

3 *If teaching and the scholarship it embodies are to be evaluated and valued, then it is critical to define its characteristics and outcomes. Our judgments about teachers, their scholarship, and their teaching require information that can be used to support both formative and summative decisions. Michael Theall discusses formative considerations in Part I, and John A. Centra provides guidelines and criteria for decision making in Part II.*

Assessing the Scholarship of Teaching: Valid Decisions from Valid Evidence

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In this chapter, the focus is on assessing the scholarship of teaching. We consider the available definitions and the results of a recent Delphi study by this volume's editor (Kreber, 1999), and propose what assessment or evaluation data, methods, analyses, interpretations, and conclusions would be appropriate and most likely to result in valid and reliable decisions. We examine how the data collected can support both formative and summative uses, and how the improvement of teaching as a result of such assessment can itself be a documentation of scholarship. We also consider the context in which the scholarship and its assessment take place and make recommendations for practice that meet both technical and practical criteria. We consider instrumental (process) and consequential (outcome) data, and how these different kinds of information can be used effectively to document and establish the scholarship of teaching.

Background

Prior to Boyer's development of the phrase *scholarship of teaching* (1990), there was a distance between teaching and other aspects of faculty life and responsibility. The classic teaching-research-service triad treated the three aspects of faculty performance differently, and evaluation practice at the time suggested that although it was assumed that data for judgments about research and service were both accessible and understandable, information about teaching was more of a problem because it was complex and time intensive. From the mid-1960s, the emphasis on student ratings dramatically increased the amount of use of these data. One important change

was initiated in the 1980s when the Canadian Association of University Teachers proposed a teaching dossier (Shore and others, 1986) and this process was popularized by Seldin (1993) in the form of the teaching portfolio. At the same time, interest in the techniques of successful college teaching resulted in several books (for example, Davis, 1993; Ebel, 1977; Lowman, 1984; McKeachie's *Teaching Tips* (1999), now in its tenth edition; and since 1980, the *New Directions for Teaching and Learning* series). Shulman's development of the concept of *pedagogical content knowledge* (1989), a combination of content expertise and deep understanding of the most effective methods of teaching and learning that content, added to the credibility of teaching as an act that incorporated scholarship. This work was supplemented by the rising importance and acknowledged usefulness of classroom assessment techniques and classroom research for both formative and summative purposes (Cross and Angelo, 1988; Cross and Steadman, 1996). The confluence of these streams of interest and investigation made the discussion of the scholarship of teaching both timely and important.

Definitions

Boyer (1990) said, "The work of the professor becomes consequential only when it is understood by others. When defined as scholarship, however, teaching both educates and entices future scholars" (p. 23). Further, Boyer noted the importance of deeply knowing content, building bridges between the teacher's understanding and the student's learning, carefully planning and examining of pedagogical procedures, stimulating active learning, and going beyond transmitting knowledge to transforming and extending it.

These criteria and explanations served to enliven the discussion, but they did not provide sufficient clarity to be operationally useful in the assessment of the scholarship of teaching. Boyer began his investigation of scholarship in the 1980s, and he was deeply involved in the work leading to the publication of *Scholarship Assessed* (Glassick, Huber, and Maeroff, 1997, for which Boyer also wrote the prologue). Glassick, Huber, and Maeroff propose "that there is a common language in which to discuss the standards for scholarly work of all kinds," and they further identify six standards for scholarly work: "clear goals, adequate preparation, appropriate methods, significant results, effective presentation, and reflective critique," noting that these six criteria are "appropriate to the full range of scholarly work" (p. 35).

The authors further explain each criterion through a short series of general questions. But are these criteria and attendant questions sufficient to allow the valid and reliable assessment of teaching as scholarship? On the one hand, there is a problem because the questions in the list are phrased only in terms of the teacher-scholar. For example, with respect to the criterion of significant results, the question is "Does the scholar achieve the goals?" (Glassick, Huber, and Maeroff, 1997, p. 36). In an instructional setting, this language does not sufficiently distinguish between *instructional*

goals, the instructor's targets of accomplishment, and *instructional objectives*, the targets of accomplishment set for, with, and sometimes by the students. Too often, the terms are mixed, and the so-called course objectives include only statements of course content or activities, without reference to specific student achievements and the methods used to determine whether these achievements meet prespecified criteria.

This problem can be solved, however, with some translation. *Goals* can be easily changed to *instructional objectives*, and the quality of course design can be judged, in part, by determining whether (1) the objectives are realistic and appropriate; (2) the instructional strategies, activities, assignments, and assessments match the specified objectives; and (3) the course design presents adequate evidence of student learning and achievement of the objectives. Significant results are thus defined in terms of outcomes. With respect to the assessment movement and classroom assessment techniques (Angelo and Cross, 1993), a parallel is found in the use of ongoing classroom assessment for formative purposes, and with respect to outcomes assessment for purposes such as institutional research, program evaluation, and accreditation.

In sum, the application of the principles of *Scholarship Reconsidered* and *Scholarship Assessed* to real-world and now to virtual classrooms requires careful review of the general criteria and the development of more specific standards if reliable and valid measurement of the scholarship of teaching is to take place. In the remainder of this chapter, we explore ways in which to match the methods of investigation to the instructional situations, and we consider how the necessarily varied kinds of information about teaching and learning can be analyzed and reported for best use by decision makers. We also propose a synergy between the evaluation and assessment functions of the investigative processes and the application of findings to instructional improvement and faculty development. Although the goal of evaluation is always to make a judgment of worth, the roles of evaluation in this case are not only to make decisions and to enable improvement but also to identify excellence so that it can be recognized and rewarded.

Part I: Scholarship and Improvement

The experts in Kreber's study (1999) did not agree when asked to rank the five most important components of the scholarship of teaching, nor did they agree about its five most critical unresolved issues.

There was some agreement, however, when the panelists rated each of the items in the two categories. Highly rated items dealt with the need to possess the equivalent of pedagogical content knowledge, with teachers' ongoing reflection and inquiry into the process and outcomes of instruction, with sharing knowledge in formal and informal ways, and with attention to students' needs and individual differences. The panel also agreed that the scholarship of teaching did not require successful grant writing, that being engaged in the work of teaching did not guarantee that a person was

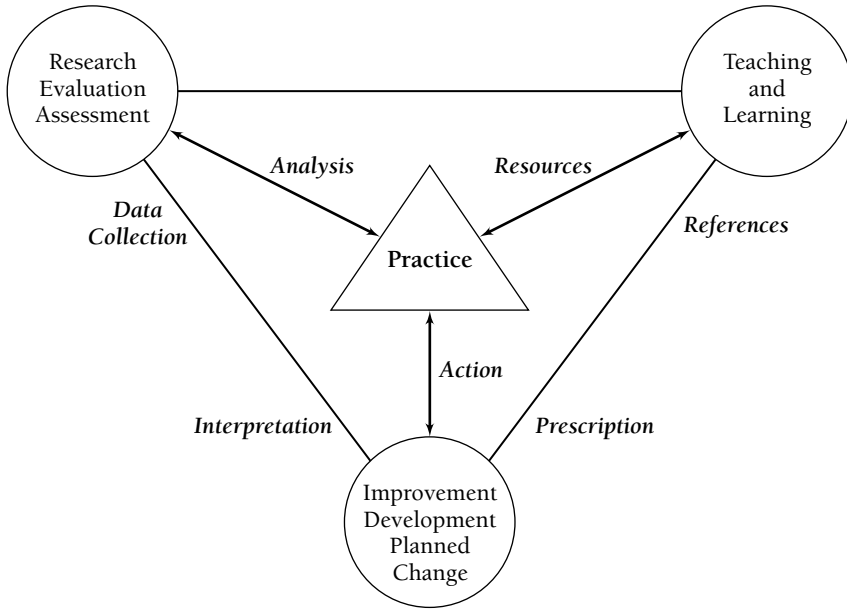
a scholar of teaching, and that effective teaching can take place even if the faculty member is not engaged in the formal scholarship of teaching. Finally, the panel agreed that effective teaching and demonstrations of the scholarship of teaching must be valued and supported, and that many faculty need training in the design of effective instruction, the process of classroom research, and the documentation of their efforts.

What does the study tell us about the relationship of scholarship to instructional improvement? Despite the lack of unanimous agreement, what stands out is quite simply that the two must coexist. In a discussion of the evaluation of teaching, Theall and Franklin proposed “a multipurpose system for evaluation, improvement, and research” (1990, p. 31). In this system, theory, research, and practice interact, with the various components constantly informing each other. A similar model is proposed here in Figure 3.1 to demonstrate the important and necessary synergy between the scholarship of teaching and the improvement of teaching.

In Figure 3.1, current scholarship from three general areas is represented within the circles. The italicized terms are typical contributions of the research to day-to-day practice. For example, the literatures of research, evaluation, and assessment provide processes for data collection and analysis. The central triangle represents day-to-day teaching practice, which is informed by the research, theory from the circles, and the disciplinary specialty and practical experience. The bidirectional arrows indicate that scholarship of teaching involves both the use of existing research and theory and the contribution of new understanding through the application of scholarly process to day-to-day practice. Improvement comes about through the teachers’ investigation of specific teaching and learning contexts, and this process adds to pedagogical content knowledge by incorporating important factors in teaching and learning across disciplines. Thus one way to improve practice is to carry out classroom research (Cross and Steadman, 1996), which contributes to the realms of research and theory as well as to better understanding of the immediate context.

This research is brought back to practice in two ways: by the direct contributions of faculty who carry out the classroom research and by the work of instructional design and faculty development practitioners who help faculty to enhance instructional effectiveness and to improve learning. When faculty participate in this cycle, they use skills from the arena of the scholarship of discovery, which, according to Boyer (1990), is aimed at the production of knowledge in a given field through research. They bring together information from varied sources and integrate it into the perspectives of their disciplines and classrooms. They apply it to their own and others’ teaching and learning situations. And in doing all this, faculty demonstrate the scholarship of teaching.

Collaboration. The literature of instructional consultation (for example, Brinko and Menges, 1997) has concentrated on the interactions of faculty and professionals in instructional design and development for the

Figure 3.1. Scholarship-Improvement-Practice Synergy

specific purpose of improving teaching and learning. A broader view (for example, Schuster, Wheeler, and Associates, 1990) includes faculty development issues such as professional growth, career development, and faculty vitality. When we combine these complementary views, the cast of players involved in the scholarship of teaching increases because instructional improvement can be combined with exploration and investigation of teaching and learning phenomena. These efforts can and should include evaluation and assessment processes; thus professionals in these areas can also be partners in efforts to better understand and explain what happens in and out of classrooms. An additional benefit is that what we learn in such efforts is important and meaningful to institutional research and other needs of departments, colleges, and universities.

In Kreber's study (1999), panelists differed about the extent to which the public presentation and dissemination of information and knowledge were part of the scholarship of teaching (see Chapter Five of this volume). An additional benefit of institutional collaborations is that they enlarge the array and accessibility of forums for disseminating what is learned in classroom studies, assessment, activities, evaluations, or other joint efforts to gather and use information. The professional organizations of the participants in collaborative efforts are often more receptive to presentations on pedagogy than are disciplinary associations that focus on research specific to the discipline's own body of knowledge.

Increasing the range of opportunities to present and discuss one's pedagogical knowledge, process, or findings has two benefits for faculty development. First, there is direct benefit to those who present or publish results. Second, but equally important, collaborative efforts bring the life of the classroom into the day-to-day reach and attention of units and individuals across campus and reinforce the notion that, rather than being in a closed society apart from the academic community, they are partners with the rest of the institutional community in achieving excellence. Their work supports and is supported by what others learn and share. The scholarship of teaching thus becomes the scholarship of the institution, and it is inclusive and meaningful rather than separate and unrelated to practice.

Practical and Contextual Concerns. The scholarship of teaching is not a concept, a practice, an idea that can exist in a vacuum. Making it so would return the scholar to a lonely ivory tower and put distance between scholarship and practice, between scholars and the real academic world of teachers and learners. The implications are that the scholarship of teaching requires time and emphasis on shared visions, shared efforts, and shared accomplishments. Are there practical limitations? The answer must be yes. Institutional size, mission, history, resources, and vitality all play a part. A small liberal arts college dedicated to teaching and learning may have an environment suitable to furthering the scholarship of teaching but may not have resources to support dissemination. Conversely, a large research-intensive institution may have many resources but focus on traditional research in the disciplines and a reward structure that does not reward the scholarship of teaching. The dynamics within departments differ widely and may affect levels of faculty interest and involvement, and the nature of differences across disciplines may impact at the department or even college level (for example, see Hativa and Marincovich, 1995; Smart and Feldman, 1998).

This kind of situational variety makes it difficult to propose a standard process or set of criteria that can be used to assess the quality or importance of the scholarship of teaching. Like any other complex endeavor, it has many components, and these form a whole greater than the sum of the parts. To exhibit all the qualities of one who is engaged in the scholarship of teaching, a teacher must have time, talent, technique, and training. For this reason, it is imperative for institutions to establish supportive conditions and to actively recognize and reward those who make it part of their professional and academic lives to inquire into and to contribute to our understanding of the dynamic and multidimensional constructs we call teaching and learning.

Part II: Criteria and Sources of Information

The scholarship of teaching can exist at the level of the individual teacher, the department, or the institution. Assessment of this scholarship must therefore be conducted at each of these levels. The important features or components of the scholarship of teaching as identified by the panel (see

Exhibits 1.1 and 1.2) can be grouped into three areas: (1) a shared public account of teaching, (2) an emphasis on learning outcomes and relevant teaching practices, and (3) discipline and pedagogical knowledge and innovation. I identified these three areas or dimensions by grouping the items that the panel of experts agreed were significant.

To assess the scholarship of teaching for each of the three areas, I first identified criteria in the form of questions. Each set of criteria relates to scholarship at the individual, the department, or the institutional level. Next, I identified the sources of information or methods of evaluation for the criteria. By so doing, I present a template that allows valid decisions to be made about the scholarship of teaching. The three areas or dimensions of the scholarship of teaching, along with specified items that illustrate the dimension, follow. I list examples of criteria or questions under the three levels (individual teacher, department, and institution).

Shared Public Account of Teaching

2. Those who practice the scholarship of teaching carefully design ways to examine, interpret, and share learning about teaching. Thereby, they contribute to the scholarly community of their discipline.
45. The scholarship of teaching entails a public account of some or all of the following aspects of teaching: vision, design, interaction, outcomes, and analysis, in a manner that can be peer reviewed and used by members of one's community.
20. People practicing the scholarship of teaching make a deliberate effort to share their experience with others (they act as mentors, communicators, faculty developers, etc.).

Individual Teacher Level. We can identify several criteria that help determine whether the person practices a shared public account of teaching. Does the teacher

- Invite colleagues into his or her class to gain their reactions?
- Visit colleagues' classes to offer useful suggestions?
- Prepare publicly available course outlines and examinations that reflect course objectives, instructional methods, and expected student learning?
- Talk about course content, teaching, or students with colleagues at lunch or other informal gatherings?
- Invite discussions with faculty development or other advisors (for example, media, computer, or testing specialists)?
- Discuss new findings in the discipline with colleagues?
- Show a willingness to share or discuss publicly his or her student evaluations?
- Mentor students or young colleagues on teaching or research activities?
- Participate in conferences, workshops, and seminars on teaching and learning?
- Write articles on teaching or student learning?

Department Level. Criteria to help assess the extent to which a shared public account of teaching exists at this level include the following. Does the department

- Have a system for peer review of teaching?
- Encourage discussion of teaching and course content topics at department meetings?
- Encourage or require members to prepare a teaching portfolio or self-report that describes instructional objectives and vision, teaching methods, learning outcomes, and other aspects of teaching?
- Have a mentoring system for junior faculty that includes teaching as well as research performance?
- Encourage classroom visits and other means of fostering informal discussions of teaching?
- Make public department-level student evaluations of teaching?
- Support faculty attendance at conferences or workshops on teaching and learning?

Institutional Level. The following criteria help determine whether the institution reflects a shared public account of teaching. Does it

- Support an active faculty development or teaching and learning program?
- Have a public policy that encourages the use of student and colleague evaluations?
- Support a mentoring program for junior teachers?
- Support a training program for teaching assistants?
- Weight teaching performance heavily in personnel selection and promotion?
- Sponsor seminars or workshops on teaching and learning?
- Encourage or require faculty to construct a teaching portfolio or a detailed report on teaching?
- Have a policy of periodic review of teaching for tenured and nontenured faculty?
- Publish results of learning outcomes and teaching environment surveys?

Emphasis on Learning Outcomes and Relevant Teaching Practices

21. Faculty who practice the scholarship of teaching are curious about the ways in which students learn and the effects of certain practices on that learning.
43. Scholarly teachers know that people learn in diverse ways; hence, they know that instruction should be diverse as well.
39. Individuals practicing the scholarship of teaching investigate the relationship between teaching and learning.

Other items in this dimension are numbers 15 and 47 (see Exhibit 1.1).

Individual Teacher Level. The following criteria are important as a basis of assessment for an emphasis on learning outcomes and relevant teaching practices. Does the teacher

- Conduct classroom research and use the results to modify teaching?
- Employ a variety of methodologies to supplement or replace lecturing?
- Take into account different student learning styles in designing instruction, exams, and assignments?
- Read extensively about student learning styles and innovations in teaching?
- Discuss classroom research results at seminars or conferences?

Department Level. The criteria listed here are examples of an emphasis on learning outcomes and relevant teaching practices. Does the department

- Administer comprehensive exams in the major field?
- Encourage team teaching or interdisciplinary courses?
- Display openness to innovation in teaching?
- Encourage research on teaching and learning?
- Ask students to include in course or department evaluations their perceptions of learning outcomes as well as the effectiveness of teaching practices?

Institutional Level. The following criteria are examples of an institution's emphasis on learning outcomes and relevant teaching practices. Does the institution

- Support research on learning outcomes and teaching through grants to the faculty?
- Have a testing program across the institution on learning outcomes?
- Survey students and graduates regarding their learning experiences at the institution?
- Survey students and graduates regarding their learning experiences at the institution?
- Emphasize evidence of student learning in personnel decisions?

Discipline and Pedagogical Knowledge and Innovation

4. The key features of the scholarship of teaching are content knowledge in the deepest sense and knowledge of pedagogy in the broadest sense, resulting in pedagogical content knowledge.
36. Scholarly teachers are always learning both about knowledge in their field and how to make connections with students.
 1. A key feature in the scholarship of teaching is having an understanding of how people learn, knowing what practices are most effective, and having knowledge about what we have learned about teaching.

Other items in this dimension: 6, 9, 13, 23, 32, 38, 40, and 44 (see Exhibit 1.1).

Individual Teacher Level. The following are criteria for assessing discipline and pedagogical knowledge and innovation. Does the teacher

- Read extensively in the literature of the discipline and on how to connect with students?
- Design courses and assignments that reflect active learning and examinations with real-world applications?
- Design course content that includes a synthesis of new knowledge in the field?
- Encourage students to conduct research or scholarly inquiry in the field?

Department Level. Criteria related to discipline and pedagogical knowledge and innovation include the following. Does the department

- Sponsor seminars or workshops about teaching in the discipline?
- Encourage nontraditional approaches to teaching?
- Reward members who publish or give conference papers on teaching in the discipline?

Institutional Level. The following are criteria to help assess discipline and pedagogical knowledge and innovation. Does the institution

- Emphasize in its reward system not only knowledge of subject content but also effective teaching practice?
- Have a faculty development program with staff committed to working with departments to promote the unique ways in which discipline knowledge may be related to students?
- Have a faculty development program that emphasizes nontraditional teaching practices?

Sources of Information

The following are examples of sources of information that may address the criteria for a scholarship of teaching.

At the individual teacher level, the self-report or teaching portfolio could provide evidence of classroom assessment projects, teaching methodologies, and personal reflections on teaching. Course syllabi should reflect, to some extent, a teacher's knowledge of both the discipline and pedagogy, as well as innovations in teaching. Analyses of assignments and examinations can be a source to identify the quality and quantity of learning. Student and peer evaluations provide another source of information on teaching practices and student perceptions of learning.

Consulting the departmental annual review can be helpful for assessing the extent to which a department exhibits a scholarship of teaching. Although such reviews tend to emphasize faculty workload, publications, and grants, they should also provide evidence on the quality of teaching in

the department. Results of major field tests, the Graduate Record Examination, or other senior examinations also provide indicators of learning outcomes. A department's publications and public statements, which may discuss and provide evidence of the quality of teaching and learning among its faculty, is another source of information.

At the institutional level, several documents address the criteria listed: the faculty handbook, the catalogue, and other publications that describe institutional policies and practices are important sources of information. So, too, is the institution's annual calendar of events and, in particular, its record of faculty attendance at relevant seminars, symposia, and workshops. In addition to these data of record, surveys and interviews of selected administrators, faculty, and students should provide insights.

The criteria and sources of information discussed provide valid evidence and are the basis for valid decisions. Those decisions can be made by an institution as part of a self-study or as an audit of its environment. Accrediting teams or other outside evaluators may also use the criteria to make judgments about the scholarship of teaching at the various levels of an institution.

Summary

Effective and scholarly teaching is deep, personal, multidimensional, and dynamic. The scholarship of teaching requires a broad array of skills and knowledge. It embraces scholarly teaching but requires more. In effect, one could say that the scholarship of teaching brings together all of the kinds of scholarship that Boyer defined.

It requires the ability to undertake and carry out the scholarship of discovery, for a teacher must be versed in the habits of thought and inquiry of the discipline and must be able to translate the principles of the discipline to learners. The teacher must be able to solve problems and to model the discovery process as well as to be able to discover new ways of helping learners gain knowledge and skills. The scholarship of discovery applied to teaching and learning is part of this benchmark.

It requires the scholarship of integration. In teaching, a world of information must be made orderly and understandable: the teacher must place in context what has been discovered in order to breathe life and meaning into courses, classes, and the discipline. This process must extend across disciplines as well, and the teacher who can put the area of specialization into a larger context helps the learner to understand both the principle at hand and the importance of integration itself.

But the investigation and synthesis that reflect both the scholarships of discovery and integration are not enough. The scholarship of teaching also involves the scholarship of application, because the theories and principles of the discipline are meaningless if taken in isolation. As the current terms *active learning*, *reflective practice*, *experiential learning*, and others

suggest, it is the involvement of the learner, who applies principles and theories to consequential problems in and beyond the discipline, that brings knowledge to life. If education is to have meaning and learners are to become reflective practitioners, they must be engaged in the discipline and its application.

Boyer said, "The work of the professor becomes consequential only when it is understood by others. . . . When defined as scholarship, however, teaching both educates and entices future scholars" (1990, p. 23). The person who demonstrates the scholarship of teaching, then, embodies all the forms of scholarship and directs them toward the goal of creating future scholars and arming them with the necessary skills and habits of thought and action that maintain the ongoing cycle of learning and teaching and teaching and learning. Scholars care deeply about their disciplines and about their work. In the scholarship of teaching, the teacher cares deeply about the discipline but, equally, about the learners and their connection to both the material, the discipline, and learning. This is the investment of self that Palmer (1983) refers to when he speaks about "the kind of community that teaching and learning require" (p. 89), the joint discovery of the beauty and power of understanding and the scholarship that enables it.

References

- Angelo, T. A., and Cross, K. P. *Classroom Assessment Techniques: A Handbook for College Teachers*. (2nd ed.) San Francisco: Jossey-Bass, 1993.
- Boyer, E. L. *Scholarship Reconsidered: Priorities of the Professoriate*. Princeton, N.J.: Carnegie Foundation for the Advancement of Teaching, 1990.
- Brinko, K. T., and Menges, R. J. (eds.). *Practically Speaking: A Sourcebook for Instructional Consultants in Higher Education*. Stillwater, Okla.: New Forums Press, 1997.
- Cross, K. P., and Angelo, T. A. *Classroom Assessment Techniques: A Handbook for Faculty*. Ann Arbor, Mich.: National Center for Research to Improve Postsecondary Teaching and Learning, 1988.
- Cross, K. P., and Steadman, M. H. *Classroom Research: Implementing the Scholarship of Teaching*. San Francisco: Jossey-Bass, 1996.
- Davis, B. G. *Tools for Teaching*. San Francisco: Jossey-Bass, 1993.
- Ebel, K. E. *The Cult of Teaching: A Guide to Mastering the Professor's Art*. San Francisco: Jossey-Bass, 1977.
- Glassick, C. E., Huber, M. T., and Maeroff, G. I. *Scholarship Assessed: Evaluation of the Professoriate*. San Francisco: Jossey-Bass, 1997.
- Hativa, N., and Marincovich, M. *Disciplinary Differences in Teaching and Learning: Implications for Practice*. *New Directions for Teaching and Learning*, no. 64. San Francisco: Jossey-Bass, 1995.
- Kreber, C. "Defining and Implementing the Scholarship of Teaching: The Results of a Delphi Study." Paper presented at the annual meeting of the Canadian Society for the Study of Higher Education, Université de Sherbrooke, Sherbrooke, Quebec, June 1999.
- Lowman, J. *Mastering the Techniques of Teaching*. San Francisco: Jossey-Bass, 1984.
- McKeachie, W. J. *Teaching Tips*. (10th ed.) Boston: Houghton Mifflin, 1999.
- Palmer, P. *To Know As We Are Known*. New York: HarperCollins, 1983.
- Schuster, J. H., Wheeler, D. W., and Associates. *Enhancing Faculty Careers: Strategies for Development and Renewal*. San Francisco: Jossey-Bass, 1990.

- Seldin, P. A. *The Teaching Portfolio*. Bolton, Mass.: Anker, 1993.
- Shore, B. M., and others. *The Teaching Dossier*. (Rev. ed.) Montreal: Canadian Association of University Teachers, 1986.
- Shulman, L. S. "Toward a Pedagogy of Substance." *AAHE Bulletin*, 1989, 41(10), 8–13.
- Smart, J. C., and Feldman, K. A. "Accentuation Effects of Dissimilar Academic Departments: An Application and Exploration of Holland's Theory." *Research in Higher Education*, 1998, 39, 385–418.
- Theall, M., and Franklin, J. "Student Ratings in the Context of Complex Evaluation Systems." In M. Theall and J. Franklin (eds.), *Student Ratings of Instruction: Issues for Improving Practice*. New Directions for Teaching and Learning, no. 43. San Francisco: Jossey-Bass, 1990.

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