Running Head: EDUCATIONAL EXPENDITURES AND STUDENT ENGAGEMENT

Educational Expenditures and Student Engagement: When Does Money Matter?

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Abstract

Studies of the relationships between higher education expenditures and student outcomes are relatively rare. The present research examined the relationships between higher education expenditures and students' engagement in educationally purposeful activities. Findings indicate that the relationships between expenditures and student engagement are contingent on both students' year in school and institutional characteristics.

Educational Expenditures and Student Engagement: When Does Money Matter?

The connections between expenditures for education and student learning have been extensively studied in K-12 education since publication of *Equality of Educational Opportunity* (Coleman et al., 1966). In contrast, few studies have addressed the relationship between higher education expenditures and student outcomes. The paucity of research on expenditures and outcomes is surprising, given declining state funding for higher education and growing demands that colleges and universities be more transparent and accountable for student learning outcomes. A better understanding of the relationships between expenditures and outcomes is needed if colleges and universities are to use limited resources wisely. The present research examined the relationship between higher education expenditures and a key determinant of student learning—engagement in educationally purposeful activities. The results of this research are important for two reasons: First, the findings identify the relationships between specific types of expenditures and student engagement. Second, the results show how the relationships between expenditures and engagement may be influenced by institutional characteristics.

Background

Educational Expenditures and Learning Outcomes

The Coleman et al. (1966) finding that school resources had little or no effect on student achievement, after taking into account student background characteristics, touched off a national debate in K-12 education (Wenglinskey, 1997). The "money doesn't matter" claim has yet to be resolved. Consistent with the findings of Coleman and his colleagues, Hanuschek's (1989, 1997) meta-analyses found that the consistent positive correlations between per-pupil expenditures and student achievement disappeared after taking into account family background characteristics. Other meta-analyses, using many of the studies examined by Hanuschek and more recent

research, found important positive relationships between expenditures and achievement, even after controlling for differences in students' backgrounds (Greenwald, Hedges, & Laine, 1996; Hedges, Laine, & Greenwald, 1994). Based on his analysis of three national data sets, Wenglinsky (1997) found that expenditures had a positive indirect effect on student achievement, acting through teacher-student ratios. He also found that the way in which expenditures influenced achievement was contingent on students' grade levels, in that the effects differed for fourth- and eighth-grade students.

Most of the research on expenditures in higher education has focused on differences in expenditures across functions (i.e., instruction, research, and public service), trends in expenditures, or issues related to economies of scale or cost reduction in higher education (Smart, Ethington, Riggs, & Thompson, 2002; Toutkoushian, 1999). The few studies examining the relationships between expenditures and educational outcomes produced contradictory results. Early studies, for example, found no significant relationships between expenditures and either exiting test scores (Rock, Baird, & Linn, 1972; Rock Centra, & Linn, 1970) or future earnings (James & Alsalam, 1993; James, Alsalam, Conaty, & To, 1989), after controlling for differences in institutional characteristics.

More recent studies have found statistically significant relationships between expenditures and college outcomes (Astin, 1993; Gansemer-Topf & Schuh, 2004; Hayek, 2001; Ryan, 2004b; Smart, Ethington, Riggs, & Thompson, 2002; Toutkoushian & Smart, 2001). However, these relationships have not been consistent, either between or within studies. For example, Astin (1993) found that expenditures for student services were positively related to retention, but Ryan (2004) failed to substantiate this relationship. Instead, Ryan (2004) found that expenditures for instruction and academic support were positively related to retention rates. Drawing on a

combination of data from the College Student Experiences Questionnaire (CSEQ), the Integrated Postsecondary Education Data System (IPEDS), and U. S. News and World Report, Hayek (2001) found a positive relationship between persistence and graduation rates and expenditures for instruction, research, academic support, and institutional support. Gansemer-Topf and Schuh (2004) found that retention at private baccalaureate colleges was positively related to expenditures for academic support, but negatively related to expenditures for student services and institutional support. Using data from the Cooperative Institutional Research Program (CIRP), Toutkoushian and Smart (2001) found positive relationships between expenditures for instruction and self-reported gains in interpersonal development, whereas Smart, Ethington, Riggs, and Thompson (2002) found that instructional expenditures were negatively related to leadership development. Toutkoushian and Smart (2001) also found that expenditures for academic support were positively related to self-reported preparation for graduate school, but negatively related to knowledge gains and the development of communication skills.

To date, the few studies of expenditures and college outcomes have produced inconsistent findings, making it impossible to derive a robust theoretical or conceptual framework for guiding research in this area. Even in K-12 education, where much research is available, conceptual frameworks incorporating per-pupil expenditures and learning outcomes have not been developed. Perhaps the closest thing to a conceptual framework is Wenglinsky's (1997) argument that the effects of expenditures on student learning are indirect (i.e., mediated by school experiences) and contingent on student grade level.

Following Wenglinsky's (1997) lead, we hypothesize that the inconsistent findings in studies of college expenditures and student learning may be in part a function of indirect and contingent effects of expenditures on educational outcomes. By examining relationships between

expenditures, college experiences, and institutional characteristics it may be possible to better understand what extent expenditures contribute to outcomes. Focusing on students' college experiences as a mediating variable is important because students' experiences, specifically their engagement in educationally purposeful activities, are a key determinant of college outcomes (Astin, 1977, 1993; Feldman & Newcomb, 1969; Kuh, Pace, & Vesper, 1997; Pace, 1990; Pascarella & Terenzini, 1991, 2005; Pascarella et al., 1996).

Research on Student Engagement

Student engagement theory had its origin in the work of Pace (1980, 1984), Astin (1984, 1985), and Kuh and his colleagues (Kuh, Schuh, Whitt, & Associates, 1991). Although these writers used different terminology (e.g., quality of effort, involvement, and engagement) to describe their concepts of student engagement, their views were based on the deceptively simple premise that students learn from what they do in college (Kuh, 2003). Research has provided consistent support for this assumption, indicating that engagement is positively related to test scores and self reports of student learning (Gellin, 2003; Kuh, Hu, & Vesper, 2000; Pascarella et al., 1996; Pike, 1999; Pike & Kuh, 2005; Pike, Kuh, & Gonyea, 2003). Student engagement is also positively linked to grades (Astin, 1977, 1993; Indiana University Center for Postsecondary Research, 2002) and persistence rates (Pike, Schroeder, & Berry, 1997).

A second important premise of student engagement theory is that, even though the focus is on *student* engagement, *institutional* characteristics influence levels of engagement on campus (see Astin, 1985; Kuh, Schuh, Whitt, & Associates, 1991; Pace, 1984). The influence institutions exert on student engagement extends well beyond global characteristics such as size and mission. Among the more important factors that influence student engagement are institutional policies that emphasize the importance of undergraduate education (see Kinzie,

Schuh, & Kuh, 2004; Kuh, Kinzie, Schuh, Whitt, & Associates, 2005) and promising educational practices such as learning communities (Pike, 1999; Pike, Schroeder, & Berry, 1997; Zhao & Kuh, 2004). Pascarella and Terenzini (2005, p. 602) concluded that because "individual effort or engagement is the critical determinant of the impact of college, then it is important to focus on the ways in which an institution can shape its academic, interpersonal, and extracurricular offerings to encourage student engagement."

Colleges and universities' patterns of expenditures represent a set of actions that can emphasize or deemphasize undergraduate education and student learning. To date, only two studies have examined the link between expenditures and student engagement. Hayek (2001) used quality of effort indicators from the College Student Experiences Questionnaire (CSEQ) along with IPEDS and U. S. News and World Report variables to determine whether expenditures mattered to student engagement. He found strong bivariate relationships between quality of student effort and expenditures for scholarships, student services, and institutional support. Relationships were less robust for quality of student effort and research and public service expenditures, and nonexistent for instruction and academic support. Ryan (2005) found a negative relationship between administrative (i.e., institutional support) expenditures and engagement. However, the findings of both studies are limited by the fact that the studies are based on convenience samples of institutions and, in Hayek's (2001) study, convenience samples of students. Ryan's (2005) study is also limited by the fact that it was based on a small set of engagement measures and dated expenditure information.

The present research goes beyond the studies of Hayek and Ryan to explore the relationships between higher education expenditures and student engagement using data from a nationally representative sample of colleges and universities. In addition, the institutional data were based

on representative samples of students and engagement measures, as well as current data on expenditures. Two questions guided this research: (1) In what ways are different types of expenditures related to student engagement? (2) Do the relationships between expenditures and engagement differ for first-year and senior students attending public and private institutions? Answers to these questions will help researchers begin building a conceptual framework for studying the relationships between expenditures and student engagement.

Methods

Data Sources

Institutions were the unit of analysis in this study. The institutional data came from the National Survey of Student Engagement (NSSE) Spring 2001 administration of *The College Student Report*, the IPEDS institutional data collection, and *America's Best Colleges 2001* (U. S. News and World Report, 2001). Information about student engagement came from the NSSE institutional benchmarks. Data about institutional characteristics and expenditures were obtained from the 2000-2001 IPEDS data collection, and the institutional selectivity measure used in this study was based on U. S. News ratings.

The NSSE 2001 sample included 177,103 first-year and senior students who were randomly selected from the populations of the 321 participating colleges and universities. Students at 261 institutions had the option of responding either via a paper-and-pencil questionnaire or via the web, and 60 schools opted for web-only administration. About 70% of the students completed the paper version of the survey, and 30% completed the survey via the web. Generally, administration mode does not affect the results, except that web respondents tend to report greater use of electronic technology (Carini, Hayek, Kuh, Kennedy, & Ouimet, 2003). The overall average unadjusted institutional response rate was slightly less than 42%. Response rates

ranged from 9% to almost 70%. A comparison of respondents' characteristics to the characteristics of the student populations at participating institutions revealed that women tended to be overrepresented among the respondents, as were Caucasians and full-time students. However, the differences were relatively small and should not affect the generalizability of the results for NSSE respondents.

Of the original 321 institutions participating in NSSE 2001, 22 were excluded due to low response rates, specialized missions, or missing IPEDS/U. S. News data. One other institution was excluded because regression diagnostics indicated that extreme scores on independent variables exerted undue influence on the regression results. Table 1 displays the characteristics of the institutions included in the study and a national profile of four-year colleges and universities. Public institutions were overrepresented in the study, which is not necessarily a problem because they enroll about 80% of all undergraduates. Among the public institutions, doctoral-research universities were slightly overrepresented and both Masters and baccalaureate-general institutions were underrepresented. The public institutions in the study were slightly larger-than-average and had higher-than-average expenditures for instruction but lower-than-average research expenditures. Among the private institutions, liberal-arts colleges and doctoral-research universities were overrepresented, whereas baccalaureate-general institutions were underrepresented. The private institutions in the study also tended to enroll more students than is typical, and had lower-than-average expenditures for research and somewhat higher-than-average expenditures for student services and institutional support.

Insert Table 1 about here

Measures

As previously noted, the NSSE institutional benchmarks provided the measures of engagement used in this study. The NSSE survey asks students to indicate the frequency with which they engage in activities that represent good educational practice and are related to positive learning outcomes (Kuh et al., 2001). Self-report data are widely used in research on college effects, and the reliability and validity of these data have been studied extensively (see Baird, 1976; Berdie, 1971; Pace, 1985; Pike, 1995; Pohlmann & Beggs, 1974). Research shows that self-report measures are likely to be valid under five conditions:

1. the information requested is known to the respondents;
2. the questions are phrased clearly and unambiguously;
3. the questions refer to recent activities;
4. the respondents think the questions merit a serious and thoughtful response; and
5. answering the question does not threaten, embarrass, or violate the privacy of the respondent or encourage the respondent to respond in socially desirable ways (Kuh, 2001, p. 4).

Studies indicate that *The College Student Report* meets these five criteria and yields accurate, meaningful information about students' college experiences (Kuh, 2001; Kuh et al., 2001; Ouimet, Bunnage, Carini, Kuh, & Kennedy, 2004).

Institutional benchmark scores were distilled from institutional means for 40 items on *The College Student Report*. The first benchmark, Level of Academic Challenge, includes questions about time spent preparing for class, institutional expectations for academic performance, the amount of reading and writing expected of students, and the emphasis placed on higher-order thinking in classes. Active and Collaborative Learning, the second benchmark, includes

questions about participating in class and working collaboratively with other students in and out of class. Questions about talking with faculty members and advisors, discussing ideas with faculty members outside of class, and working with faculty members on research projects comprise the third benchmark, Student Interaction with Faculty Members. The Enriching Educational Experiences benchmark includes questions about interacting with diverse groups of students, using electronic technology, and participating in activities such as internships, study abroad, and a culminating experience. Finally, the Supportive Campus Environment benchmark includes questions about students' perceptions of the extent to which the institution helps them succeed academically and socially. It also includes questions about the quality of students' relationships with faculty, peers, and administrative personnel and offices.

Separate benchmark scores were calculated for first-year students and seniors. Group mean generalizability analyses (see Kane, Gilmore, & Crooks, 1976) revealed that dependable (i.e., $Ep^2 \geq 0.70$) scores could be calculated using as few as 50 students. Table 2 presents the mean benchmark scores for public and private institutions included in the study. Consistent with the results for other NSSE administrations, benchmark scores were generally higher for private institutions (National Survey of Student Engagement, 2000, 2002, 2004).

Insert Table 2 about here

The 2000-2001 IPEDS data collection provided all but one of the remaining variables in the study. That variable, selectivity of admissions, was obtained from U. S. News ratings. Carnegie classification, coded doctoral/research, master's, and baccalaureate (not coded) for public institutions and doctoral/research, master's, baccalaureate liberal arts, and baccalaureate general

(not coded) for private institutions was taken from the IPEDS institutional characteristics survey. FTE enrollment, as well as undergraduate and graduate enrollment, was taken from the institutional characteristics and Fall enrollment surveys. Because there is evidence to suggest that engagement may be influenced by socioeconomic status (see Kuh et al., 2001), IPEDS finance data on Pell grants, divided by undergraduate enrollment, was included as a measure of institutional socioeconomic status. For this measure the larger the ratio, the lower the SES of undergraduate students attending the institution.

Six types of expenditure measures were obtained from the IPEDS finance survey: (1) instruction, (2) research, (3) public service, (4) academic support, (5) student services, and (6) institutional support. Previous research has found that all of these types of expenditures are related, in one way or another, to engagement and/or college outcomes. Descriptions of the expenditure categories are provided in Table 3. Different reporting requirements for public and private institutions required that separate analyses be conducted for the two types of colleges and universities. IPEDS finance data include expenditures for both graduate and undergraduate education, whereas the NSSE benchmarks are specific to undergraduate education. Procedures adopted by the National Center for Higher Education Management Systems (NCHEMS) were used to adjust expenditures to reflect only undergraduate education (P. T. Ewell, personal communication, November 15, 2004).[1] Based on research and recommendations by NCHEMS staff, no adjustments in expenditures were needed to account for regional variations in cost of living (P. T. Ewell, personal communication, November 15, 2004). In order to account for the relationship between institutional size and expenditures, the six expenditure measures were divided by undergraduate FTE enrollment. In addition, log transformations of these measures were utilized to account for the diminishing marginal productivity of inputs (see Ryan, 2005).

Preliminary analyses indicated that the use of log transformations substantially improved the interpretability of results.

Insert Table 3 about here

Data Analysis

Using institutions as the unit of analysis, the NSSE benchmark scores were regressed on institutional characteristics and expenditure variables. Separate analyses were conducted for public and private institutions and first-year and senior benchmarks. Preliminary regression analyses and diagnostics were used to determine if linear dependencies in the data produced problems of multicollinearity and if extreme scores exerted undue influence on the results. Although correlations among expenditure categories did not create problems of multicollinearity, preliminary analyses revealed that the small number of baccalaureate institutions in the public sector did produce linear dependencies in the regression results. As a result, the categories of baccalaureate liberal arts and baccalaureate-general institutions were combined for the analyses of public institutions. Influence diagnostics (i.e., Mahalanobis Distance, Cook's D, and Centered Leverage Values) also indicated that the extreme scores of one private institution unduly influenced the regression results. That institution was dropped from the study and the final regression analyses were conducted using 144 public and 154 private institutions.

In the final regression analyses, benchmark scores were regressed on institutional characteristics and expenditure measures. We used Omnibus *F* tests and estimates of explained variance (R^2) to evaluate the appropriateness of the models and standardized regression coefficients to evaluate relationships between institutional characteristics and expenditures and

the NSSE benchmarks. Because the models for public and private institutions differed, we could not statistically compare regression coefficients across groups.

Results

First-Year Students Attending Public Institutions

The regression analyses for first-year students attending public institutions revealed that the models including institutional characteristics and expenditures were significantly and positively related to all five NSSE benchmarks. The standardized regression coefficients in Table 4 show that two expenditure measures, academic support and institutional support, were positively related to Level of Academic Challenge. Institutional characteristics and expenditure measures collectively accounted for 32% of the variance in the benchmark scores. The correlations between both expenditure variables and academic challenge were also positive and significant.

Insert Table 4 about here

Academic and institutional support expenditures were also positively related to Active and Collaborative Learning, and the full set of independent variables explained about 26% of the variance (Table 4). In addition, being a doctoral-research university was negatively related to engagement in these kinds of educational activities. Average Pell grant per undergraduate was positively related to Active and Collaborative Learning, indicating that institutions with less affluent students had higher scores in this area of effective educational practice. Institutional characteristics and expenditures also accounted for a substantial proportion of the variance in Student Interaction with Faculty Members ($R^2 = 0.26$). Again, being a doctoral-research university was negatively related to student-faculty contact, whereas academic and institutional

support expenditures, along with average Pell grant per undergraduate, were positively related to such interactions. The model for Enriching Educational Experiences also was statistically significant, explaining more than one-third of the variance. Institutional selectivity, average Pell grant per undergraduate, and expenditures for academic and institutional support were all positively related to engaging in these kinds of activities (Table 4).

The relatively consistent pattern of effects for the first four benchmarks did not hold for the Supportive Campus Environment measure. Although the omnibus regression results were statistically significant, the model explained only 15% of the variance in benchmark scores. Moreover, the only effect that reached statistical significance in the model was a negative relationship between first-year students' perceptions of the campus environment and doctoral-research university status.

Seniors Attending Public Institutions

The regression results in Table 5 indicate that institutional characteristics and expenditures were significantly related to seniors' reports of academic challenge, accounting for 22% of the variance in the institutional benchmark. Level of Academic Challenge scores were negatively related to the doctoral-research university measure and positively related to expenditures for academic and institutional support. Similar patterns were found for the other benchmarks in that significant relationships were evident for institutional characteristics and expenditures, although the direction and magnitude of the relationships varied.

Insert Table 5 about here

Institutional characteristics and expenditures accounted for 37% of the variance in the Active and Collaborative Learning benchmark, but the only measure that was significantly related to the benchmark score was being a doctoral-research university and it was negative. Institutional characteristics and expenditures accounted for 30% of the variance in the Student Interaction with Faculty Members benchmark. Being a doctoral-research university or a Masters university was negatively related to student-faculty interaction, whereas the relationship between expenditures for instruction and this benchmark was positive. Table 5 also shows that being a public doctoral-research university or a public Masters-level university was negatively related to the Enriching Educational Experiences and Supportive Campus Environment benchmarks. As with first-year students, selectivity of admissions and average Pell grant per undergraduate were positively related to institutional scores on the Enriching Educational Expenditures benchmark. Expenditures for instruction and research also were positively related to Enriching Educational Experiences.

First-Year Students Attending Private Institutions

Consistent with the analysis of public institutions, Table 6 shows that institutional characteristics and expenditures were significantly related in one way or another to all five measures of effective educational practice. For example, 42% of the variance in Level of Academic Challenge was explained, with the doctoral-research university measure being negatively related to the benchmark. Selectivity of admissions and expenditures for research were positively related to Level of Academic Challenge. Counter to the results for public institutions, average Pell grants per undergraduate was negatively related to benchmark scores, indicating that institutions with relatively more affluent undergraduate student populations had higher scores.

Insert Table 6 about here

Relatively little variance in Active and Collaborative Learning (18%) was explained by institutional characteristics and expenditures. Being a doctoral-research university was the only variable that was significantly—again negatively—related to this measure. Institutional characteristics and expenditures were more robust in explaining variance in Student Interaction with Faculty Members. However, only expenditures for student services were significantly related to the benchmark scores. Institutional characteristics and expenditures accounted for more than half (54%) of the variance in the Enriching Educational Experiences benchmark, with being a liberal-arts college and expenditures for instruction significantly, and positively, related to the measure. Being a doctoral-research university was significantly, and negatively, related to the Supportive Campus Environment benchmark.

Seniors Attending Private Institutions

Institutional characteristics and expenditures were related to all five benchmarks of engagement for seniors at private institutions (Table 7). Being a doctoral-research university was negatively related to four of the five benchmarks; the exception was Enriching Educational Experiences. For Level of Academic Challenge, institutional characteristics and expenditures accounted for 37% of the variance. In addition to doctoral-research university status, being a Masters university and average Pell grants per undergraduate were negatively related to Level of Academic Challenge. Conversely, three expenditure measures, instruction, public service, and student services, were positively related to the Active and Collaborative Learning benchmark scores. Expenditures for instruction and student services were also significantly and positively

related to Student Interaction with Faculty Members. Approximately 44% of the variance in the benchmark was accounted for by the institutional characteristics and expenditures variables in the model. In the case of Enriching Educational Experiences, slightly more than half (51%) of the variance in the benchmark was explained by the model. Being a liberal arts college, along with expenditures for instruction and public service, was positively related to Enriching Educational Experiences scores. In addition to doctoral-research university status, expenditures for research were negatively related to the Supportive Campus Environment benchmark (Table 7). Expenditures for public service were positively related to Supportive Campus Environment scores.

Insert Table 7 about here

Limitations

The findings from the 2001 NSSE survey are generally consistent with the results from other NSSE administrations, with Spearman rho institutional benchmark correlations ranging from .74 to .93 (Kuh, 2003), and institutional characteristics and expenditures tending to be relatively stable. Yet, these results represent only a snapshot in time. It is possible that using data from different years would yield different results. Also, because *The College Student Report* is a relatively short survey, it does not measure all the potentially informative aspects of student engagement. If additional questions were included, perhaps different results would emerge. The fact that the regression models for public and private institutions were slightly different may also have affected the results in unknown ways. As a result, comparisons of the results for public and private institutions should be viewed as tentative and exploratory.

It is also important to understand that the results do not necessarily indicate the causal effects of expenditures on engagement. In some cases, such as the negative relationships between expenditures for student services and engagement at public institutions, disappointing levels of engagement, student satisfaction, or persistence and graduation may have led to greater expenditures for student services. Finally, aggregation bias in the results is a possibility because institutions served as the unit of analysis (see Burstein, 1980). At a minimum, the estimates of explained variance are larger than in many studies because student-level variance is not included in the models.

Discussion

Four sets of findings emerged from this study. First, the relationships between expenditure patterns and student engagement are complex and contingent on student year in school, institutional control, and type of engagement. This complexity is evident in a number of instances for instruction, academic support, and institutional support expenditures, which were most often related to the NSSE benchmarks. Expenditures for academic and institutional support were associated with four of the five benchmarks for first-year students attending public institutions and for one of the benchmarks for seniors, whereas expenditures for instruction had stronger relationships with student-faculty interaction and enriching experiences at both public (seniors only) and private institutions (first-year students and seniors). It may be that the positive effects of expenditures for instruction flow from more favorable student-faculty ratios and devoting resources to special academic offerings which, in turn, provide greater opportunities for student-faculty contacts and engaging in enriching educational experiences.

Few substantive relationships were found between student engagement and the three remaining expenditure categories (i.e., research, public service, and student services), although

public service expenditures were positively related to active and collaborative learning, enriching educational experiences and a supportive campus environment for seniors in private colleges. The positive relationship between public service expenditures and the three benchmarks noted above may reflect the different nature of public service in private institutions where the orientation is to enhance the learning environment for students by strengthening the sense of community on campus through active participation in institutional governance and work with students on committees and projects, as contrasted with contributing one's expertise to community affairs off campus as may be the case at public institutions.

Second, the results consistently indicate that attending a doctoral-research university is negatively related to student engagement. Statistically significant negative associations were found in 15 of the 20 equations shown in Tables 4 through 7—a rate far greater than for any other variable in the equations. The negative associations between doctoral-research status and student engagement were particularly strong for seniors attending public institutions. It is important to understand that the relationships between institutional type and student engagement are not simply a product of institutional size, student ability, or socioeconomic background, as these characteristics were controlled in the analyses. Moreover, some doctoral-research universities, particularly research-intensive institutions, have relatively high levels of student engagement (Hu & Kuh, 2002; National Survey of Student Engagement, 2000, 2001; Kinzie, Schuh, & Kuh, 2004; Kuh, 2002, 2003; Kuh et al., 2005). Nonetheless, the overall pattern suggests that high levels of student engagement are not a distinctive attribute of many doctoral-research universities. In part this may be a function of their complex, multifaceted missions. At doctoral-research universities, student engagement may get less attention from faculty members and administrators than at liberal arts colleges with more focused, singular missions.

The third finding to emerge from this study is that the relationships between the socioeconomic status of the student body and engagement were opposite for public and private institutions. Consistent with expectations, private institutions with more affluent students (i.e., lower average Pell grants) were more engaging. In contrast, public institutions with less affluent student populations were found to be more engaging. The finding that public institutions with lower SES student populations are more engaging may reflect more of a populist mission for those institutions. That is, because of their missions, the institutions may attract less affluent students but concentrate their efforts and resources on policies and programs that meet students educational needs, thereby engaging them at higher levels (Kuh et al., 2005).

Fourth, money does not seem to be an important factor in creating a supportive, affirming campus environment. In fact, whereas expenditures were related to the first four benchmarks for both first-year students and seniors attending public and private institutions, there were no statistically significant relationships between expenditures and first-year students' perceptions of the campus environment. Although there were statistically significant relationships between expenditures and seniors' perceptions of the college environment, only one of the relationships was positive. Apparently, whether students feel appreciated, understood, and nurtured is not something that a college or university can necessarily purchase with financial resources. How students view the campus environment may be more a function of institutional culture—the values and norms that shape behavior and influence how people interpret events and actions. A strong institutional culture can bring a measure of coherence to campus life and—when the culture values talent development, academic achievement, and respect for human differences—encourage students to become more actively involved in various aspects of campus life (Kuh et al., 2005). Equally important for the purposes of this study, a strong, coherent culture that values

teaching and learning may also influence where and how an institution invests its financial and human resources.

Implications for Research and Practice

A primary objective of this research was to lay the groundwork for a conceptual model of the relationships among expenditures, student engagement, and educational outcomes. The paucity of research to date, coupled with a lack of consistent findings, has prevented researchers from developing a conceptual framework that can guide research. Based on previous studies, the only thing that could be said about the relationships among expenditures, engagement, and outcomes is that they are likely to be indirect and contingent. The results of the present research suggest that a conceptual model of the relationships among expenditures, engagement and outcomes is not readily attainable. In fact, the results of this study seem to indicate that the complexity of the relationships is greater than was first supposed. If, as Pascarella and Terenzini concluded in 1991 and again in 2005, most of the ways in which college affects students are indirect and contingent, it may be unrealistic to expect that the relationships among expenditures, student engagement, and college outcomes will readily lend themselves to a simple conceptual model. Additional research, utilizing different data sets and a variety of engagement and outcome measures, is needed to form a body of knowledge upon which a conceptual model can be built.

Despite the lack of clear guidance for developing a conceptual model, the findings do suggest some directions for future research. For example, the findings for the institutional support category are surprising inasmuch as this category includes expenditures for general administrative services, executive leadership, legal and fiscal operations, administrative computing, public relations, development, and other expenses not intuitively related to student

engagement and learning. Moreover, the consistent, unidirectional regression and bivariate correlation results for institutional support expenditures indicate that these findings are not simply a statistical artifact of the generally positive correlations among all types of expenditures. Similar findings were reported by Hayek (2001). Additional research, focusing on the components of this expenditure category, is needed to understand how expenditures for institutional support are related to engagement

The findings of this study also have important implications for practice. At first blush, the findings from this study seem to suggest that, of the six expenditure categories, instruction, followed closely by academic and institutional support, have the strongest positive relationships with the five NSSE measures of student engagement in effective educational practices. Thus, perhaps investing more in these areas could have positive payoffs in terms of student engagement and educational effectiveness.

However, such an interpretation masks the overall complexity and conditional nature of the relationships between expenditure categories and student engagement in educationally purposeful activities. Our findings also show substantial variation in relationships between specific expenditure categories and the engagement indices for first-year and seniors students enrolled in public or private institutions. Whether these aggregated data translate to what is occurring on an individual campus cannot be known for certain. Moreover, in today's austere fiscal climate on college campuses, campus leaders are not likely to have slack resources to maximize engagement on all five benchmark domains. The most intelligent use of these results is to make judicious decisions about *how* financial resources can be combined with faculty and staff time and facilities to create powerful, affirming learning environments with an emphais on funding interventions that are likely to benefit students of differing abilities and aspirations.

The relationships between expenditure patterns and student engagement are complex. Campus leaders desiring to influence student engagement through resource allocation must be aware that such decisions may well have differential effects on alternative student engagement activities or learning outcomes and for different types of students at different types of institutions. The results of this study and emerging complementary research (Kuh et al., 2005) suggest that both financial and moral support for student-centered policies and programs are necessary for creating campus cultures that promote and sustain effective educational practice. At the very least, why and where an institution invests its resources may make a non-trivial difference in the messages it sends about institutional priorities and values. This, in turn, helps to channel faculty, staff, and student time and energy toward certain activities more than others. Much more research is needed to determine where and how financial investments shape institutional and individual behavior resulting in improved levels of student engagement and other indicators of student success and educational effectiveness. Until more is known, campus leaders should proceed cautiously and carefully monitor the effects of their resource-allocation decisions.

Notes

[1]Expenditures for instruction, academic support, and student services were adjusted to remove expenditures for graduate education. First, IPEDS enrollment data were used to calculate the proportion of total enrollment that was graduate enrollment. Second, the proportion representing graduate enrollment was multiplied by 1.5—the typical cost increment for graduate programs in most state resource allocation models and in most cost studies. Third, total expenditures for instruction, academic support, and student services were multiplied by the weighted proportion to produce an estimate of spending for graduate education. Finally, graduate spending was subtracted from total expenditures to arrive at an estimate of expenditures for undergraduate education.

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Table 1

Characteristics of Institutions Included in the Study

	Institutions in the Study	All Institutions
Public and Private Institutions		
Public Institutions	48.3%	36.3%
Private Institutions	51.7%	63.7%
Public Institutions (N=144)		
Doctoral/Research University	39.6%	32.3%
Masters University	49.3%	53.1%
Baccalaureate – Liberal Arts College	7.6%	4.9%
Baccalaureate – General College	3.5%	9.7%
FTE Enrollment	11,328	9,500
Institutional Socioeconomic Status	$537	$522
Expenditures – Instruction (Thousands of $)	$65,850	$60,959
Expenditures – Research (Thousands of $)	$20,322	$27,978
Expenditures – Public Service (Thousands of $)	$10,716	$11,048
Expenditures – Academic Support (Thousands of $)	$16,675	$17,106
Expenditures – Student Services (Thousands of $)	$10,988	$8,781
Expenditures – Institutional Support (Thousands of $)	$17,253	$15,004

Table 1 (Continued)

	Institutions in the Study	All Institutions
Private Institutions (N=154)		
Doctoral/Research University	16.2%	10.3%
Masters University	38.3%	36.9%
Baccalaureate – Liberal Arts College	31.8%	22.4%
Baccalaureate – General College	13.6%	30.3%
FTE Enrollment	3,254	2,578
Institutional Socioeconomic Status	$396	$438
Expenditures – Instruction (Thousands of $)	$26,670	$26,506
Expenditures – Research (Thousands of $)	$2,079	$8,640
Expenditures – Public Service (Thousands of $)	$976	$1,106
Expenditures – Academic Support (Thousands of $)	$6,296	$6,754
Expenditures – Student Services (Thousands of $)	$8,581	$5,750
Expenditures – Institutional Support (Thousands of $)	$13,130	$10,175

Table 2

Mean NSSE Benchmark Scores for Public and Private Institutions

NSSE Benchmark	First-Year Students at Public Institutions	Seniors at Public Institutions	First-Year Students at Private Institutions	Seniors at Private Institutions
Level of Academic Challenge	50.4	54.7	55.5	58.8
Active & Collaborative Learning	38.3	48.1	43.2	51.3
Student Interaction with Faculty	36.6	40.3	42.4	46.4
Enriching Educational Experiences	53.8	45.1	60.9	52.2
Supportive Campus Environment	57.5	54.1	63.7	60.2

Table 3

Descriptions of the IPEDS Expenditure Categories Used in the Study

Expenditure Category	Description
Instruction	Instructional expenses include general academic instruction, occupational and vocational instruction, special sesssion instruction, community education, preparatory and adult basic education, and remedial and tutorial instruction conducted by the teaching faculty for the institution's students.
Research	Research expenses include all funds expended for activities specifically organized to produce research outcomes and commissioned by an agency either external to the institution or separately budgeted by an organizational unit within the organization.
Public Service	Public service expenses include all funds expended for activities established primarily to provide noninstructional services beneficial to groups external to the institution. Examples are seminars and projects provided to particular sectors of the community.
Academic Support	Academic support expenses include the support services that are an integral part of the institution's primary mission of instruction, research, and public service. These include library expenses, museums, galleries, audio/video services, academic computing support, academic administration, personnel development, and course and curriculum development.
Student Support	Student services expenses are those funds expended for admissions, registrar activities, and activities whose primary purpose is to contribute to students' emotional and physical well-being and to their intellectual, cultural, and social development outside the context of the formal instructional program. Examples include career guidance, counselling, financial aid administration, and student health services.
Institutional Support	Institutional support expenses include the day-to-day operational support of the institution, excluding expenditures for physical plant operations. Included in this category are expenditures for general administrative services, executive direction and planning, legal and fiscal operations, public relations, and development.

Source: Integrated Postsecondary Education Data System Finance Data File

Table 4

Regression Results for First-Year Student Attending Public Institutions

	LAC	ACL	SIF	EEE	SCE
Doctoral/Research University	-0.04	-0.45*	-0.44*	-0.21	-0.54*
Masters University	-0.09	-0.14	-0.19	-0.04	-0.18
Selectivity of Admissions	0.12	0.10	0.05	0.32*	0.20
Average Pell/FTE	-0.01	0.27*	0.29*	0.27*	0.20
Expenditures Instruction	0.00	0.01	0.05	0.06	0.15
Expenditures Research	-0.08	0.17	0.11	0.15	-0.04
Expenditures Public Service	-0.13	-0.11	-0.09	-0.04	-0.06
Expenditure Academic Supp.	0.32*	0.25*	0.32*	0.30*	0.12
Expenditures Student Services	0.02	-0.14	-0.16	-0.17	-0.13
Expenditures Institutional Sup	0.35*	0.29*	0.22*	0.27*	0.08
R-square	0.32	0.26	0.26	0.36	0.15

* $p < 0.05$

LAC = Level of Academic Challenge; ACL = Active and Collaborative Learning; SIF = Student Interaction with Faculty Members; EEE = Enriching Educational Experiences; SCE = Supportive Campus Environment

Table 5

Regression Results for Seniors Attending Public Institutions

	LAC	ACL	SIF	EEE	SCE
Doctoral/Research University	-0.52*	-0.73*	-0.86*	-0.71*	-0.71*
Masters University	-0.11	-0.04	-0.25*	-0.25*	-0.29*
Selectivity of Admissions	0.18	-0.02	0.04	0.20*	0.12
Average Pell/FTE	-0.08	0.17	0.17	0.24*	0.14
Expenditures Instruction	0.16	0.09	0.32*	0.38*	0.22
Expenditures Research	-0.01	0.17	0.22	0.44*	-0.18
Expenditures Public Service	-0.12	-0.06	-0.10	-0.07	-0.03
Expenditure Academic Supp.	0.24*	0.12	0.08	0.06	-0.02
Expenditures Student Service	-0.06	-0.06	-0.09	-0.01	-0.16
Expenditures Institutional Sup	0.20*	0.09	0.06	0.05	0.03
R-square	0.22	0.37	0.30	0.41	0.29

* $p < 0.05$

LAC = Level of Academic Challenge; ACL = Active and Collaborative Learning; SIF = Student Interaction with Faculty Members; EEE = Enriching Educational Experiences; SCE = Supportive Campus Environment

Table 6

Regression Results for First-Year Student Attending Private Institutions

	LAC	ACL	SIF	EEE	SCE
Doctoral/Research University	-0.29*	-0.33*	-0.02	0.01	-0.31*
Masters University	-0.15	-0.08	0.04	0.00	-0.07
Liberal Arts College	0.01	-0.18	0.12	0.30*	-0.01
Selectivity of Admissions	0.22*	0.04	-0.11	0.12	0.12
Average Pell/FTE	-0.15*	-0.01	-0.14	-0.12	-0.05
Expenditures Instruction	-0.04	0.17	0.18	0.20*	0.03
Expenditures Research	0.23*	-0.09	0.07	-0.03	-0.17
Expenditures Public Service	0.04	0.12	0.05	0.12	0.13
Expenditure Academic Supp.	0.17	-0.03	0.04	0.06	-0.02
Expenditures Student Services	0.06	0.11	0.36*	0.12	0.14
Expenditures Institutional Sup	0.16	0.15	0.11	0.15	0.03
R-square	0.42	0.18	0.41	0.54	0.22

* $p < 0.05$

LAC = Level of Academic Challenge; ACL = Active and Collaborative Learning; SIF = Student Interaction with Faculty Members; EEE = Enriching Educational Experiences; SCE = Supportive Campus Environment

Table 7

Regression Results for Seniors Attending Private Institutions

	LAC	ACL	SIF	EEE	SCE
Doctoral/Research University	-0.44*	-0.29*	-0.24*	-0.09	-0.38*
Masters University	-0.21*	-0.02	0.00	-0.04	-0.13
Liberal Arts College	-0.06	-0.19	0.17	0.27*	0.00
Selectivity of Admissions	0.03	-0.05	0.05	0.13	-0.05
Average Pell/FTE	-0.15*	0.00	-0.03	-0.07	-0.04
Expenditures Instruction	0.09	0.18*	0.22*	0.25*	0.12
Expenditures Research	0.04	-0.17	-0.02	-0.11	-0.32*
Expenditures Public Service	0.08	0.17*	0.07	0.18*	0.15*
Expenditure Academic Supp.	0.17	-0.08	0.01	0.01	-0.03
Expenditures Student Services	0.11	0.24*	0.29*	0.10	0.10
Expenditures Institutional Sup	0.14	0.01	-0.02	0.12	0.00
R-square	0.37	0.24	0.44	0.51	0.36

* $p < 0.05$

LAC = Level of Academic Challenge; ACL = Active and Collaborative Learning; SIF = Student Interaction with Faculty Members; EEE = Enriching Educational Experiences; SCE = Supportive Campus Environment