

FIRST THINGS FIRST: Developing Academic Competence in the First Year of College[★]

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Perhaps two-thirds of the gains students make in knowledge and cognitive skill development occur in the first 2 years of college (Pascarella, E. T., and Terenzini, P. T. (2005). *How college affects students* Vol. 2. A third decade of research. San Francisco: Jossey-Bass). A significant proportion of the students entering America's colleges and universities, however, never make it to their second year at the institution where they began. This study, part of a national effort to transform how colleges and universities think about, package, and present their first year of college, is based on data from nearly 6,700 students and 5,000 faculty members on 30 campuses nationwide. The study identifies the individual, organizational, environmental, programmatic, and policy factors that individually and collectively shape students' development of academic competence in their first year of college.

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KEY WORDS: college students; first-year students; first-year experience; academic competence; foundations of excellence; college outcomes.

A student's first year of college is vitally important for a number of reasons, not the least of which is the significant gain in learning and cognitive development associated with this period. Using information

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reported by Osterlind (1996, 1997), Pascarella and Terenzini (2005) estimated that, of the first-to-senior-year gains students made in English, science, and social studies, between 80% and 95% occurred in students' first 2 years of college. The same pattern appears in mathematics learning. Similarly, nearly two-thirds (63%), and perhaps as much as 90%, of the gains students make in critical thinking skills occur in the first 2 years of college (Facione, 1997; Facione, 1990a, 1990b, 1991).

The first college year is critical not only for how much students learn but also for laying the foundation on which their subsequent academic success and persistence rest. The typical American four-year college or university, however, loses a quarter of its new students before they start their second year (ACT, 2002). Over a six-year period, only 55% of the students who begin a bachelor's degree program at a four-year college or university will complete it at that same institution (Consortium for Student Retention Data Exchange, 2002). Loss rates are even higher among low-income and historically underrepresented students (Terenzini, Cabrera, and Bernal, 2001). The losses that many individuals and most institutions experience during a student's first year reflect an unacceptable and unnecessary waste of individual, institutional, and national talent and resources.

BACKGROUND ON THE FOUNDATIONS OF EXCELLENCE PROJECT

The study was part of the Foundations of Excellence[®] in the First College Year Project (<http://www.fyfoundations.org>), a two-year national research and development effort to increase understanding of the multiple, interconnected factors that influence academic success and persistence among first-year college students. The project staff views the first year as a significant period in students' academic and personal lives and seeks to facilitate a transformation in the way colleges and universities think about, package, and present the first year of college to their new students. This study, based on data from nearly 6,700 students and 5,000 faculty members on 30 four-year campuses nationwide, sought to identify the individual, organizational, environmental, programmatic, and policy factors that individually and collectively shape first-year students' academic success.

Foundational Dimension and the Underlying Literature

Relying on the research published over the past 35 years (e.g., Pascarella and Terenzini, 1991, 2005) and on professional experience,

project staff¹ distilled seven principles, called “Foundational Dimensions[®],” that underlie the structures, activities, and cultures of institutions that are effective in promoting the success and persistence of their first-year students. The original dimension statements were subsequently refined in a broad series of campus-based discussions among faculty members and administrators on nearly 200 liberal arts and comprehensive university campuses. The dimensions state that institutions with effective first years:

- (1) *Have Organizational Structures and Policies that Provide a Comprehensive, Integrated, and Coordinated Approach to the First Year.* Studies of institutional-level effects on student outcomes indicate that personal and organizational environments and cultures are more influential forces than structural characteristics such as size, control, mission, and selectivity (see, for example, Berger, 2000, 2001–2002, 2002; Berger and Milem, 2000). This dimension suggests that institutions vary in important ways in the extent to which they provide structures, policies, and delivery mechanisms that support first-year student success.
- (2) *Facilitate Appropriate Recruitment, Admissions, and Student Transitions Through Policies and Practices that are Intentional and Aligned with Institutional Mission.* Recent research suggests that the college withdrawal/success process begins far sooner than the first year of college (Terenzini et al., 2001). Studies of the college search and selection process (Cabrera and La Nasa, 2001; Cabrera, Burkum, and La Nasa, In press; Hossler, Schmit, and Vesper, 1999) and of the intersection of precollege and post-matriculation factors (Paulsen and St. John, 2002) indicate clear links between what happens *before* students enroll and their subsequent success in college.
- (3) *[Assign] the First College Year a High Priority for the Faculty.* Few college experiences are more strongly linked to student learning and persistence than students’ interactions with faculty members. It matters little whether these contacts entail faculty members’ pedagogical approaches (Johnson and Johnson, 1995; Qin, Johnson, and Johnson, 1995), interactions in learning communities, or contacts in the broader context of the major department’s values and norms (Smart, Feldman, and Ethington, 2000). Such contacts influence changes in the cognitive, psychosocial, and attitudinal domains of students’ lives (Berger and Milem, 2000; Volkwein, 1991), as well as their persistence and degree completion (Braxton, Sullivan, and Johnson, 1997).
- (4) *Serve All First-Year Students According to their Varied Needs.* The scholarly and practical importance of taking into account differences

among students has become increasingly apparent in studies of conditional (or interaction) effects. Gender- or race/ethnicity-related conditional effects are reported in students' verbal, quantitative, and subject matter competence (Flowers, Osterlind, Pascarella, and Pierson, 1999; Whitt, Pascarella, Pierson, Elkins, and Marth, In press) and development of higher-order cognitive skills (Flowers, 2000; Terenzini, Springer, Yaeger, Pascarella, and Nora, 1996). Compensatory effects indicate that grade performance and several first-year experiences are particularly important to the subsequent success of students of color (Zea, Reisen, Beil, and Caplan, 1997), low-ability students (Carini, Kuh, and Klein, In press; Ewell, 2002, 2005), and first-generation students (Pascarella, Pierson, Wolniak, and Terenzini, 2004).

- (5) *Engage Students, Both in and Out of the Classroom, in Order to Develop Attitudes, Behaviors, and Skills Consistent with the Desired Outcomes of Higher Education and the Institution's Philosophy and Mission.* Pascarella and Terenzini (2005) concluded that "the impact of college is largely determined by individual effort and involvement in the academic, interpersonal, and extracurricular offerings on a campus....This is not to say that an individual campus's ethos, policies, and programs are unimportant. Quite the contrary. But...it is important to focus on the way in which an institution can shape its academic, interpersonal, and extracurricular offerings to encourage student engagement" (p. 602).
- (6) *Ensure that all First-Year Students Encounter Diverse Ideas, World-views, and People as a Means of Enhancing their Learning and Preparing them to Become Members of Pluralistic Communities.* Student encounters with ideas different from those they hold and with people different from themselves relate to a variety of positive outcomes: increased knowledge acquisition and subject mastery (Johnson and Johnson, 1995; Johnson, Johnson, and Smith, 1996); growth in higher cognitive skill development (Dey, 1991; Terenzini, Springer, Yaeger, Pascarella, and Nora, 1994); more positive self-concept and self-esteem (Chang, 1999); greater development of interpersonal and leadership skills (Antonio, 2000, 2001; Hurtado, 1997); more inclusive sociopolitical, gender-role, racial/ethnic attitudes; and increased in civic and community involvement.
- (7) *Conduct Assessment and Maintain Associations with other Institutions and Relevant Professional Organizations in Order to Achieve Ongoing First-Year Improvement.* Although we know of no studies of links between institutional assessment and student learning or persistence, logic suggests they might exist. Institutional assessment implies an interest in student learning and in increasing institutional effectiveness.

After reviewing 30 years of research, some of it summarized above, Pascarella and Terenzini (1991, 2005) concluded that *multiple forces* operate in *multiple settings* to influence student learning and persistence. They also concluded, however, that with very few exceptions, studies of college effects on students were highly segmented and based on overly narrow conceptual perspectives, concentrating on only a handful of relevant factors at a time. The result, these authors point out, is a body of evidence that “present[s] only a partial picture of the forces at work” (2005, p. 630) in shaping student learning and development.

This study undertook a broad examination of students’ first-year experiences using a conceptual framework based on Foundational Dimensions and the research literature that underlies them. The model is more comprehensive than those typically adopted, including those of the National Study of Student Learning (Pascarella et al., 1996) and the National Survey of Student Engagement (Kuh, 2001). The study’s purpose was not only to explore as full a range of forces as possible influencing student success in the first college year, but also to identify those features of the college experience that appear to be the primary influences. The study extends previous research by incorporating, both conceptually and empirically, a broader array of influences than those of the vast majority of studies of college impact. Students change in many ways, but this study focused on the extent to which students developed in their academic competence, an educational outcome central to the mission of all colleges and universities.

METHODS

Conceptual Framework

Guided by Astin’s Inputs-Environment-Outputs approach (1993), as well as an extension offered by Terenzini, Springer, Pascarella, and Nora (1995), the conceptual framework adopted for this study hypothesizes that students come to college with a range of demographic, personal, and academic characteristics and experiences. These traits shape students’ engagement with various aspects of their institution, and those involvements, in turn, are shaped by a variety of curricular, classroom, and out-of-class experiences and conditions. All of these dynamics occur within, and are themselves shaped by, an often-overlooked fourth domain, the institutional context, comprising an institution’s organizational characteristics, structures, practices, and policies, and the campus’s faculty and peer cultures and environments. Figure 1 offers a graphical representation of the conceptual

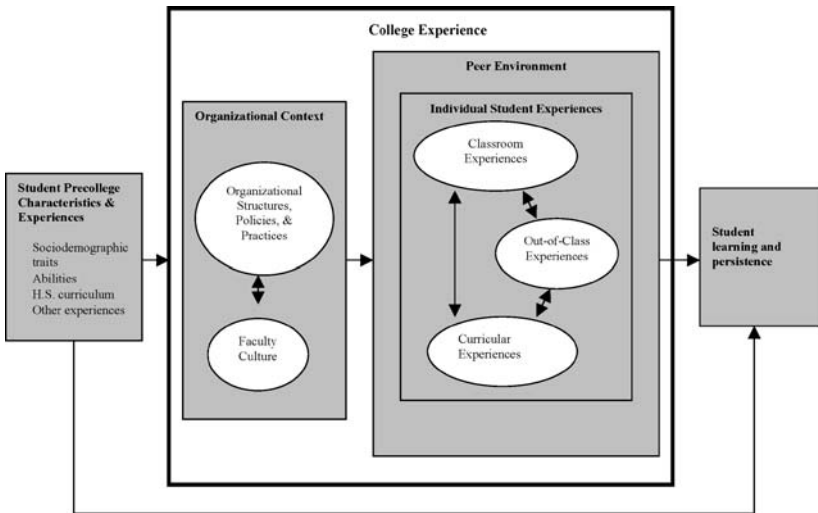


FIG. 1. Comprehensive model of influences on student learning and persistence.

framework adopted for this study. That framework grows out of both the research literature and the Foundational Dimensions it implies and which are summarized above.

Although Fig. 1 will serve to guide the study of an array of student learning outcomes and persistence (Terenzini and Reason, 2005), this study focuses on only one of those college outcomes—the development of academic competence. The framework implies that growth in this area is a function primarily of student engagement in three particular venues: the curriculum (e.g., the courses taken and major field of study), the classroom (e.g., pedagogical approaches and behaviors of instructors), and the out-of-class activities in which students engage. Generally, the more actively students involve themselves in the curricular and co-curricular experiences of college, the more growth they can expect to experience.

Curricular Experiences

Not surprisingly, students' academic content learning and cognitive skill development are greatest in areas where they take the most courses (Pascarella and Terenzini, 2005), particularly in the development of quantitative skills (Astin, 1993). Astin found, for example, that majoring in the physical sciences, engineering, and technical fields was directly related to increases in scores on the quantitative section of the Graduate

Record Exam (GRE). Similarly, the concentration of coursework in the natural sciences, and perhaps other areas, is related to growth in critical thinking (Smith-Saunders and Twale, 1997, 1998).

Classroom Experiences

A large number of studies explore the relationships between pedagogical approaches, faculty members' in-class behaviors, and student learning. Indeed, Pascarella and Terenzini (2005) concluded that this area of research grew more during the 1990s than did any other area of scholarship they reviewed. They identified several innovative pedagogical approaches, particularly those that focused on and required students to engage actively with the subject matter, that produced greater gains in learning and cognitive skill development than did the more traditional, lecture-and-discussion approach. Similarly, teacher behaviors such as preparation, availability and helpfulness, and rapport with students also produced gains in learning, as well as in critical thinking skills.

Out-of-Class Experiences

The evidence clearly indicates that students' learning and cognitive development is shaped not only by what happens in the classroom or other instructional settings, but also by the extent to which students take advantage of the range of learning opportunities their institutions provide outside the classroom. Indeed, some evidence suggests that course-related gains in students' critical thinking skills may be matched by gains independently attributable to students' out-of-class experiences (Terenzini et al., 1995). Overall, and with other things being equal, the greater the level of students' engagement with new ideas and people in some way different from themselves, the more likely they are to learn (Kuh, Kinzie, Schuh, and Whitt, 2005; Pascarella and Terenzini, 2005). When such reinforcement is missing, or, indeed, when certain subcultures serve to isolate participants from new and different ideas and people, the effects may even be negative, as with the inverse relation between men's participation in revenue-producing sports (football and basketball) or Greek social fraternities and the rate of their cognitive development during college (Pascarella, Bohr, Nora, and Terenzini, 1995; Pascarella et al., 1996; Pascarella and Smart, 1991). In the main, however, students' interactions with peers and faculty members appear to have the most consistent out-of-class effect on content acquisition and mastery, particularly when they extend and reinforce what happens in students' other, more formal academic experiences. Student involve-

ment in any of a variety of formal “diversity experiences” also has a distinctive and uniquely positive effect on dimensions of general cognitive development. These experiences include involvement in racial/cultural awareness workshops and coursework focusing on social/cultural diversity and intergroup relations.

The individual student experience, however, does not occur in discrete pieces or in isolation to other components of the overall college experience. Astin (1993), for example, concluded that “the student’s peer group is the single most potent source of influence on growth and development during the undergraduate years” (p. 398). As implied in Fig. 1, this study treats the peer environment as a central mediating force (its operationalized form is discussed below).

Although students’ level of engagement is typically treated as an individual characteristic or as an aggregate (the peer environment), both influences exist within a still larger setting, the organizational context, which is frequently overlooked in the college impact literature or is operationalized in terms of such institutional characteristics as type of control, size, mission, or selectivity. Most studies indicate that such variables are too remote from the student experience to have much, if any, effect on student learning (Astin, 1993; Dey et al., 1997; Pascarella and Terenzini, 1991, 2005). Kuh and his colleagues (2005), however, discuss how institution-level policies, practices, and climates can influence student engagement. They also discuss the role a campus’s “ethos,” the system of values in an institution, plays in mediating student engagement and, consequently, student learning.

Finally, this study’s conceptual framework acknowledges that students’ academic competence is shaped in no small measure by students’ precollege characteristics. These personal and academic backgrounds and experiences both prepare and dispose students to varying degrees to engage with the learning opportunities their institution offers. In the aggregate, moreover, these characteristics and dispositions are important determinants of the peer environment. Given this study’s focus on those aspects and components of the first-year experience that influence students’ development of academic competence—and over which faculty members and administrators have some degree of policy or programmatic control, students’ precollege experiences are treated as control variables.

Design, Population, and Sample

Because of time and resource constraints, the study adopted a cross-sectional, *ex post facto*, survey design. Although a longitudinal design would be preferable, Astin (1993) has suggested that college impacts can

also be estimated from the “intensity” of student exposure to various college influences. For example, students at institutions with a more effective constellation of first-year programs, services, and experiences would be expected to develop higher levels of academic competence than similar students at less coherently organized institutions.

Operationally, the population of the sample was the first-year students entering institutions belonging to the Council of Independent Colleges (CIC) or to the American Association of State Colleges and Universities (AASCU). The study relied on an opportunity sample of 24 CIC and AASCU institutions (12 from each sector) selected through a competitive process for participation in the Foundations of Excellence Project. That sample was augmented by six additional institutions (4 AASCU and 2 CIC) that elected to participate in the data collections at their own expense.

Following the study’s conceptual framework, project staff gathered information from both students and faculty members. The student population consisted of those first-year students eligible for sampling for the institution’s participation in the National Survey of Student Engagement (see below). Faculty members were defined as all tenured, tenure-track, and non-tenure track instructional staff of all ranks (i.e., professor, associate professor, assistant professor, instructor, or lecturer), regardless of their full- or part-time status. The population definition excluded faculty members teaching in programs that served only graduate students, teaching only evening or continuing education division courses, or holding adjunct, clinical, or emeritus titles. In most cases, the entire faculty population (as defined) at a campus was invited to participate. At institutions where the size of the faculty prohibited a census, a simple random sample of faculty members was drawn.

Data Collection Procedures

As a condition of participation in the overall Foundations of Excellence Project (of which this study is a part), institutions were required to participate in the 2003 or 2004 National Survey of Student Engagement (NSSE). Adoption of NSSE as one of two primary data collection instruments not only provided extensive information on students’ experiences and outcomes, but also helped minimize study costs. NSSE provides information on first-year academic and non-academic experiences known to influence performance and persistence, as well as self-reported gains in various educational outcomes (Kuh, 2001). Data in this study come from 6,687 full- and part-time, first-year students on the 30 participating campuses. Information on the size of the NSSE sampling

populations and on the representativeness of students for those populations was unavailable. Thus, response rates and respondents' representativeness for the populations from which they came remain unknown.

Survey forms also gathered information from faculty members on their characteristics, pedagogical preferences, professional activities, and perceptions of their campus's approach to the first year of college. Penn State University's Survey Research Center undertook the data collection, using both paper and web-based instruments with four waves of contacts. The chief academic officers on each campus also wrote to faculty members encouraging their participation. Of the 11,282 faculty members contacted, usable responses were received from 5,024 (a 45% response rate). Respondents from each institution were weighted to be representative of all faculty members at that institution with respect to gender, employment status (F/PT), and academic rank. Weights were also used to adjust for differing response rates across institutions within each institutional sector.

Variables

Project staff gathered data on a large number of predictor variables and scales developed to operationalize the four sources of influence on student learning as delineated in the conceptual framework: students' precollege characteristics and experiences; the institution's organizational structures, policies, and practices; students' experiences during their first year (and, in the aggregate, the peer environment as well); and the faculty culture.

Control Variables

The study controlled for entering students' sex, race/ethnicity (White/non-White), age, entry status (native/transfer), enrollment status (full-/part-time), residence (on/off campus), academic major, parental education, and the year the NSSE was completed. Controls were also included for institutional sector (AASCU/CIC) and degree of urbanicity (rural/suburban/urban). Because of its high correlation with other conventional institutional characteristics, sector also served as a reasonable proxy measure of institutional size, type of control, mission, and Carnegie Classification.

Independent Variables of Primary Interest

Project staff developed a set of measures of institutional performance for each of the Foundational Dimensions listed earlier. Performance

indicators were factorially derived scales developed for both the faculty and student responses. These performance indicator scales were derived in a series of principal components analyses of relevant sets of items with varimax rotations. Only components loading at .40 or higher were retained; items loading above .40 on two or more factors were (with one or two exceptions) excluded. Scale scores for both student and faculty scales were developed by summing a respondent's scores on the component items and dividing by the number of items in the scale (Armor, 1974). Where items in the same scale had different metrics, scores on all items within the scale were converted to *z*-scores to put all items on a common metric, and a constant of 10 was added to eliminate negative *z*-values. The resulting standardized scores were then averaged to form a scale score. Table 1 provides psychometric information for each of the 20 faculty-based and 7 student-based scales. As will be seen below, not all student- or faculty-based performance indicators were retained for the final analytical model.

The left-hand portion of Table 1 lists the 20 scales factorially derived from the Faculty Survey (designed specifically for this project) to operationalize all seven of the Foundational Dimensions. As can be seen in the table, each dimension has at least two, and as many as five, faculty-based scales reflecting institutional performance on those dimensions; the only exception is the Diversity dimension, which has only a single performance indicator. The internal consistency reliabilities (Cronbach's Alpha) of these scales are generally high: only four of the 20 scales have alphas below the standard .70 level, and eight of the scales have alphas of .80 or higher. Fourteen of the 20 scales have alphas of .75 or higher.²

Because of the need to rely on NSSE (a secondary data source), and because NSSE was designed to measure only student engagement, student-based performance indicator scales could be developed for only three of the seven dimensions. As can be seen in the right-hand portion of Table 1, the alphas for these scales are, overall, moderately reliable. The Co-Curricular Engagement scale has little internal consistency reliability (alpha = .25), probably due at least in part to the fact that it contains only two items. The Cognitive Engagement and Supporting All Students scales meet or exceed conventional reliability standards (alphas = .82 and .71, respectively).

Students were the unit of analysis in this study. To operationalize the administrative practices and policies, as well as the faculty environment on each campus, faculty scores for each scale were averaged, and the mean faculty-scale score was then assigned to each student from that institution. Student-based scales were used in two ways. An individual level score was computed for each student on each scale to represent the

TABLE 1. Foundational Dimensions and Student- and Faculty-based Performance Indicators

Dimension	Faculty Performance Indicators ^a	Scale Alpha	Student Performance Indicators ^b	Scale Alpha
1. Organization	Organized Approach (5) ^c	.89	None	n.a. ^d
	Faculty & Std. Aff. Cooperation (3)	.86		
	Coherent First Year (4)	.87		
2. Transitions	Clarity About Offerings (3)	.71	None	n.a.
	Early Involvement (4)	.79		
	Setting Expectations (2)	.78		
3. Faculty	Preparing Faculty (2)	.84		
	Conveying a Sense of the Place (2)	.77		
	Importance of the First Year (4)	.74	None	n.a.
	Importance of Teaching (2)	.84		
	Support for Faculty (7)	.86	Supporting All Students (5)	.71
4. All Students	Meeting Student Needs (2)	.76		
	Active Teaching (4)	.77	Out-of-Class Engagement (4)	.67
	Feedback to Students (2)	.80	Academic Engagement (5)	.56
5. Engagement	Emphasis on Writing (3)	.60	Institutional Challenge (1)	n.a.
	Community Service (2)	.55	Co-Curricular Engagement (2)	.25
	Passive Teaching (2)	.49	Cognitive Engagement (4)	.82
6. Diversity	Promoting Diversity Encounters (5)	.81	Diverse Interactions (4)	.67
	Assessment for Improvement (3)	.78	None	n.a.
7. Improvement	Faculty Development (3)	.66		

^aSource: Faculty Survey, Spring 2004.

^bSource: 2003 and 2004 responses to the National Survey of Student Engagement.

^cNumber of items comprising scale.

^dNot applicable.

student's experience. The peer environment is represented, for any given campus, as the mean of the scale scores for students on that campus for those dimensions where student-based performance indicators could be developed.

Dependent Variable

The dependent variable was a six-item "academic competence" scale based on first-year students' NSSE-reported college impact in several academic areas. Specifically, students were asked to report the "extent [to which] your experience at this institution contributed to your knowledge, skills, and personal development in various areas." In this study, items reported on were: "writing clearly and effectively," "thinking critically and analytically," "speaking clearly and effectively," "analyzing quantitative problems," "using computing and information technology," and "acquiring a broad general education." Students estimated the effects of their college experiences on a four-point scale, where 1 = "very little" and 4 = "very much." The scale was factorially derived, and scale scores were developed, using the same procedures described above; the scale has an alpha of .85.

Analytical Procedures

Ordinary least-squares (OLS) multiple regression was the primary analytical procedure used for this study. For both preliminary and final equations, variables were entered in a two-step hierarchical process, beginning with student and institutional characteristics (control variables), followed by the performance indicators. To reduce multicollinearity and enhance the interpretability of results, preliminary regression equations were estimated using each Foundational Dimension separately to identify the performance indicators for that dimension that were statistically significantly related to the outcome measure in the absence of performance indicators from other dimensions. These regressions combined student and faculty performance indicators within a dimension. In each model, academic competence scores were regressed on the performance indicators for a given dimension, after entering all student and institutional control variables (see Table 2).

For the peer environment measures, academic competence was regressed on the seven mean peer environment scale scores as a group; students' precollege characteristics and institutional sector and urbanicity were controlled, and all other performance indicators were excluded from the model. For all regressions, only those scales that

TABLE 2. Specifications for Variables used in Final, Reduced Model**Control Variables (Entered in Step 1)***Age:* Age at time of NSSE administration (spring, 2003 or 2004)*Sex:* 1 = male, 2 = female*Race:* 1 = White, 2 = student of color*Transfer status:* 1 = started at this institution, 2 = started at a different institution*Enrollment:* 1 = Less than full-time, 2 = full time*Residence:* Place of residence at time of NSSE administration, where 1 = on-campus (dormitory or fraternity/sorority house), 2 = off-campus*Father's education:* 7-point scale from 1 = did not finish high school to 7 = doctoral degree*Mother's education:* 7-point scale from 1 = did not finish high school to 7 = doctoral degree*Major Field:* 10 dummy-coded variables: Arts and humanities, biology, business, education, engineering, physical science, professional, social science, other, undecided*Year of NSSE Administration:* 2003 or 2004*Institutional Sector:* Sector of institutional membership: 1 = American Association of State Colleges and Universities, 2 = Council for Independent Colleges*Degree of Institutional Urbanicity:* 3-point categorical scale based on information from IPEDs; 1 = small town/rural, 2 = suburban, 3 = urban.**Independent Variables of Primary Interest (Entered in Step 2)****Organization Dimension***Coherent First Year:* A 4-item, faculty-based scale, where 0 = "not at all" and 3 = "a great deal." The scale measures faculty members' perceptions of the degree to which their institution's first-year courses, programs, and services are integrated, coordinated, intentional, and active. (Cronbach's Alpha = .87).**Transitions Dimension***Preparing Faculty:* A 2-item, faculty-based scale, where 1 = "strongly disagree" and 5 = "strongly agree," measuring faculty members' perceptions of institutional effectiveness in keeping faculty informed of services to which they can refer students who are having academic or social difficulty. (Alpha = .84).**All Students Dimension****Supporting All Students:* A 5-item, student-based scale measuring students' perceptions of the supportiveness of the institutional environment. Items addressed students' perceptions of the institutional emphasis on supporting their academic, personal, and social needs (1 = "very little" to 4 = "very much") and their relationships with faculty and staff members (1 = "unavailable, unhelpful, unsympathetic" to 7 = "available, helpful, sympathetic"). (Alpha = .71).**Engagement Dimension***Out-of-Class Engagement:* A 4-item, student-based scale, where 1 = "never" and 4 = "very often," measuring how often students engaged in academic activities or with faculty members outside of the classroom. (Alpha = .67).

TABLE 2. (Continued)

**Academic Engagement:* A 5-item, student-based scale measuring how often students actively engage in class activities, such as asking questions or contributing to class discussions (1 = “never” to 4 = “very often”) and the average number of hours each week preparing for class. (Alpha = .56).

Institutional Challenge: A single item reflecting students’ perceptions of the degree to which their institution emphasizes spending significant amounts of time on studying and academic work, where 1 = “very little” and 4 = “very much.”

**Co-Curricular Engagement:* A 2-item, student-based scale measuring students’ perceptions of the degree to which the institution emphasizes attending campus events and activities (1 = “very little” and 4 = “very much”) and the average hours spent per week preparing for class. (Alpha = .25).

Cognitive Engagement: A 4-item, student-based scale measuring students’ perceptions of the degree to which coursework emphasizes higher-order cognitive skills, where 1 = “very little” and 4 = “very much.” (Alpha = .82).

Peer Environment–Institutional Challenge: The mean scale score for students on the same campus on the Institutional Challenge performance indicator.

Peer Environment–Cognitive Engagement: The mean scale score for students on the same campus on the Cognitive Engagement performance indicator.

Diversity Dimension

Diverse Interactions: A 4-item, student-based scale measuring the frequency of, and institutional emphasis placed upon, students’ interactions with diverse others and ideas. Examples of items in this scale include “how often have you [the student] (a) had serious conversations with students of a different race or ethnicity than your own and (b) had serious conversations with students who have very different religious beliefs, political opinions, or personal values (1 = “never” to 4 = “very often”). One item measured students’ perceptions of the degree to which the institution emphasizes diverse interactions (1 = “very little” to 4 = “very much”). (Alpha = .67).

Improvement Dimension

Faculty Development: A 3-item, faculty-based scale, where 0 = “none” and 3 = “three or more,” measuring the number of times, during the two years prior to the study, faculty members participated in development activities related to first-year students (Alpha = .66).

*For scales using items with different metrics, all items were standardized and a constant of 10 added to eliminate negative z-scores (for ease of interpretation) before a mean scale score was calculated.

were statistically significant predictors of academic competence were retained for subsequent use in a “reduced” model regression. Those scales, as well as all control variables and their metrics, are summarized in Table 2. The results of the reduced model regression are reported in the next section.

RESULTS

The reduced regression equation produced an overall adjusted R^2 of .458. Students' precollege characteristics and institutional characteristics, the covariates, produced an adjusted R^2 of .039. Thus, the vast majority of the explained variance in academic competence is attributable to what happened to students during their first year and not to the characteristics they brought with them to college. With the covariates taken into account, both the student experience and faculty environment variable sets produced statistically significant and unique contributions to explaining variance in student gains in academic competence. Table 3 reports all variables included in the final, reduced regression analysis.

Several features in Table 3 are notable. First, individual student experiences were by far the most powerful predictors in the model. Specifically, first-year students' perception of the support they received, as indicated by a higher score on the Supporting All Students scale, was the single greatest influence on their development of academic competence. Students who reported feeling that the faculty and staff at their institution provided the academic and non-academic support they needed, and who felt they had good relationships with faculty members and administrative staff, were more likely than similar students at other institutions to report greater gains in academic competence. Similarly, students who reported being cognitively engaged, and that their institutions emphasized analysis, synthesis, evaluation, and application of ideas and information, were also significantly more likely to report higher levels of academic competence than their peers who reported their institutions were less cognitively challenging. The influence of these components of the Cognitive Engagement scale was, however, only about three-quarter the impact of students' perceptions of being supported by the institution.

Students who were more academically engaged, who reported that their institution emphasized spending significant amounts of time on studying and doing academic work (Academic Engagement scale), and who reported more encounters with diverse individuals and ideas (Diverse Interactions scale) also reported advantages in academic competence over students who were less engaged at their institution, attended an institution that placed less emphasis on studying, or where they had fewer encounters with diverse people and ideas.

Second, six of the seven Foundational Dimensions were represented in the reduced model by at least one performance indicator. The Engagement Dimension produced five statistically significant and independent performance indicators (all student-related). Some of that

TABLE 3. Summary of Final Regression Analysis ($N = 6,687$)

Variable	B	SE B	β
Step 1			
Age	.001	.001	.015
Sex	-.017	.014	-.012
Race	-.001	.016	-.001
Transfer Status	-.017	.022	-.008
Enrollment	.032	.026	.013
Residence	.033	.015	.025*
Father's Education	-.007	.004	-.018
Mother's Education	-.002	.005	-.006
Major Field			
Arts & Humanities	.074	.090	.038
Biological Sciences	.184	.093	.063*
Business	.217	.090	.125*
Education	.161	.090	.090
Engineering	.238	.103	.043*
Physical Sciences	.203	.096	.053*
Professional	.165	.090	.089
Social Sciences	.137	.091	.066
Other	.200	.090	.113*
Undecided	.097	.092	.035
Year of NSSE	-.023	.016	-.014
Institutional Sector	-.023	.024	-.017
Urbanization	-.001	.010	-.001
Step 2			
Coherent First-Year (F) ¹	.073	.037	.034*
Preparing Faculty (F)	-.157	.041	-.057***
Supporting All Students (S)	.277	.010	.313***
Out-of-Class Engagement (S)	-.039	.013	-.034**
Academic Engagement (S)	.180	.013	.158***
Institutional Challenge (S)	.131	.009	.155***
Co-Curricular Engagement (S)	.015	.009	.017
Cognitive Engagement (S)	.233	.011	.241
Peer Environment–Institutional Challenge (S)	.008	.068	.002
Peer Environment–Cognitive Engagement (S)	.260	.116	.042*
Diverse Interactions (S)	.058	.011	.062***
Faculty Development (F)	.083	.033	.032*

F (48) = 109.147. $p < .001$. Adjusted $R^2 = .458$.

* $p < .05$; ** $p < .01$; *** $p < .001$.

¹Indicates the data source for each variable added in step 2: F = Faculty, S = Student/NSSE.

representation may have been due to the conceptual and empirical proximity of individual student engagement levels and learning outcomes. The presence of performance indicators from all but one of the Foundational Dimensions, however, provided at least preliminary evidence of the construct validity of those dimensions as important forces shaping first-year student learning.

Third, three of the ten statistically significant influences on students' academic competence were faculty performance indicators. Although their contributions were notably smaller than those of most measures derived from students, at least a portion of this circumstance is probably attributable to the fact that faculty performance indicators are averaged within each institution and to the attenuated variance common to such variables. Higher reports from faculty members' that their institution's provided a coherent first year experience for students had a significant and positive influence on students' academic competence. Faculty members on those campuses reported that their institutions view the first-year as a distinct period on which later years build, that academic and student affairs units work together in delivering the first-year, and that programs and services have stated goals that are actively pursued. In addition, students reported higher levels of academic competence if they were enrolled at an institution whose faculty reported active involvement in conferences focusing on teaching and learning or on the first-year experience and reported reading materials about how to improve the first-year experience.

Fourth, although two of the seven peer environment scales produced statistically significant and positive contributions to academic competence in the preliminary regressions, only one, Peer Environment: Cognitive Engagement, made a statistically significant contribution in the reduced model. The statistical significance of this aggregate variable indicates that students on a campus where their first-year peers perceive their coursework emphasizes higher-order thinking skills report higher levels of impact on their academic competence than do similar students on campuses placing less emphasis on higher-order cognitive skills in first-year courses. The scale's contribution is statistically significant, and substantively noteworthy, implying as it does the supportive role of an intellectually engaging environment.

Finally, two of the statistically significant predictors produced negative beta weights. The explanations for these findings are not entirely clear. One or both of these relations may be statistical artifacts, attributable to suppressor effects. The negative influence of the Preparing Faculty Scale (faculty members' perceptions of their institution's performance in keeping them apprised of the academic and support services to which they

can refer students), however, might reflect campuses with faculty members who are strongly committed to helping students succeed but who feel their institution could do even more than they presently do to help faculty accomplish that goal. Similarly, the negative beta associated with students' reports about their out-of-class engagement may be a function of time as a finite commodity. Students engaged in the kinds of activities that promote development of their academic competence may also be less engaged than other students in out-of-class activities, such as community service, discussing career plans with an advisor, or working with faculty members on activities unrelated to their coursework.

Limitations

This study, like all research, is limited in several respects. First, the influences impinging on first-year students are many and complexly interrelated. Although this study sought to examine those forces as comprehensively as possible, the conceptual framework adopted to guide the study may nonetheless be underspecified. To the extent that important factors are overlooked, the study's resulting portrait of the more important influences at work may be incomplete.

Second, the findings of this study must be generalized cautiously. The participating institutions come from only two sectors of the American higher education community—small, private liberal arts colleges and comprehensive public universities. Each of the 30 institutions participating in the study, moreover, elected to participate. Indeed, 24 of them were selected after a competitive application process. Thus, these institutions, as well as their students and faculty members, may not be representative of all four-year colleges and universities, and they may not be typical even of other CIC or AASCU campuses. Nonetheless, they constitute a non-trivial number of institutions and large numbers of students and faculty members. As such, this study is among a small handful that has attempted data collection on such a large and comprehensive scale. In addition, the competitive selection process may well have attenuated the variance in many of the independent and dependent variables in this study, inasmuch as these institutions had demonstrated a serious interest in their first-year students' experiences. To the extent such attenuation exists, the findings reported here may underestimate the impact of the various experiences and conditions identified as salient in the development of students' academic competence.

Third, the constructs summarized in Fig. 1 are complex abstractions, and the measures employed in this study might only partially reflect that complexity. Other measures of those constructs may produce somewhat

different findings. The NSSE survey form, however, was developed by an elite group of higher education researchers and, under the guidance of a highly qualified Technical Advisory Group and National Advisory Board, has undergone numerous revisions since its initial development in 1998. Similarly, scholars and administrators familiar with the first year of college reviewed the Faculty Survey and suggested constructive revisions. In addition, and with a few exceptions, the internal consistency reliabilities of the scales used in this study are high.

Finally, the study relies on student reports of their gains in academic competence as the criterion measure in this study, and such self-reports are open to challenges to their construct validity. At the same time, however, a growing body of evidence suggests that under appropriate circumstances self-reported outcomes are reasonable proxies for more objective, standardized measures (see, for example, Anaya, 1999; Dumont and Troelstrup, 1980; Hansford and Hattie, 1982; Pike, 1995, 1996). Kuh (2005) reviewed the literature on the validity of student self-reports and identified five conditions that, when met, suggest self-reports are reasonable proxies for more objective, standardized measures: “(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 questions does not threaten, embarrass, or violate the privacy of the respondent or encourage the respondent to answer in socially desirable ways” (p. 158). We believe the student reports used in this study meet all five of these conditions. Moreover, while self-reports have their limitations when compared with standardized tests, the latter also come with their own limitations, including availability, length, cost, administration requirements, and relevance to the question at hand.

SUMMARY AND DISCUSSION

The research reported here explicates the *multiple* forces and the *multiple* settings in which a range of student and organizational forces operate to influence student learning and development in the first year of college. The study undertook a comprehensive view of the influences on student learning, grounded in seven Foundational Dimension statements, each of which identifies features of institutions that are effective in promoting first-year student success and persistence. The dimensions synthesize over 30 years of student outcomes research and provide a conceptual framework to support one of the most comprehensive examinations of student learning to date.

Based on data from 6,687 first-year students and 5,024 faculty members from 30 public and private, four-year institutions, analyses identified several student and organizational variables that independently contribute to students' development of academic competence during the first year of college. Ten performance indicators representing six of the seven Foundational Dimensions were significantly related to academic competence. Table 4 lists the 10 statistically significant performance indicators, as well as the beta weights, Foundational Dimension, and data source associated with each.

These statistically independent predictors reflect both student experiences on campus and faculty perceptions of the internal organizational features of their institutions. More specifically, students' sense of support, levels of cognitive and academic engagement, and perceptions of institutional challenge were directly related to students' reported gains in academic competence. The extent to which their institutions provided a coherent first year was also a statistically significant contributor.

The study's findings have implications for policies and practices at both the institutional and national levels. First, findings provide a detailed and comprehensive identification of the first-year college experiences that influence students' development of academic competence. On this level, the data alert institutional decision makers to the policies and practices, over which they have some control, that have the greatest potential to influence students' development of their academic competence. The findings also point, however, to the broad array of

TABLE 4. Statistically Significant Performance Indicators and their Beta Weights, in Descending Order

Performance Indicator	Beta	Dimension	Source
Supporting All Students	.31***	All Students	Students
Cognitive Engagement	.24***	Engagement	Students
Academic Engagement	.16***	Engagement	Students
Institutional Challenge	.16***	Engagement	Students
Preparing Faculty	-.06***	Transitions	Faculty
Diverse Interactions	.06***	Diversity	Students
Peer Environment–Cognitive Engagement	.04*	Engagement	Students
Coherent First Year	.03*	Organization	Faculty
Out-of-Class Engagement	-.03**	Engagement	Students
Faculty Development	.03*	Improvement	Faculty

* $p < .05$, ** $p < .01$, *** $p < .001$.

individual, peer, and organizational forces at work shaping student learning in the first year.

Second, the findings suggest the benefits to higher education researchers of expanding current conceptualizations of how college affects student outcomes. The findings clearly imply a need for conceptual frameworks and methodological designs for studying first-year student outcomes that are more comprehensive than those typically adopted. Future research is likely to be more informative and useful for practice and policy if the frameworks and approaches incorporate not only students' experiences but also measures of internal organizational characteristics, structures, practices, and policies, and a campus's faculty and peer cultures and environments.

The findings highlight the importance of the first year of college and suggest the need to reconsider and restructure current approaches, services, practices, and policies relating to the first college year in order to enhance the educational effectiveness of that critical period in students' lives. Institutional decision makers who hope to influence students' development of academic competence in the first year would do well to focus on the behaviors that comprise the Supporting All Students, Cognitive Engagement, Academic Engagement, and Institutional Challenge scales (see Table 2 for a description of the component items of each scale).

Students' perceptions of the campus environment as supportive were the most powerful predictor of growth in academic competence. Instituting policies and practices aimed at improving relationships between faculty and staff may also be an effective strategy, as might efforts to increase the frequency with which students encounter individuals different from themselves and ideas different from those they brought with them to college. Similarly, these results suggest that institutional administrators should adopt a holistic approach to supporting students academically, as well as personally and socially.

As expected, various forms of engagement were also powerful predictors of growth in academic competence. The findings suggest that faculty members should provide opportunities for first-year students to engage in and practice advanced cognitive activities, including opportunities to analyze, synthesize, judge, and apply information. Similarly, faculty members should be encouraged to use pedagogical methods that promote active student engagement with their courses' content, requiring students to participate actively in classes and to write multiple iterations of papers, and to come into contact with diverse peoples, cultures, and ideas. Such activities require students to invest psychological and physical energy and demand more time-on-task devoted to

academic endeavors, all of which are likely to enhance academic competence.

The study's design, methods, and instruments also provide researchers on individual campuses with prototype designs and tools for studying and focusing local institutional attention on the first year for students on their campus. The research design and study findings clearly imply the need to move beyond a narrow, segmented view of the first year of college toward a comprehensive perspective. The Foundational Dimensions framework appears to be an effective mechanism to understand and assess first-year students' experiences.

The study's findings also have implications for the way higher education researchers and public policy-makers conceptualize the first year of college and its influence on student outcomes. These findings highlight the complex interconnections among the multiple influences that shape first-year students' academic knowledge acquisition and skill development. In so doing, the results reported here also point to the need, when policy decisions are being made, for greater awareness of the factors and dynamics at work in students' first year. When public higher education policy-makers are considering issues related to student access and degree completion, these findings point toward dimensions of the first year that might serve as a fruitful framework to structure accountability reporting and to provide incentive funding. As a result, legislators and administrators may not only have greater influence over the achievement of desired educational outcomes but also be in position to make more effective and efficient use of scarce public resources.

The number of Foundational Dimensions represented in the reduced model, which also holds for other outcome measures in the larger study, supports the efficacy of the argument that educational benefits will derive from closely re-examining how the first year of college is viewed, packaged, and delivered. Based on our findings, the development of academic competence in the first year of college appears to be influenced by multiple factors, including factors related to students' experiences, faculty and peer cultures and environments, and institutional policies.

Analysts studying college impacts also will benefit from the study's development and validation of two new conceptions of influences on students' learning as measured by the academic competence scale. One addresses faculty activities, perceptions, and cultures; the second pertains to organizational structures, programs, and policies. A common framework underlies both of these new conceptions—the seven Foundational Dimensions.

END NOTES

1. Foundations of Excellence project members contributing to this phase John N. Gardner, Betsy O. Barefoot, Robert D. Reason, Stephen W. Schwartz, Randy L. Swing, Patrick T. Terenzini, M. Lee Upcraft, and Edward Zlotkowski.
2. A complete list of the student- and faculty-based performance indicators and their component items, as well as the Foundational Dimensions[®] to which each relates, is available from the lead author.

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