Do Liberal Arts Colleges Really Foster Good Practices in Undergraduate Education?

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Researchers estimated the net effects of liberal arts colleges on 19 measures of good practices in undergraduate education grouped into seven categories. Analyses of 3-year longitudinal data from five liberal arts colleges, four research universities, and seven regional universities were conducted. Net of a battery of student precollege characteristics, whether or not a student was enrolled full-time and lived on campus, and the academic selectivity of the institution attended, liberal arts colleges evidenced stronger positive impacts on a broad range of empirically vetted good practices in undergraduate education than did either research universities or regional institutions. The impact was most pronounced in the initial year of postsecondary education.

In a review of the literature on college impact, Pascarella and Terenzini (1991) argued that the academic selectivity, or preparedness, of an institution's student body may, in and of itself, reveal very little about that institution's impact on student cognitive and personal development. Rather, "selectivity may have a latent impact . . . that is activated only when embedded in a supportive social-psychological context" (Pascarella & Terenzini, 1991, p. 546). The elements of this supportive social-psychological context would appear to be such things as a strong faculty emphasis on teaching and student development, a common valuing of the life of the mind, small size, a shared intellectual experience, and frequent interaction in and outside the classroom between students and faculty and between students and their peers (Pascarella & Terenzini, 1998). Such institutional traits would appear to be most often found at small, selective liberal arts colleges (Astin, 1999; Chickering, 1969; Chickering & Reisser, 1993; Pascarella & Terenzini, 1991). To be sure, there is cross-sectional evidence to suggest that both current students and alumni of liberal arts colleges report a significantly different undergraduate experience than counterparts who are students or graduates of other types of institutions. These differences include higher levels of academic and social engagement, more intense learning experiences, and more frequent extracurricular involvement (Heath, 1968; Hu & Kuh, 2003; "What Matters in College After College," 2002). However, the extent to which liberal arts colleges actually foster such educationally influential experiences is not clear from the existing cross-sectional evidence. By their very nature, cross-sectional studies make it extremely difficult to control for differential student recruitment and selection effects (Astin,

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2003; Pascarella, 2001; Pascarella & Terenzini, 1991). It may simply be the case that liberal arts colleges attract and enroll students who are more inclined to high levels of academic and social engagement, and more receptive to the educational influences of postsecondary education. To address this issue, we employed longitudinal data to estimate the unique or net impact of attending a liberal arts college on students' experiences in seven areas identified by existing evidence as good practices in undergraduate education. The longitudinal nature of the data permitted us to estimate the impact of liberal arts colleges on good practices while statistically controlling for a broad range of important student precollege characteristics, secondary school experiences, and other potential confounding influences.

The Structure of Good Practices in Undergraduate Education

In a project sponsored by the American Association for Higher Education, the Education Commission of the States, and The Johnson Foundation, Chickering and Gamson (1987, 1991) synthesized the existing evidence on the impact of college on students and distilled it into seven broad categories or principles for good practice in undergraduate education. These seven principles or categories are: (a) student-faculty contact, (b) cooperation among students, (c) active learning, (d) prompt feedback to students, (e) time on task, (f) high expectations, and (g) respect for diverse students and diverse ways of knowing (Chickering & Gamson, 1991). The influence of Chickering and Gamson's seven principles has been extensive. For example, one of the most broad-based annual surveys of undergraduates in the country, the National Survey of Student Engagement (NSSE), is based on questionnaire items that attempt to operationalize the seven good practices (Kuh, 2001).

From an empirical standpoint, the NSSE and similar surveys are solidly based. Extensive evidence exists to support the predictive validity of Chickering and Gamson's (1987, 1991) principles of good practice in undergraduate education. Even in the presence of controls for important confounding influences, various measures of the good practice dimensions are significantly and positively linked to desired aspects of cognitive and noncognitive growth during college (Astin, 1993; Chickering & Reisser, 1993; Kuh, Schuh, Whitt, & Associates, 1991; Pascarella & Terenzini, 1991, in press). Examples of individual studies supporting the predictive validity of specific dimensions of good practices in undergraduate education include the following: *student-faculty contact* (Anaya, 1999; Frost, 1991; Kuh & Hu, 1999; Terenzini, Springer, Yaeger, Pascarella, & Nora, 1994); *cooperation among students* (Cabrera, Crissman, Bernal, Nora, Terenzini, & Pascarella, 2002; Johnson & Johnson, 1993; Johnson, Johnson, & Smith, 1998a, 1998b; Qin, Johnson, & Johnson, 1995); *active learning* (Grayson, 1999; Hake, 1998; Kuh, Pace, & Vesper, 1997; Lang, 1996; Murray & Lang, 1997); *academic effort/time on task* (Astin, 1993; Ethington, 1998; Hagedorn, Siadat, Nora, & Pascarella, 1997; Johnstone, Ashbaugh, & Warfield, 2002; Watson & Kuh, 1996); *prompt feedback to students* (d'Apollonia & Abrami, 1997; Feldman, 1997); *high expectations* (Arnold, Kuh, Vesper, & Schuh, 1993; Astin, 1993; Bray, Pascarella, & Pierson, 2003; Whitmire & Lawrence, 1996); and *diversity experiences* (Gurin, 1999; Kitchener, Wood, & Jensen, 2000; Pascarella, Palmer, Moye, &

Pierson, 2001; Terenzini et al., 1994; Umbach & Kuh, (2003).

Other evidence on college impact not synthesized by Chickering and Gamson (1987, 1991) suggests the predictive validity of two additional dimensions of good practice in undergraduate education. These are the *quality of teaching received* (Feldman, 1997; Hines, Cruickshank, & Kennedy, 1985; Pascarella, Edison, Nora, Hagedorn, & Braxton, 1996; Wood & Murray, 1999); and *influential interactions with other students* (Astin, 1993; Davis & Murrell, 1993; Douzenis, 1996; Volkwein & Carbone, 1994; Whitt, Edison, Pascarella, Nora, & Terenzini, 1999).

It is clear from the existing evidence that we can identify dimensions of good practice in undergraduate education that uniquely enhance cognitive and personal development during college. For the current investigation, we sought to determine if liberal arts colleges are more proficient in fostering these good practices than are other institutions. In operationalizing good practices, we were guided by the research on the predictive validity of different dimensions of good practice reviewed above. Indeed, many of the operational definitions of good practices employed in this investigation were either adapted or taken directly from the studies on predictive validity previously cited (e.g., Bray et al., 2003; Cabrera et al., 2002; Feldman, 1997; Hagedorn et al., 1997; Pascarella et al., 1996; Terenzini et al., 1994; Whitt et al., 1999).

METHOD

Sample and Data Collection

The institutional sample was 16 four-year colleges and universities located in 13 states throughout the country. Institutions were chosen from the National Center on Education Statistics IPEDS data to represent differences in colleges and universities nationwide on such characteristics as institutional type and control (e.g., selective and general private liberal arts colleges, public and private national research universities, comprehensive regional colleges and universities), size, location, commuter versus residential character, and ethnic distribution of the undergraduate student body. This sampling technique provided a sample of institutions with a wide range of selectivity—from some of the most selective institutions in the country to institutions that were essentially open admission. The student population from the 16 schools approximated the national population of four-year undergraduates by ethnicity, gender, and age. Five of the institutions were private liberal arts colleges that varied widely in selectivity, and had a median enrollment of 1,707. According to the Carnegie Typology, they were designated as either selective or general liberal arts colleges. Three of the institutions were designated by the Carnegie Typology as Research I institutions, while one was designated a Research II institution. Hereafter, this group of four institutions will be termed research universities. The median enrollment of the research universities was 22,990. The remaining seven institutions fell into Carnegie categories between liberal arts colleges and research universities. These were comprehensive and doctoral-granting institutions with limited graduate programs and a primarily regional mission. The median enrollment at these seven institutions was 12,478. Hereafter, this group of colleges and universities is termed regional institutions.

The individuals in the sample were participants in the National Study of Student Learning (NSSL), a federally funded, 3-year

longitudinal investigation of the factors that influence learning and cognitive development in college. The initial sample of 2,913 students was selected randomly from the incoming first-year class at each of the 16 participating institutions. The first data collection was conducted in Fall 1992 as the students were entering college. The data collected included student demographic characteristics and high school experiences, as well as aspirations and expectations of college. Participants also completed the reading comprehension, mathematics, and critical thinking tests of the Collegiate Assessment of Academic Proficiency (CAAP) developed by ACT (American College Testing Program, 1990). Each of the three tests consisted of multiple-choice items and took 40 minutes to complete. In the Spring of 1993, and again in the Spring of 1994 and the Spring of 1995, each participant completed different CAAP tests as well as the College Student Experiences Questionnaire (CSEQ) (Pace, 1990) and an NSSL follow-up questionnaire. The CSEQ and the NSSL questionnaires gathered extensive information about each student's classroom and nonclassroom experiences during the preceding school year. Useable data at the end of the first, second, and third years of the study were available for 1,957 students, 1,341 students, and 936 students, respectively. Because of attrition from the sample, we developed a separate sample weighting algorithm for each of the 3 years of the study to adjust for potential response bias by sex, ethnicity, and institution. For each year of the study, within each of the 16 institutions, participants were weighted up to that institution's end-of-year population by sex (male or female) and race/ethnicity (White, Black, Hispanic, Other). For example, if an institution had 100 Hispanic men in its first-year class and 25 Hispanic men in the sample, each Hispanic male in the first-year sample was assigned a weight of 4.00.

Although applying sample weights in this way corrects for bias in the samples we analyzed by sex, ethnicity, and institution, it cannot adjust for nonresponse bias. However, we conducted several additional analyses to examine differences in the characteristics of students who participated in all years of the NSSL and those who dropped out of the study. The dropouts consisted of two groups: (a) those who dropped out of the institution during the study, and (b) those who persisted at the institution but dropped out of the study. Initial participants who left their respective institutions had somewhat lower levels of precollege cognitive test scores (as measured by Fall 1992 scores on the CAAP reading comprehension, mathematics, and critical thinking modules), socioeconomic background, and academic motivation than their counterparts who persisted in the study. Yet students who remained in the study and those who dropped out of the study but persisted at the institution differed in only small, chance ways with respect to precollege cognitive test scores, age, race, and socioeconomic background (Pascarella, Edison, Nora, Hagedorn, & Terenzini, 1998).

Variables. The independent variable was a set of two dummy variables (coded 1 or 0) that compared students attending liberal arts colleges with students attending either research universities or regional institutions. As indicated previously, in selecting and creating dependent measures, we were guided by Chickering and Gamson's (1987, 1991) principles of good practice in undergraduate education and research on effective teaching and influential peer interactions in college. From the data available on the

yearly CSEQ and NSSL follow-up questionnaires, we created 19 individual measures or scales of good practices grouped in seven general categories:

1. *Student-Faculty Contact*: quality of nonclassroom interactions with faculty, faculty interest in teaching and student development;
2. *Cooperation Among Students*: instructional emphasis on cooperative learning, course-related interaction with peers;
3. *Active Learning/Time on Task*: academic effort/involvement, essay exams in courses, instructor use of higher order questioning techniques, emphasis on higher order examination questions, computer use;
4. *Prompt Feedback*: instructor feedback to students;
5. *High Expectations*: course challenge/effort, scholarly/intellectual emphasis, number of textbooks or assigned readings, number of term papers or written reports;
6. *Quality of Teaching*: institutional skill/clarity, instructional organization/preparation;
7. *Influential Interactions With Other Students*: quality of interactions with students, non-course-related interactions with peers, cultural and interpersonal involvement.

All 19 individual measures were formed by summing student responses on the CSEQ and NSSL follow-up questionnaires obtained during the first; the first and second; or the first, second, and third follow-up data collections. Table 1 shows detailed operational definitions and where appropriate, psychometric properties of the independent variable and all dependent variables in the study.

Analyses. Because measures of good practices in the study were based on student self-reports, there was a danger that the impact of liberal arts colleges would be seriously confounded by the distinct characteristics or predilections of the students they recruit and enroll (Astin, 2003; Pascarella, 2001). This is a major methodological problem in nearly all existing cross-sectional research on the impact of liberal arts colleges on students' academic and nonacademic experiences during college. However, in this investigation, the longitudinal nature of the NSSL data permitted us to introduce statistical controls for a wide range of student precollege characteristics and experiences.

Ordinary least squares regression was the basic data analytic approach employed. For each of the 3 years of the study, each dependent variable (i.e., good practice measure) was regressed on the two dummy variables representing liberal arts colleges versus research universities or regional institutions and a battery of student precollege and other control variables. The student precollege control variables were: tested academic preparation (a composite of students' precollege CAAP reading, mathematics, and critical thinking test scores; reliability = .83); a measure of academic motivation (reliability = .65); a measure of educational degree plans; whether or not the college attended was one's first choice; age; race; sex; a composite measure of parental educational degree attainment and income; self-reported secondary school grades; and time spent during secondary school in eight separate areas of involvement (studying, socializing with friends, talking with teachers outside of class, working for pay, exercising or sports, studying with friends,

TABLE 1.

Operational Definitions of Independent and Dependent Variables

Independent Variable

Liberal Arts College vs. Other Institutions: Two dummy variables that represented students at liberal arts colleges vs. students at research universities and students at liberal arts colleges vs. students at regional institutions.

Dependent Variables

Student-Faculty Contact

Quality of Nonclassroom Interactions With Faculty: An individual's responses on a five-item scale that assessed the quality and impact of one's nonclassroom interactions with faculty. Examples of constituent items were: "Since coming to this institution I have developed a close personal relationship with at least one faculty member," "My nonclassroom interactions with faculty have had a positive influence on my personal growth, values and attitudes," and "My nonclassroom interactions with faculty have had a positive influence on my intellectual growth and interest in ideas." Range of options was 5 (*strongly agree*) to 1 (*strongly disagree*). Alpha reliability = .83. The scale was summed through the first and second year of college.

Faculty Interest in Teaching and Student Development: An individual's responses on a five-item scale assessing students' perceptions of faculty interest in teaching and students. Examples of constituent items were: "Few of the faculty members I have had contact with are genuinely interested in students" (coded in reverse), "Most of the faculty members I have had contact with are genuinely interested in teaching," and "Most of the faculty members I have had contact with are interested in helping students grow in more than just academic areas." Range of options was 5 (*strongly agree*) to 1 (*strongly disagree*). Alpha reliability = .71. The scale was summed through the first and second year.

Cooperation Among Students

Instructional Emphasis on Cooperative Learning: An individual's responses on a four-item scale that assessed the extent to which the overall instruction received emphasized cooperative learning. Examples of constituent items were: "I am required to work cooperatively with other students on course assignments," "In my classes, students teach each other in groups instead of only having instructors teach," and "Instructors encourage learning in student groups." Range of options was 4 (*very often*) to 1 (*never*). Alpha reliability = .81. The scale was summed through the first and second year.

Course-Related Interaction With Peers: An individual's responses on a 10-item scale that assessed the nature of one's interactions with peers focusing on academic coursework. Examples of constituent items were: "Studying with students from my classes," "Tried to explain the material to another student or friend," and "Attempted to explain an experimental procedure to a classmate." Range of options was 4 (*very often*) to 1 (*never*). Alpha reliability = .79. The scale was summed through the first and second year.

Active Learning/Time on Task

Academic Effort/Involvement: An individual's response on a 37-item, factorially derived but modified scale that assessed one's academic effort or involvement in library experiences, experiences with faculty, course learning, and experiences in writing. The scale combined four, 10-item involvement dimensions from the CSEQ, minus three items that were incorporated into the Course-Related Interaction with Peers Scale described above. Examples of constituent items were: "Ran down leads, looked for further references that were cited in things you read," "Did additional readings on topics that were discussed in class," and "Revised a paper or composition two or more times before you were satisfied with it." Range of options was 4 (*very often*) to 1 (*never*). Alpha reliability = .92. The scale was summed through the first and second year.

table continues

TABLE 1. *continued*

Number of Essay Exams in Courses: An individual's response to a single item from the CSEQ. Range of options was 1 (*none*) to 5 (*more than 20*). The item was summed through the first and second year.

Instructor Use of Higher Order Questioning Techniques: An individual's responses on a four-item scale that assessed the extent to which instructors asked questions in class that required higher order cognitive processing. Examples of constituent items were: "Instructors' questions in class ask me to show how a particular course concept could be applied to an actual problem or situation," "Instructors' questions in class ask me to point out any fallacies in basic ideas, principles or points of view presented in the course," and "Instructors' questions in class ask me to argue for or against a particular point of view." Range of options was 4 (*very often*) to 1 (*never*). Alpha reliability = .80. The scale was summed through the first and second year.

Emphasis on Higher Order Examination Questions: An individual's responses on a five-item scale that assessed the extent to which examination questions required higher order cognitive processing. Examples of constituent items were: "Exams require me to point out the strengths and weaknesses of a particular argument or point of view," "Exams require me to use course content to address a problem not presented in the course," and "Exams require me to compare or contrast dimensions of course content." Range of options was 4 (*very often*) to 1 (*never*). Alpha reliability = .77. The scale was summed through the first and second year.

Using Computers: An individual's response on a three-item scale indicating extent of computer use: "Using computers for class assignments," "Using computers for library searches," and "Using computers for word processing." Range of options was 4 (*very often*) to 1 (*never*). Alpha reliability = .65. The scale was summed through the first and second year.

Prompt Feedback

Instructor Feedback to Students: An individual's response on a two-item scale that assessed the extent to which the overall instruction received provided feedback on student progress. The items were: "Instructors keep me informed of my level of performance," and "Instructors check to see if I have learned well before going on to new material." Range of options was 4 (*very often*) to 1 (*never*). Alpha reliability = .70. The scale was summed through the first and second year.

High Expectations

Course Challenge/Effort: An individual's responses on a six-item scale that assessed the extent to which courses and instruction received were characterized as challenging and requiring high level of effort. Examples of constituent items were: "Courses are challenging and require my best intellectual effort," "Courses require more than I can get done," and "Courses require a lot of papers or laboratory reports." Range of options was 4 (*very often*) to 1 (*never*). Alpha reliability = .64. The scale was summed through the first and second year.

Number of Textbooks or Assigned Readings: An individual's response on a single item from the CSEQ. Range of options was 1 (*none*) to 5 (*more than 20*). The item was summed through the first and second year.

Number of Term Papers or Other Written Reports: An individual's response on a single item from the CSEQ. Range of options was 1 (*none*) to 5 (*more than 20*). The item was summed across the first and second year.

Scholarly/Intellectual Emphasis: An individual's responses on a three-item scale that assessed perceptions of the extent to which the climate of one's college emphasized: (a) the development of academic, scholarly, and intellectual qualities; (b) the development of esthetic, expressive, and creative qualities; or (c) being critical, evaluative, and analytical. Responses were on a semantic differential-type scale where the range of options was 7 (*strong emphasis*) to 1 (*weak emphasis*). Alpha reliability = .79. The scale was summed through the first and second year.

Quality of Teaching

Instructional Skill/Clarity: An individual's responses on a five-item scale that assessed the extent to which the overall instruction received was characterized by pedagogical skill and clarity. Examples of constituent items were: "Instructors give clear explanations," "Instructors make good use of examples to get across difficult points," and "Instructors interpret abstract ideas and theories clearly." Range of options was 4 (*very often*) to 1 (*never*). Alpha reliability = .86. The scale was summed through the first and second year.

table continues

TABLE 1. *continued*

Instructional Organization and Preparation: An individual's responses on a five-item scale that assessed the extent to which the overall instruction received was characterized by good organization and preparation. Examples of constituent items were: "Presentation of material is well organized," "Instructors are well prepared for class," and "Class time is used effectively." Range of options was 4 (*very often*) to 1 (*never*). Alpha reliability = .87. The scale was summed through the first and second year.

Influential Interactions With Other Students

Quality of Interactions With Students: An individual's responses on a seven-item scale that assessed the quality and impact of one's interactions with other students. Examples of constituent items were: "Since coming to this institution I have developed close personal relationships with other students," "My interpersonal relationships with other students have had positive influence on my personal growth, attitudes and values," and "My interpersonal relationships with other students have had a positive influence on my intellectual growth and interest in ideas." Range of options was 5 (*strongly agree*) to 1 (*strongly disagree*). Alpha reliability = .82. The scale was summed through the first and second year.

Non-Course-Related Interactions With Peers: An individual's response on a ten-item scale that assessed the nature of one's interactions with peers focusing on nonclass, or nonacademic issues. Examples of constituent items were: "Talked about art (painting, sculpture, architecture, artists, etc.) with other students at the college," "Had serious discussions with students whose philosophy of life or personal values were very different from your own," and "Had serious discussions with students whose political opinions were very different from your own." Range of options was 4 (*very often*) to 1 (*never*). Alpha reliability = .84. The scale was summed through the first and second year.

Cultural and Interpersonal Involvement: An individual's response on a 38-item, factorially derived but modified scale that assessed one's effort or involvement in art, music, and theater, personal experiences, student acquaintances and conversations with other students. The scale combined items from five involvement dimensions of the CSEQ, minus eight items that were incorporated into the Non-Course-Related Interactions With Peers Scale described above. Examples of constituent items were: "Seen a play, ballet, or other theater performance at the college," "Been in a group where each person, including yourself, talked about his/her personal problems," "Made friends with students whose interests were different from yours," "Had conversations with other students about major social problems such as peace, human rights, equality, and justice," and "In conversations with other students explored different ways of thinking about the topic." Range of options was 4 (*very often*) to 1 (*never*). Alpha reliability = .92. The scale was summed through the first and second year.

volunteer work, and extracurricular activities). In addition, we introduced controls for three additional variables that were substantially collinear with attendance at a liberal arts college: a proxy for the academic selectivity of the student body (the average precollege composite CAAP reading, math, and critical thinking score of students entering each institution), a measure of full- or part-time enrollment (credit hours completed each year), and a dummy variable indicating whether or not a student lived on- or off-campus.

A preliminary analysis underscored the importance of introducing controls for the above influences. Compared to their counterparts at the comparison institutions, liberal arts college students were: significantly more likely to be attending their college of first choice; have significantly higher levels of parental education and income, composite precollege CAAP test scores, and level of academic motivation; and be significantly more likely to be active in extracurricular activities and other types of engagement in secondary school. During the first year of postsecondary education, students at the liberal arts college in the sample were also significantly more likely than their counterparts at other institutions to live on campus

and be enrolled full-time.

In estimating the net or unique impact of attending a liberal arts college (versus other institutions) on any good practice dimension in the second and third year, we also included controls for one's score on that dimension in the previous year. This permitted us to estimate the unique impact on good practices of each succeeding year of attendance at a liberal arts college.

All analyses conducted were based on weighted sample estimates, adjusted to the actual sample size to obtain correct standard errors for tests of statistical significance. Because of the large sample sizes, an alpha level of .01 was used in all tests of statistical significance. For all statistically significant net differences in good practice variables between liberal arts colleges and other institutions, an estimated effect size was computed. This was done by dividing the metric regression coefficient, indicating the average adjusted difference on a specific good practice dimension between liberal arts college students and their counterparts at other institutions, by the pooled standard deviation of the good practice variable (Hays, 1994). The result indicated that part of a standard deviation that liberal arts colleges were advantaged or disadvantaged on the good practice variable relative to research universities or regional institutions. A positive effect size indicated an advantage for liberal arts colleges, whereas a negative effect size indicated that liberal arts colleges were disadvantaged relative to research universities or regional institutions.

RESULTS

Table 2 shows a summary of the statistically significant estimated effects of attending a liberal arts college (versus other institutions) on student reports of good practices in undergraduate education during the first 3 years of college. For any specific good practice variable, the metric regression weight represents the average difference between liberal arts colleges and comparison institutions statistically adjusted for all student precollege and other control variables. The effect size represents the metric regression coefficient as that part of a standard deviation that liberal arts colleges are advantaged over comparison institutions.

Part A of Table 2 shows the estimated net effects of the first year of attendance at a liberal arts college on good practices in undergraduate education. As the table indicates, students attending liberal arts colleges reported a significantly higher level on 12 of the 19 good practice dimensions than did similar students at either research universities or regional institutions. This included both first-year measures of student-faculty contact, level of cooperative learning, three out of five measures of active learning/time on task, instructor feedback to students, three out of four indicators of high expectations, and both measures of effective teaching. Furthermore, liberal arts college students reported significantly more essay exams and computer use during the first year than did their counterparts at research universities, and a significantly higher scholarly/intellectual emphasis than similar students at regional institutions. All these significant effects persisted in the presence of controls for an extensive battery of student precollege characteristics and other influences. Thus, they cannot be explained away by differences between liberal arts college students and those attending comparison institutions in precollege characteristics such as tested academic ability, academic motivation, secondary school achievement,

TABLE 2.

Statistically Significant Estimated Effects of Attending a Liberal Arts College (vs. a Research University or Regional Institution) on Good Practices in Undergraduate Education

	Liberal Arts Colleges vs.Research Universities		Liberal Arts Colleges vs.Regional Institutions	
Good Practice Variable	**Metric Regression Coefficient[a]**	**Effect Size[b]**	**Metric Regression Coefficient[a]**	**Effect Size[b]**
PART A: FIRST YEAR OF COLLEGE				
Student-Faculty Contact				
Quality of nonclassroom interactions with faculty	2.211*	.590	1.092*	.291
Faculty interest in teaching and student development	1.814*	.570	0.783*	.246
Cooperation Among Students				
Instructional emphasis on cooperative learning	0.496*	.186	0.586*	.206
Active Learning/Time on Task				
Academic effort/involvement	4.893*	.330	6.460*	.486
Number of essay exams in courses	0.395*	.386		
Instructor use of higher order questioning techniques	1.415*	.544	0.986*	.412
Emphasis on higher order examination questions	1.073*	.396	0.665*	.245
Computer use	0.910*	.389		
Prompt Feedback				
Instructor feedback to students	0.778*	.542	0.348*	.243
High Expectations				
Course challenge/effort	1.313*	.476	0.982*	.356
Number of textbooks or assigned readings	0.318*	.360	0.284*	.322
Number of term papers or written reports	0.425*	.421	0.458*	.453
Scholarly/intellectual emphasis			0.953*	.323
Quality of Teaching				
Instructional skill/clarity	1.304*	.466	0.896*	.316
Instructional organization/preparation	0.891*	.347	0.876*	.341
PART B: SECOND YEAR OF COLLEGE				
Student-Faculty Contact				
Quality of nonclassroom interactions with faculty	2.273*	.345	1.205*	.183
Faculty interest in teaching and student development	1.725*	.303	1.069*	.188
Cooperation Among Students				
Instructional emphasis on cooperative learning	0.629*	.148		

TABLE 2. *continued*

Good Practice Variable	Liberal Arts Colleges vs.Research Universities		Liberal Arts Colleges vs.Regional Institutions	
	Metric Regression Coefficient[a]	Effect Size[b]	Metric Regression Coefficient[a]	Effect Size[b]
Active Learning/Time on Task				
Number of essay exams in courses	0.463*	.288		
Instructor use of higher order questioning techniques	0.679*	.168		
Emphasis on higher order examination questions	1.085*	.234		
Prompt Feedback				
Instructor feedback to students	0.522*	.360		
High Expectations				
Number of term papers or written reports	0.404*	.256	0.385*	.244
Scholarly/intellectual emphasis			0.703*	.143
Quality of Teaching				
Instructional skill/clarity	0.614*	.127		
PART C: THIRD YEAR OF COLLEGE				
Student-Faculty Contact				
Faculty interest in teaching and student development	1.209*	.142		
Cooperation Among Students				
Instructional emphasis on cooperative learning	0.831*	.140		
Active Learning/Time on Task				
Academic effort/involvement			5.083*	.135
Number of essay exams in courses	0.298*	.136		
Instructor use of higher order questioning techniques	0.658*	.118		
Prompt Feedback				
Instructor feedback to students	0.580*	.414		
Quality of Teaching				
Instructional skill/clarity	0.930*	.131		

Note. Sample sizes: *First year*—liberal arts colleges = 580; research universities = 544; regional institutions = 833. *Second year*—liberal arts colleges = 419; research universities = 373; regional institutions = 549. *Third year*—liberal arts colleges = 299; research universities = 259; regional institutions = 378. Equations also include controls for: tested precollege academic ability (composite of CAAP reading comprehension, mathematics, and critical thinking test scores); the average tested precollege academic ability (composite of CAAP reading comprehension, mathematics, and critical thinking test scores) of students entering each institution; precollege educational plans; a measure of precollege academic motivation; whether or not the college attended was one's first choice; age; sex; race; parents' education and income; secondary school grades; time spent during secondary school in eight separate activities (studying, socializing with friends, talking with teachers outside of class, working for pay, exercising or sports, studying with friends, volunteer work, and extracurricular activities); on-campus versus off-campus residence; and cumulative number of credit hours completed. In the second-year analyses, each equation also included a student's first-year score on each good practice variable. In the third-year analyses, each equation also included a student's cumulative first- and second-year score on each good practice variable.

[a] The metric regression coefficient represents the average difference between liberal arts college students and comparison institution students on each good practice variable, statistically adjusted for the controls listed in the above "Note".

[b] The effect size is computed by dividing the metric regression coefficient by the pooled standard deviation of the good practice variable and indicates that fraction of a standard deviation that liberal arts college students are advantaged or disadvantaged (depending on the sign) relative to the comparison institution students.

*$p < .01$.

family background, or secondary school level of social and other involvement. Similarly, the differences uncovered are not attributable to full- or part-time attendance, living on versus off campus, or the academic selectivity (average student precollege test scores) of the institution attended.

Part A of Table 2 also shows an effect size estimate of the net first-year advantage of liberal arts colleges on each statistically significant good practice variable. The average advantage of liberal arts colleges over research universities in good practices (.429 of a standard deviation) was somewhat larger than the corresponding average advantage of liberal arts colleges over regional institutions (.322 of a standard deviation).

Part B of Table 2 shows the estimated net effects of the second year of attendance at a liberal arts college on good practices in undergraduate education. (Recall in these analyses that, in addition to all other statistical controls, a student's first-year score on each good practice variable was also incorporated into the regression specification.) As Part B of Table 2 indicates, net of other influences, students attending liberal arts colleges reported significantly higher levels on 9 of 19 good practice variables than did similar students at research universities. These included both second-year student-faculty contact measures, emphasis on cooperative learning, three of five measures of active learning/time on task, instructor feedback to students, number of term papers or written reports, and instructional skill/clarity. By comparison, liberal arts college students reported significantly higher levels than their counterparts at regional institutions on only 4 of 19 second-year good practice variables. These included both measures of student-faculty contact, number of term papers or written reports, and scholarly/intellectual emphasis.

The second year of attendance at a liberal arts college not only evidenced fewer statistically significant net advantages in good practices than the first year of attendance, the estimated magnitude of the advantages were also smaller. The average second-year advantage of liberal arts colleges over research universities in good practices was .248 of a standard deviation. This compared to .429 of a standard deviation in the first year. Similarly, the average second-year advantage of liberal arts colleges over regional institutions in good practices was .190 of a standard deviation. The corresponding advantage in the first year was .322 of a standard deviation.

Part C of Table 2 shows a summary of the estimated net effects of the third year of attendance at a liberal arts college on the good practice dimensions. (Recall in these analyses that, in addition to all other statistical controls, a student's cumulative first- and second-year score on each good practice variable was also incorporated into the regression specification.) As Part C of Table 2 indicates, the third year of attendance at a liberal arts college evidenced only a small number of statistically significant net advantages in good practices, and nearly all of these were confined to the comparison with research universities. Compared to similar students at research universities, liberal arts college students reported significantly higher levels of faculty interest in teaching and student development, instructional emphasis on cooperative learning, essay exams in courses, instructor use of higher order questioning techniques, instructor feedback to students, and instructional skill/clarity. Liberal arts colleges had a third-year advantage over regional institutions in

only one good practice variable—academic effort involvement.

Consistent with the trends observed from the first to the second year, the third year of attendance at a liberal arts college not only evidenced fewer statistically significant net advantages in good practices than the second year of attendance, the estimated magnitude of the advantages were also smaller. The average third-year advantage of liberal arts colleges over research universities in good practices was .171 of a standard deviation. This compared to .248 of a standard deviation in the second year. Though based on only one significant net difference, the magnitude of the third advantage of liberal arts colleges over regional institutions was .135 of a standard deviation. This corresponding advantage in the second year was .190 of a standard deviation.

DISCUSSION

The primary purpose of this study was to determine if liberal arts colleges positively influenced 19 measures of good practices in undergraduate education grouped into seven categories. Analyses of three-year longitudinal data from five liberal arts colleges, four research universities, and seven regional institutions, located in 13 states from around the country were conducted. The longitudinal data permitted us to introduce statistical controls for an extensive battery of student precollege characteristics and other confounding influences. The results of our analyses suggested two major conclusions.

First, our study provided consistent evidence supporting the contention that in comparison with other institutions, liberal arts colleges do, in fact, foster a broad range of empirically vetted good practices in undergraduate education. These good practices included measures of the quality and impact of student interactions with faculty, emphasis on cooperative learning, measures of student academic effort and time on task, prompt feedback to students, indices of high academic expectations, and measures of the quality of teaching received. Though modest in magnitude, the statistically significant positive effects of liberal arts colleges persisted even in the presence of controls for an extensive battery of confounding influences. The positive link between attendance at a liberal arts college and exposure to good practices in undergraduate education was not merely a function of such characteristics of the students enrolled as academic ability, academic motivation, secondary school achievement, family background, or precollege propensity for social and extracurricular involvement. Similarly, the liberal arts college advantages we uncovered were statistically independent of full- or part-time enrollment, living on or off campus, and the academic selectivity of an institution's student body. Put another way, our evidence suggests that liberal arts colleges tend to promote good practices in undergraduate education in a manner that cannot be explained by their full-time, residential character, their academic selectivity, or the background abilities, motivations, and interests of the students they enroll.

A second major conclusion was that the advantages liberal arts colleges demonstrated in promoting good practices in undergraduate education were most pronounced in the first year of postsecondary education. Thereafter, the incremental contribution of each additional year of attendance at a liberal arts college over previous years becomes progressively smaller in magnitude. For example, during the first year of postsecondary education, liberal arts colleges had

significant net advantages over research universities on 14 good practice dimensions, with an average effect size of .429 of a standard deviation. By comparison, in the second year of college, liberal arts colleges were advantaged on nine good practices (versus research universities) with an average effect size of .248 of a standard deviation. In the third year, liberal arts colleges were advantaged on only six good practices, with an average effect size of .171 of a standard deviation. A very similar trend was found in the comparison of net differences in good practices between liberal arts colleges and regional universities.

Such evidence is quite consistent with the notion that many of the most powerful educating experiences of liberal arts colleges are a function of intense socialization processes that occur primarily during the first year of exposure to postsecondary education (Chickering & Reisser, 1993; Hagedorn, Pascarella, Edison, Braxton, Nora, & Terenzini, 1999; Heath, 1968). This does not mean that liberal arts colleges are having only a trivial influence on good practices in undergraduate education subsequent to one's initial exposure to postsecondary education. Our regression specifications were designed to estimate the incremental impact on good practices attributable to each successive year of attendance at a liberal arts college. The diminishing returns relationships we uncovered, however, does not mean that the emphasis on good practices in undergraduate education at liberal arts colleges is any less salient in the second and third years of postsecondary education than it was in the first year. Rather, what our findings suggest is that liberal arts colleges have their most pronounced impact on good practices in undergraduate education in the initial year of college. Thereafter, liberal arts colleges continue to significantly promote good practices above and beyond their first-year impact, but their additional contributions in subsequent years increase at a diminishing rate.

In terms of promoting good practices in undergraduate education, the liberal arts colleges in our sample started out with a substantial number of advantages over research universities and regional institutions. They tended to enroll a student body that was more likely to live on campus and attend college full-time, was more academically selective and motivated, had parents with greater exposure to postsecondary education, and was more oriented toward extracurricular and social engagement in secondary school. Yet, even with these advantages taken into account, liberal arts colleges were still significantly more likely than research universities and regional institutions to promote a broad range of good practices. Although our data are not as helpful in determining just how liberal arts colleges are able to bring this about, we suggest that it may be attributable to the combination of several factors.

The first of these factors is institutional size. As indicated previously, the median student enrollment in the liberal arts colleges in our sample was 1,707. This compared with a median student enrollment of 22,990 in the sample's research universities and 12,478 in the sample's regional institutions. As suggested by Chickering and Reisser (1993), simply by virtue of their relatively small size, liberal arts colleges present students with a more manageable social-psychological environment that invites greater levels of student engagement than do larger institutions. Interestingly, in our findings, the impact of small size did not manifest itself

in a student's interactions with his or her peers. The effects of attending a liberal arts college on measures of influential interaction with other students tended to become nonsignificant when attending college full-time and living on campus were taken into account. Rather, the small size of liberal arts colleges may have had a more pronounced enabling influence on the frequency, quality, and impact of a student's relationships with faculty. In both the first and second year of postsecondary education, liberal arts college students reported higher levels of both faculty interest in teaching and student development and the quality of their non-classroom interactions with faculty than did similar students at either research universities or regional institutions. Though limited to relationships with faculty, such evidence is supportive of recent efforts such as learning communities and living-learning centers that attempt to create more effective academic subenvironments within large universities (Inkelas & Weisman, 2003; Tinto & Goodsell, 1994).

Clearly, small institutional size and the attendant likelihood of small classes might have important implications, not only for shaping the nature of student-faculty relationships, but also for the quality and impact of teaching that occurs in liberal arts colleges (Astin, 1999; Ludlow, 1996; Wachtel, 1998). However, it is likely that size accounts for only part of the impact. What may be of equal if not greater importance is an institutional ethos or culture that places a premium on effective teaching and high academic expectations. This ethos or culture may be most pervasive at selective liberal arts colleges, but the evidence from this study, though admittedly indirect, suggests that it may be characteristic of liberal arts colleges irrespective of their level of selectivity. Controlling for student-body selectivity, as well as an extensive battery of other confounding influences, liberal arts colleges in our sample still demonstrated significant first-year advantages over both research universities and regional institutions on measures of effective teaching and high expectations such as: instructional skill/clarity, instructional organization/preparation, instructional emphasis on cooperative learning, instructor use of higher order questioning techniques, emphasis on higher order examination questions, student academic effort/involvement, course challenge/effort, and number of assigned readings and written reports.

A culture that values both innovative and effective teaching and high academic expectations is probably the result of a complex interweaving of mutually reinforcing influences. Certainly liberal arts colleges are more likely than other four-year institutions to attract and hire faculty who, for both personal and professional reasons, value good teaching (Leslie, 2002). Furthermore, these initial values are probably accentuated even further by interaction with similarly oriented faculty already at the institution. High academic expectations may also be shaped in part at least by faculty recruitment and hiring practices. However, it is likely that creating an institutional culture of high intellectual expectations is also promoted through purposeful administrative policies that support and reinforce a challenging undergraduate academic experience both in and out of the classroom. Our findings suggest that an academically selective student body may not be a necessary prerequisite for such an institutional culture at liberal arts colleges.

Finally, if student precollege traits, and a selective, residential, full-time student

body do not fully explain why liberal arts colleges foster good practices in undergraduate education, it further reinforces the importance of institutional policies and programs aimed at narrowing the gap in student experiences between liberal arts colleges and other types of institutions. Learning communities, living-learning centers, first-year seminars and similar interventions may offer several viable approaches for accomplishing this at larger institutions (Inkelas & Weisman, 2003; Tinto & Goodsell, 1994; Upcraft, Gardner, & Associates, 1989).

Limitations

Clearly the results of this investigation are limited by the nature of the sample. The NSSL researchers chose to study the effects of a wide range of student experiences, in substantial depth, over time. This meant a limit on the number of institutions studied. Consequently, the findings may not be generalized to all four-year institutions in the country, and external validity is an undeniable limitation of the study.

Similarly, a second limitation of the relatively small number of institutions in the study is that it made more sophisticated, and potentially more revealing, data analytic approaches such as hierarchical linear modeling problematic. This study focused on the estimated effects of attending a liberal arts college on individual students' reports of good practices in undergraduate education. It is not clear how different the results might have been if institutional-level data had been analyzed.

The findings are also limited by our operational definitions of "good practices in undergraduate education." Although we were guided by existing evidence on empirically vetted indicators of good practice dimensions, our operational definitions of variables were limited by the data we analyzed. Certainly there are other equally valid measures of good practices that might have yielded somewhat different results than the current investigation.

Fourth, the findings are limited by attrition from the sample across the three years of the study. Despite our weighting of the sample to make it more representative of the population in each successive follow-up year, the potential for some selection bias is a clear limitation of the study.

Finally, the study is limited by the fact that the data were collected in the 1990s. Weighed against this, however, is the longitudinal nature of the NSSL data and the richness of the variables measured. We know of no other longitudinal data set that permits one to introduce extensive controls for important confounding influences and yet provides such an extensive array of reliable and valid measures of good practices in undergraduate education

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