

Evidence-Based Scholarship of Teaching & Learning:
A Literature Review and Preliminary Conceptual Model

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The drumbeat of accountability has continued to permeate and reverberate within American higher education institutions for over twenty-five years, most notably in relation to student outcomes like retention, graduation rates, and student learning. All 50 states enforce some sort of reporting system within their public colleges and universities, and all mandate some sort of learning outcomes assessment, although definitions of “learning outcomes” can vary widely (Shavelson, 2010). So loud is the drumbeat now that almost no one in academe associated with his or her institution’s curriculum or instruction can claim that he or she cannot hear it.

Accordingly, one might expect to find a plethora—or at least an emergence—of research focusing on teaching, pedagogical, or curricular practices that lead to successful student learning outcomes. After all, instruction is the college activity most widely associated with learning, and higher education is the social institution most widely associated with empirical study.

Therefore, the purpose of this literature review was to systematically critique the extant literature on college teaching and student learning outcomes, most notably the empirical connections between the two. Subsequently, we sought to develop a preliminary conceptual model of relationships between teaching and pedagogical practices and student learning outcomes, using the Astin (1991, 1993) inputs-environments-outcomes (I-E-O) model as a foundational structure. The following methodology was used to select research literature for this study. First, the previous decade of issues from the four most cited research journals in the field of higher education – *Journal of College Student Development*, *Journal of Higher Education*, *Review of Higher Education*, and *Research in Higher Education* – were reviewed, with special

attention paid to articles presenting evidence-based approaches to college teaching and student learning. Second, the researchers performed a keyword search via Academic Search Premier; the search included articles that reference higher education, teaching, and learning. Based on the keyword search, the researchers identified five additional journals – *Innovative Higher Education*, *Teaching in Higher Education*, *Liberal Education*, *New Directions for Institutional Research*, and *College Teaching*. Again, the researchers reviewed the previous decade of issues, with special attention to evidence-based approaches. One journal, *College Teaching*, contained 277 relevant articles; however, these articles—which are currently being reviewed—are not included in this paper. In addition, article reference lists were consulted and repeatedly cited works were added to the appropriate categories. Finally, a number of articles suggested by colleagues were added to the review. A total of 112 works (journal articles, books/monographs, chapters, association reports, etc.) were compiled, 70 of which were drawn from the *Journal of College Student Development* (12 articles), the *Journal of Higher Education* (12 articles), *Research in Higher Education* (36 articles), and *Review of Higher Education* (6 articles).

Summary of Works Reviewed

The 112 works were sorted into relevant thematic groupings, and ten distinct categories emerged: accreditation/quality assurance, classroom assessment, curriculum, diversity, faculty and pedagogy, learning outcomes, learning theory and approaches, scholarship of teaching and learning, teaching/course evaluations, and teaching methods. Each of the categories are summarized below.

Accreditation/Quality Assurance

This set of literature discusses the policy context for college teaching and student learning, most notably, accreditation requirements. Some, such as Ewell (2008), summarize the

role of accreditation in American higher education and the increasing emphasis being placed on the assessment of student learning outcomes by accrediting bodies. Others, such as Benjamin and Hersh (2002) and Erwin & Sebrell (2003), present measurement or validity studies of new instruments developed to assess student learning: a general intellectual skills assessment created by RAND, and a test of critical thinking by ETS, respectively. Finally, one study measured the impact of professional accreditation standards (in this case, the Accreditation Board for Engineering and Technology, or ABET) on curricular changes at 39 institutions, which, in turn, were associated with student learning outcomes such as design and problem solving and communication skills (Volkwein, Lattuca, Harper & Domingo, 2007).

Teaching Methods

This set of literature focuses on the practice of teaching, specifically methods of instruction and the impact of these methods on instructors or students. Kuh (2008), for example, described practices (e.g., first-year seminars and experiences, undergraduate research, service learning) that have been shown to be beneficial for students, while Delucchi (2007) assessed the effects of collaborative learning strategies on examination performance in a set of courses. Three studies (Pascarella, Cruce, Wolniak & Blaich, 2004; Seifert et al., 2010; Zhao & Kuh, 2004) used large national datasets to explore the effects of either a broad range of “good” teaching practices or one specific practice. Finally, others, such as Howard (2002), compared teaching approaches (e.g., distance vs. face-to-face instruction) and examined differences in student participation, performance, or learning outcomes.

Teaching and Course Evaluations

The literature related to teaching and course evaluations includes examinations of evaluation approaches, as well as analyses of evaluation results. Two studies (Lattuca &

Domagal-Goldman, 2007; Harrison, Douglas & Burdsal, 2004), for example, reviewed different types of teaching evaluation techniques, while a study by Renaud and Murray (2005) examined the validity of teaching evaluations. Others explored the relationship between students' ratings of teaching effectiveness and factors such as student, instructor and course characteristics (Eiszler, 2002; Nasser, F., & Hagtvet, 2006; Onwuegbuzie et al., 2007). Finally, one study (Pan et al., 2009) examined data from teaching evaluations in order to develop a system for analyzing students' open response comments.

Faculty and Pedagogy

This set of literature focuses on faculty members and teaching. Several studies, for example, examined faculty behaviors or characteristics (e.g., nonverbal behaviors, research productivity, spirituality) (Babad, 2007; Kuh, Chen & Nelson Laird, 2007; Lindholm & Astin, 2008). Some explored the impact of these behaviors or characteristics on factors such as teaching effectiveness (Marsh & Hattie, 2002) and students' self-reported gains in learning (Umbach & Wawrzynski, 2005). Similarly, Bosch et al. (2008) discussed the ways in which faculty behaviors and characteristics contributed to whether an institution could be described as "learner-centered." Other studies focused on institutional approaches to pedagogy, seeking to understand criteria for teaching awards programs (Chism, 2006) or attempts to achieve teaching excellence (Frost & Teodorescu, 2001).

Curriculum

This set of literature focuses on curricula along disciplinary and institutional lines. Bahr (2008), for example, examined the effectiveness of remedial math programs at community colleges. Others studied the impact of curricular reform within the field of engineering (Colbeck, 2002; Lambert, Terenzini & Lattuca, 2007) or the connection between discipline and

student outcomes (Nelson Laird & Garver, 2010; Nelson Laird, Shoup, Kuh & Schwarz, 2008). Two studies examined educational practices within the context of general education curricula (Nelson Laird & Garver, 2010; Nelson Laird, Niskode'-Dossett & Kuh, 2009). Finally, two studies explored the ways in which curricular reform at the institutional level affected programmatic (Arnold, 2004) and academic (Harper & Lattuca, 2010) outcomes.

Classroom Assessment

Literature included in this category predominantly relates to evaluating or assessing student learning in discrete classroom settings. Several works discuss a variety of ways to assess student learning in the classroom, documenting practices and offering guidance for assessment practitioners and faculty members (Maki, 2004; Suskie, 2009). Angelo and Cross (1993), for example, describe and explain 50 classroom assessment techniques, and advise readers on how to analyze assessment data, while Headden (2011) showcases assessment practices that are being used by colleges across the country. Others examined faculty beliefs about the assessment of interdisciplinary student work (Boix Mansilla, Duraisingh, Wolfe, Haynes, 2009; Boix Mansilla & Duraisingh, 2007), or described the results of evaluation projects (Cabrera, Colbeck & Terenzini, 2001; Weaver & Jiang, 2005).

Diversity

Student experiences with diversity include classroom experiences, out-of-classroom experiences, or a combination of these two collegiate experiences. This body of literature emphasizes institutional environments that support and encourage student learning in terms of diversity and experiences with diversity. However, each study defines diversity differently. For example, Kuh & Umbach (2006) examine student learning in relation to three constructs of diversity: structural diversity, (e.g., student race/ethnicity distribution), diversity-related

initiatives (e.g., diversity courses, cultural awareness workshops, cultural centers) and students' interaction with diverse peers, faculty or staff. Others, such as Meeuwisse, Severiens, & Born (2010) examine racial differences between minority and majority students and their experiences with classroom learning environments.

Learning Outcomes

Works in this group examine learning outcomes along a number of dimensions, including: the relationship between student engagement and learning (Carini, Kuh & Klein, 2006); the efficacy of group work (Colbeck, Campbell, & Bjorklund, 2000); the effects of best teaching practices on student cognitive development (Cruce, Wolniak, Seifert & Pascarella 2006); the effects of locus of control on student learning outcomes (Wang, 2005); the student outcomes of living-learning programs (Inkelas, Soldner, Longbeam & Leonard, 2008); the relationship between faculty-student interactions and student learning outcomes (Lundberg & Schreiner, 2004); the effect of academic discipline on student gains (Pike & Killian, 2001); predictors of critical thinking, analytical reasoning, and writing (Arum & Roksa, 2011); and the relationship between college environment, diversity, and student learning (Hurtado, Dey & Gurin, 2003). Learning is measured with various instruments, including student self-report assessments, such as the Cooperative Institutional Research Program survey (CIRP), the College Student Experiences Questionnaire (CSEQ), the National Study of Student Engagement (NSSE), and the National Study of Student Learning (NSSL). Additionally, other direct assessments are utilized, such as the Collegiate Assessment of Academic Proficiency (CAA) and the Collegiate Learning Assessment (CLA), and performance assessments such as the New Jersey Department of Education Tasks in Critical Thinking and the Graduate Record Exam (GRE) Essay Prompts.

Learning Theory & Approaches

This set of literature provides information on students' beliefs about, and preferences for, learning approaches across various dimensions. For example, the studies examine differences in learning according to discipline (Breen & Lindsay, 2002; Hativa & Birenbaum, 2000), personal values (Lietz & Matthews, 2010), epistemological beliefs (Paulsen & Feldman, 2007), locus of control (Perry, et al., 2005), personality type (Salter, Evans, and Forney, 2006), and gender (Whitt, Pascarella, Nesheim, & Marth, 2003).

Scholarship of Teaching & Learning

These works present philosophical arguments for reflective postsecondary pedagogy (Bass, 1999; Halpern & Hakel, 2003; Hutchings & Shulman, 1999; Miller, 2008) and empirical examinations of teaching cultures (Entwistle, 2000; Henderson & Buchanan, 2007; Huber, 2001). Additionally, this literature provides practical recommendations for faculty and institutional administrators; specifically, institutional offices that support faculty development and offices that assess student learning outcomes.

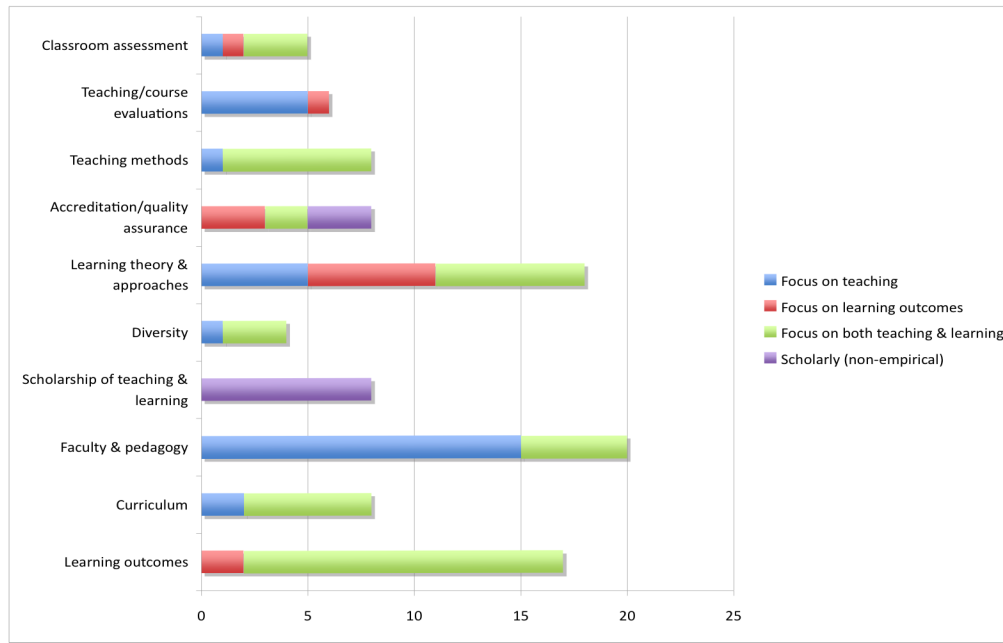
Toward a Conceptual Framework: Using Astin's I-E-O Model

While reviewing the above literature sources in the 10 categories, another pattern among the works began to emerge. Although the purpose of the literature review was to identify the extant research on connections between college teaching and student learning, several of the collected works had a decidedly stronger emphasis on either college teaching practices or student learning outcomes, to the point of essentially excluding the other. For example, Weaver and Jiang (2005) investigated how students' personal attributes and their perceptions of classroom organization related to their class participation. However, they did not study the relationship between class participation and a student learning outcome, for example: critical

thinking skills or appreciation of differing perspectives. Similarly, Lyke and Young (2006) assessed the type of cognitive strategy students used in their Human Development courses, and compared post-test scores to pre-test scores. Yet, they did not assess the teaching and/or pedagogical practices used in the Human Development course and its potential relationship with cognitive strategies used. On the other hand, a significant subset of the works consulted included a clearly defined learning outcome (or perhaps more than one), and incorporated at least one (but often more than one) aspect of the classroom environment and instructors' teaching/pedagogical practices into their conceptual frameworks.

Even more interestingly, within the 10 emergent thematic categories, there were distinct patterns regarding whether the works within the categories evidenced an emphasis on 1) teaching practices over learning outcomes; 2) learning outcomes over teaching practices, or 3) a relative balance of both. For example, the works placed in the Teaching/Course Evaluation and Faculty & Pedagogy thematic categories predominantly preferred teaching practices and environments and omitted learning outcomes in their conceptual models. Alternatively, some of the thematic categories included studies that treated teaching and learning constructs more-or-less in balance: for example, Teaching Methods and Learning Outcomes. What's more, some categories, such as Learning Theory & Approaches, included a mix of all three types of emphases (focus on teaching, focus on learning, and balanced mix of the two). Figure 1 provides an illustration of the proportion of studies within each of the 10 categories that fall into one of the three emphases.

Figure 1

Teaching or Learning Emphasis by Thematic Category

The above imbalanced emphases (focus on teaching environments and not learning outcomes, or focus on learning outcomes and not teaching environments) represent what Astin (1991; 1993) would identify as an incomplete Inputs-Environments-Outcomes (I-E-O) model. Astin asserts that student outcomes (such as learning outcomes) are influenced by students' interactions with their college environments (such as the teaching and pedagogical practices of their instructors and their classroom environments) and their inputs, or pre-college background characteristics such as demographic information and high school experiences. Astin argues that models that seek to understand the relationship between any one college environment—say, instructional teaching practices—and an outcome must also account for the student inputs and other college environments that may also influence that same outcome. Failing to do so may

result in an overestimated relationship between the particular college environment and the outcome. Thus, focusing specifically on the learning outcome but not the teaching and classroom environments may satisfy those who only seek to learn the “value-added” of a college education. But those who work in higher education are naturally interested in pinpointing which elements of students’ college experiences, or “environments” (e.g., their classroom instruction, co-curricular activities, or interactions with diverse peers) facilitate student learning. Illumination of those elements can help university faculty and staff optimize the learning environment by enhancing predictors of student learning and eliminating negative factors. Merely assessing the teaching and classroom environments but failing to connect those environments to a learning outcome makes a different mistake, that of assuming that uncovering effective environments will necessarily lead to effective outcomes. Yet, that is an empirical question that must be examined and not assumed.

Therefore, an effective conceptual framework for researchers attempting to study the relationship between college teaching and student learning should include inputs (or student background characteristics), environments (both teaching/pedagogical and other environments) and well-defined learning outcomes. Toward this end, we organized the constructs utilized in the works reviewed into inputs, environments, and outcomes in order to highlight *a priori* relationships uncovered in previous studies. The conceptual model that emerged (and that is described in the next section) serves as a starting point for those interested in the empirical examination of college teaching and student learning: it provides an index of the constructs that have been utilized in previous work, the extent to which those constructs were used in previous works, and illuminates key gaps in the extant literature. (See Figure 2.)

Figure 2

IEO Conceptual Model for Assessing College Teaching & Student Learning

INPUTS	ENVIRONMENTS	OUTCOMES
Demographic characteristics (6) Prior aptitude (6) Prior aspirations, expectations, and motivations (5) High school experiences (1)	Institutional characteristics (9) Curricular measures (19) Characteristics of instructors/instruction (19) Peer environment (8) Individual involvement (15) Individual perceptions (15)	Cognitive (28) Affective (15)

A Preliminary Postsecondary Teaching and Learning I-E-O Model**Inputs**

The most commonly utilized inputs included demographic characteristics such as gender, race/ethnicity, age, family socioeconomic status, and parents' education. Other inputs include prior aptitude (e.g., SAT or ACT score, high school grade point average, math and English competency examinations), academic goals and college expectations. However, as a whole, far fewer inputs were incorporated into previous research than environments. Moreover, very few studies included a pre-test or proxy pre-test of the study's respective outcome; thus, most did not account for the variance explained in the dependent variable by prior disposition or aptitude.

Environments

Due to the volume of constructs classified as environments in the literature reviewed, we have divided up the measures into six domains (which loosely follow Astin's partitions of the college environment, from the most distal to the most proximal characteristics): institutional characteristics, curricular measures, characteristics of instructors/instruction, peer environment, individual involvement, and individual perceptions.

Institutional characteristics. Institutional characteristics were a less commonly examined environment, with each variable in this category appearing in only one source. Macro-level variables within this category were related to organization and classification, while micro-level variables pertained to policies and practices. Organization and classification variables included reporting divisions within the institution and Carnegie classification, while policies and practices variables included level of spending per student and commute time.

Curricular measures. Constructs related to curricular measures were among the most common environments measured in previous studies. Within the category of curricular measures, the most popular variable was active and collaborative learning. Among the studies that featured this variable, active and collaborative learning was operationalized in a variety of ways. Some studies, for example, utilized NSSE composite measures on active and collaborative learning to examine the effects of active and collaborative learning environments on student learning outcomes (Pascarella, Seifert & Blaich, 2010; Umbach & Wawrzynski, 2005). Others (Cabrera, Colbeck & Terenzini, 2001; Harper & Lattuca, 2010; Volkwein et al., 2007) analyzed self-report data collected from engineering students at multiple institutions, in order to learn more about the ways in which active and collaborative learning is integrated into engineering curricula. In addition, some studies, such as Hemenway, Straits, Wilke and Hufnagel (2002), also included an observational component in order to document practices and interactions that constitute active and collaborative learning. The second most commonly studied variables were academic discipline (e.g., humanities, STEM, Biglan categories), instructor effectiveness in various classroom activities, time devoted to in-class activities, and course organization and design. Less commonly utilized curricular measures in the reviewed literature included descriptive aspects of curricular measures – such as student-centered pedagogy and student

design projects – as well as variables that were more evaluative in nature, such as students' perceived level of academic challenge and coherence of curriculum. Finally, the variables that were least often studied were intentionality in course activities, problems with tutorials, and role interdependence.

Characteristics of instructors and modes of instruction. In the category of characteristics of instructors and instruction, the most popular variable was faculty-student interaction, followed by student ratings of overall teaching effectiveness and quality, as well as clarity and organization of the course and classroom. Variables less commonly utilized were more evaluative in nature and included promptness of feedback, as well as whether instructors or instruction were deemed helpful, engaging, or supportive and encouraging. Other variables that were studied less often included instructor characteristics such as being friendly and informed, as well as characteristics of instruction such as pace and evaluations. Finally, instructor/instruction variables that were included least often ranged from the race/ethnicity of the instructor to students' perceptions of fair grading.

Peer environment. Another category measured in studies was students' peer environment. Within this category, the most frequently studied variables were peer climate (e.g., the nature of interactions among students), forms of interaction (e.g., classroom activities, learning communities, online learning), and compositional diversity. The next most commonly studied variables were residence and out-of-class interaction. Variables that were studied least often were related to the environments in which students learn, as well as collaborative or group work among students.

Individual involvement. Within the category of individual involvement, the most commonly incorporated constructs included: time devoted to out-of-class activities; enrollment

status (including transfer status); and academic major. The next most commonly studied variables pertained to participation in activities such as internships, research, professional societies, athletics, and Greek organizations, as well as hours worked and year in school. The variables examined less often were behavioral in nature (e.g., interaction with academic advisors, help-seeking from peers), while others pertained to first-year experiences or homework.

Individual perceptions. Finally, a number of studies measured students' individual perceptions—of themselves and their environments. The most frequently measured variables within this category were confidence or self-efficacy, as well as perceptions of a supportive campus environment or climate. A second tier of studies studied variables including satisfaction, goal and reward interdependence, and the ways in which students managed time and navigated campus resources. A final set of less well-studied psychological constructs included control, anxiety, and self-regulation, as well as sense of belonging to the institution and career goal orientation.

Outcomes

Student outcomes in the teaching and learning literature are clustered into two groupings: cognitive and affective learning outcomes.

Cognitive learning outcomes. The most commonly studied cognitive learning outcomes are critical thinking skills and learning/knowledge acquisition. The second most commonly studied cognitive outcomes are problem solving skills, gains in personal & intellectual development, grades, understanding people of different cultures, and communication. Other, less commonly studied cognitive learning outcomes include design and analytic skills, writing, reading comprehension, mathematics knowledge, integrative learning, academic attainment, inquiry, and self-understanding. Scholars assess cognitive outcomes with varying methods, such

as academic performance in individual courses, standardized instruments and scales (e.g., CIRP, CAAP, CLA), self-report questionnaires, essay prompts, and student grade point average. .

Affective learning outcomes. The most popular affective learning outcomes were gains in teamwork skills and overall satisfaction with courses. Other affective learning outcomes include goal orientation, adaptability, moral character, and internal locus of attribution for academic success. Rather than utilize standardized instruments and academic performance measures, scholars assessed affective learning outcomes largely with self-report questionnaires, and with focus groups or interviews. For the full preliminary conceptual model, including all constructs in each category, see Figure 3 (attachment).

Summary

In an effort to synthesize and organize the extant literature on college teaching/pedagogy and student learning outcomes, we identified 112 works and grouped them into 10 categories. The categories with the most citations within them were: Faculty and Pedagogy, Learning Theory and Approaches, and Learning Outcomes. These categories suggest that the higher education literature, which was the primary source for this review, examines teaching and learning evenly from the three major perspectives: teaching behaviors (Faculty and Pedagogy), learning outcomes (Learning Outcomes) and student perspectives on their own learning (Learning Theory and Approaches).

In addition, we found that some of the studies, similarly, tended to examine teaching and learning somewhat insufficiently. Some focused on teaching practices without attempting to correlate them with student learning outcomes. Others focused on student outcomes without attempting to tie them to specific teaching practices. However, many did incorporate both teaching practices and learning outcomes into their analyses, including a few studies that

integrated multiple measures of teaching/pedagogical practices into their conceptual models. Thus, in order to unite the teaching and learning literature into one framework, we organized the measures in the studies into an Astin (1991, 1993) inputs-environments-outcomes (I-E-O) model. When examined in total, several teaching-related constructs have been utilized in prior empirical studies: for example, 19 different curricular measures and 19 characteristics of instructors or instruction were included among the 112 literature sources consulted. Regarding student learning outcomes, the majority (28) were cognitive in nature, including 12 that examined some form of critical thinking and 10 that investigated knowledge acquisition.

Implications for Future Research

The preliminary conceptual model that we created from this review of literature forms the basis from which the future study of evidence-driven research on the nexus between teaching and learning should henceforth move forward. Future researchers can use the measures listed in Figure 3 as the baseline for their work. Not only can they ascertain the various measures that have been used in the previous study of college teaching and student learning, but they can note which measures have been used in more than one study—including those that have been used in numerous works. Thus, this model can serve as an organizing framework, or central clearinghouse, of the teaching and learning literature. It can be added to over time so that it is kept current, and it can help unite a formerly disparate literature in order to aid empirical inquiry in teaching and learning in moving forward with intentionality. Finally, the model should encourage future researchers to understand that studies involving the relationship between college teaching/pedagogy and student learning outcomes should follow Astin's tenets about examining matters of college impact: in other words, future studies should include a) a clearly defined outcome; b) the college environment in question (i.e., specific teaching and/or pedagogical

practices) as well as other college environments thought to influence the respective outcome; and c) measures representing incoming characteristics that differentiate among students (or, inputs).

Implications for Policy and Practice

Given the imperative mandated to colleges and universities across the country to assess their student learning outcomes, the preliminary conceptual model also has implications for higher education policy among key stakeholders and institutional practice. Future studies executed using this preliminary model as their guide could yield some very important indicators among those both inside and outside the institution. From those studies, external stakeholders interested in accountability (e.g., accreditors, legislators) can learn how student learning has been studied empirically, and come away with documented evidence of the impact of college on students' learning (i.e., the "value added" of a college education). In addition, students and parents will be reassured that their investment in their students' educations was an opportunity cost worth spending, and how different facets of the college environment (e.g., the curriculum, instructor characteristics) as well as their own college participation (e.g., peer interaction, individual involvement) can enhance their overall learning.

Meanwhile, at the institutional level, faculty utilizing results from future studies drawing upon this preliminary conceptual model will begin to be able to pinpoint which of their teaching and pedagogical practices are empirically linked to improved student learning. Faculty and other internal constituents may also begin to understand how student learning occurs in a college environment more holistically, and that classroom practices may only indirectly relate to student learning through other student involvements and interactions. Thus, this review's preliminary conceptual model of teaching and learning holds the potential to transform the dialogue on teaching and learning in strategic, practical, and mission-valuable ways.