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The social basis of learning is a concept that has been embraced by the higher educating community. Since the 1980s, there has been exciting growth and the development of specific practices that better engage students in academic content.

Social Basis of Learning: From Small-Group Learning to Learning Communities

Karl A. Smith

It is indeed an honor to be invited to contribute to the thirtieth-anniversary volume of *New Directions for Teaching and Learning*. I recall my delight when I discovered the series, because it contained practical advice that was grounded in theory and promising practices. In 1980 I was an early-career engineering faculty member who was deeply interested in student learning. I was beginning to implement cooperative learning in my classes and was looking for ideas and resources, and especially for a community of like-minded colleagues.

My first encounter with the social basis of learning occurred in about 1974 in a Social Psychology of Education course taught by one of David Johnson's Ph.D. students, Dennis Falk (currently a Professor of Social Work at the University of Minnesota-Duluth). I began taking courses in the College of Education in the early 1970s because I had an overwhelming sense that there was a better way to help engineering students learn than what I was doing, which was essentially what had been done to me; that is, lectures, homework assignments, and individual exams. This overwhelming sense of a better way of doing things was prompted by questions the students asked, which revealed that they had no idea what I was talking about. A representative setting was a course in thermodynamics and kinetics—very abstract areas involving a lot of mathematics—where I was "teaching as taught." My sense that there was a better way was grounded in

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my training and experience as an engineer, where one of the fundamental ideas was "advancing the state of the art." What I encountered in the Social Psychology of Education course, however, changed my life.

During the first session, Professor Falk assigned us to groups, which was a bit of a surprise to me, as I don't think I had ever experienced this before. He said that there was a lot of dense content and many difficult concepts in the course, and that some of us could probably manage by ourselves but most would benefit from interacting with others. He stressed the ideas of interdependence and accountability, and modeled them through a series of group exercises and assignments. The emphasis on interdependence and accountability was a revelation for me, because it was familiar. This was the way I worked as an engineer on the job and in my research setting. Interdependence and accountability were central to success! At that moment I thought, "Why don't we do this in engineering classes?" The rest, some will say, is history, as cooperative learning is now embraced by many engineering faculty, and its use is increasing by faculty at large, as indicated by the UCLA Higher Education Research Institute Survey of Faculty, as shown in Table 2.1 (DeAngelo and others, 2009).

My intention in this review of the social basis of learning is to summarize contributions on this topic to the *New Directions for Teaching and Learning* (abbreviated *NDTL*) series and connect them to events occurring more broadly.

Table 2.1. The American College Teacher: National Norms for 2007–2008

Methods Used in "All" or "Most" Classes	*All Faculty 2005 (%)*	*All Faculty 2008 (%)*	*Assistant 2008 (%)*
Cooperative learning	48	59	66
Group projects	33	36	61
Grading on a curve	19	17	14
Term/research papers	35	44	47

Social Basis of Learning in Inaugural Issues of *New Directions for Teaching and Learning*

Kenneth Eble, editor of *NDTL* 1 (1980), titled "*Improving Teaching Styles*," writes, "Every teacher develops a particular way of going about the complex task of teaching, and those distinctive characteristics of behavior and approach make up what is identified as teaching 'style'." (Eble, 1980, p. vii). The social nature of learning is included in this inaugural issue, most prominently in Edward Glassman's article. Glassman (1980) features

cooperative learning, and elaborates on his 1978 article in *Biochemical Education*, "Teaching Biochemistry in Cooperative Learning Groups."

Joseph Axelrod also has an intriguing article in the first volume (Axelrod, 1980). He refers to his 1973 book *The University Teacher as Artist* (Axelrod, 1973), in which he articulates several "teacher mental images about teaching," as shown in Table 2.2.

Axelrod's taxonomy provides a fascinating perspective on the era, and a window into the future. Prior to the Barr and Tagg (1995) and Campbell and Smith (1997) arguments on the shift from teacher-centered to student-centered learning, most of the emphasis was on the teacher and "teacher styles." One of the first places the comparison of old and new paradigms of teaching appeared was Johnson, Johnson, and Smith (1991). See Table 2.3.

Table 2.2. Teacher Mental Images About Teaching (Axelrod, 1973)

Mental Image	*Motto*	*Characteristics*	*Disciplines*
Content	I teach what I know	Pour it in, lecture	Science, math
Instructor	I teach what I am	Modeling, demonstration	Many
Student—cognitive development	I train minds	Active learning, discussion	English, humanities
Student—development of whole person	I work with students as people	Motivation, self-esteem	Basic skills teachers

Table 2.3. Comparison of Old and New Paradigm of Teaching

	Old Paradigm	*New Paradigm*
Knowledge	Transferred from faculty to students	Jointly constructed by students and faculty
Students	Passive vessel to be filled by faculty's knowledge	Active constructor, discoverer, transformer of knowledge
Faculty purpose	Classify and sort students	Develop students' competencies and talents
Relationships	Impersonal relationships among students and between faculty and students	Personal transaction among students and between faculty and students
Context	Competitive/individualistic	Cooperative learning in classroom and cooperative teams among faculty
Teaching assumption	Any expert can teach	Teaching is complex and requires considerable training

The comparison of old and new paradigms was updated by Smith and Waller (1997), and the figure has been cited many times, and reproduced in numerous publications, such as Colander (2004).The second issue, *Learning, Cognition, and College Teaching*, edited by Wilbert McKeachie, continues to set the stage for powerful connections between research and practice. Distributed throughout the second issue are important features of the social nature of learning, such as McKeachie's (1980) citation of research on surface versus deep processing and the importance of instructor strategies to facilitate deep processing.

Research on "deep learning" is still very active, and a recent article explores connections between student engagement and deep learning, especially in terms of disciplinary differences (NelsonLaird and others, 2008).

Social Basis of Learning Throughout the Thirty Years of *New Directions for Teaching and Learning*

Over the thirty-year history of *New Directions for Teaching and Learning*, the social nature of learning was emphasized in at least 15 issues (out of 120 or 12.5%), numbers 1, 2, 14, 32, 41, 42, 47, 59, 67, 74, 81, 95, 108, 116, and 117; and it was the central feature of many of these.

New Directions for Teaching and Learning No. 14, *Learning in Groups*, edited by Clark Bouton and Russell Garth (1983), was transformative for me, and raised the prominence of the social basis of learning. The entire issue was devoted to the theory and practice of small-group learning, and I found this level of emphasis very reassuring. Influential chapters for me included "Teachers and Learning Groups: Dissolution of the Atlas Complex" (Finkel and Monk, 1983) and "Developing Student Skills and Abilities" (Bouton and Rice, 1983).

The National Institute of Education (1984) report, *Involvement in Learning: Revitalizing Involvement in Learning: Realizing the Potential of American Higher Education. Final Report of the Study Group on the Conditions of Excellence in American Higher Education,* was published in 1984, as was Astin's (1984) "Student Involvement" article. The congruence of support for the social basis of learning provided by this work on the importance of student involvement in learning strengthened my resolve to focus in this area, and I think helped build the foundation of support that influenced the broader community.

A couple of the *NDTL* volumes, 32 and 81, focused on large classes, and included several chapters emphasizing the social basis of learning. Examples include Frederick's (1987) article "Student Involvement: Active Learning in Large Classes," and the Cooper and Robinson (2000) article "The Argument for Making Large Classes Seem Small." Teaching large classes well is an ongoing challenge for college and university faculty, and many books and articles have been written to help faculty, such as Stanley and Porter (2002).

The late 1980s and early 1990s was a landmark period for supporting and advancing the social basis of learning. In 1987 the "Seven Principles for Good Practice in Undergraduate Education" was published in the *AAHE Bulletin* (Chickering and Gamson, 1987). Three of the seven principles emphasized the social basis of learning: Good practice encourages student-faculty contact, good practice encourages cooperation among students, and good practice encourages active learning. Chickering and Gamson followed up on the *AAHE Bulletin* article in volume 47 (1991), *Applying the Seven Principles for Good Practice in Undergraduate Education*. Gamson (1991) noted in her history of the Seven Principles that more than 150,000 copies were ordered directly from the Johnson Foundation and, since it wasn't copyrighted, an unknown (and likely very large) number of copies were distributed electronically. The publication of the "Seven Principles for Good Practice in Undergraduate Education" was a marker event and provided enormous support for the change from competitive and individualistic learning to cooperative learning.

Several research studies supporting the social basis of learning were published during this period. Pascarella and Terenzini (1991) discussed the importance of engaging students in their synthesis of research about how college affects students, "Perhaps the strongest conclusion that can be made is the least surprising. Simply put, 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 . . . If the level of involvement were totally determined by individual student motivation, interest, and ability, the above conclusion would be uninteresting as well as unsurprising. However, a substantial amount of evidence indicates that there are instructional and programmatic interventions that not only increase a student's active engagement in learning and academic work but also enhance knowledge acquisition and some dimensions of both cognitive and psychosocial change."

Research using a variety of theoretical frameworks and methodologies supported the claim that the frequency and quality of student-student and student-faculty interaction are most influential for college students' academic development, personal development, and satisfaction (Astin, 1993; Light, 1992; Johnson, Johnson, and Smith, 1991b). Astin's (1993) large-scale correlational study of what matters in college (involving 27,064 students at 309 baccalaureate-granting institutions) found that two environmental factors were by far the most predictive of positive change in college students' academic development, personal development, and satisfaction. These two factors—interaction among students and interaction between faculty and students—carried by far the largest weights and affected more general education outcomes than any other environmental variables studied, including the curriculum content factors. This result indicates that how students approach their general education and how the faculty actually deliver the curriculum is more important than the formal

curriculum, that is, the content, collection, and sequence of courses. The assessment study by Light (1992) of Harvard students indicates that one of the crucial factors in the educational development of the undergraduate is the degree to which the student is actively engaged or involved in the undergraduate experience. Johnson, Johnson, and Smith (1991a) summarized meta-analysis results for randomized design field and laboratory studies of cooperative, competitive and individualistic learning and reported significant effect sizes for cooperative learning for academic success, quality of relationships, and psychological adjustment. Several follow-up reports have provided further support for cooperative learning (Johnson, Johnson, and Smith, 1998, 2007; Smith, Sheppard, Johnson, and Johnson, 2005; Springer, Stanne, and Donovan, 1999).

Emphasis on the importance of student engagement in learning continued in *NDTL* 67 and 74. Sutherland and Bonwell (1996) featured a broad range of faculty options for using active learning and college classes in *NDTL* 67, and Anderson and Speck (1998) argued that we need to change the way we grade student performance under the new learning paradigm.

I was delighted to see problem-based learning featured in *NDTL* 68, since it provided more support for student engagement and highlighted the role of structure and tasks. Many of the articles in this volume were salient for me; however, the opening paragraph of the concluding section continues to resonate with me: "Common to many of the stories in this issue is a complaint about the skills of university graduates. In business, education, science, architecture, and medicine, we are concerned to note that our graduates possess a knowledge base that is too theoretical and abstract, that they are out of touch with important problems of society or their discipline, and that they lack communication skills. Our authors have turned to problem-based learning (PBL) as one means of addressing these concerns. In a problem-based classroom, students are actively engaged in constructing knowledge and developing skills in using that knowledge for problem analysis and resolution through self-directed study and collaborative discussion" (Wilkerson and Gijselaers, 1996, p. 101). I, too, had turned to problem-based learning, and discovering that I was part of a larger community was reassuring.

A strong presence for learning communities emerged during this period, including *NDTL* 41 (Gabelnick and others, 1990), and this work has continued to flourish. A recent synthesis of this extraordinary work is *Learning Communities: Reforming Undergraduate Education* (Smith and others, 2004). Learning communities continue to be advocated as a "high impact educational practice" (Kuh, 2008), and I am confident that the prominence of learning communities will increase, and will have an enormous influence on students' personal and academic development as well as their sense of belonging.

The emphasis on the social basis of learning was maintained during the first decade of the twenty-first century, the third decade of *NDTL*. *Strategies for Energizing Large Classes: From Small Groups to Learning Communities* presented the stories of forty-eight instructors across the North American continent who are infusing their classes with small-group activities or are working explicitly to create student community within large classes (MacGregor, Cooper, Smith, and Robinson, 2000). A common response among the instructors who were interviewed was their surprise at our interest. They didn't think anyone was interested and they were frustrated that their colleagues didn't seem to care. They thought they were the only one, and as a result of *NDTL* 81 they discovered that there is a broader community of faculty who are committed to facilitating student learning in large classes.

Problem-based learning was revisited in 2003 in *NDTL* 95, and the editors (Knowlton and Sharp) addressed the role of PBL in the information age. Specifically, they provided articles that emphasized design and implementation issues, including philosophical and theoretical issues, integration of design and implementation, and implementation and facilitation.

One of the most research-intensive volumes that focused on the social basis of learning was *NDTL* 108, *Developing Student Expertise and Community: Lessons from How People Learn* (Petrosino, Martin, and Svihla, 2006), in which the authors describe results from a collaboration of learning scientists, assessment experts, learning technologists, and bioengineering domain experts who described a vision to transform bioengineering education to produce adaptive experts. McKenna (2006), "Implementing Learning—Science Research in University Settings: New Research Opportunities," highlighted the differences between K–12 teachers (where much of the learning science research is based) and university faculty and argued that because university faculty are predominantly subject-matter experts and few have training in learning methods and theories, there is a pressing need for learning science research.

Two recent volumes, *NDTL* 116 and 117, focused on the social basis of learning, one devoted to a very specific form of student engagement, team-based learning (Michaelson, Sweet, and Parmelee, 2008), and the other focused on improving the climate for undergraduate teaching and learning (Baldwin, 2009).

The social basis of learning is sufficiently developed and embraced by the higher educating community that there is a mushrooming of specific practices emerging—team-based learning (TBL), peer instruction (PI), process-oriented guided-inquiry learning (POGIL), just-in-time-teaching (JITT), and many more. Two of my favorites are the large-class implementation of PBL in undergraduate courses at the University of Delaware (Allen, Duch, and Groh, 1996), and student-centered active learning environment for undergraduate programs (SCALE-UP) (Beichner, 2006).

New Directions for Teaching and Learning 117 focused on science, mathematics, engineering, and technology (STEM) fields (Baldwin, 2009), fields that have lagged in embracing the social basis of learning. As noted in Table 2.1, 59% of faculty report that they use cooperative learning in all or most courses, and 17% reporting grading "on the curve." One indication of the lag is Astin's (1993) comparison of engineering faculty with all faculty. Astin reported that 43% of engineering faculty reported "grading 'on the curve,'" compared with 22% of all faculty. Sadly, many STEM faculty have not figured out that it is difficult, if not impossible, to get students to work together and help one another if they are pitted against one another by a competitive grading system (grading 'on the curve'). STEM disciplines are getting considerable attention, and one prominent example that is highly relevant for the social basis of learning is the Board of Science Education Workshop, Evidence on Promising Practices in Undergraduate Science, Technology, Engineering, and Mathematics (STEM) Education.

Fairweather (2008) argues in his summary report on the workshop, ". . . although faculty in STEM disciplines vary substantially on a broad array of attitudinal and behavioral measures" (Fairweather and Paulson, 2008) careful reviews of the substantial literature on college teaching and learning suggest that the pedagogical strategies most effective in enhancing student learning outcomes are not discipline dependent (Pascarella and Terenzini, 2005). Instead, active and collaborative instruction coupled with various means to encourage student engagement invariably lead to better student learning outcomes irrespective of academic discipline (Kuh, Kinzie, Schuh, and Witt, 2005; Kuh, Kinzie, Buckley, Bridges, and Kayek, 2007). The assumption that pedagogical effectiveness is disciplinary specific can result in "reinventing the wheel," proving yet again that pedagogies engaging students lead to better learning outcomes (2005, pp. 4 and 5).

Social Basis of Learning and the Future of *New Directions for Teaching and Learning*

What will the next thirty years bring and what role will *NDTL* play? There is strong agreement that it's impossible to predict the future; however, based on the history of *NDTL* and my experience as an author of several *NDTL* articles, it seems reasonable to speculate.

Svinicki (1990, p. 1) wrote, "There is a real need for 'translators and disseminators' whose job it is to extract the best from the array of potential ideas and pass it along in workable form to individual faculty members," and I think this will continue to be a crucial need and a role that *NDTL* will help fulfill. The challenges are great, however, as Fairweather (2008) argues. "Finally, resistance to adopting more effective teaching strategies in part derives from the perception of STEM faculty that the teaching process is at odds with the research process, and that research is more interesting and more valued at their institutions (Fairweather, 1996; Massy, Wilger,

and Colbeck, 1994). The perception of the importance of teaching in faculty rewards and the perceived consequence of spending more time on improving teaching, namely having less time for research, adversely affects faculty involvement in pedagogical reform" (Fairweather, 2005). This behavioral pattern holds true even when faculty members express a deep commitment to teaching and to their students (Leslie, 2002).

I sincerely hope *NDTL* will continue to focus on the nexus between theory and practice and that more faculty will turn to *NDTL* for guidance in identifying and embracing evidence-based promising practices.

Thirty years have passed since I first encountered *NDTL* and I still eagerly open each issue as it arrives in anticipation of the new ideas and insights. A big part of my current work with graduate students and faculty (especially early-career faculty) is to help them develop a deep interest in and appreciation of the importance of connections between theory and practice, as is captured very well in *NDTL*. Best wishes with the transition. Keep up the terrific work.

References

Allen, D. E., Duch, B. J., and Groh, S. E. "The Power of Problem-Based Learning in Teaching Introductory Science Courses." In L. Wilkerson and W. H. Gijselaers (eds.), *Bringing Problem-Based Learning to Higher Education*. New Directions for Teaching and Learning, no. 68. San Francisco: Jossey-Bass, 1996.

Anderson, B., and Speck, B. W. (eds.). *Changing the Way We Grade Student Performance: Classroom Assessment and the New Learning Paradigm*. New Directions for Teaching and Learning, no. 74. San Francisco: Jossey-Bass, 1998.

Astin, A. *What Matters in College? Four Critical Years Revisited*. San Francisco: Jossey-Bass, 1993.

Astin, A. W. "Student Involvement: A Developmental Theory for Higher Education." *Journal of College Student Personnel*, 1984, *25*, 297–308.

Axelrod, J. *The University Teacher as Artist*. San Francisco: Jossey-Bass, 1973.

Axelrod, J. "From Counterculture to Counterrevolution: A Teaching Career 1959–1984." In K. Eble (ed.), *Improving Teaching Styles*. New Directions for Teaching and Learning, no. 1. San Francisco: Jossey-Bass, 1980.

Baldwin, R. G. (ed.). *Improving the Climate for Undergraduate Teaching and Learning in STEM Fields*. New Directions for Teaching and Learning, no. 117. San Francisco: Jossey-Bass, 2009.

Barr, R. B., and Tagg, J. "From Teaching to Learning: A New Paradigm for Undergraduate Education." *Change*, 1995, *27*(6), 12–25.

Beichner, R., (2006). "North Carolina State University: SCALE-UP." In D. Oblinger, (ed.), *Learning Spaces*. Boulder, CO: Educause.

Beichner, R. J., Saul, J. M., Abbott, D. S., Morse, J. J., Deardorff, D. L., Allain, R. J., Bonham, S. W., Dancy, M. H., and Risley, J. S. "The Student-Centered Activities for Large Enrollment Undergraduate Programs (SCALE-UP) Project." In E. F. Redish and P. J. Cooney (eds.), *Research-Based Reform of University Physics*. College Park, Md.: American Association of Physics Teachers, forthcoming.

Bonwell, C. C., and Sutherlund, T. E. (eds.). *Using Active Learning in College Classes: A Range of Options for Faculty*. New Directions for Teaching and Learning, no. 67. San Francisco: Jossey-Bass, 1996.

Bouton, C., and Rice, B. "Developing Student Skills and Abilities." New Directions for Teaching and Learning, no., 14 pp. 31–40. San Francisco: Jossey-Bass, 1983.
Campbell, W. E., and Smith, K. A. (eds.). 1997. *New paradigms for college teaching*. Edina, MN: Interaction Book Company.
Chickering, A. W., and Gamson, Z. F. "Seven Principles for Good Practice in Higher Education." *American Association for Higher Education Bulletin*, 1987, *39*, 3–7.
Colander, D. "The Art of Teaching Economics." *International Review of Economics Education*, 2004, 3(1), 63–76.
Cooper, J. L., and Robinson, R. "The Argument for Making Large Classes Seem Small." In J. MacGregor, J. L. Cooper, K. A. Smith, and P. Robinson (eds.), *Strategies for Energizing Large Classes: From Small Groups to Learning Communities*. New Directions for Teaching and Learning, no. 81. San Francisco: Jossey-Bass, 2000.
DeAngelo, L., Hurtado, S., Pryor, J. H., Kelly, K. R., and Santos, J. L. (2009). *The American college teacher: National norms for the 2007-2008 HERI faculty survey*. Los Angeles: Higher Education Research Institute, UCLA.
Eble, K. (ed.). *Improving Teaching Styles*. New Directions for Teaching and Learning, no. 1. San Francisco: Jossey-Bass, 1980.
Fairweather, J. (1996). *Faculty work and public trust: Restoring the value of teaching and public service in American academic life*. Boston: Allyn & Bacon.
Fairweather, J. (2005). Beyond the Rhetoric: Trends in the Relative Value of Teaching and Research in Faculty Salaries. *Journal of Higher Education, 76*, 401–422.
Fairweather, J. (2008). "Linking Evidence and Promising Practices in Science, Technology, Engineering, and Mathematics (STEM) Undergraduate Education: A Status Report." Commissioned Paper for the Board of Science Education Workshop, Evidence on Promising Practices in Undergraduate Science, Technology, Engineering, and Mathematics (STEM) Education. [http://www7.nationalacademies.org/bose/PP_Commissioned_Papers.html]
Fairweather, J., and Paulson, K. "The Evolution of Scientific Fields in American Universities: Disciplinary Differences, Institutional Isomorphism." In J. Valimaa and O. Ylijoki (eds.), *Cultural Perspectives in Higher Education* (pp. 197–212). Dordrecht, Netherlands: Springer, 2008.
Finkel, D. L., and Monk, G. (1983). "Teachers and Learning Groups: Dissolution of the Atlas Complex." In C. Bouton and R. Y. Garth (eds.), *New Directions for Teaching and Learning*, *14*, pp. 83–97.
Frederick, P. J. "Student Involvement: Active Learning in Large Classes." In M. G. Weimer (ed.), *Teaching Large Classes Well*. New Directions for Teaching and Learning, no. 32. San Francisco: Jossey-Bass, 1987.
Gabelnick, F., MacGregor, J., Matthews, R. S., and Smith, B. L (eds.). *Learning Communities: Creating Connections Among Students, Faculty, and Disciplines*. New Directions for Teaching and Learning, no. 41. San Francisco: Jossey-Bass, 1990.
Gamson, Z. F. (1991). A brief history of the seven principles for good practice in undergraduate education. In A. W. Chickering & Z. F. Gamson (eds.), *Applying the seven principles for good practice in undergraduate education. New Directions in Teaching and Learning*, no. 47 (pp. 5–12). San Francisco: Jossey-Bass.
Glassman, E. "The Teacher as Leader." In K. Eble (ed.), *Improving Teaching Styles*. New Directions for Teaching and Learning, no. 1. San Francisco: Jossey-Bass, 1980.
Johnson, D. W., Johnson, D. T., and Smith, K. A. *Active Learning: Cooperation in the College Classroom*. (1st ed.) Edina, Minn.: Interaction Book Co., 1991a.
Johnson, D. W., Johnson, R. T., and Smith, K. A. *Cooperative Learning: Increasing College Faculty Instructional Productivity*. ASHE-ERIC Report on Higher Education. Washington, D.C.: The George Washington University, 1991b.
Johnson, D. W., Johnson, R. T., and Smith, K. A. "Cooperative Learning Returns to College: What Evidence Is There That it Works?" *Change*, 1998, *30*(4), 26–35.

Johnson, D. W., Johnson, R. T., and Smith, K. A. "The State of Cooperative Learning in Postsecondary and Professional Settings." *Educational Psychology Review,* 2007, *19*(1), 15–29.

Kuh, G., Kinzie, J., Buckley, J., Bridges, B., and Kayek, J. *Piecing Together the Student Success Puzzle: Research, Propositions, and Recommendations.* Washington, D.C.: Association for the Study of Higher Education, 2007.

Kuh, G., Kinzie, J., Schuh, J., and Witt, E. *Student Success in College: Creating Conditions That Matter.* Washington, D.C.: Association for the Study of Higher Education, 2005.

Kuh, G. D. *High-Impact Educational Practices: What They Are, Who Has Access to Them, and Why They Matter.* Washington, D.C.: Association for American Colleges and Universities, 2008.

Leslie, D. "Resolving the Dispute: Teaching Is Academe's Core Value." *Journal of Higher Education*, 2002, *73*, 49–73.

Light, R. J. *The Harvard Assessment Seminars: Second Report.* Cambridge, Mass.: Harvard University Press, 1992.

MacGregor, J., Cooper, J., Smith, K., & Robinson, P. (2000). Strategies for energizing large classes: From small groups to learning communities. New Directions for Teaching and Learning vol. 81. San Francisco, Jossey-Bass.

Massy, W., Wilger, A., and Colbeck, C. "Department Cultures and Teaching Quality Overcoming 'Hallowed' Collegiality." *Change*, 1994, *26*, 11–20.

McKenna, A. (2006). Implementing learning-science research in university settings: New research opportunities. New Directions for Teaching and Learning vol. 108. San Francisco, Jossey-Bass.

McKeachie, W. J. "Improving Lectures by Understanding Students' Information Processing." In W. J. McKeachie (ed.), *Learning, Cognition, and College Teaching.* New Directions for Teaching and Learning, no. 2. San Francisco: Jossey-Bass, 1980.

Michaelson, L. K., Sweet, M., and Parmelee, D. X. *Team-Based Learning: Small-Group Learning's Next Big Step.* New Directions for Teaching and Learning, no. 116. San Francisco: Jossey-Bass, 2008.

National Institute of Education. *Involvement in Learning: Revitalizing Involvement in Learning: Realizing the Potential of American Higher Education. Final Report of the Study Group on the Conditions of Excellence in American Higher Education*, Washington, D.C., 1984.

Nelson Laird, T. F., Shoup, R., Kuh, G. D., and Schwarz, M. J. "The Effects of Discipline on Deep Approaches to Student Learning and College Outcomes." *Research in Higher Education,* 2008, *49*, 469–494.

Pascarella, E., and Terenzini, P. *How College Affects Students: A Third Decade of Research.* San Francisco: Jossey-Bass, 2005.

Pascarella, E. T., and Terenzini, P. T. *How College Affects Students: Findings and Insights from Twenty Years of Research.* San Francisco: Jossey-Bass, 1991.

Petrosino, A. J., Martin, T., and Svihla, V. *Developing Student Expertise and Community: Lessons from How People Learn.* New Directions for Teaching and Learning, no. 95. San Francisco: Jossey-Bass, 2006.

Smith, B. L., MacGregor, J., Matthews, R. S., and Gabelnick, F. *Learning Communities: Reforming Undergraduate Education.* San Francisco: Jossey-Bass, 2004.

Smith, K., and Waller, A. "Afterword: New Paradigms of College Teaching." In W. Cambell and K. Smith (eds.), *New Paradigms for College Teaching.* Edina, Minn.: Interaction Book Co., 1997.

Smith, K. A., Sheppard, S. D., Johnson, D. W., and Johnson, R. T. "Pedagogies of Engagement: Classroom-Based Practices." *Journal of Engineering Education*, 2005, *94*(1), 87–102.

Springer, L., Stanne, M. E., and Donovan, S. S. "Effect of Small Group Learning on Undergraduates in Science, Mathematics, Engineering and Technology: A Meta-Analysis." *Review of Educational Research*, 1999, *69*(1), 21–51.

Stanley, C. A., and Porter, M. E. *Engaging Large Classes: Strategies and Techniques for College Faculty.* San Francisco: Jossey-Bass, 2002.

Svinicki, M. D. "Editor's Notes." In M. D. Svinicki (ed.), *The Changing Face of College Teaching.* New Directions for Teaching and Learning, no. 42. San Francisco: Jossey-Bass, 1990.

Sutherland, T. E., and Bonwell, C. C (eds.) *Using Active Learning in College Classes: A Range of Options for Faculty*. New Directions for Teaching and Learning, vol. 67. San Francisco: Jossey-Bass, pp. 3–16.

Wilkerson, L., and Gijselaers, W. H. (eds.). *Bringing Problem-Based Learning to Higher Education.* New Directions for Teaching and Learning, no. 68. San Francisco: Jossey-Bass, 1996.

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