Teaching in higher education: Is there a need for training in pedagogy in graduate degree programs?

Terrell E. Robinson
Tallahassee Community College

Warren C. Hope
Florida A&M University

ABSTRACT

The number of students graduating with masters' and doctoral degrees from the State University System of Florida (SUSF) has increased over the past thirty years. However, no research has been conducted concerning the preparation of graduates to teach in higher education. PK-12 teachers are taught how to teach. Should college and university faculty members also receive instruction in pedagogy? Graduate curricula have a focus on a discipline's knowledge base and research. It is postulated that college and university faculty members should possess pedagogical skills, have knowledge of lesson planning, and know how to deliver content. This research sought to ascertain professors' level of perceived need for graduate degree programs to include training in pedagogy that prepares students to teach in higher education. To what extent do university professors perceive a need for graduate degree programs to include training in pedagogy to prepare students to teach in higher education was the research question behind the inquiry. Two hundred full and part-time faculty members in the State University System of Florida responded to survey items, which rendered an overall mean that addressed the research question.

Keywords: Graduate, teaching, higher education, Florida, faculty members, professors

INTRODUCTION

Professorial productivity is measured in teaching, research, and service. Regarding teaching, Ward (2001) asserted that, the mediocre teacher tells. The good teacher explains. The superior teacher demonstrates. The great teacher inspires. The teacher who inspires is the standard bearer. An assumption can be made that it is the inspirational teacher who is well prepared to instruct being an expert in content and skilled in executing the art and science of teaching.

Teaching the scholar how to teach is not a new concept. Milton (1972) argued that even though significant research about learning has been published, "faculty do not have the time, the familiarity with its specialized language, or the inclination to avail themselves of the literature…." (p. ix). Milton maintained that "elementary principles of learning, especially in higher education, have been neglected, abandoned to an abiding faith in traditional methods, or periodically subjugated to innovative hunches" (p. ix), or in other words, they teach the way they were taught. According to Cahn (1978), American educators have noted that in comparison to primary and secondary teachers, most college and university professors received minimal or no training in educational theory and methodology.

In the 1980s, there was recognition of the need to prepare college and university professors to teach, which led to the emergence of the Teaching Assistant (TA). Even TAs realized the need for some formal training before teaching a college course. Boehrer and Sarkisian (1985) expressed a perspective on the TA's quandary:

> With many academic departments, acceptance into a graduate program conveys an automatic license to teach. This notion presumes that, if a person can learn the subject, they can also teach it. For the new TA, perhaps the most immediate threat to self-esteem comes from the discrepancy between the assumption that he knows how to teach and the discovery that he does not. (p. 15)

Boehrer and Sarkisian (1985) surmised that TAs and new professors will quickly "discover that students' learning does not necessarily mirror their own" and that "teaching a class is more complex than tutoring an individual" (p. 13). Regardless of whether or not graduate students have served as TAs, once the degree is obtained, they are considered "credentialed" to teach in a college or university classroom.

Smock and Menges (1985) commented that even though only about 50% of new doctoral graduates accept positions in higher education, a considerable number of graduate students in many disciplines continue to see teaching as their primary career goal. Thus, in departments where this is the case, time devoted to helping TAs become better teachers can be justified because increasing their knowledge and skills related to communicating information in small groups is an important educational and professional goal in itself. Even graduate students whose career goals are external to academia, the skills necessary to prepare and lecture, lead a group discussion, or moderate other forums will prove to be valuable.

When concentrating on the educational institution as a learning organization, community colleges, small private colleges, and universities traditionally emphasize teaching. In contrast, large universities focus on producing scholarly research. Regardless of size, public or private, it is important that all postsecondary institutions develop a reputation for excellence in teaching (Senge, 1990). While many students may have an opportunity to teach at some point during their

doctoral journey, often their programs do not provide structured experiences that prepare them to contend with issues such as "assessment, different types of student learning, the pedagogy of the discipline, curricular innovations, the impact of technology on education, or the variety of teaching styles that may be helpful with students from different racial, ethnic, or cultural backgrounds" (Gaff, Pruitt-Logan, Sims, & Denecke, 2003, p. 3).

Many changes occurred in the college classroom from 1970 to 1990. Two examples of the transformation are differences in learning styles and the incorporation of technology. With these changes, it is imperative that educators have serious debate about the need for professors to receive instruction in educational theory, instructional methodology, and educational technology. However, the likelihood of specific action resulting might be difficult. Cross (1990) expressed a plausible reason for this skepticism indicating that "most professors are naïve observers of teaching in addition to being naïve practitioners of the art and science of teaching" (p. 10). She contended that, "professors do not know enough about the intricate processes of teaching and learning to be able to learn from their own constant exposure to the classroom . . . . as they are not prepared to observe the more subtle measures of learning" (p. 10). Cross stressed that college professors should know "how to teach, not in an amateur way, in which some classes go well and others do not. Rather, professors "need to know how to teach in an expert way, with the ability to diagnose, analyze, evaluate, prescribe, and most importantly, improve the quality of teaching and learning in the college classroom" (Cross, p. 11).

Also in the 1990s, a little more than a decade after Cahn's (1978) research, many college and university professors in the United States still were not highly qualified teachers. Hiatt (1991) alluded to this predicament expressing that:

> Teaching requires that its practitioners acquire knowledge and skill in identifying behavior, mastery of the processes that change behavior, and the means to assess the changes in behavior…[However,] the time devoted to preparing teachers, especially instructors at the post-secondary level, with the needed pedagogical skills for handling a classroom of thirty is minimal compared to other semi-professionals and professionals. (pp. 1-2)

To address the deficiency in faculty preparation in educational theory and methodology, college and university administrators in the United States have created faculty development programs. These administrators have utilized research on adult learning and college teaching to provide professors with important instructional knowledge and skill followed by periodic updates. It would be appropriate to assume that the overall quality of teaching in higher education has improved. However; contrary to this assumption is that nothing has changed. It is still common knowledge that if professors desire to receive tenure, more time must be placed on research and publishing and less on updating knowledge and skills for teaching adult learners (Milton, 1972; Hiatt, 1981).

Moreover, budgetary constraints, especially in the current economy, have compounded the problem. Quite often, when an academic department loses manpower, other full-time faculty members must assume the teaching responsibilities, which results in less time for improving teaching techniques.

Even in the 2000s, with increased evidence from the classroom combined with research in cognitive psychology and neuroscience, teaching on most college campuses still has not changed. Schmidt (2008) advised that college professors could become more effective teachers

if they considered the question of what their students learned in the same manner they approached their own academic research. Schmidt further expressed that faculty members believe in experimentation, learning through trial and error, and gathering evidence, but do not apply these methods of inquiry to their own teaching.

Presenters at a recent conference held at Harvard concurred with Schmidt's assessment describing conventional teaching as ineffective. One presenter asserted that faculty members still teach according to habits and hunches. The presenter concluded that professors who did not have an understanding of pedagogy may think about the content students should learn, but not the cognitive capabilities they should develop (Berrett, 2012).

Recognizing students lack of preparation to teach in higher education, the logical time to prepare eventual faculty members to do so is during their master's and doctoral degree programs just as PK-12 teachers are taught prior to entering the classroom (Cross, 1990). The foundation of knowledge and skill that is established while in graduate school can then be augmented by faculty development workshops throughout their careers.

Inappropriate instructional preparation, decrease in student achievement, and the absence of effective communication are some of the problems that will occur because of the lack of knowledge and skill in teaching adult learners (Chism, Lees, & Evenbeck, 2002). Rosensitto (1999) declared more than a decade ago that, "Many graduate degree programs are still designed to only graduate individuals who can produce high levels of scholarship and research" (p. xxvi). Earning a master's or doctoral degree in a field of study is still considered the official credential for teaching at the college level.

With regard to preparation to teach in higher education, not much has changed in graduate curricula over the years. Non-teacher education graduate degree programs in the SUSF do not require the study of pedagogy or andragogy to prepare students for higher education teaching. Schlieb (1999) and Peterson (1999) also claimed that the majority of graduate students preparing for a career in higher education are not currently required to study instructional theory and methodology appropriate for use in higher education.

Purpose of the Study

Given the increase in the number of students earning graduate degrees from postsecondary institutions in the State University System of Florida, and the likelihood that many will teach in higher education, an examination of preparation to teach is important. This investigation sought to determine professors' level of perceived need for graduate degree programs to include formal curricula designed to prepare students to teach in higher education and stimulate further interest in and research on the preparation of individuals to teach in this arena.

METHODOLOGY

To what extent do college and university professors perceive a need for graduate degree programs to include training in pedagogy to prepare students to teach in higher education was the research question driving the inquiry. A 43-item survey was employed to collect data. Survey research is appropriate in investigations concerning preferences, attitudes, and opinions. For this research, the survey was used to identify higher education faculty members' perceived need for pedagogical training in graduate programs.

Sample and Sampling Procedures

Full and part-time faculty members employed by a four year college or university in the State University System of Florida (SUSF) constituted the population. Established in 1954, the system has 11 member institutions, Florida A&M University, Florida Atlantic University, Florida Gulf Coast University, Florida International University, Florida State University, New College of Florida, University of Central Florida, University of Florida, University of North Florida, University of South Florida, and University of West Florida.

According to the National Center for Education Statistics (2010), in fall 2009, the SUSF employed 16,560 professors. These full and part-time faculty members included instructors, assistant professors, associate professors, full professors, adjunct professors, professor emeriti, lecturers, and those with "assistant in" and "associate in" faculty titles. For this research, 3,528 professional school (law, dentistry, pharmacy, veterinary science, and medicine) faculty members were excluded because the majority of these graduates enter private practice rather than pursue a teaching career. Even so, sample size was based on the total number of SUSF faculty members.

According to Krejcie and Morgan (1970), 377 is an appropriate sample for the SUSF faculty population. However, to increase the return percent, the sample size was doubled. Simple random sampling was accomplished using a computer random number generator. First, the sampling frame was organized. A listing of all SUSF faculty members from each institution was located on the Florida Board of Governors' website. After accessing each university's website, a Microsoft Excel database with column headings professor's full name, faculty rank, work email, and random number identification was created for all SUSF faculty members. The sample was drawn from the SUSF Faculty List created in Excel. The function code =RAND() was placed into the random number cells. This is Excel's way of assigning a random number between 0 and 1 in the selected cells. After number assignment, the columns were sorted by names, faculty rank, email, and random number in ascending order. Sorting this list by the random number rearranged professor's names, faculty rank, and email from lowest to highest. The first 754 names beginning with the lowest random number were selected.

Instrumentation

The National Faculty on the Need to Prepare Graduate Students to Teach in College and University Settings was used to collect data. The survey has 43 items delineated into three sections: institutional information, individual information, and professor perceived need. The dependent variable was the perceived need grand total (Perceived Need-GT). This is a mean score across specific items. The level of perceived need for each respondent was determined by adding 21 scores from items 17-33, 35, 37, 39, and 41. The maximum score for each item is 5 and the minimum is 1. Each item was to be given a score of 5, 4, 3, 2, or 1 based on a respondent's choice of Agree Strongly = 5, Agree = 4, Uncertain = 3, Disagree = 2, or Disagree Strongly = 1. Negatively directed items, 18 and 19, were scored in the reverse pattern, 1, 2, 3, 4, 5. Thus, the range of possible total scores for the dependent variable perceived need was 21 to 105 with 63 being the midpoint.

Data Collection Procedures

Selected faculty members received an invitational email asking for their participation in the research. Faculty members accessed the survey by clicking on the http://www.surveymonkey.com/s/National_Faculty_Survey link attached to the email. Implied consent was evident when the participant completed the survey and submitted.

Four attempts were made to collect data. For the first attempt, seven hundred fifty-four emails were sent and eighty responses were received. Six hundred seventy-four emails were sent to non-responders on the second attempt and forty responses were received. Six hundred thirty four emails were sent to non-responders in the third attempt and thirteen responses were obtained. For the fourth attempt, six hundred twenty one emails were sent to non-responders and sixty-seven responses received. After 37 calendar days, a total of 200 faculty members had completed and submitted usable surveys yielding a 53.05% response rate.

Data Analysis

Survey Monkey provided a summarized report of the raw data. This report showed descriptive statistics, mean, standard deviation, frequency, and cross tabulations. Data contained in the SAV file extension was transferred to SPSS 19.0. Using a scale measurement, summary scores were tabulated and analyzed to produce the Mean Perceived Need-GT. Data derived from items 17-33, 35, 37, 39, and 41 enabled a response to the research question.

RESULTS

Descriptive statistics were produced via summation of scores for the 200 respondents from aforementioned items. SPSS 19.0 was used to analyze the variable "total score" which then provided the descriptive statistics shown in Table 1. As can be seen in Table 1, the mean is 74.40 and is higher than 63, which is the midpoint of the total possible score. These results indicate that faculty members recognize the need for graduate students to experience training in pedagogy as preparation to teach in higher education. In addition to the result obtained through data analysis for items 17-33, 35, 37, 39, and 41, summaries of items 13 and 15 reveal important information regarding professors' belief about the need to prepare students to teach in higher education. Item 13 asked whether or not the respondents were required to take any courses designed to develop teaching skills while in graduate school. Table 2 shows the summarized responses. As can be seen, almost 80% of faculty members indicated no in response to item 13. This result is at the heart of the research question and the postulation that there is a need to prepare graduate students to teach in higher education.

Table 1
Descriptive Statistics for Perceived Need-GT

Variable	M	SD	Minimum	Maximum	Range
Total Score	74.40	11.39	40.00	96.00	56.00

Note. N = 200.

Table 2
Graduate Student Instructional Preparation

Category	Number of Responses	Response Percentage
Yes	44	22.0%
No	156	78.0%

Note. N = 200.

Item 15 asked whether or not faculty members had enrolled in any courses designed to develop teaching skills since completing the master's or doctoral degree. The courses could have been taken face-to-face, online, or a combination of the two. Summarized responses are shown in Table 3. Again, the important issue of preparation to teach in higher education is pronounced as more than 60% of faculty members specified no. That more than 60% of respondents indicated no prompts the additional question of just how are higher education faculty members acquiring teaching skills?

Table 3
Teaching Skills Preparation Since Completion of Highest Degree

Category	Number of Responses	Response Percentage
Yes	75	37.0%
No	125	62.0%

Note. N = 200.

University Professors' Perspectives on the Need for Training in Pedagogy

Survey item 43 was open-ended and allowed university professors to provide feedback about the survey and express their thoughts about the need for training in pedagogy in graduate degree programs. Of the 200 professors who completed the survey, 35 made comments. Eighteen professors' comments were selected for inclusion. Professors' comments were categorized as (a) favorable toward the need for training in pedagogy, (b) favorable toward the need for training in pedagogy with exception, and (c) unfavorable toward the need for training in pedagogy. Professors' comments provide personal perspectives on the need for training in pedagogy in graduate degree programs.

Professors' responses favorable toward the need for training in pedagogy.

Six professors' comments were categorized as favorable toward the need for training in pedagogy. Professor 1 related that, "Regarding question 26, I do feel that graduate programs in the biomedical sciences (my field) should offer at least one course in teaching techniques (or at least allow students to take them from Departments of Education for credit toward degree), but

should not require said courses. There are too many who wish to pursue careers in industry or purely in research-related areas."

Professor 2 stated, "I think those graduate students that will be required to teach at the college level need to know about teaching strategies, how the brain learns, and how to appropriately and accurately assess student learning. Accountability is only going to become more stringent."

Professor 3 indicated that, "Preparing graduate students for the teaching part of academic careers is an important topic, and I applaud you for taking this on. All too often, assigning students to be a GTA or instructor of record is the only preparation they get, and frequently without any useful feedback. That said: my only concern with your methodology is whether you will end up with a lot of should do more, which is fine in principle, but not very helpful when measured against the real constraints of the world, such as limited time, limited funding, large classes, etc. The hard part is to figure out what is most important in a sea of important things to study and train."

Professor 4 remarked, "Useful area of study. I am hoping to include teaching related materials in a PhD level doctoral preparation class. One of your earlier questions said, what is considered in tenure. I think there is what is officially considered as opposed to what actually is. Research is way more important here than good teaching—which is a shame!"

Professor 5 related that, "You are studying a very important aspect of graduate student learning. It is especially necessary in my area of engineering."

Professor 6 surmised that, "The long and short of it is graduate students should receive some training on how to teach. It should not be an education department set of classes but instead should be handled from the senior faculty in that discipline. The big problem is paying for it—do we force all of our students to take a class focused on making them a better teacher when some of them will never (or believe they will not) teach?"

Professors' responses favorable toward the need for training in pedagogy with exception.

Seven professors' comments were considered to be in the category favorable toward the need for training in pedagogy with exception. Professor 7 stated, "In response to questions about students in my area that relate, I assumed that the students would be assigned to teaching. My answers would be very different if students were neither interested in nor assigned to teaching. For example, MBA students need not be subjected to teaching courses unless teaching is in the picture."

Professor 8 noted that, "Some graduate students that are interested in teaching should do this, but this should not be incorporated into all disciplines as it will water down the actual skills needed. Certificate programs in addition to the typical course work would be ideal for PhD students."

Professor 9 revealed that, "I am an experimentalist in a physical sciences discipline, so the things I value in my teaching will likely be quite different than what my colleagues in other disciplines value."

Professor 10 asserted, "I like the idea of increasing training about teaching, but not the idea of requiring academic courses that emphasize educational theory. I think that workshops are more appropriate, especially if they include a lot of practical examples."

Professor 11 concluded that, "It would certainly be nice for grad students to get more formal instruction on teaching, but the primary focus should be producing experts in their field of

study. Adding much more instruction on how to teach might negatively impact this goal or extend the amount of time required for graduate education."

Professor 12 offered that, "In general, I do not think that formal coursework is needed for college pedagogy. But seminars and occasional brown bags on specific topics help."

Professor 13 emphasized that, "If the agenda here is teacher development in graduate programs, I think this is very important. But I would be skeptical of teacher training courses provided through the college of education, since their approach is so specifically shaped by their association with the school system. Graduate students don't need to be taught how to teach in general, but rather how to teach as mathematicians, philosophers, biologists or whatever. For this reason teaching apprenticeship would best be handled in the departments, though many programs could do a better job at it. The idea of separate teaching tracks in grad programs sounds appealing on the face of it, but fits in too well with the trend toward cost cutting and the erosion of tenure line. You would be setting up these students for dead end instructor positions while the research emphasis students would get all the ranked positions."

Professors' responses unfavorable toward the need for training in pedagogy.

Five professors' gave comments that were categorized as unfavorable toward the need for training in pedagogy. Professor 14 stated, "Graduate students have a hard enough time learning how to research, and many of them do not go on to faculty positions where teaching is involved. It just doesn't make sense to waste resources training these students to teach unless or until we know they will be taking a position that involves teaching. That's probably why we have the system we have, where pedagogical instruction is not emphasized for our graduate students. I wouldn't want my grad students (whom I pay to work on grant-funded projects) to be distracted by additional coursework that is only preparing them for a teaching role that they will likely never have."

Professor 15 revealed that, "Graduate students have too much to learn to spend time on all of the detail that you suggest. It needs to be done outside of graduate education in science."

Professor 16 asserted that, "I don't think that an M.S. or Ph.D. degree should include courses in effective teaching practices. That type of training should be provided by the university or college that hires the graduate if they expect that individual to teach."

Professor 17 concluded, "I would rather have someone with a master's degree or PhD in math (not math education), and zero pedagogical training, in a high school math class, than someone with no advanced degree in math (not math education) and a masters or PhD in education. Someone who's good enough at math can quickly and easily learn the necessary pedagogical techniques. Someone who are not good enough at math will always be a poor math teacher, no matter how many pedagogical classes he or she takes."

Professor 18 specified that, "Research universities prepare students to do research. Preparing them to be teachers only hurts their employment prospects. Once they are hired, and tenured, then they can worry about becoming better teachers. This is the way the system is designed."

CONCLUSION

Graduate students preparing to become college professors generally receive an extensive research foundation. This translates to less time devoted to preparation to teach, although

teaching is one of the first responsibilities that new faculty members face. A valid argument against adding teaching preparation to a graduate program is that it may increase the amount of time to complete the degree. This argument prompts reminder of Allen and Rueter's (1990) statement that, "it has been sarcastically noted that college teaching is the only profession requiring no formal training of its practitioners" (p. 9). Johnston (1997) concluded that it is not sensible to take courses to prepare for research and then simply hope to perform well when teaching without any prior instruction. Acquiring the knowledge and skill in adult learning is important to all graduate majors, especially if a career in postsecondary instruction is desired. Teaching is not a profession in which most people, even intelligent and accomplished graduate students are automatically skilled (Weimer, 1997).

Scholars have written of the need for graduate students to be prepared to teach in higher education. The American Association of University Professors (2000) recognized that graduate students should receive appropriate preparation and supervision in teaching. Walstad and Becker (2009) stressed that it is essential to know that teaching a course is an important instructional duty. If it is not handled well, it can impact a department by increasing student complaints and potentially negatively affecting the employment prospects of the poorly performing graduate students. Slevin (1992) went as far as to specify that teaching preparation should begin while completing the doctoral program.

The results of this research support the need to prepare graduate students to teach in higher education. Faculty members' responses to items 17-33, 35, 37, 39, and 41 on the National Faculty Survey on the Need to Prepare Graduate Students to Teach in College and University Settings provide a composite view of perspectives related to the need to prepare graduate students to teach in higher education. The mean score of 74.40 derived from responses was above the mid-point of 63 on the scale of 21 to 105. In addition, professors' comments to an open-ended item indicate support for training in pedagogy in graduate degree programs. In a final analysis, a conclusion can be drawn from this research that there is a need for training in pedagogy for those who teach in higher education and that there is support among SUSF faculty members for that training to occur in graduate programs.

REFERENCES

Allen, R. R., & Rueter, T. (1990). *Teaching assistant strategies: An introduction to college teaching.* Dubuque, IA: Kendall/Hunt.

American Association of University Professors. (2000). Statement on graduate students. Retrieved from http://www.aaup.org/AAUP/pubsres/policydocs/contents /statementongraduatestudents.htm

Berrett, D. (2012). Harvard conference seeks to jolt university teaching. Chronicle of Higher Education. Retrieved from http://chronicle.com/article/Harvard-Seeks-to-Jolt/130683/

Boehrer, J., & Sarkisian, E. (1985). The teaching assistant's point of view. *New Directions for Teaching and Learning, 1985*(22), 7-20. doi: 10.1002/tl.37219852203

Cahn, S. M. (1978). *Scholars who teach.* San Francisco: Jossey-Bass.

Chism, N., Lees, N. D., & Evenbeck, S. (2002). Faculty development for teaching innovation. *Liberal Education, 88*(3), 34-41.

Cross, K. P. (1990). Teaching to improve learning. *Journal on Excellence in College Teaching, 1*(1990), 9-22.

Gaff, J. G., & Pruitt-Logan, A. S. (1998). *Preparing future faculty in the social sciences and humanities.* Retrieved from http://www.preparing-faculty.org/PFFWeb.PFF4Manual.pdf

Hiatt, D. B. (1981). *Teaching from alternative frames of reference. Perspectives on* e*ducation as educology*, Ed. James E. Christensen. Washington, D.C.: University Press.

Johnston, S. (1997). Preparation for the role of teacher as part of induction into faculty life and work. *New Directions for Teaching and Learning,* 1997(72), 31–39. doi: 10.1002/tl.7204

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 38*(3), 608. doi: 10.1177/001316447003000308

Milton, O. (1972). *Alternatives to the traditional: How professors teaching and how students learn*. San Francisco: Jossey-Bass.

National Center for Education Statistics. (2010). Fall 2009 Florida state university system full-time and part-time instruction/research/public service. Retrieved from http://nces.ed.gov /ipeds/datacenter/statistics.aspx

Peterson's graduate and professional programs: An overview. (1999). (33rd ed., Book 1). Princeton, NJ: Peterson's.

Rosensitto, A. M. (1999). *Faculty perceptions of the need for graduate programs to include formal curricula designed to prepare candidates to teach in college and university settings* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (Accession No. ADG9943986)

Schmidt, P. (2008). Harvard's Derek Bok: Professors, study thine own teaching. *Chronicle of Higher Education.* Retrieved from http://chronicle.com/article/Harvards-Derek-Bok-/1239

Schlieb, J. (1999). Review: Histories of pedagogy. *College English, 61*(4), 139-146.

Senge, P. M. (1990). The leader's new work: Building learning organizations. *Sloan Management Review, 32*(1), 1-17. Retrieved from http://sloanreview.mit.edu/files /saleable-pdfs/3211.pdf

Smock, R., & Menges, R. (1985). Programs for TAs in the context of campus policies and priorities. *New Directions for Teaching and Learning, 1985*(22), 21-33. doi: 10.1002/tl.37219852204

Ward, W. A. (2001). Teaching. Retrieved from http://www.quoteland.com /author.asp?AUTHOR_ID=130

Weimer, M. (1997). Integration of teaching and research: Myth, reality, and possibility. *New Directions for Teaching and Learning, 72*, 53–62. doi: 10.1002/tl.7206