342	.223	.425	.434	.544	1.000	-.375	-.511	.321	-.480	-.338	-.419	.266
M831	-.046	-.229	-.337	-.346	-.316	-.375	1.000	.551	-.092	.256	.240	.219	-.145
M832	-.182	-.126	-.328	-.416	-.395	-.511	.551	1.000	-.252	.382	.319	.360	-.217
M801	.470	.212	.363	.262	.426	.321	-.092	-.252	1.000	-.328	-.248	-.297	.719
M805	-.189	-.113	-.311	-.349	-.366	-.480	.256	.382	-.328	1.000	.707	.773	-.300
M806	-.122	-.199	-.348	-.337	-.355	-.338	.240	.319	-.248	.707	1.000	.742	-.218
M807	-.174	-.084	-.287	-.329	-.300	-.419	.219	.360	-.297	.773	.742	1.000	-.281
M808	.342	.128	.285	.205	.365	.266	-.145	-.217	.719	-.300	-.218	-.281	1.000
M810	.348	.218	.328	.320	.402	.296	-.194	-.253	.762	-.293	-.223	-.225	.771
M812	-.152	-.335	-.365	-.321	-.320	-.313	.336	.257	-.242	.274	.439	.215	-.085
M813	-.203	-.362	-.323	-.227	-.286	.264	.285	.176	-.255	.141	.251	.060	-.155
M814	.117	.217	.311	.249	.236	.240	-.213	-.197	.230	-.289	-.347	-.195	.048
M815	-.005	.093	.147	.270	.165	.179	-.057	-.164	.028	-.247	-.243	-.293	-.014
M816	-.109	.067	.113	.231	.042	.102	-.076	-.135	-.226	-.167	-.252	-.267	-.264
M817	-.013	.079	.074	.218	.106	.116	.069	-.053	-.112	-.085	-.089	-.145	-.087
M326	-.530	-.231	-.305	-.237	-.461	-.342	-.026	.173	-.631	.321	.214	.301	-.480

INCLUDE SAT AND MALE AS INDEP.VARS
FILE SAVEM77 (CREATION DATE = 9/24/85)

**** MULTIPLE REGRESSION ****

	M810	M812	M813	M814	M815	M816	M817	M826
PUBLIC	-.349	.222	.271	-.127	-.013	.109	.137	.394
PRIVIND	.041	-.249	-.245	.243	-.008	.028	-.065	.013
FTE83	-.235	-.121	-.067	.129	.029	.183	.085	.562
PPROF82	-.240	.345	.389	-.302	.472	.469	.441	.264
PPTHC83	-.480	.275	.225	-.131	129	.397	.272	.281
PUGHC83	.290	.070	.035	-.142	-.105	-.329	-.193	-.320
MAJDOC	-.067	-.251	-.187	.231	.057	.116	.050	.337
COMPR	-.170	.075	.053	-.037	.016	.112	.075	.224
GBA	.257	.048	.052	-.080	-.152	-.247	-.210	-.405
SATVM77	.126	-.707	-.643	.538	-.043	-.041	-.277	.051
M51A	.421	-.043	-.078	.059	.008	-.164	-.076	-.725
M51B	-.018	-.246	-.142	.268	.204	.180	.124	.086
M51C	-.320	.210	.134	-.227	-.170	-.007	-.039	.589
ICC1ADJ	.348	-.152	-.203	.147	- 005	-.109	-.073	-.590
M403	.218	-.335	-.362	.343	.093	.067	.079	-.231
M404	.328	-.365	-.328	.311	.147	.113	.074	-.305
M405	.320	-.321	-.227	.299	.270	.231	.218	-.237
M406	402	-.320	-.286	.236	.165	.042	.106	-.461
M829	.296	-.313	-.204	.240	179	.102	.116	-.342
M831	-.184	.336	.285	-.213	-.057	-.076	.063	-.026
M832	-.253	.257	176	-.197	-.164	-.135	-.053	.173
M801	.762	-.242	-.255	.230	.028	-.226	-.118	-.631
M805	-.293	.274	.141	-.289	-.247	-.187	-.085	.321
M806	-.223	.439	.251	-.347	-.243	-.252	-.089	.214
M807	-.225	.215	.060	-.195	- 293	-.267	-.145	.301
M808	.771	-.085	-.155	.048	-.014	-.264	-.087	-.480
M810	1.000	-.293	-.300	.256	-.005	-.271	-.140	-.477
M812	-.283	1.000	.678	-.676	-.173	-.071	.093	.116
M813	-.300	.678	1.000	-.584	.019	.022	.222	.102
M814	.256	-.676	-.584	1.000	154	.135	-.028	-.133
M815	-.005	-.173	.019	.154	1.000	.546	.681	-.019
M816	-.271	-.071	.022	.135	.546	1.000	.570	.209
M817	-.140	.093	.222	-.028	.681	.570	1.000	.078
M826	- 477	.116	.102	-.133	-.019	.209	.078	1.000

Appendix 2

Basic Statistics on All Study Variables

CLASS TYPE OF INSTITUTION

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
MAJDOC	1.	28	8.6	8.6	8.6
COMPR	2.	124	38.0	38.0	46.6
GBA	3.	153	46.9	46.9	93.6
SPECIALTY	4.	21	6.4	6.4	100.0
	TOTAL	326	100.0	100.0	

CONTROL

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
PUBLIC	1.	123	37.7	37 7	37.7
INDEP	2.	79	24.2	24.2	62.0
RELIG	3.	124	38.0	38.0	100.0
	TOTAL	326	100.0	100.0	

VARIABLE FTE83 TOTAL FTE 83

MEAN	3805.098	STD ERROR	225.330	STD DEV	4068.443
KURTOSIS	3.131	SKEWNESS	1.833	MINIMUM	192.000
MAXIMUM	20286.000				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE PPROF82 %PROFESSIONAL DEGS 82

MEAN	62.626	STD ERROR	1.244	STD DEV	22.452
KURTOSIS	1.096	SKEWNESS	-1.216	MINIMUM	.000
MAXIMUM	100.000				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE PPTHC83 %PART TIME HEADCOUNT 83

MEAN	27.108	STD ERROR	1.030	STD DEV	18.596
KURTOSIS	-.179	SKEWNESS	.641	MINIMUM	.000
MAXIMUM	94.009				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE PUGHC83 %UNDERGRAD HEADCOUNT 83

MEAN	80.337	STD ERROR	.942	STD DEV	17.004
KURTOSIS	3.133	SKEWNESS	-1.434	MINIMUM	.000
MAXIMUM	100.000				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE SATVM77 SAT VERBAL+MATH 77

MEAN	940.573	STD ERROR	6.783	STD DEV	121.528
KURTOSIS	1.079	SKEWNESS	.580	MINIMUM	592.000
MAXIMUM	1340.000				

VALID OBSERVATIONS - 321 MISSING OBSERVATIONS - 5

VARIABLE M51A Sect 5 Quest 1 CLAN: Admin+Fac MEAN

MEAN	47.674	STD ERROR	.997	STD DEV	18.004
KURTOSIS	-.741	SKEWNESS	-.259	MINIMUM	5.000
MAXIMUM	86.250				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE M51B Sect 5 Quest 1 EMERGENT: Admin+Fac MEAN

MEAN	17.751	STD ERROR	.492	STD DEV	8.876
KURTOSIS	1.256	SKEWNESS	1.077	MINIMUM	2.000
MAXIMUM	53.333				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE M51C Sect 5 Quest 1 HIERARCHY: Admin+Fac MEAN

MEAN	18.972	STD ERROR	.658	STD DEV	11.877
KURTOSIS	.157	SKEWNESS	.818	MINIMUM	.833
MAXIMUM	57.143				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE M51D Sect 5 Quest 1 MARKET: Admin+Fac MEAN

MEAN	15.424	STD ERROR	.522	STD DEV	9.428
KURTOSIS	1.014	SKEWNESS	.923	MINIMUM	.000
MAXIMUM	33.571				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE ICC1ADJ INTRACLASS CORR.SECT 5 Q1 ADJUSTED

MEAN	.462	STD ERROR	.016	STD DEV	.296
KURTOSIS	-1.292	SKEWNESS	-.067	MINIMUM	.000
MAXIMUM	.953				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE M403 Sect 4 Quest 3: Admin+Fac MEAN

MEAN	3.171	STD ERROR	.041	STD DEV	.738
KURTOSIS	-.713	SKEWNESS	.154	MINIMUM	1.571
MAXIMUM	4.889				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE M404 Sect 4 Quest 4: Admin+Fac MEAN

MEAN	3.845	STD ERROR	.032	STD DEV	.57
KURTOSIS	.133	SKEWNESS	-.622	MINIMUM	1.800
MAXIMUM	5.000				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE M405 Sect 4 Quest 5: Admin+Fac MEAN

MEAN	3.963	STD ERROR	.022	STD DEV	.395
KURTOSIS	.843	SKEWNESS	-.594	MINIMUM	2.500
MAXIMUM	4.833				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE M406 Sect 4 Quest 6: Admin+Fac MEAN

MEAN	3.375	STD ERROR	.033	STD DEV	.592
KURTOSIS	-.545	SKEWNESS	-.270	MINIMUM	1.800
MAXIMUM	4.700				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE M801 Sect 8 Quest 1: Admin+Fac MEAN

MEAN	3.878	STD ERROR	.032	STD DEV	.580
KURTOSIS	.539	SKEWNESS	-.784	MINIMUM	1.833
MAXIMUM	5.000				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE M805 Sect 8 Quest 5: Admin+Fac MEAN

MEAN	2.196	STD ERROR	.027	STD DEV	.491
KURTOSIS	.321	SKEWNESS	.729	MINIMUM	1.167
MAXIMUM	3.833				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE M806 Sect 8 Quest 6: Admin+Fac MEAN

MEAN	2.150	STD ERROR	.029	STD DEV	.516
KURTOSIS	.761	SKEWNESS	.667	MINIMUM	1.125
MAXIMUM	4.200				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE M807 Sect 8 Quest 7: Admin+Fac MEAN

MEAN	2.058	STD ERROR	.024	STD DEV	.431
KURTOSIS	1.557	SKEWNESS	.904	MINIMUM	1.250
MAXIMUM	4.000				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE M808 Sect 8 Quest 8: Admin+Fac MEAN

MEAN	3.250	STD ERROR	.035	STD DEV	.629
KURTOSIS	-.682	SKEWNESS	-.383	MINIMUM	1.500
MAXIMUM	4.429				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE M810 Sect 6 Quest 10: Admin+Fac MEAN

MEAN	3.456	STD ERROR	.030	STD DEV	.538
KURTOSIS	.355	SKEWNESS	-.748	MINIMUM	1.600
MAXIMUM	4.667				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE M812 Sect 8 Quest 12: Admin+Fac MEAN

MEAN	3.186	STD ERROR	.040	STD DEV	.727
KURTOSIS	.107	SKEWNESS	-.250	MINIMUM	1.143
MAXIMUM	5.167				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE M813 Sect 8 Quest 13: Admin+Fac MEAN

MEAN	5.195	STD ERROR	.046	STD DEV	.837
KURTOSIS	1.115	SKEWNESS	-1.020	MINIMUM	1.667
MAXIMUM	6.425				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE M814 Sect 8 Quest 14: Admin+Fac MEAN

MEAN	3.356	STD ERROR	.038	STD DEV	.690
KURTOSIS	2.215	SKEWNESS	1.108	MINIMUM	2.000
MAXIMUM	6.333				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE M815 Sect 8 Quest 15: Admin+Fac MEAN

MEAN	4.936	STD ERROR	.038	STD DEV	.686
KURTOSIS	-.224	SKEWNESS	-.398	MINIMUM	3.000
MAXIMUM	6.857				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE M816 Sect 8 Quest 16: Admin+Fac MEAN

MEAN	5.364	STD ERROR	.034	STD DEV	.610
KURTOSIS	.398	SKEWNESS	-.470	MINIMUM	3.000
MAXIMUM	6.667				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE M817 Sect 8 Quest 17: Admin+Fac MEAN

MEAN	5.094	STD ERROR	.040	STD DEV	.714
KURTOSIS	.682	SKEWNESS	-.688	MINIMUM	2.875
MAXIMUM	6.857				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE M826 Sect 8 Quest 26: Admin+Fac MEAN

MEAN	2.624	STD ERROR	.045	STD DEV	.807
KURTOSIS	.219	SKEWNESS	.724	MINIMUM	1.000
MAXIMUM	5.167				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE M829 Sect 8 Quest 29: Admin+Fac MEAN

MEAN	4.310	STD ERROR	.045	STD DEV	.815
KURTOSIS	-.444	SKEWNESS	.064	MINIMUM	2.200
MAXIMUM	6.500				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE M831 Sect 8 Quest 31: Admin+Fac MEAN

MEAN	3.462	STD ERROR	.035	STD DEV	.633
KURTOSIS	.629	SKEWNESS	.400	MINIMUM	1.800
MAXIMUM	6.000				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

VARIABLE M832 Sect 8 Quest 32: Admin+Fac MEAN

MEAN	3.081	STD ERROR	.035	STD DEV	.628
KURTOSIS	-.202	SKEWNESS	.218	MINIMUM	1.500
MAXIMUM	5.000				

VALID OBSERVATIONS - 326 MISSING OBSERVATIONS - 0

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