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AUTHOR Kuh, George D; And Others
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ABSTRACT

The purpose of this study was to determine the contributions of student effort, campus environments and institutional culture to student learning in three types of institutions: small residential colleges; large residential universities; and universities located in metropolitan areas. Data sources were qualitative assessments of 13 campus cultures and a College Student Experience Questionnaires completed by 3,601 undergraduates (38% response rate) at these institutions. Among the findings was that student gains exhibited a linear dependence on the combination of student effort, environmental characteristics, and the institution's culture. In general, the more effort students devoted to learning activities, the more they learned. Patterns of student learning and development did not differ appreciably across institutional types. Institutional culture had more influence on student learning at large residential institutions than at small residential colleges and metropolitan universities. Appendices provide lists of College Student Experiences Questionnaire effort scales, environment scales, and estimate of gains scores. Contains 37 references. (Author/GLR)

The Influence of Student Effort, College Environments, and Campus Culture on Undergraduate Student Learning and Personal Development

George D. Kuh
James C. Arnold
Nick Vesper

Center for Postsecondary Research and Planning
School of Education
Indiana University
Bloomington IN 47405
812-855-0175
BITNET: kuh@iubacs
FAX: 812-855-3044

April 19, 1991

Texas A&M University
Department of Educational
Administration
College Station, TX 77843
(409) 845-0393

ASSOCIATION FOR THE STUDY OF HIGHER EDUCATION

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ABSTRACT

The Influence of Student Effort, College Environments, and Campus Culture on Undergraduate Student Learning and Personal Development

What and how much students learn vary across colleges (Pascarella & Terenzini, 1991). The purpose of this study was to determine the contributions of student effort, campus environments and institutional culture to student learning in three types of institutions: small residential colleges, large residential universities, and universities located in metropolitan areas. Data sources were qualitative assessments of 13 campus cultures and 3601 College Student Experience Questionnaires completed by undergraduates at these institutions. Student gains exhibited a linear dependence on the combination of student effort, environmental characteristics, and the institution's culture. In general, the more effort students devote to learning activities, the more they learn. Patterns of student learning and development did not differ appreciably across institutional types. Institutional culture had more influence on student learning at large residential institutions than at small residential colleges and metropolitan universities.

The Influence of Student Effort, College Environments, and Campus Culture on Undergraduate Student Learning and Personal Development

Student learning in college occurs through associations with peers, faculty and others in such settings as classrooms, laboratories, libraries, athletic and recreational facilities, student residences, fine arts facilities, and campus unions (Pace, 1988). What and how much students learn vary across colleges (Pascarella & Terenzini, 1991). Baird (1990) found that, on average, students at selective liberal arts colleges reported higher levels of involvement in different learning activities compared with their counterparts at general liberal arts colleges, comprehensive universities, and doctoral universities.

Pace's (1988) analysis of College Student Experience Questionnaire (CSEQ) data demonstrated that the variance in involvement in learning activities may be greater within institutional categories (e.g., selective liberal arts, research universities) than between categories. That is, students at some selective liberal arts colleges are more involved in learning activities than peers at other selective colleges.

Social learning theory (Bandura, 1977) suggests that people tend to exhibit consistent patterns of behavior in particular settings (Barker, 1968) because environmental stimuli consistently elicit and reinforce certain behaviors (Barker, 1968; Moos, 1976). These environmental stimuli have important

objective, physical components as well as important subjectively perceived and experienced qualities (Baird, 1988; Huebner, 1979; Western Interstate Commission for Higher Education, 1973). This point of view suggests that variations in student learning across colleges and universities may be, in part, a function of characteristics of college environments: physical properties including the use of open space and the size, location, and use of buildings (Gerber, 1989); the ambience created by the behavior and personalities of students (Astin & Holland, 1961); the perceptions of students (Pace, 1984); the environmental "press" (Stern, 1970) or expectations established by dominant student (Clark & Trow, 1966) or faculty groups; and the cultural elements of campus life consisting of patterns of norms, practices, symbols, values, beliefs, and assumptions that guide the behavior of individuals and groups (Kuh & Whitt, 1988).

The college outcomes literature (e.g., Astin, 1977; Feldman & Newcomb, 1969; Pascarella & Terenzini, 1991) indicates that institutions that clearly and consistently express their educational purposes seem to be able to shape desirable student behavior and foster interactions among people who are basically supportive of the institution's purposes (Baird, 1988). That is, institutions with salient missions create expectations for how students are to spend their time (e.g., studying in the library or socializing) and how much effort is required to be academically and socially successful (Pascarella & Terenzini, 1991).

Taken together, these perspectives suggest that student learning and development are affected by two sets of factors: (a) such institutional environmental characteristics as the quality of relationships between student peers and faculty, and (b) such characteristics of student involvement or effort as time spent studying in the library or participating in educational programs in the union building or residence hall. The institutional factors can be further divided into two types: operational environmental factors (e.g., the emphasis an institution places on general education or vocational preparation) and those indigenous to the institutional culture (e.g., egalitarian attitudes that encourage faculty contact with all students). Thus student learning gains can be expressed as a combination of operational environmental factors, underlying cultural factors, and student involvement (effort) factors. Although the interactions of these factors might be complex, parsimony suggests a simple linear model:

gains = operational environment
+ cultural environment
+ student involvement

We think we have appropriate measures of these factors in order to test the linear model and explain the effects of these factors on gains in student learning. If the influence of these factors on student learning can be better understood, faculty members, academic and student affairs administrators, trustees

and others can consider ways in which to modify institutional policies and practices to encourage learning.

Purpose

The purpose of this study was to determine how student involvement in campus activities, student perceptions of their college environment, and institutional culture work together to influence student learning. These relationships were explored within the context of three types of institutions: small residential colleges, large residential universities, and universities located in metropolitan areas. Three questions guided the study:

1. Can a linear model based on involvement and environmental factors explain student gains in learning and personal development?
2. Is institutional type associated with different patterns of student learning and development?
3. Can quantitative data describing the relationship between characteristics of college environments and student learning be enriched by using qualitative assessments of campus culture? That is, can informed observations of campus culture add to the explanatory power of the influence of the environment on learning?

This last question raises issues of combining qualitative and quantitative methods which are too complicated to adequately address here. We are aware of the debate and the difficulties of reconciling the two approaches (e.g., Howe, 1988; Lincoln, 1986;

Lincoln & Guba, 1989; Smith & Heshusius, 1986). However our purpose was not to contribute to the debate but to see whether some of the information obtained through qualitative methods can be used to better understand the influence of cultural aspects of college environments on student learning that cannot be nor have been estimated using survey techniques (Jick, 1979). This mixing of approaches has been used with some success in the higher education retention literature (Bean & Vesper, 1990).

Methods

The information on which this investigation was based was gathered under the auspices of the College Experiences Study, a year-long investigation of the institutional conditions associated with student involvement in out-of-class learning opportunities at 14 colleges and universities (Kuh, Schuh, Whitt, Andreas, Lyons, Strange, Krehbiel & MacKay, 1991).

Data Sources

Participating institutions were identified with the assistance of 48 experts drawn from higher education scholars (e.g., Alexander Astin, Zelda Gamson, C. Robert Pace, David Riesman), higher education associations (e.g., American Association for Higher Education, American Council on Education, Council of Independent Colleges), regional accreditation associations, selected college and university presidents, and former presidents of the American College Personnel Association

and the National Association of Student Personnel Administrators. The study included large universities (Iowa State University, Miami University, Stanford University, University of California, Davis), small liberal arts colleges (Berea College, Earlham College, Grinnell College, The Evergreen State College), and metropolitan institutions (University of Alabama-Birmingham, University of Louisville, University of North Carolina-Charlotte, Wichita State University). A women's college (Mount Holyoke College) and a historically black college (Xavier University) were also studied.

Data Collection

As indicated earlier, both qualitative and quantitative methods were employed. Qualitative methods (interviews, observations, document analysis) were used to discover and describe institutional cultures and subcultures as well as other aspects of campus life thought to be related to student learning (e.g., institutional mission and philosophy, policies and practices). About 1300 people (175 faculty, 83 academic administrators including presidents, chief academic officers and registrars, 305 student affairs professionals, 644 students, and 73 others such as graduates, trustees, librarians, and staff) were interviewed, some of them more than once, during 26 visits of 2-4 days in duration to the 14 colleges and universities. A detailed description of the qualitative methods employed is presented in Whitt and Kuh (in press).

In addition to the qualitative data collection activities, the College Student Experience Questionnaire (CSEQ) was administered to 9445 randomly selected undergraduate students at 13 of the 14 institutions. Students at The Evergreen State College refused to participate in this phase of the study because they believe standardized instruments are not able to capture some of the more important dimensions of their education.

Usable CSEQs were returned by 3601 students: Berea (236/398, 59%); Earlham (85/400, 21%); Grinnell (264/605, 42%); Iowa State (270/994, 27%); Miami (538/1000, 54%); Mount Holyoke (180/396, 46%); Stanford (192/690, 28%); University of Alabama-Birmingham (316/748, 42%); University of California, Davis (725/1486, 49%); University of Louisville (317/965, 32%); University of North Carolina-Charlotte (201/750, 27%); Wichita State (209/934, 22%); and Xavier (68/120, 34%).

The response rate (38%), although not unusual for a survey instrument of this type, was depressed by the inclusion of the four metropolitan institutions in the study. The 31% participation rate of students at metropolitan universities can be attributed in part to the fact that few students at these institutions live on campus (most are older than 25, attend college part time, and commute to class) and have many other activities (e.g., job, family, community responsibilities) that compete with responding to surveys. Also, student participation in survey research is notoriously low at Stanford; the responses to the annual Stanford Senior Survey, an activity to which the

Stanford administration devotes considerable effort, yields only about 30% annually. In any event, because the CSEQ data was used in concert with the institutional case reports based on the qualitative data, 3601 cases were deemed sufficient for the purposes of this study.

Independent Variables. Three sets of independent variables were employed corresponding to the categories of student involvement (effort), college environment, and institutional culture. The CSEQ Quality of Effort scales reflect student involvement by measuring how often students engage in such activities as studying, use of the library, use of recreational facilities, and talking with peers and faculty about academic matters or personal concerns (Appendix A). The CSEQ has 14 such scales made up of multiple items (each with a four-point rating scale: 4=very often, 3=often, 2=occasionally, 1=never). Because not all undergraduates are able to live in a residence hall or join a fraternity or sorority, this scale was omitted from the analysis per Pace's (1987) suggestion.

The assessment of institutional environments was based on a quantitative measure of student perceptions produced by the eight CSEQ College Environment Scales (Appendix B). Five of the seven-point rating scales (from 7=strong emphasis to 1=weak emphasis) refer to the extent to which students perceive that the environment emphasizes certain aspects of learning (scholarship, estheticism, critical thinking, vocational competence, practical

relevance of courses); the remaining three scales refer to relationships among students, faculty, and administrators.

The measures of institutional cultures were distilled from the case summaries produced by the College Experiences Study for each of the 13 institutions. The reports describe the physical setting, campus culture, history and traditions, policies and practices, and the role of faculty and staff in promoting student learning. Six cultural variables were derived from the qualitative data and were scored from one (1) to seven (7) (Table 1). For example, the ethos of one institution might be egalitarian (=1), another meritocratic (=7), yet another a mixture of these two extremes exhibiting some aspects of both (=3). The scores are not meant to be normative statements of the conditions on a particular campus but informed judgments of structural and functional properties of campus cultures (Kuh & Whitt, 1988). A description of the cultural variables follows:

(a) LOCATION--perceived or real distance from urban settings and their attendant amenities, from isolation (= 1) to city-based (=7);

(b) STATUS--status distinctions between students, faculty, and administration, from absence where everyone is addressed by their first name and there are no fraternities on campus (=1), to an emphasis on status where persons are almost always addressed using titles, and fraternity and other exclusionary social groups tend to dominate student life (=7);

(c) ETHOS--pervasive assumptions about how to encourage learning, from egalitarian as an emphasis on collaborative learning (=1), to meritocratic as an emphasis on competitive behavior (=7);

(d) PHILOS--student life philosophy, from autonomous where students are expected to be responsible and self-directed (=1), to very structured where numerous rules and regulations governing student life are imposed by the institution (=7);

(e) STRENGTH-- strength of the institutional culture, from weak where there are relatively few pervasive cultural values and norms (=1), to strong where numerous traditions, ceremonies, and rituals as well as binding behavioral norms dominate (=7);

(f) MULTIC--enacted (not merely espoused) institutional commitment to multiculturalism, from low where issues related to diversity and multiculturalism are not emphasized in the institution's mission, philosophy, policies and practices (= 1), to high where numerous references to multiculturalism by institutional leaders are undergirded by policies and practices such as the presence of ethnic theme houses or community centers and institutional financial aid targeted for students from historically underrepresented groups (=7).

Insert Table 1 about here

Dependent Variables. The 21 Estimate of Gains scales from the CSEQ consist of student ratings of progress toward important educational goals (Appendix C). According to Pace (1988), these goals are frequently mentioned in the higher education literature and have been used in national surveys over the past several decades.

> The questions in the Estimate of Gains section . . . is a value added question. It doesn't ask students to estimate how much they have benefitted from college, or how well they can do certain things, or how much they know. It asks how much they have gained, how much they have added to their knowledge, their intellectual skills, and to other abilities and insights as a result of their experiences in college. . . . We know from both internal and external evidence that [students'] recall of activities and their estimates of gains are credible, and that they respond carefully and perhaps in many cases with personal interest to the content of the questionnaire. Because their responses are congruent with other judgments, and because for some goals the students may well be the only qualified judges of whether they are different today than from what they were when they arrived, we must pay attention to what they say. (Pace, 1988, pp. 102-103)

As with the Quality of Effort scales, the Estimate of Gains scales are scored on a four-point rating scale (4=very much, 3=quite a bit, 2=some, 1=very little).

The characteristics of collegiate environments differ by size and types such as small, single-purpose liberal arts colleges or large research universities (Astin, 1977; Baird, 1988; Pace, 1988). Data from the CSEQ were analyzed by the three institutional types studied: (a) small residential with fewer than 5,000 students (Berea, Earlham, Grinnell, Mount Holyoke); (b) large residential with 5,000 or more students (Iowa State, Miami, Stanford, University of California, Davis); and (c) institutions located in a metropolitan setting with a high proportion of commuting students (University of Alabama at Birmingham, University of Louisville, University of North Carolina at Charlotte, Wichita State University, Xavier University).

Data Analysis

Taken together, the relationships among the 14 Quality of Effort, 8 College Environment, and 21 Estimate of Gains scales are too numerous to meaningfully examine and interpret. Hence, factor analysis (as recommended by Pace, 1987) was used to reduce these three sets of variables to a more wieldy number. Factor definitions and their component CSEQ scales follow.

The Estimate of Gains scales were reduced to five gains factors (Pace, 1987):

PERS & SOC	personal and social development
	SELF+OTHERS+VALUES+TEAM+HEALTH
SCI & TECH	science and technology
	SCI+SCI/TECH+CONSQ S/T
ED, LIT & ARTS	general education, literature and the arts
	GENLED+LIT+ARTS+WRITE+PHILS
INTEL SKILLS	intellectual skills
	ANALY+SYNTH+QUANT+INQ
VOC PREP	vocational preparation
	VOC+CAREER+SPEC

The Quality of Effort scales were reduced to four involvement factors (Pace, 1987):

QE ACAD	academic activities
	LIB+FAC+COURSE+WRITE
QE INTERPERS	informal personal activities
	AMT+PERS+STACQ+CONTPS+CON INFO
QE GRP FACIL	activities related to groups and facilities
	UNION+ATHL+CLUBS
QE SCI	activities related to science
	SCI

The College Environment scales were reduced to three environmental factors (Pace, 1987):

ENV RELATS	supportive personal relationships
	STU+FAC+ADM
ENV SCHOL	scholarly, intellectual emphasis
	SCH+ESTH+CRIT

ENV VOC	vocational, practical emphasis
	VOC+PRAC

In addition to having been empirically established (Pace, 1987), these factors also appear conceptually and intuitively valid. That is, those scales expected a priori to be highly correlated do, indeed, group together in sensible ways.

Because we were testing a linear model, 15 OLS multiple regression analyses were conducted, one for each institutional type using each of the five dependent gains factors. For each model the 13 independent variables were the four involvement factors, the three environmental factors, and the six cultural variables. All variables were entered first and then removed one at a time to improve overall model fit and variable significance.

Results

The results of the analyses by institutional type are presented in Tables 2-4. The following presentation has been organized by the dependent variables, the five Estimate of Gains factors.

Gains in Personal and Social Development (PERS & SOC)

At small residentials the model fit was R^2=.316 with two quality of effort factors (GRP FACIL and INTERPERS) and one environmental factor (RELATS) having the highest influence (betas of .25, .16, .23 respectively) (Table 2). The other two quality of effort factors, ACAD and SCI, and the SCHOL environmental

variable had small effects (.09, -.07, .08), with SCI negative. Only one cultural variable, LOCATION, had a small effect (.08). Thus, at small residentials, gains in personal and social development are affected most by membership in clubs and organizations and use of group facilities, informal activities with peers, and by the perceived quality of student, faculty, and administrator relationships.

At large residentials, the model fit was R^2=0.284 with two quality of effort factors, INTERPERS and GRP FACIL, having the strongest influences (betas of .22 and .21); the environmental factor RELATS (.14) and the cultural factor ETHOS (.13) also were important (Table 3). Other statistically significant variables included the quality of effort factor ACAD (.06), environmental factors SCHOL (.08) and VOC (.09), and the cultural variable STRENGTH (-.09). As with the small residentials, the factors with the most influence on gains were QE INTERPERS and QE GRP FACIL. The size of the ETHOS effect suggests that competition had a positive affect on learning at large residentials.

Five factors also appeared in the regression equation for metropolitan institutions (R^2=0.316): QE INTERPERS (beta 0.24), QE GRPFACIL (.22), ENV RELATS (.15), ENV VOC (.15) and QE ACAD (.13) (Table 4). This parallels the results for large residentials though none of the institutional cultural variables appear.

Gains in Science and Technology (SCI & TECH)

Science and technology gains provided the most robust model: small residentials, R^2=0.516; large residentials, R^2=0.457; and metropolitan, R^2=0.415 (Tables 2-4). For all institutional types, the major contributor was the student's involvement in science activities, QE SCI: small residentials (beta 0.66); large residentials, (0.63); metropolitan (0.59). At small residentials, academic involvement (ACAD) and the cultural variable PHILOS are comparable influences (.13 and -.10) (Table 2); at large residentials, STRENGTH (-.14) appears (Table 3). Thus SCI & TECH gains at small residentials are enhanced at institutions that provide considerable structure (e.g., rules governing student behavior). At large residentials, greater gains in SCI & TECH learning was associated with weak institutional cultures.

Insert Tables 2-4 about here

Gains in General Education, Literature and Arts (ED, LIT & ARTS)

Of all the gains areas, student learning in general education, literature and arts was a function of the most complex combination of primary factors. Gains at small residentials (R^2=0.405) were influenced by three quality of effort factors (INTERPERS, .37; ACAD, .18; SCI, -.16) and two environmental factors (SCHOL, .22; RELATS, .19) (Table 2). Thus, a combination

of interpersonal and academic factors were all important to gains in general education, literature and arts.

At large residentials (R^2=0.404), gains were a function of informal relations with peers (INTERPERS, .40), with the cultural variables STRENGTH (.28) and ETHOS (-.23) and the environmental SCHOL (.20) (Table 3). The effort variables SCI (-.18), and ACAD (.15) are also comparable to the cultural variable LOCATION (.13). This is the only gains factor in which three cultural variables appear. Emphasis on collaborative learning, a strong campus culture, and proximity to a metropolitan area were positively related to gains in ED, LIT & ARTS.

At metropolitan campuses (R^2=0.320), gains were related to three effort variables (INTERPERS, .39; ACAD, .25; SCI, -.14), with the environmental SCHOL (.13) and RELATS (.11) of lesser influence (Table 4). As with the other types of institutions, the amount of effort devoted to science-related activities had a negative influence on gains in ED, LIT & ARTS. As with the small residential colleges, cultural variables were not associated with student learning at metropolitan institutions.

Gains in Intellectual Skills (INTEL SKILLS)

Five primary factors contributed to gains in intellectual skills at small residentials (R^2=0.322): QE ACAD (beta 0.28) and QE SCI (.23) were fairly high, with ENV RELATS (.15), ENV SCHOL (.13), and QE INTERPERS (.12) of lesser influence (Table 2). The significance of the cultural variable, ETHOS (.07), suggests that

gains in intellectual skills are enhanced at small colleges that emphasize competitive behavior.

At large residentials (R^2=0.280), INTEL SKILLS was related to QE SCI (.28), QE ACAD (.19), and ENV SCHOL (.16) (Table 3). ETHOS (.08) and the effort factors GRP FACIL (0.07) and INTERPERS (.06), and the environmental factors RELATS (.07) and VOC (.08) all had comparable influences on gains. It is not surprising that large residentials that emphasize intellectual effort and competitive behavior and are perceived to emphasize academics foster gains in intellectual skills.

Gains in intellectual skills of students at metropolitan institutions (R^2=0.252) were primarily dependent on effort in SCI (.25) and ACAD (.20) (Table 4). The environmental factors VOC (.14) and RELATS (.10) have about the same amount of influence on learning as the cultural variables, PHILOS (-.12) and STRENGTH (.10), and the effort factor INTERPERS (.11). Again, as with the other two institutional types, gains in intellectual skills at metropolitan institutions is primarily a function of the amount of effort students devote to science-related activities and such other academic activities as using the library and studying. The relationships between cultural variables and gains suggest that the more automony given to students and the stronger the campus culture, the greater the gains in intellectual skills.

Gains in Vocational Preparation (VOC PREP)

At small residential institutions (R^2=0.295), VOC PREP was primarily dependent on ENV VOC (beta 0.27), QE ACAD (0.21) and QE SCI (.21) (Table 2). ENV RELATS (.12) and PHILOS (.07) were also contributors. When the environment is structured (PHILOS), supportive (ENV RELATS) and emphasizes vocational preparation (ENV VOC), gains in this area result.

For large residential institutions (R^2=0.253), vocational preparation gains were a function of ENV VOC (beta 0.30), QE SCI (.20), QE ACAD (.19), ETHOS (.15) and STRENGTH (-.13) (Table 3). Institutions with a weak culture that emphasized competitive behavior and whose environments were perceived as emphasizing vocational preparation were associated with gains in VOC PREP.

VOC PREP gains at metropolitan institutions (R^2=0.217) were influenced by ENV VOC (.31) and QE ACAD (.23) (Table 4). Other variables contributing to vocational gains were ENV RELATS (.09), LOCATION (.08), STATUS (-.07) and QE SCI (.07).

Discussion

In this section we answer the three questions that guided this study.

1. **Can a linear model based on measures of student involvement (effort), campus environments, and institutional culture explain student gains in learning and personal development?**

At all institutional types, the five gains factors exhibited an acceptable linear dependence on the combination of student

involvement, environmental characteristics, and cultural factors. The linear models yielded R^2 ranging from .295 to .516 at small residentials, .253 to .457 at large residentials, and .217 to .415 at metropolitan institutions. Thus a linear model has an acceptable fit and is an appropriate approach for estimating the influence of these factors on student learning and personal development.

Overall, the R^2s were higher on each of the gains factors for the small residentials except for PERS & SOC where the fit of metropolitans was comparable to that of residentials. Thus the best model fit is for the smaller colleges, least robust for the metropolitan universities, with the large residential universities in between. Perhaps as the homogeneity of the student body decreases and institutional complexity increases, interaction effects might better explain gains than a linear model.

2. Is institutional type associated with different patterns of student learning and development?

Patterns of student learning and development did not differ appreciably across institutional types. Student learning at all three types of institutions depended on a combination of involvement, environmental, and cultural factors. This observation is consistent with the view from ecological psychology wherein people both shape their environment and are shaped by it (Banning, 1975; Barker, 1963; Kaiser, 1972; Wicker,

1979). An exception may be student self-reported gains in science and technology (SCI & TECH) where student involvement was the predominant influence over other factors. However, it is also possible that the CSEQ scales do not adequately measure characteristics of institutional environments that encourage learning related to science and technology. For example, no CSEQ scale assesses the physical environment of computer clusters or science laboratories or the number or availability of these types of facilities.

For all areas of student learning and development (except for vocational preparation--VOC PREP) at all institutional types the variables with the most influence were student involvement factors. This suggests student initiative generally plays a more important role in determining what a student learns in college than environmental or cultural factors (Pace, 1987).

At all types of institutions, involvement in informal interpersonal activities (QE INTERPERS) contributed significantly to students' personal and social development (PERS & SOC) and to learning in general education, literature and arts (ED, LIT & ARTS). But effort devoted to interpersonal activities had less influence on gains in intellectual skills (INTEL SKILLS), vocational preparation (VOC PREP), or science and technology (SCI & TECH).

3. **Can descriptions of the relationships between student effort, college environments, and student learning based on qualitative measures be enriched by using qualitative assessments of campus culture?**

Information about campus cultures did provide additional insight into influences on student learning. For example, institutional culture appears to have a greater influence on student learning at large residential institutions that at the other two institutional types. Two of the cultural variables, institutional ethos (ETHOS) and strength of campus culture (STRENGTH), were significant contributors to various aspects of student learning at large residentials with LOCATION having a smaller effect on ED, LIT & ARTS. At small residentials, institutional philosophy (PHILOS) was significantly related to science and technology gains (SCI & TECH); at metropolitan institutions PHILOS was correlated with intellectual skills gains (INTEL SKILLS); LOCATION was related to vocational preparation (VOC PREP).

The relationships between cultural properties of these institutions and student learning must be interpreted with caution. For example, it is not apparent why gains in intellectual skills are favored at large residentials with a meritocratic ethos over those with an egalitarian ethos, while at the same type of institution, gains in general education, literature, and arts <u>are</u> positively influenced by egalitarianism. Perhaps, the activities in which students engage to produce gains

in the two areas of INTEL SKILLS and ED, LIT & ARTS might be intrinsically different (e.g., the items contributing to INTEL SKILLS reflect analytical ability required in the physical sciences while the items contributing to ED, LIT & ARTS reflect integration and synthesis of ideas from different fields). Similarly, the strength of campus culture was negatively associated with gains in PERS & SOC, SCI & TECH and VOC PREP.

A competitive institutional ethos was related to development of intellectual skills. It is unlikely, however, that common academic indicators of competitiveness (e.g., increasing standards for admission or grades)--by themselves--will encourage intellectual skill development. Because culture is a holistic phenomenon, attempts to modify certain cultural properties will have an influence on other properties and, thus, may not produce the desired effect. In addition, the betas are relatively small and none of the small residential institutions had a competitive ethos (Table 1). Hence, this finding is specious as far as the small colleges are concerned.

A possible explanation for the low correlation between gains scores and cultural variables at small residentials may be due to attenuated variance in the assigned values. These colleges and universities were selected for participation in this study because they provided rich out-of-class learning opportunities for students. Hence the variance in certain CSEQ scales (e.g., Environmental Scales) may have been attenuated somewhat by raising the floor (i.e., few low scores are reported). For

example, the small residentials had "strong" cultures, an egalitarian ethos, and tended to discourage status distinctions (Table 1). Cultural variables at metropolitan institutions also did not predict student gains as well as the cultures of large residentials. We suggest that this is due to two reasons. First, these metropolitan institutions had less distinctive cultures than the residential institutions, in part because their missions have changed over time (e.g., from a private, liberal arts college, to a municipal college, to a metropolitan university--Kuh et. al, 1991). As the missions of these institutions evolved, the institutions did not replace many of the traditions that existed when they were small private colleges but which have now been long forgotten. Hence, many of the artifacts that make an institution's culture distinctive have been lost. Second, students at these institutions spend relatively little time on campus; therefore, they are not influenced as much by the institutional culture as are their counterparts at residential institutions.

There is also a risk in assuming that cultures seem to have relatively little influence at the small residential and metropolitan institutions. The variety of institutional properties that contribute to an institution's culture embraces many of the qualities that are accounted for by the variables in the Environmental factors cluster (e.g., an emphasis on scholarship and relations between people). That is, the amount of emphasis given to esthectic qualities and collaboration among

faculty, staff and students and how much a student must study to be successful is as much a part of an institution's culture as it is the institution's environment; they are inseparable.

Finally, the absence of relationships between some of the cultural variables and student gains warrant consideration. For example, LOCATION of the institution (isolated to city-based) rarely appeared in the models. One possible interpretation is that student learning is not limited by unalterable features such as the institution's location. Many students at metropolitan institutions do not have a choice about where they attend college; their campus is the "only game in town." Students, faculty and administrators may find it reassuring that learning is just as likely to occur in those settings as in others. Also, the MULTIC (commitment to multiculturalism) variable never appeared in a regression equation. This does not mean an institution's position on diversity is unrelated to student learning and development. It is more likely that MULTIC was too simple a measure of the underlying complex concept or that the effects are indirect through other environmental factors.

Implications

The results of this study suggest numerous implications for college and university faculty and administrators interested in enhancing undergraduate learning. Because the patterns of student learning did not differ appreciably by institutional type, the following implications warrant consideration by

institutional agents at all types of colleges and universities provided these ideas are adapted to the educational purposes and cultures of their institution.

Gains in intellectual skills (INTEL SKILLS) were a function of the effort a student directs to such academic activities (QE ACAD) as discovering new resources in the library, discussions with faculty, and preparing papers for class. Faculty can encourage such student behavior by inviting students to work on joint research projects, or encouraging collaborative research projects in which students work together, and by requiring longer, perhaps more complex writing projects that demand that students search for materials in the library. This may seem like a rather simple suggestion to address such a complicated behavior as student learning. Yet only about 48 hours of a typical college student's week are devoted to attending class and studying (Boyer, 1987). Part of the reason students spend relatively little time studying is that faculty themselves are spending less time on teaching-related activities and more time on research and scholarship (Carnegie Foundation for the Advancement of Teaching, 1991). Simply put, students learn more when they invest more time in learning activities such as writing, discovering materials in the library, and talking with peers and faculty members about class related material. When faculty members opt for multiple choice exams and assign relatively few papers, they demand less effort from their

students; hence, students learn less. When students are expected to write and use the library for research, they do so.

Interpersonal factors reflected in both student effort and perceived environmental characteristics (QE INTERPERS and ENV RELATS) dominated in two areas of student learning: PERS & SOC (where QE GRP FACIL is also significant) and ED, LIT & ARTS. Gains in personal and social development were linked to participation in such diverse activities (GRP FACIL) as visiting an art gallery, attending a theater performance, participating in social events in the student center or intramural sports. In addition, opportunities to talk about these events with peers (INTERPERS) were important for encouraging learning. While it seems reasonable to expect that students' personal and social development can be attributed to informal, interpersonal activities and college environments characterized by supportive relations, it may be somewhat more surprising to see gains in general education, literature and arts dependent on peers and the institution's culture. These findings support other work (Bean, 1985) that relations with one's peers are as important to student learning in certain areas as are faculty. If one has a choice about where to go to college, the "quality" of the student body may be as important as that of the faculty.

Encouraging interaction among peers is difficult at some types of institutions (e.g., metropolitan universities) because, for many students, the "student role" is but one of several competing priorities in their lives. That is, as previously

noted, metropolitan universities attract high proportions of commuting and part-time college students, many of whom are over the age of 25 and have families, work full-time, and are actively involved in civic and church affairs; therefore, the amount of time they spend on campus is relatively limited. To encourage student learning, metropolitan institutions and other colleges that have high numbers of commuting, part-time students could structure more opportunities for students to come together when students are on the campus. For example, by scheduling guest lectures over the noon hour followed by a colloquium (with childcare provided for the entire event) and perhaps requiring attendance for certain speakers or events as part of the course grade, student interaction with peers and faculty can be encouraged through the curriculum as well as through out-of-class experiences (Jacoby, 1989). In addition, because student contact in metropolitan institutions tends to take place in academic settings (classroom buildings, library), opportunities for students and students and faculty to come together prior to or immediately following class are important. Placing benches and chairs in the hallways of academic buildings and providing student lounges in academic facilities is another way that metropolitan institutions can encourage their students to learn from one another and continue class discussions beyond the classroom (Kuh, et al., 1991).

The cultural variables were more potent in explaining student learning at large residential institutions than at small

residential or metropolitan institutions. This observation suggests that the importance that university presidents are placing on efforts to nurture a stronger sense of community on the campus may pay dividends in student learning. That is, not only are feelings of institutional loyalty, safety, and security advanced when members of a college community share common way of knowing and understanding; student learning also seems to be advanced.

Because culture is a complex, holistic set of phenomena made up of mutually shaping properties, it is not easy to intentionally modify an institution's culture in the short term (Kuh & Whitt, 1988). It is beyond the scope of this paper to describe culture-shaping strategies (c.f., Frost, Moore, Louis, Lundberg & Martin, 1985; Morgan, 1986). Suffice it to say that it is possible that the strength of an institution's culture can be influenced to a modest degree. For example, artifacts are visible aspects of campus culture and include such events and activities as opening fall convocations and commencement activities (ceremonies) and language such as words in the institution's alma mater song and "terms of endearment" (i.e., language used by students and faculty that have context-specific meanings). By assiduously emphasizing such distinctive aspects of an institution's culture through publications and gatherings of community members (orientation, convocations, commencement), perhaps the strength of an institution's culture may be enhanced over time.

Limitations

Clearly, this study is limited in several ways. First, and perhaps most important, the generalizability of the findings of this study to other institutions is limited by the nature of the sample. The institutions participating in this study were selected because they reputedly provided high quality out-of-class learning opportunities for their undergraduate students. The degree of student effort focused on learning and personal development may be different at other institutions. Second, the response rates at the metropolitan institutions may have affected in unknown ways the patterns of student effort and perceptions of the environment reported here; that is, if more students from these institutions had completed the CSEQ, different perceptions of the environment and learning outcomes may have resulted. Third, the reduction of a complicated tapestry of cultural properties to seven numerical indices may have obfuscated how cultural properties work in concert to influence student learning and personal development. Fourth, variables in addition to those included in this analysis influence how much effort students devote to learning and the resulting gains in learning and personal development. For example, student ability and previous experiences with faculty and peers certainly play a role in how much effort students put forth in activities such as studying, engaging in in-class and out-of-class discussions with faculty, and taking advantage of other learning opportunities available in collegiate environments (e.g., library resources, musical and

theatrical performance). Finally, within-institution differences in patterns of student effort, perceptions of the environment, and learning and personal development gains were not analyzed. Pascarella and Terenzini (1991) suggested that the undergraduate experience of students at the same institution may be quantitatively and qualitatively different, depending on where students live, what they study, and the attitudes and values of members of their reference groups.

Conclusion

College environments and, to a lesser extent an institution's cultural properties, either encourage or discourage student learning. Students devote effort to activities that are emphasized (or at least are perceived by students to be valued) by their institutions. This is particularly true in the area of vocational preparation and science and technology. Gains in general education are associated with a more complicated pattern of variables related to student effort and institutional environments including cultural properties. While cultural properties have generally moderate influences on behavior, an institutional ethos that encourages competitive behavior seems to foster greater gains in learning and personal development, particularly in large residential institutions. Similarly, gains seem to be less affected by where an institution is located than the degree of effort students devote to activities associated with learning and personal development.

Consistent with other studies that have investigated the influence of student effort on learning, the results of this study suggest that the more time and effort students devote to learning activities, the more they learn (Pascarella & Terenzini, 1991). Many observers (e.g., Heath, 1968; Keeton, 1971) have argued that institutions of higher education are more likely to have the desired impact on student learning when they present a coherent mission and philosophy, such as we think is the case in the institutions in this study (Kuh, et al., 1991). The findings support the claim that coherence of an institution's educational purposes seem to be associated with outcomes consistent with these purposes.

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TABLE 1
VALUES OF CULTURAL VARIABLES

	Strength	Location	Status	Ethos	Philos	Multic
Small Residential						
Berea	7	1	2	2	6	6
Earlham	7	3	1	1	2	4
Grinnell	6	1	3	2	1	5
Mount Holyoke	7	6	3	2	3	5
Large Residential						
UC-Davis	5	2	4	3	2	6
Iowa State	4	4	4	4	4	5
Miami	7	2	6	6	6	1
Stanford	6	2	2	2	1	7
Metropolitan						
UA-B	1	7	5	6	4	3
Louisville	4	7	4	4	4	5
Wichita State	4	7	2	3	5	4
UNCC	1	5	4	5	4	2
Xavier	7	6	7	7	7	7

TABLE 2

SMALL RESIDENTIAL REGRESSION ANALYSIS
(Beta Weights)

	GAINS FACTORS				
	PERS & SOC	SCI & TECH	ED, LIT & ARTS	INTEL SKILLS	VOC PREP
Involvement Factors					
QE ACAD	0.09	0.13**	0.18**	0.28**	0.21**
QE INTERPERS	0.16**	-----	0.37**	0.12*	-----
QE GRP FACIL	0.25**	-----	-----	-----	-----
QE SCI	-0.07	0.66**	-0.16**	0.23**	0.21**
Environmental Factors					
ENV RELATS	0.23**	0.08	0.19**	0.15**	0.12*
ENV SCHOL	0.08	-----	0.22**	0.13**	-----
ENV VOC	-----	0.09*	-0.07	-----	0.27**
Cultural Variables					
STRENGTH	-----	-----	-----	-----	-----
LOCATION	0.08	-----	-----	-----	-----
STATUS	-----	-----	-----	-----	-----
ETHOS	-----	-----	-----	0.07	-----
PHILOS	-----	-0.10**	-----	-----	0.07
MULTIC	-----	-----	-----	-----	-----
N	623	629	626	619	630
R2	0.316	0.516	0.405	0.322	0.295

Non-asterisked values have $p<0.05$
* $p<0.01$
** $p<0.001$

TABLE 3

LARGE RESIDENTIAL REGRESSION ANALYSIS
(Beta Weights)

	GAINS FACTORS				
	PERS & SOC	SCI & TECH	ED, LIT & ARTS	INTEL SKILLS	VOC PREP
Involvement Factors					
QE ACAD	0.06	0.05*	0.15**	0.19**	0.19**
QE INTERPERS	0.22**	-----	0.40**	0.06	-----
QE GRP FACIL	0.21**	-----	-----	0.07*	-----
QE SCI	-----	0.63**	-0.18**	0.28**	0.20**
Environmental Factors					
ENV RELATS	0.14**	0.07*	-----	0.07*	0.08*
ENV SCHOL	0.08*	0.06*	0.20**	0.16**	-----
ENV VOC	0.09**	-----	-----	0.08*	0.30**
Cultural Variables					
STRENGTH	-0.09*	-0.14**	0.28**	-----	-0.13**
LOCATION	-----	-----	0.13**	-----	-----
STATUS	-----	-----	-----	-----	-----
ETHOS	0.13**	-----	-0.23**	0.08**	0.15**
PHILOS	-----	-----	-----	-----	-----
MULTIC	-----	-----	-----	-----	-----
N	1391	1409	1398	1391	1405
R2	0.284	0.457	0.404	0.280	0.253

Non-asterisked values have $p<0.05$
* $p<0.01$
** $p<0.001$

TABLE 4

METROPOLITAN REGRESSION ANALYSIS
(Beta Weights)

	GAINS FACTORS				
	PERS & SOC	SCI & TECH	ED, LIT & ARTS	INTEL SKILLS	VOC PREP
Involvement Factors					
QE ACAD	0.13**	-----	0.25**	0.20**	0.23**
QE INTERPERS	0.24**	0.07	0.39**	0.11*	-----
QE GRP FACIL	0.22**	-----	-0.08	-----	-----
QE SCI	-0.09*	0.59**	-.014**	0.25**	0.07
Environmental Factors					
ENV RELATS	0.15**	-----	0.11**	0.10*	0.09
ENV SCHOL	-----	0.09*	0.13**	-----	-----
ENV VOC	0.15**	-----	-----	0.14**	0.31**
Cultural Variables					
STRENGTH	-----	-----	-----	0.10	-----
LOCATION	-----	-----	-----	-----	0.08*
STATUS	-----	-----	-----	-----	-0.07
ETHOS	-----	-----	-----	-----	-----
PHILOS	-----	-----	-----	-0.12*	-----
MULTIC	-----	-----	-----	-----	-----
N	842	858	848	846	854
R2	0.316	0.415	0.320	0.252	0.217

Non-asterisked values have $p<0.05$
* $p<0.01$
** $p<0.001$

Appendix A

CSEQ QUALITY OF EFFORT SCALES

LIB	Library Experiences such as asking the librarian for help or using specialized bibliographies
FAC	Experiences with Faculty such as visiting informally with an instructor or working on a faculty project
COURSE	Course Learning such as listening attentively in class or do additional readings on course topics
AMT	Art, Music, Theater such as visited an art gallery or worked on a theatrical production
UNION	Student Union such as met friends at the union or went to hear a speaker
ATHL	Athletic and Recreation Facilities such as used the gym for individual activities or played on an intramural team
CLUBS	Clubs and Organizations such as attending an event by a student group or committee work
WRITE	Experiences in Writing such as spending five hours writing a paper or submitted an article for publication
PERS	Personal Experiences such as telling your personal reactions to a friend or talking to a counselor
STACQ	Student Acquaintances such as made friends with student of different interests or discussions with international students
SCI	Science/Technology such as memorizing formulas or writing a computer program
CONTPS	Topics of Conversation such as talking about jobs, money, careers or social and ethical issues
CONINFO	Information in Conversations such as explore different ways to think about a topic or persuading a friend to change his or her mind

Appendix B

CSEQ COLLEGE ENVIRONMENT SCALES

SCH	Emphasis on the development of academic, scholarly, and intellectual qualities.
ESTH	Emphasis on the development of esthetic, expressive, and creative qualities.
CRIT	Emphasis on being critical, evaluative, and analytical.
VOC	Emphasis on the development of vocational and occupational competency.
PRAC	Emphasis on the personal relevance and practical values of your courses.
STU	Relationships with other students, student groups, and student activities.
FAC	Relationships with faculty members.
ADM	Relationships with administration personnel and offices.

Appendix C

CSEQ ESTIMATE OF GAINS SCORES

VOC	Vocational training--acquiring knowledge and skills applicable to a specific job or type of work.
SPEC	Acquiring background and specialization for further education in some professional, scientific, or scholarly field.
GENLED	Gaining a broad general education about different fields of knowledge.
CAREER	Gaining a range of information that may be relevant to a career.
ARTS	Developing an understanding and enjoyment of art, music and drama.
LIT 2	Broadening your acquaintance and enjoyment of literature.
WRITE	Writing clearly and effectively.
CMPTS	Acquiring familiarity with the use of computers.
PHILS	Becoming aware of different philosophies, cultures, and ways of life.
VALUES	Developing your own values and ethical standards.
SELF	Understanding yourself--your abilities, interests, and personality.
OTHERS	Understanding other people and the ability to get along with different kinds of people.
TEAM	Ability to function as a team member.
HEALTH	Developing good health habits and physical fitness.
SCI	Understanding the nature of science and experimentation.
SCI/TECH	Understanding new scientific and technical developments.
CONSQ S/T	Becoming aware of the consequences (benefits/hazards/ dangers/values) of new applications in science and technology.
ANALY	Ability to think analytically and logically.
QUANT	Quantitative thinking--understanding probabilities, proportions, etc.
SYNTH	Ability to put ideas together, to see relationships, similarities, and differences between ideas.
INQ	Ability to learn on your own, pursue ideas, and find information you need.