

Paths to Learning:

Teaching for Engagement in College

Barbara F. Tobolowsky, Editor

The National Resource Center for
The First-Year Experience® and Students in Transition
University of South Carolina

Cite as:

Tobolowsky, B. F. (Ed.). (2014). *Paths to learning: Teaching for engagement in college*. Columbia, SC: University of South Carolina, National Resource Center for The First-Year Experience and Students in Transition.

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ISBN: 978-1-889-27192-7

Published by:

National Resource Center for
The First-Year Experience and Students in Transition
University of South Carolina
1728 College Street, Columbia, SC 29208
www.sc.edu/fye

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Production Staff for the National Resource Center:

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Cover Design: Josh Tyler, Graphic Artist

Composition and Layout: Erin Morris, Graphic Designer

External Reviewers: Brad Garner, Director of Faculty Enrichment and The Learning Academy
Center for Learning and Innovation, Indiana Wesleyan University

Library of Congress Cataloging-in-Publication Data

Paths to learning : teaching for engagement in college / Barbara F. Tobolowsky, editor.

pages cm

Includes index.

ISBN 978-1-889271-92-7

1. College teaching. 2. Reflective learning. I. Tobolowsky, Barbara F., editor of compilation.

LB2331.P363 2014

378.l'25--dc23

2014011024

Chapter 2

Research on Successful Learning Practices

Jillian Kinzie

Today's higher education institutions are confronted by current critiques regarding how much students learn and skepticism about the value of undergraduate education. Yet, while there is explicit pressure for postsecondary education to demonstrably improve the quality of learning and student success, the strategy for making these improvements is not always clear cut. One approach to addressing current pressures is to focus more explicitly on student learning and, in particular, use research-based approaches to inform improvements in undergraduate education. This strategy requires greater awareness of research on student learning and a willingness to change the conditions for learning on campus.

Fortunately, it seems that college educators are more interested in the learning processes of their students than ever before (Doyle, 2008). These perspective shifts underscore the need to understand what matters to learning. What are optimal experiences and settings for learning? What instructional practices are most likely to produce learning for more students? What aspects of the total college environment enhance students' learning?

The design of effective undergraduate education demands greater understanding and use of research-based approaches. This chapter introduces foundational

concepts and research on practices that lead to learning, beginning with the particulars of effective education practice followed by an overview of the literature on engaging pedagogy and instructional practice.

Overview of Research on Learning

Research about learning in college draws from a wide base and several disciplines, including psychology; philosophy; sociology; and more recently, neuroscience. Learning in college is a complex process, which is influenced by intellectual, social, and emotional characteristics as well as the development of the learner, the conditions and structures of the learning environment, the quality of teaching, and the integration of all of these factors. Learning theories attempt to explain various types of learning, including (a) behavioral theories, which emphasize the forming of associations between stimuli and responses through selective reinforcement, and (b) cognitive theories that explain learning in terms of information processing and student perceptions of peers, teachers, and materials. (See Chapter 3 for more on foundational learning theories.) Effective learning environments require the specification of relevant theoretical perspectives for the types of learning in the college context and draw on these perspectives to design learning practice.

Learning theories are usually tied closely to educational practices, and teaching and learning are often inseparably linked. However, these connections are all too frequently ignored in practice. In fact, educational practices employed in college tend to be based more on modeling, trial and error, or intuitive guesswork than on theories of learning or research on effective learning practices.

A considerable body of research reveals a lot about learning in college and the general practices that promote college student learning. Pascarella and Terenzini (2005) synthesized hundreds of studies on the impact of general instructional approaches. The research includes evidence of the impact of learning outside the classroom, class size, institution-wide climate to support learning, and general activities for learning. This vast body of research also explores specific strategies and their influence on learning, such as active and collaborative learning, supplemental instruction, first-year seminars, peer teaching, and structures such as learning communities in which groups of students are in a formal program taking two or more classes together. Several of these specific topics, including learning theories, critical pedagogy, and cooperative and collaborative learning, are explored in subsequent chapters in this volume. Therefore, this chapter focuses, more broadly, on research regarding specific learning strategies that contribute to student learning.

Framework of Effective Educational Practice

Current pressures to improve student learning are driving attention to evidence-based practices. Correspondingly, since issuing their first volume on this topic in 1991, Pascarella and Terenzini (2005) noted the expansion of research on the effect of college on student learning and a broader vision of how students learn. The expansion is related in part to more research on the increasingly diverse, national undergraduate student body and the need to understand what accounts for variations in outcomes by factors including age, race/ethnicity, gender, full- and part-time status, and institutional type. This view of how students learn went beyond a simple perspective that described learning as an act of acquiring facts and concepts marked by achievement of verifiable outcomes, to a view of students actively constructing and creating knowledge by making sense of the content and their experiences. This perspective has led to a range of innovative instructional approaches (e.g., collaborative and cooperative learning, problem-based learning, service-learning), which is the basis for this examination of research on successful learning practices.

The research discussed in the next section explores recent developments in neuroscience and how it informs teaching and learning, followed by the particulars of effective education practice. Specifically, the section looks at educational interventions proven to contribute to college student learning.

Research on Neuroscience

Some theories of learning are explained by differences in styles and traits. Learning styles are typically included in discussions about promoting students' learning. Although learning differences are more often the result of preferences or experiences rather than some inborn trait of the individual, they can be useful to introduce students to a wider range of strategies to help them master material in a meaningful way. Introducing students to their preferences in order to build a wider repertoire of study strategies can help them engender new ways to study and prepare for class.

More recently, neuroscience, cognitive science, or the study of the brain, has provided new fundamental insights into the many processes that influence learning. The work of Bransford, Brown, and Cocking (2000) offers a comprehensive overview of the field of neuroscience, exploring how to link the findings of research on the science of learning to the practice of teaching and learning. Recommendations to create learning-centered environments that pay careful attention to the knowledge, skills, attitudes, and beliefs that learners bring to the educational setting are vital.

This approach has been labeled *culturally responsive* and *culturally relevant* (Ladson-Billings, 1995), and attempts to draw out what students understand in relation to the problems on hand, discuss their misconceptions sensitively, and create new learning situations that allow for a readjustment of their ideas.

Work in neuroscience has reinforced learning theory research. For example, as in cognitive and constructivist theories of learning, a key finding in the science of learning is the importance of feedback and assessment. Opportunities for feedback, such as online monitoring of both group work and individual performance, can be formal and informal and should occur continuously as a part of instruction. Effective teachers also help students build skills of self-assessment—an important part of the metacognitive approach to instruction. However, because metacognition takes the form of an internal dialogue, requiring students to monitor their own understanding, many students may be unaware of its importance unless the processes are explicitly emphasized by instructors (Pintrich, 2002)—and contextualized by discipline. Bransford et al. (2000) suggested that in history, for example, students must think about who authored the reading and how this may affect the interpretation of events; whereas, in physics, students are monitoring their understanding of the underlying physical principle at work. As students learn to assess their own understandings and work, as well as the work of their peers, everyone learns more effectively.

Although some fear brain science research is too new and untested to apply in educational settings, Sousa's (2011) recent work includes new information about how the brain can affect teaching and learning. These findings show how sleep deprivation and stress influence learning; explore the effect of emotions on learning, memory, and recall; and challenge the notion that the brain can multitask.

Brain research fundamentally asserts the following conclusions about learning: (a) practice increases learning, (b) environment makes a difference, (c) learning changes the physical structures of the brain, (d) learning organizes and reorganizes the brain, and (e) emotion is the glue that holds learning together (Zull, 2002). Brain research also suggests the most important lesson for teaching is the role of prior learning. In particular, what learners bring to the learning environment—their beliefs, cultural backgrounds, knowledge of academic content, and study strategies—determines the ease or difficulty of their learning. Learners use current knowledge to construct new knowledge, and what they know and believe at the moment affects how they interpret new information. This suggests that educators must take time to gather information about their students and use the teaching tools of analogy, metaphor, simile, and example to build concrete experiences with which students can connect.

This research can help inform choices about teaching strategies. Selecting techniques, such as inquiry-based learning, lecturing, or cooperative learning, should be based on what is important for students to experience at that point or how to achieve a particular learning goal. For example, hands-on and application experiences may be appropriate to ground emergent knowledge, lecturing might be a way to excite imagination, and small-group learning could be the most effective way to provide students feedback on their preconceptions and apply emerging understandings. Knowing more about how people learn allows instructors to purposefully diversify their repertoire and develop a rich set of opportunities to construct an educational program.

Effective Educational Practice Research

Coincident with national calls for improvement in undergraduate education beginning in the late 1980s, significant attention has been dedicated to asserting what contributes to quality undergraduate learning and delineating effective approaches to teaching and learning. For example, the Education Commission of the States (1995) outlined 12 attributes for delivering a quality undergraduate education, concluding that when colleges and universities systematically engage in these good practices, student performance and satisfaction improve.

These 12 attributes (Education Commission of the States, 1995) broadly identify aspects of an institution's organizational culture and values, its curriculum, and the type of instructional practice needed for effective undergraduate education (Figure 2.1). Undergraduate quality begins with a campus culture that (a) sets high expectations for student learning and makes active efforts to help students reach them; (b) designs curricula and instructional efforts to meet students' diverse backgrounds, levels of preparation, and previous experiences; and (c) emphasizes the first years of undergraduate study and the importance of transition and challenging core academic experiences. A quality undergraduate curriculum demands coherence in learning experiences and reinforcement of specific outcomes, multiple opportunities in and outside the classroom for synthesizing experiences, practice of learned skills, and integration and application. Quality undergraduate instruction builds on active learning that requires regular discussion, considerable written work, application and demonstration experiences, frequent feedback on performance, collaborative learning with peers, substantive contact with faculty, and adequate time-on-task. These practices are important individually and are mutually reinforcing, and continue to be asserted as a foundation for educational quality.

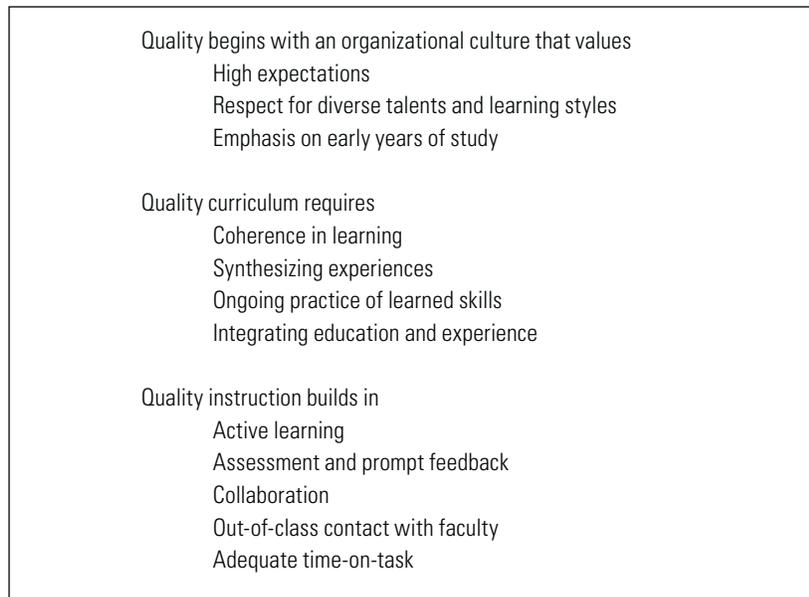


Figure 2.1. Attributes of quality undergraduate education. Source: *Making Quality Count in Undergraduate Education*, Education Commission of the States (1995).

More specific to teaching, summaries of research on effective educational practice have generally advocated for active and experiential learning. The *Seven Principles for Good Practice in Undergraduate Education*, developed by a group of scholars of higher education and derived from the past 50 years of research, outlined a set of standards to improve learning (Chickering & Gamson, 1987; 1991), including (a) engaging in student-faculty contact, (b) encouraging cooperation among students, (c) using active-learning techniques, (d) providing prompt and meaningful feedback, (e) emphasizing time-on-task, (f) communicating high expectations, and (g) respecting diverse talents and ways of learning. Although each of the seven principles can stand alone, when all are present, their effects multiply and can exert a powerful force in undergraduate education.

This short list of empirically based, common-sense principles has been influential in broadening approaches to pedagogy on college campuses. The practices have been associated with many desirable outcomes, hold meaning for learning across professional programs and the liberal arts, and foster learning among all students—including across racial/ethnic groups, ages, socioeconomic statuses, genders, and levels of preparation (Cruce, Wolniak, Seifert, & Pascarella, 2006;

Mayhew, Wolniak, & Pascarella, 2008; Pascarella, Salisbury, & Blaich, 2011; Pascarella & Terenzini, 2005). Further, the principles assert the responsibility of educators and college and university leaders to foster an environment favorable to good practice in higher education.

Delving Deeper Into Principles of Good Practice

Evidence of the value of the seven principles as good practice for undergraduate education is robust. The research base for the principles is briefly reviewed in this section as well as other good practice techniques and strategies.

Student-faculty interaction has been well documented to have a positive impact on academic, social, and personal growth and development. Research by Pascarella and Terenzini (1991, 2005) and Astin (1984), among others, delineates the role of faculty in promoting students' academic achievement, persistence in college, and other educational outcomes, including cognitive, intellectual, and academic self-concept and career choice measures (Berger & Milem, 2000; Delaney, 2008; Kuh & Hu, 2001; Lundberg & Schreiner, 2004; Pascarella & Blaich, 2013; Umbach & Wawrzynski, 2005). Informal student-faculty interaction activities—being a guest in a professor's home, working on a research project with a faculty member, talking with instructors outside of class, and serving on committees with faculty—are positively correlated with student learning and development (Astin, 1993b; Kuh, 2003; Kuh & Hu, 2001). In addition, intentional programs to facilitate student-faculty interaction have different effects on students. For example, relationships with faculty predicted development of academic competence among new students in the first year of college (Reason, Terenzini, & Domingo, 2006) and sophomore success, in terms of GPA and satisfaction (Graunke & Woosley, 2005; Juillerat, 2000). Further, student-faculty interaction is also important because it encourages students to devote greater effort to other educationally purposeful activities.

Cooperative learning techniques, often grouped together with active learning in discussions about teaching and learning research, are effective in helping students learn content, promoting increased investigation of the subject, and fostering greater diligence in learning course material. These strategies are particularly useful to new students because they are effective in building camaraderie and forming support networks in early college years (Koprowski & Perigo, 2000; Slavin, 1990; Zambreno, Hoover, Anderson, & Gillman, 2002). Cooperative, and more specifically, problem-based learning have also been found to enhance student learning (Slavin, 1990; Smith, Sheppard, Johnson, & Johnson, 2005). Of course, the practice of cooperative learning must be carefully constructed by the instructor, and students must understand and be held accountable for their responsibility to

the group. Important disciplinary approaches and techniques for effective group learning have been tested and constructed. For example, Michaelson, Knight, and Fink (2004) detailed approaches to *team-based learning*, a strategy that provides students the opportunity to practice using course concepts to solve problems. (See Chapter 7 for more on cooperative and collaborative learning.)

Active learning encompasses activities in which students engage in a classroom other than listening passively to an instructor's lecture. A large amount of research confirms the benefits of active learning for promoting content acquisition, course success and satisfaction, and persistence to the next term (Bonwell & Eison, 1991; Braxton, Jones, Hirschy, & Hartley, 2008; Faust & Paulson, 1998; Hake, 1998; McKeachie & Svinicki, 2006; Silberman, 1996). Active learning has also been shown to be effective in online learning environments (Durrington, Berryhill, & Swafford, 2006). (See Chapter 8 for more on online pedagogies.) Commonly used and proven active-learning techniques include the *one-minute-paper*, a short in-class writing activity on a posed question (Angelo & Cross, 1993); reading quizzes followed by small-group discussion; and *buzz groups*, a structured format to talk about difficult concepts and ensure all students in large classes contribute to the discussion (McKeachie & Svinicki, 2006). Also, much of the research and dialog about active learning in college classrooms suggests that lecture, when combined with active-learning techniques, is a worthwhile alternative to a lecture-only format.

Prompt and meaningful feedback from faculty has a general positive impact on educational gains (Cole, 2008). Faculty feedback on performance has been found to be valuable across disciplines. For example, Dohrer (1991) used drafts, interviews, and think-aloud protocols to study undergraduate students' views of instructor feedback in a writing course and concluded that feedback and opportunities for revision helped students learn from their mistakes. Koprowski (1997) found that peer reviews enabled students to feel empowered by the process of giving and receiving comments and resulted in significantly improved writing in science when compared to receiving feedback from the instructor alone. (See Chapter 9 for more on assessment techniques.)

Time-on-task is perhaps the most important influence on student learning. Pace's (1979; 1980) research connecting the quality of student effort with student learning, and Astin's (1984; 1993b) theory of student involvement, which emphasizes the psychological energy that learning demands, demonstrate the importance of students' dedicating time to educationally purposeful activities, such as studying, interacting with faculty and peers, participating in campus organizations, and attending campus events. Instructional approaches are needed to encourage time-on-task, including faculty (a) clearly communicating the minimum amount

of time required to prepare for class and understand complex material; (b) helping students set challenging goals for their own learning; (c) underscoring the importance of regular work, steady application, self-pacing, and scheduling; and (d) meeting with students who fall behind to discuss their study habits, schedules, and other commitments.

Communicating high expectations to all students and showing regard for their unique interests and talents facilitates academic, social, personal, and vocational growth (Sorcinelli, 1991). A key element of high expectations is adopting a talent development (Astin, 1985) philosophy throughout the institution. Such a view contends that “excellence is determined by our ability to develop the talents of our students” (Astin, 1993a, p. 6). In addition to recognizing that every student can learn under the right conditions, this perspective requires the institution to organize its resources and create conditions for teaching and learning based on educationally effective practices (Harper & Quaye, 2009; Kuh, Kinzie, Schuh, Whitt, & Associates, 2010).

Respecting diverse talents and ways of learning is appropriate for all students; however, this principle is particularly effective in working with historically underserved students, especially when their experiences, talents, and skills are honored and viewed as classroom assets. Because faculty members can at times misunderstand, ignore, or devalue the talents of students from diverse backgrounds, differences can be viewed as deficiencies (Harper & Quaye, 2009). Treisman (1992) found that African American and Hispanic students, who met academic prerequisites and demonstrated ability, failed calculus, not because of a lack of motivation (as initially presumed by faculty) but because of social and intellectual isolation (i.e., students studied alone, kept their academic and social lives separate, and were marginalized through campus programs that failed to link multiethnic student communities around shared academic interests). Through talent development strategies, these students were able to use and further hone their mathematical and problem-solving talents (Treisman, 1992). Further, engaging students in diverse learning experiences is vital to advancing student learning and gains in multicultural understanding and intercultural outcomes (Harper & Quaye, 2009). Incorporating readings that reflect the scholarly contribution of diverse writers and, more importantly, listening to diverse students in order to understand how to enhance their educational experience can help enrich the learning environment for all students, fostering greater progress in personal and educational growth (Chang, Denson, Saenz, & Misa, 2006; Hurtado, Dey, Gurin, & Gurin, 2003; Umbach & Kuh, 2006). Among the more effective approaches related to introducing diverse perspectives are using interactive teaching techniques, such as small-group discussions, role playing,

and debates; creating a supportive, inclusive classroom climate; recognizing that everyone, including faculty, is a learner; and reflecting on how to use the diversity present among members of the class to enhance learning (ACE & AAUP, 2000).

Cumulative Impact of Principles

Research examining the cumulative value when students experience all seven principles has also been conducted. Kuh, Pace, and Vesper (1997) created indicators to examine three of the seven principles—student-faculty contact, cooperation among students, and active learning—and their relationship to students' self-reported learning gains in general education, intellectual skills, and personal and social development. The indicators showed positive and consistent relationships to self-reported learning outcomes. In addition, multivariate longitudinal analyses of these practices at a diverse group of 18 institutions have shown them to be related to cognitive development and several other positive outcomes (Cruce et al., 2006). Similarly, as part of their comprehensive reviews of research on college impact, Pascarella and Terenzini (1991, 2005) concluded that exposure to a range of instructional practices, such as peer teaching, active discussion, experiential learning, integration across courses, and effective teaching practices, contributes to students' engagement in learning and academic work, thereby enhancing their learning and development.

Other Good Instructional Practices

Improvements to teaching and learning require increased attention to implementing engaging pedagogies. Recent research on effective instruction and what outstanding teachers do offers practical lessons for instructional practice. Bain (2004) used observation, interviews with teachers and their students, focus groups, and reviews of course syllabi and student work to study the practices of dozens of professors who were extraordinarily successful in helping students learn in ways that made a sustained and positive influence on their learning and development. Bain concluded that outstanding teachers employed several broad patterns of thinking and practice, including (a) a conviction that teaching demands hard work and is approached thoughtfully; (b) an instructional practice built by working backwards from larger student objectives, not getting bogged down in details; (c) high expectations of students and a belief that all students want to learn and can; and (d) systems to solicit and incorporate student feedback. Most importantly, as teachers prepare, conduct, and evaluate their classes, they regard their students' learning with as much interest as their own process of discovery in their discipline.

A classic book in college pedagogy that emphasizes instructional practice and depicts the craft of teaching is *McKeachie's Teaching Tips* (Svinicki & McKeachie, 2014). This resource provides strategies for everyday teaching and suggestions to maximize learning for every student. The book summarizes current best practices succinctly and describes the most foundational aspects of teaching, including writing objectives, encouraging active learning in large classes, making group learning work, and teaching students to read actively. It also addresses concepts such as motivational theory, cultural diversity, and the ethics of teaching and learning. Because effective educational practice should help students become aware of the strategies for learning and problem solving, it is incumbent on educators to employ a range of methods to engage students, make these explicit to students, and facilitate the development and awareness of learning strategies and methods for continued learning.

Another research-based resource for instructional practice is *Tools for Teaching* (Davis, 2009). Many of the topics are similar to those addressed in *McKeachie's Teaching Tips*, including course designs that support engagement, methods to encourage participation in discussion-based classes, effective lecturing, and ways to personalize the learning experience for students. Research-based strategies, including collaborative learning, case study analysis, simulations, undergraduate research, guest speaker presentations, and civic engagement opportunities, are presented. Instructional practices that contribute to learning and occur outside the classroom are also discussed, such as making effective use of office hours, communicating with students electronically, and providing academic advising.

In *How Learning Looks: Seven Research-Based Principles for Smart Learning*, Ambrose and colleagues (2010) distilled the research literature from a breadth of perspectives, including cognitive, developmental, and social psychology as well as anthropology and organizational behavior, explicating general measures of how students learn and translating the findings into what this means for effective teaching. These key principles include (a) acknowledging students' prior knowledge, (b) using effective organization to enhance student learning, (c) applying information about what impacts motivation, (d) helping students develop and integrate component skills to develop mastery, (e) employing goal-directed practice and targeted feedback, (f) creating a positive climate to energize students' learning, and (g) teaching students how to monitor and adjust their approaches to learning to become self-directed learners. Integrating theory with real-classroom examples in practice, this resource helps faculty apply cognitive science advances to improve their own teaching.

Most resources for instructional practice emphasize the value of faculty inquiry into teaching practice, often identified in the teaching and learning literature as employing *classroom assessment techniques*, or CATs (Cross & Steadman, 1996; Steadman, 1998). This technique involves checking in with students to gauge what they are learning and what they do not fully understand as a way to improve instruction and student performance. CATs are an inquiry into what students are actually learning when they are in the process of gaining new knowledge. By systematically asking students about their learning as a normal part of a course, it is possible to gain valuable feedback about gaps in students' understanding of a particular topic. The goal is to gain an understanding of what students know (and do not know) in order to make responsive changes in teaching. CATs are anonymous, nongraded, and aimed at gathering feedback from students about what they have learned and what they find confusing about a topic. Research has examined the effects of CATs on student learning (Angelo & Cross, 1993; Cross & Steadman 1996) and found they contribute to deep learning and greater involvement in the learning process, among other outcomes.

As the resources referenced in this section demonstrate, a wealth of research-based approaches is available to instructors interested in the literature on teaching. These principles and practices can aid in the design of course; classroom pedagogy; and, more broadly, the environment for learning.

Student Engagement

The use of the term *engagement* followed from the conclusion that “the greater the student’s involvement or engagement in academic work or in the academic experience of college, the greater his or her level of knowledge acquisition and general cognitive development” (Pascarella & Terenzini, 1991, p. 616). In 2005, the authors proposed that colleges and universities optimize conditions to encourage student engagement. They determined that once students start college, a key factor to whether they will survive and thrive is the extent to which they take part in educationally effective activities (Pascarella & Terenzini, 2005).

The components of educationally effective practice associated with student engagement include Chickering and Gamson’s (1987) seven principles (which were discussed above), and additional student behaviors and institutional conditions proven to be associated with desirable outcomes, such as student satisfaction, persistence, educational attainment, and learning and development (Kuh, 2001, 2003; McCormick, Kinzie, & Gonyea, 2013; Pascarella, Seifert, & Blaich 2010; Pascarella & Terenzini, 1991, 2005; Pike, 1995). Student behaviors include such

aspects as the time and effort students put into their studies, interaction with faculty, and peer involvement. Institutional conditions include resources and educational policies, programs, and practices. Most important about the student engagement concept is that it involves the intersection of student behaviors *and* institutional conditions. For example, high levels of purposeful student-faculty contact and active and collaborative learning supported by institutional environments perceived by students as inclusive and affirming can foster student engagement. Both student and institutional dimensions are critical to student engagement.

The advent of the National Survey of Student Engagement (NSSE) in 2000 increased the visibility of the concept of student engagement in postsecondary education. Hundreds of baccalaureate-granting institutions began to assess engagement in an intentional and empirical way, and by 2013, more than 1,500 colleges and universities had information about the quality of student engagement. The annual survey of first-year students and seniors asks students how often they have participated in, for example, projects that required integrating ideas or information from various sources; posed questions in class or contributed to class discussions; received prompt feedback from faculty on their academic performance; participated in service-learning projects; or tutored or taught other students. The questionnaire provides institutions and students a clear sense of what matters to student learning and success and can deepen institutional understanding of how students perceive learning experiences and the college environment.

An important more recent finding related to student engagement research is the evidence that certain institutional conditions, structures, and educational practices make substantial contributions to persistence, student development, and learning (NSSE, 2007; Kuh, 2008). These practices (dubbed *high-impact*), such as learning communities, undergraduate research, and service-learning, have proven to be a promising way to promote student engagement and help students achieve the learning and personal development outcomes essential for the 21st century (AAC&U, 2007; Brownell & Swaner, 2010; Kuh, 2008; Kuh & O'Donnell, 2013). High-impact practices (a) make a claim on students' time and energy in ways that may require close interaction with faculty or diverse others, (b) call upon students to apply their learning in novel situations, and (c) are correlated with deep approaches to learning (NSSE, 2007, 2012). Providing students with opportunities to apply and test what they are learning through problem solving with peers inside and outside the classroom, study abroad, internships, and capstone experiences helps them develop habits of the mind and heart that promise to stand them in good stead for a lifetime of continuous learning. For instance, Zhao and Kuh (2004) showed that students who participated in a learning community were more engaged

across the board in other educationally purposeful activities compared with their counterparts who had not participated in such a program. Students interacted to a greater degree with faculty and diverse peers; studied more; and reported a stronger emphasis on higher-order cognitive activities, such as synthesizing material and analyzing problems. They also reported gaining more from their college experience.

Edgerton (2001) introduced the term *pedagogies of engagement* to describe the modes of teaching and learning needed to improve educational quality. Over the last decade, more specific models for understanding student engagement from a pedagogical standpoint have emerged. For example, Barkley (2010) developed a classroom-based model emphasizing engagement as both a process and product of the interaction between motivation and active learning. Instructional practices should set up conditions that enhance students' eagerness to learn and require students to do more of the work. Barkley profiled faculty who created such conditions and provided a large collection of student engagement techniques developed from good teaching practice literature.

Scholars, such as Gabriel (2008), explicated the value of engagement for teaching underprepared students and offered techniques to help students raise their skills so they can complete their studies. Prominent in Dweck's (2000) principles for instruction is that teachers must help students believe in their ability to learn, and that by modeling, providing feedback, and talking to students about their effort, faculty can enhance students' learning and success. Additional teaching and learning research (e.g., Ahlfeldt, Mehta, & Sellnow, 2005; Smith et al., 2005) explored classroom-based pedagogies of engagement, particularly cooperative and problem-based learning that enhances student involvement in learning, and urged faculty to consider how students engage in their college experience in both formal and informal ways. These examples of the intersection of the scholarship of teaching and learning with student engagement demonstrate the connection of student engagement to educational practice, as well as a commitment to improvement driven by classroom-based evidence and insights.

If, as Shulman (2005) asserted, "learning begins with student engagement" (p. 38), then methods for ascertaining the extent to which students are engaged in the learning process can provide helpful feedback for campus educators who wish to make an impact on student learning. With evidence from assessments of student engagement, practitioners concerned about student success gain instructive insights about their students' educational experiences and how they may be improved. For example, survey results can reveal to faculty members the extent to which students believe courses emphasize memorization or faculty provide

timely feedback. Simple data points like these can catalyze discussions about course assignments and learning assessments, or about expectations for feedback (Kuh et al., 2010).

Environments That Foster Educational Success

The quality of the total learning environment plays a role in shaping student behavior and influencing educational growth. Person-environment theory focuses on the college environment and how it influences behavior through interactions with the student. Strange and Banning (2001) classified existing environmental models, explaining how they shape student behaviors and what aspects of the environment optimize learning. They reported that educational environments are powerful when they offer students a sense of security and inclusion, mechanisms for involvement, and an experience of community.

The notion of creating a *learning-centered environment* (Doyle, 2008; Tagg, 2003) draws on person-environment theories, emphasizing a broad array of activities and aspects of environmental design that advance learning. Specifically, the concept shifts away from instruction that is fundamentally teacher-centered, sometimes termed *sage on the stage*, and instead emphasizes a practice in which students and professors coconstruct the learning experience and learn from one another. Learner-centered refers to environments that pay attention to the knowledge, skills, attitudes, and beliefs that learners bring to the educational setting. Weimer (2002) specified that in learning-centered environments, students are challenged to have ownership in the learning experience, including design of the curriculum, responsibility for some levels of instruction, and peer review.

Closing Call to Action: Using Research-Based Approaches to Inform Teaching

Greater attention to ensuring the success of all students and, in particular, addressing graduation rate gaps demands improvements in the conditions for learning and quality of instruction. Digital-media savvy students and increased populations of online and adult learners compel a major shift in educational methods, away from passive, lecture courses and towards interactive, collaborative learning experiences, using a variety of learning media and sites. The demand to ensure success for a wider range of students and for greater incorporation of interactive and application experiences makes it increasingly important to ensure that educational practices are aligned with these goals.

The good news is that faculty and administrators in colleges and universities seem to be interested in teaching and improving the quality of learning (Tagg, 2012). Greater attention to educational quality calls for faculty to explicitly consider how students engage in their college experience and to create learning activities that are in harmony with research findings about the best ways to help students learn. Research must inform instructional practice and the creation of successful learning experiences in more colleges and universities.

The best way to assess the value of the models and strategies suggested in this chapter and throughout this volume is to try them out. Educators may understandably feel uneasy about departing from accustomed teaching patterns, trying new strategies, or requiring more of students in terms of peer teaching. They may also worry that new pedagogy will take too much time to arrange and implement. Yet, these approaches are sound and worth the venture in terms of the potential improvement to learning as well as the feedback it provides on effectiveness. If a new method produces desired results, the next step is to determine how to make it a part of the teaching repertoire; if not, the question becomes, What needs to change, or is there a different approach? With the demand for educational reform, educators need to respond by doing something different and collect more information about what is feasible and, even more, what works.

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