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What have we Learned from the First Year of the National Study of Student Learning?

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This article summarizes some of the major findings from the first year of the federally-funded National Study of Student Learning. The article also discusses the implications of those findings for higher education policy and practice.

Student affairs professionals take seriously their responsibilities for fostering learning and personal development. . . . If learning is the primary measure of institutional productivity by which the quality of undergraduate education is determined, what and how much students learn also must be the criteria by which the value of student affairs is judged. (ACPA, p. 2, 1994)

This statement, taken from the 1994 American College Personnel Association (ACPA) publication The Student Learning Imperative: Implications for Student Affairs (SLI), clearly underscores student learning and cognitive development during college as central concerns of student affairs professionals. Among other things, the SLI statement contains the assertion that student affairs divisions include experts on students and teaching and learning, as well as the argument that student affairs policies and practices should be based on not only results of research on student learning but also institution-specific assessment data. Thus, the SLI, developed and endorsed by a group of higher education leaders that included the ACPA president and the executive director of the National Association of Student Personnel Administrators, places student affairs at the center of postsecondary education's primary mission of facilitating student learning and intellectual growth.

Although the SLI's aims include encouraging use of knowledge about student learning and intellectual growth in the development of student affairs programs, two points remain problematic. First, student affairs journals do not publish much research and scholarship on student learning, and so the required knowledge base may not be readily available in the field's literature (Kuh, Bean, Bradley, & Coomes, 1986). Second, the knowledge base itself has limitations. In their review of the literature on college impact, Pascarella and Terenzini (1991) pointed out that there is still much to learn about collegiate influences on student learning and intellectual growth.

The National Study of Student Learning (NSSL), a 3-year longitudinal research project begun in 1992 under the auspices of the National Center on Postsecondary Teaching Learning, and Assessment (NCTLA), is intended to expand knowledge about college impact by examining the influence of academic and nonacademic experiences on (a) student learning, (b) student attitudes about learning, (c) student cognitive development, and (d) student persistence. Also, the NSSL was designed so that researchers could identify the extent to which academic and nonacademic experiences differ by student and institutional characteristics. This paper contains

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summaries of some of the major findings to date from the NSSL and a discussion of the implications of those results for higher education policy and practice.

METHOD

Institutional Sample
In this study 18 four-year and 5 two-year postsecondary institutions participated. Institutions were selected from the National Center on Education Statistics' Integrated Postsecondary Education Data System (IPEDS) database to represent differences in colleges and universities nationwide on a variety of characteristics including institutional type and control (e.g., private and public research universities, private liberal arts colleges, public and private comprehensive universities, 2-year colleges, historically black colleges), size, geographic location, commuter or residential character, and the racial/ethnic distribution of the undergraduate student body. In the aggregate, the student population of the 23 participating institutions approximates the Fall 1992 national population of undergraduates by ethnicity and gender.

Student Sample and Data Collection
The first set of data was collected in the Fall of 1992. Each of the 23 participating institutions was given a target sample size relative in magnitude to the size of its entering class, and students were to be sampled randomly from the population of new students entering each institution. The overall target sample was 5,000 students; the obtained sample (i.e., those students actually participating) for the Fall 1992 data collection was 3,840 (76.8%).

The initial data collection lasted approximately 3 hours and included surveys of entering-student characteristics and tests of academic proficiency. Students were advised that they were participating in a national longitudinal study of student learning and would be paid a $25 stipend for their participation. They also were advised that the information they provided would be kept confidential and would never become part of their institutional records, and that they were being expected only to make a good-faith effort on the cognitive test modules and respond candidly to all questionnaire items.

A survey developed by NCTLA was used to obtain information on students' characteristics and backgrounds, as well as students' aspirations, expectations, and orientations toward learning as they entered college. Participants also completed Form 88A of the Collegiate Assessment of Academic Proficiency (CAAP). The CAAP was developed by the American College Testing Program (ACT) to assess general skills (e.g., writing, science reasoning, reading, mathematics) typically acquired by students during the first 2 years of college (ACT, 1989). The total CAAP consists of five 40-minute, multiple-choice test modules. Three modules—reading comprehension, mathematics, and critical thinking—were administered to NSSL participants in Fall 1992. The internal consistency reliabilities for the three modules range from .79 to .86. Correlations between the modules and cumulative grade-point average are significant and positive, as are the modules' relationships to similar measures, such as grades in English and mathematics (ACT, 1991) and the Watson-Glaser Critical Thinking Appraisal (Bohr, Pascarella, Nora, & Terenzini, 1995).

Follow-up testing of the sample took place in the Spring of 1993. This data collection required about 3-1/2 hours and included the reading comprehension, mathematics, and critical thinking modules from Form 88B of the CAAP, Pace's (1984, 1987, 1990) College Student Experiences Questionnaire (CSEQ) to measure students' first-year experiences in college, and a follow-up assessment of aspects of students' first-year experiences and learning orientations not covered by the CSEQ. Students were paid a stipend of $35 for their participation in the second data collection. Of the 3,840 students who completed the Fall 1992 testing, 2,685 participated in Spring 1993 (69.9%).

Given the high response rates at both testings, it is not particularly surprising that the participants were reasonably representative of the population from which they were drawn. Nonetheless, the sample was weighted to adjust for potential response bias by gender, ethnicity, and institution. Based on the sampling plan that led
to the selection of the 23 institutions in the study and the weighting of individual respondents within each institution, the weighted aggregate sample of 2,685 students was reasonably representative, by gender and ethnicity, of the national population of first-year students entering higher education in the United States in the Fall of 1992.

Data Analysis
Various forms of least-squares regression analysis and analysis of covariance were the main data analysis procedures employed. These techniques permitted the researchers to estimate the unique or net effects of independent variables of interest while statistically controlling for salient precollege and other potential confounding influences. That is, the researchers used statistical procedures to isolate the effects of certain student experiences, such as type of institution attended, while taking differences among students, such as precollege ability, into account. Specific controls are described in each of the following sections on the results.

LIMITATIONS
The NSSL data have several limitations that one should keep in mind when interpreting the findings. First, although the overall sample is multi-institutional and consists of a broad range of 2- and 4-year institutions from 16 states throughout the country, the fact that the analyses were limited to 5 two-year and 18 four-year colleges means that one cannot necessarily generalize the results to all 2- and 4-year institutions in the United States. Similarly, although attempts were made in the initial sampling design and subsequent sample weighting to make the sample as representative as possible at each institution, the time commitment and work required of each student participant undoubtedly led to some self-selection. The responses of the students who were willing to participate in the study might have differed from those of the students who were invited but declined to participate. Third, the measures of cognitive development were limited to reading comprehension, mathematics, and critical thinking. Although these are important dimensions of cognitive development, they are certainly not the only way in which cognitive or intellectual development can be operationally defined. Alternative conceptualizations or operational definitions of the dependent measures might have yielded findings different from those yielded by the NSSL analyses. Fourth, the NSSL analyses conducted so far are limited by the fact that the sample has been traced only over the first year of college. The results reported here might not hold for subsequent years in college. Finally, the NSSL is based on correlational, rather than experimental, data. Although efforts were made to control the influence of potential confounding variables with statistical procedures, such procedures cannot provide the same level of control—or certainty about causation—as true experiments.

RESULTS
Effects of Two-Year and Four-Year Colleges
The first analysis of the NSSL data involved a comparison of the cognitive impacts of the first year in 5 two-year and 6 four-year colleges and universities matched on first-year-student precollege ability (i.e., a composite of scores on the three precollege CAAP modules, reading comprehension, mathematics, and critical thinking). Influences of students’ individual precollege ability (i.e., the appropriate CAAP module score), gender, ethnicity, socioeconomic origins, precollege academic motivation, age, credit hours taken, residence on or off campus, work responsibilities, and the average precollege ability of the students attending each institution were controlled. No significant differences were found between 2-year college students and their 4-year college counterparts on end-of-first-year reading comprehension, mathematics, critical thinking, and composite achievement (a combination of all three CAAP module scores) (Pascarella, Bohr, Nora, & Terenzini, 1995a).

Recent research on the occupational and economic consequences of where one begins postsecondary education has suggested that 2-year colleges may be a cost-effective way for students to complete the first 2 years of college.
without sacrificing job market competitiveness in such areas as income or job status (Whitaker & Pascarella, 1994). The results of the first year of the NSSL suggest further that students who begin college at 2-year institutions also might not sacrifice intellectual gains. At least during the first year of attendance, the cognitive impacts of 2-year colleges may be indistinguishable from those of 4-year institutions that enroll similar students.

Effects of Historically-Black and Predominantly-White Colleges

In a second analysis the cognitive effects on Black students of attendance at 2 historically Black colleges and universities (HBCUs) and 16 predominantly White colleges were compared. Statistical controls were used for individual precollege ability and academic motivation, gender, family socioeconomic origins, age, credit hours taken, campus residence, and the average precollege ability of the students attending each institution. Differences between the groups were not statistically significant and there was general parity in reading comprehension, mathematics, critical thinking, and composite achievement between Black students at HBCUs and Black students at predominantly White institutions. On three of the four outcome measures (reading comprehension, mathematics, and composite achievement), the statistically nonsignificant trends tended to favor Black students at the two HBCUs (Bohr, et al., 1995).

A long-standing critique of HBCUs asserts that these institutions might not provide an academic experience equal to that of many predominantly White institutions because of disadvantages in important educational resources such as libraries, laboratories, computer facilities, distinguished faculties, and academically well-prepared students (e.g., Bowles & DeCosta, 1971; Jencks & Reisman, 1968; Pascarella, Smart, & Stoelcker, 1989). At the same time, an impressive body of evidence suggests that HBCUs create comfortable campus climates that foster students' satisfaction, sense of community, and adjustment to college and that increase the likelihood of persistence and degree completion (e.g., Allen, 1986, 1987; Allen, Epps, & Haniff, 1991; Anderson, 1985; Pascarella, Smart, Ethington & Nettles, 1987; Pascarella et al., 1989; Thomas & Gordon, 1983). The NSSL results suggest further that these colleges also create social and psychological environments supportive of their students' intellectual development, despite possible limitations in educational resources.

These findings are also important for predominantly White institutions that are concerned about the intellectual growth and achievement of their Black students. If supportive environments foster learning at HBCUs, how might similar climates for learning be fostered at White institutions? What should such environments include, and what obstacles exist to their development? Of course, the racial composition of HBCUs might be integral to the learning environments they create. Black colleges can, however, provide model programs and services to enhance student learning that might be transferable to White institutions. One example is the "ladder" of general science programs at Xavier University (LA), designed to implement high expectations for intellectual achievement while providing systematic structures for social, psychological, and academic support (Andreas, 1991; Kuh, Schuh, Whitt, & Associates, 1991).

Effects of Perceived Teacher Behaviors

In a third analysis, the extent to which perceived teacher behaviors (i.e., student perceptions of teacher organization and preparation, and teacher skill and clarity) influenced the development of general cognitive skills in the first year of college was examined. These teacher behaviors had been identified in previous research as significant predictors of student course achievement (e.g., Cohen, 1981; Feldman, 1989, 1994). In the current study, statistical procedures controlled for the influences of precollege cognitive ability and academic motivation, the average cognitive ability of the incoming class at each institution, ethnicity, gender, age, credit hours taken, work responsibilities, and the pattern of courses taken. The extent to which students judged the overall instruction received during their first year of college as high in teacher organization and preparation had a significant positive association...
with end-of-first-year reading comprehension, mathematics, critical thinking, and composite achievement. That is, first-year students who perceived their instructors to be organized and prepared (e.g., “presentation of material is well organized,” “class time is used effectively,” and “course goals and requirements are clearly explained”) tended to demonstrate greater cognitive gains than their peers who perceived that they had received less well-organized and prepared instruction (Pascarella, Edison, Nora, Hagedorn, & Braxton, 1995).

These results have at least two implications for higher education practitioners and policy makers. First, they suggest that the positive link between perceived teacher organization and preparation and course achievement might extend to broad-based, general cognitive proficiencies. Second, and perhaps more important from a policy standpoint, effective teacher organization and preparation skills, such as those identified by the students in this study, are ones that can be taught—and learned—through teaching improvement efforts (Weimer, 1990).

Effects on First-Generation Students

A fourth analysis of the NSSL data (Terenzini, Springer, Yaeger, Pascarella, & Nora, 1995) painted a portrait of first-generation college students, and their college experiences that differs in a number of ways from that of their traditional peers. First-generation students were more likely to come from low income families, to be Hispanic, to have weaker reading, math, and critical thinking skills, to have lower degree aspirations, and to have been less involved with peers and teachers in high school. First-generation students also had more dependent children, expected to take longer to complete their degree programs, and reported less encouragement from their parents to attend college.

During college, first-generation students (compared to their traditional peers) studied less, took fewer courses in the humanities and fine arts, and completed fewer hours during their first year. They worked more hours off-campus and were less likely to attend a racial/cultural awareness workshop, perceive faculty members as concerned about students, and receive encouragement from friends to continue their enrollment. They were also more likely than traditional students to report experiencing racial/ethnic or gender discrimination.

While first-generation students entered college with lower reading, math, and critical thinking skills than traditional students, the two groups gained in their math and critical thinking abilities to about the same degree during the first year of college. Traditional students, however, showed greater gains in reading comprehension, even after initial reading skill differences were controlled. The findings across all three outcome measures suggest that group differences in college experiences may have a small, but statistically significant, differential effect on group learning gains. For example, the number of hours spent studying appeared to be more important for reading skill improvement among first-generation students than for their traditional peers. Similarly, the total number of hours completed was more strongly and positively associated with gains in first-generation students’ critical thinking abilities.

The evidence suggests that these first-generation students (compared to traditional students) come to college less well-prepared and with more non-academic demands on them, and they enter a world where they are less likely to experience many of the conditions that other research (Pascarella & Terenzini, 1991) indicates are positively related to persistence, performance, and learning. The combined portrait of first-generation students is one of a group at academic risk, and their number is expected to grow over the next decade.

This study suggests the need to smooth first-generation students’ transitions from work or high school to college. “Bridge” programs involving collaboration between high school, community colleges, and 4-year institutions have proven to be successful. Successful programs provide “systematic and comprehensive academic support services (such as assessment and remediation, learning laboratories, tutorial services, intrusive advising, and monitoring of student progress) until a student was firmly established in a major” (Richardson & Skinner, 1992. p. 39).
Effects of Intercollegiate Athletic Participation

A fifth analysis of the NSSE data involved estimation of the effects on first-year cognitive development of participation in intercollegiate athletics. Statistical controls were applied for precollege ability and academic motivation, the average ability of the incoming class at each institution, NCAA Division I or Non-Division I participation, ethnicity, age, credit hours taken, and campus residence. The analysis of the NSSE data revealed that male football and basketball players had significantly lower end-of-first-year reading comprehension and mathematics scores than did male athletes in other intercollegiate sports or male nonathletes. The differences between male nonathletes and male athletes in sports other than football and basketball were small and non-significant.

When the same potentially confounding influences were controlled for, women intercollegiate athletes showed significantly less first-year development in reading comprehension than did their nonathlete counterparts. The two groups were essentially the same in mathematics and critical thinking (Pascarella, Bohr, Nora, & Terenzini, 1995b). Further analysis indicated that the impact of athletic participation on first-year reading comprehension was not the same for all women athletes. Rather, the largest reading comprehension disadvantages accrued to those women who had begun college with the lowest levels of reading comprehension. As the level of precollege reading comprehension increased, the magnitude of the disadvantage for women athletes, relative to their nonathlete counterparts, tended to decrease. Thus, the cognitive impediments linked with athletic participation were not the same for all women athletes, but rather were most pronounced for women athletes who were at the greatest disadvantage as they entered college.

The apparent learning disadvantages accruing to males who play intercollegiate football and basketball, and to female intercollegiate athletes with low precollege reading skills, suggest that any steps taken to ameliorate these negative consequences need to be taken early in these students' collegiate careers. The significant negative influences of athletics for these groups were detectable after only 1 year of intercollegiate athletic participation. A growing body of evidence (e.g., Pascarella, Brier, Smart, & Herzog, 1987; Walberg & Tsai, 1983) suggests that these 1-year differences may well be the first stage in a process that produces a serious cumulative disadvantage, one that is likely to worsen over time.

Influences on, and Consequences of, Openness to Diversity and Challenge

A sixth analysis involved an examination of the extent to which students' development of openness to cultural/racial diversity and challenge during the first year of college was influenced by measures of the institutional environment and students' academic and non-academic experiences. The scale measuring students' openness to diversity and challenge was an 8-item Likert-type measure with internal consistency reliabilities of .83 for the precollege scale and .84 for the end-of-first-year scale. Diversity and challenge scale items included "I enjoy having discussions with people whose ideas and values are different from my own," "Learning about people from different cultures is a very important part of my college education," "I enjoy taking courses that challenge my beliefs and values," "The courses I enjoy most are those that make me think about things from a different perspective," and "Contact with individuals whose background (e.g., race, national origin, sexual orientation) is different from my own is an essential part of my college education."

Statistical controls were used for precollege openness to diversity and challenge, academic ability, academic motivation, coursework patterns, and other potentially confounding influences. Data analysis revealed a number of variables that had significant, net positive effects on end-of-first-year openness to diversity and challenge. These variables included a non-discriminatory racial environment at the institution attended, on-campus residence, participation in a racial or cultural awareness workshop, and extent of involvement with diverse student peers. Greek affiliation had a significant negative effect on openness to challenge and diversity for both
men and women. Additional analyses indicated that on campus residence and participation in a racial or cultural awareness workshop had stronger positive effects on openness to diversity and challenge for White students than for non-White students. Conversely, Greek affiliation had a stronger negative effect on openness to diversity and challenge for both White men and women than it did for students of color (Pascarella, Edison, Nora, & Terenzini, 1994).

In a related NSSL analysis (Springer, Terenzini, Pascarella, & Nora, 1995) researchers examined how initial level of openness to diversity shaped students’ associations with socially diverse peers, as well as the frequency of students’ discussions of substantive issues related to ethnic, racial, or cultural diversity. As a group, White students at the end of the first year of college perceived significantly less campus prejudice against ethnic minority students than did African American, Asian American, or Hispanic students. However, White students who were initially more open to diversity were more likely to have culturally diverse student acquaintances and to discuss issues of race, ethnicity, or culture more frequently than those with less initial openness to diversity. These experiences each exerted significant and positive direct effects on White students’ perceptions of prejudice against minority students on campus. White students who were more open to diversity as they began college had, at the end of the first year, perceptions of prejudice against minority students similar to the perceptions of students of color. Thus, students’ openness to diversity directly not only affected their perceptions of prejudice but also indirectly affected their perceptions through their peer associations and frequency of discussions about diversity.

These results have several implications for higher education practitioners. First, they tend to support Astin’s (1993) contention that the student’s peer group is a particularly potent source of influence on growth and development during the undergraduate years. Students who were involved with peers different from themselves demonstrated growth in openness to diversity and challenge and were more likely to perceive the racial climate on their campus in ways that were congruent with those of students of color. Knowledge of the importance of peer influence on student learning can, therefore, influence broad range of institutional policies and practices (e.g., orientation programs, housing assignments and residence life programs, work study programs, Greek system policies, and collaborative learning settings) intended to bring White students into more frequent and educationally purposeful contact with racially, ethnically, and culturally diverse peers.

Second, the findings have implications for institutional policies aimed at enhancing students’ acceptance and appreciation of diversity. For example, this study indicates that racial or cultural awareness workshops can foster students’ openness to cultural, racial, and value diversity. The finding that openness to diversity and challenge was positively influenced by a nondiscriminatory racial environment suggests that institutions can facilitate students’ growth on this dimension. This can be done through policies and programs that teach faculty, administrators, and students about what constitutes racial discrimination and that demonstrate unequivocally how racism and intolerance for diversity are anathema to the institutional ethos and mission.

Cognitive Effects of Greek Affiliation
The NSSL also involved examination of the cognitive effects of affiliation with a social fraternity or sorority (i.e., Greek affiliation) during the first year of college. Statistical controls were made for individual precollege ability and academic motivation, gender, ethnicity, age, credit hours taken, work responsibilities, campus residence, patterns of coursework taken, and the average cognitive ability of the incoming class at each institution. Analyses of the data revealed that men who were members of social fraternities had significantly lower end-of-first-year reading comprehension, mathematics, critical thinking, and composite achievement than their peers who were not affiliated with Greek organizations. First-year fraternity membership had the largest negative effect on critical thinking. By the end of their first year of
college, men in fraternities had, on average, a disadvantage of .27 of a standard deviation in critical thinking when compared to their non-Greek peers. The corresponding disadvantages in reading comprehension and mathematics for men in fraternities were .17 of a standard deviation and .14 of a standard deviation, respectively.

Additional analyses revealed that, for men, ethnicity influenced the cognitive effects of Greek affiliation. Joining a fraternity had a strong negative effect on all four cognitive outcomes for White men, but a modest positive influence on all four cognitive outcomes for men of color (Pascarella, Nora, Edisson, Hagedorn, & Terenzini, 1994). What the data cannot tell us, however, is whether the fraternities to which the NSSL students belonged were predominantly White, predominantly of color, or balanced in their racial/ethnic composition.

The analysis of data for women indicated that joining a sorority during the first year of college also had a negative effect on cognitive development. However, only the negative effects for reading comprehension and composite achievement were statistically significant. The overall magnitude of the negative cognitive influences of Greek membership tended to be smaller for women than for men.

The results of these analyses tend to reinforce findings of previous research. Pike and Askew (1990), for example, in their single-institution study, found statistically significant, but small, negative effects of fraternity membership on the cognitive development of college seniors. The NSSL study indicates, however, that the negative cognitive effects of Greek affiliation might be discernible as early as the end of the first year of college. This should lead to consideration of policies on timing of Greek membership. For example, rush and new-member activities, especially for White men, might be deferred to the second semester—or even the second year—of college.

The findings also suggest that, although fraternities and sororities can "provide unusually rich out-of-class learning and personal development opportunities for undergraduates" (Kuh & Lyons, 1990, p. 20), normative peer cultures and practices of Greek life can be inconsistent with the educational and intellectual missions of colleges and universities. Therefore, administrators and faculty are advised to "compare the purposes and practices of Greek organizations with their institutions' mission and philosophy to determine whether they are compatible" (p. 27). Evidence of lack of compatibility should lead to an examination of the role of Greek life in the institution—including, indeed, a restructuring of those policies and practices.

Multiple Influences On Critical Thinking

A final analysis of the NSSL data was conducted to determine the influence of in-class and out-of-class experiences—together and separately—on first-year students' critical thinking. Statistical procedures controlled for the effects of students' initial level of critical thinking, degree aspirations, age, gender, ethnicity, and social origins, as well as institutional characteristics such as form of control (private or public) and type (2- or 4-year), and several measures of institutional environmental emphasis (e.g., analytical, scholarly, aesthetic). Both in-class and out-of-class experiences had small, but statistically significant and unique, positive effects on changes in critical thinking during the first year in college (Terenzini, Springer, Pascarella, & Nora, 1994). In fact, out-of-class-experiences were somewhat more important to development of critical thinking than in-class experiences were.

The in-class/instructional variables significantly and positively associated with end-of-first-year critical thinking were the number of courses taken in the humanities and fine arts and the natural sciences and engineering, as well as the total number of credit hours completed in the first year. Significant out-of-class experiences were student involvement in clubs and organizations, attendance at a racial/cultural awareness workshop, and student perceptions of faculty concern for student development.

These results highlight the centrality of out-of-class experiences to student learning in college (Astin, 1993; Baxter Magolda, 1992) and reinforce the assertion stated at the beginning of this article: Student affairs professionals and student affairs programs play a major role in
student learning and cognitive development during college. These results also suggest the need for a rethinking of the current structural and functional relationships between academic and student affairs divisions in colleges and universities. If students develop intellectually as a consequence of an interconnected and holistic set of in-class and out-of-class influences, then administrative structures, program planning, and program implementation should be similarly interconnected and collaborative.

SUMMARY AND CONCLUSIONS

What main points have arisen from the first year of the NSSL? First, the findings thus far indicate that some widely accepted perceptions of the quality of the academic experiences offered by 2-year colleges and historically Black institutions (HBCUs) should be questioned. Many people in higher education and the public at large believe that 2-year colleges and HBCUs offer educational experiences academically inferior to those available at 4-year or predominantly White colleges and universities. The analyses of NSSL data indicated that those beliefs may lack empirical support. After controlling for a variety of entering-student characteristics, including levels of precollege critical thinking, reading, and math, 2-year-institution students showed gains in these cognitive areas comparable to those of students who entered 4-year institutions. Also, after applying similar statistical controls, no differences in gains in critical thinking, reading comprehension, or math skills were found between Black students who completed their first year of college at HBCUs and Black students who spent their first year at predominantly White institutions. Both findings suggest the need to reexamine current policies and practices affecting the allocation of resources to 2- and 4-year institutions in the public sector, as well as the level of public and private support provided to HBCUs.

Second, the NSSL evidence indicated that the degree of instructors' organization and preparation for classes may be linked not only to students' general academic achievement but also to the development of higher order academic and cognitive skills. These instructional skills can be taught to, and learned by, faculty members through instructional improvement activities.

Third, through the NSSL analyses, student experiences and campus interventions were identified that affect student learning and development, both positively and negatively. Students' participation in a racial or cultural awareness workshop, residence on campus, perceptions of a nondiscriminatory racial environment at the institution attended, and interpersonal contact and involvement with diverse peers were significantly, positively, and uniquely related to gains in openness to cultural/racial diversity and challenge. These findings underscore the important role students' peers play in an institution's overall educational impact. Ways must be found to incorporate this source of influence systematically in educational programs and policies.

But not all college experiences have positive effects on student learning. First-year participation in a social sorority or fraternity (especially a fraternity) and participation in men's intercollegiate football and basketball (and women's basketball for players with low cognitive skills as they enter college) had negative influences on students' development of higher order academic and cognitive skills. Also, Greek participation (for White men and women) had a statistically significant negative influence on changes in openness to racial/cultural diversity and challenge. Given that all these negative effects were identifiable after only 1 year of college, and the likelihood (based on other evidence) that these differences are likely to increase rather than diminish over time, such findings raise questions about the wisdom of institutional policies that permit first-year students to participate in these activities.

The NSSL evidence that these college influences appear to be specific to student subgroups with certain characteristics (e.g., gender, race/ethnicity, first-generation student status) emphasizes the need for institutional programming and interventions that are sensitive to student differences. Pascarella and Terenzini (1991) suggested that more lip-service than serious attention is given to individual student
differences in our colleges and universities, and the NSSL findings summarized here suggest that closer attention must be paid to such differences.

Finally, the NSSL findings highlight the interconnected, even overlapping, influence of students’ college experiences as they shape student learning. Taken together, these analyses point to a wide variety of curricular, instructional, out-of-class, and organizational climate variables that affect how students learn and grow. This finding indicates a need to blur the boundaries between “academic” and “student” affairs. It is clear from this and other studies (see Pascarella & Terenzini, 1991) that students develop in much more holistic and integrated ways than are reflected in current organizational structures, attitudes, and behaviors. The evidence suggests a need for greater cooperation and collaboration among organizational units within and across academic and student affairs.

Despite its limitations, the National Study of Student Learning provides an important resource for higher education professionals concerned with student learning and cognitive development in college. No other database currently contains such in-depth measures of student learning and cognitive development from a sample of students from such diverse 2- and 4-year institutions. In future analyses researchers will address the development of students’ science reasoning and writing skills after 2 years of college, and will revisit the development of critical thinking and reading comprehension at the end of the third year of college. These future analyses, along with the findings reviewed in this paper, contribute to a research base upon which student affairs professionals can develop policies and programs to promote student learning.

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