Journal of Agricultural Education, 60(4), 212-222
https://doi.org/10.5032/jae.2019.04212

An Examination of Changes in Student Course Evaluations of CALS Faculty after Participating in a Faculty Development Program

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Abstract

F*aculty development programs in agricultural colleges have aimed to improve teaching and learning in undergraduate and graduate courses. The purpose of this study was to examine how students perceived instructor teaching behaviors after instructors participated in the Teacher's College program at the University of Florida. Student course evaluation scores were used as an indicator of instructor behaviors. A paired samples t-test was used to compare participant's student evaluation scores before with their student evaluation scores after the program. Results indicated a statistically significant difference between scores, demonstrating slightly higher student evaluation scores after completion. It was also found faculty had higher student evaluation scores for classes they taught during the semester of participation. Lastly, this study compared student evaluation scores for courses before, during, and after faculty members' completion of the program with their department student evaluation averages. Results indicated before Teacher's College, faculty members had slightly lower student evaluation averages compared to department averages. Student evaluation averages were found to be slightly higher than department averages during and after Teacher's College. Although variations were found between graduate and undergraduate-level courses, this study supports the use of faculty development programs as a strategy to improve teaching behaviors of faculty.*

***Keywords*:** faculty development; course evaluations; professional development; college teaching

Introduction

In 2009, the National Research Council (NRC) identified the need for college graduates to be well versed in critical thinking and problem-solving skills in order to solve the increasingly complex global problems that have emerged in the world. The expansion of an interconnected, global society has led employers in agriculture to seek college graduates who have strong analytical and communication skills that are required in the modern agricultural workforce (NRC, 2009). Despite these demands, a shortage of highly qualified college graduates who demonstrate these qualities exist, placing unprecedented pressure on institutions to deliver students a high quality educational experience that meet their needs (Sellingo, 2013). To that end, the NRC (2009) called for changes in the way instructors in colleges of agriculture teach.

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The NRC (2009) suggested that instructional methods that are centered in active learning and real world applications within interdisciplinary contexts can be used to foster students' critical thinking and problem solving skills. However, faculty in agricultural colleges have questioned their ability to use instructional strategies that enable students to gain these skills (Harder, Roberts, Stedman, Thoron, & Myers, 2009). Boyer (1990) indicated that effective teaching should be a priority in post-secondary education, despite the reality that teaching quality is often overshadowed by the heavy emphasis in academic research and that a majority of faculty are hired on the basis of their research proficiency as opposed to their teaching ability (Adams, 2002). Weidner (1994) added that students also believe that teaching is the most important job of university faculty. Teaching can be improved through professional development opportunities and through placing added emphasis on self-reflection, peer assessment and student evaluations of teaching.

Professional Development in Teaching and Learning

Because of the demand for college graduates in agriculture to be competent critical thinkers, and the low efficacy of college faculty in using methods that foster such skills, efforts should be made to develop more effective agriculture teachers in post-secondary education (NRC, 2009). Therefore, the need for a renewed investment to improve teacher effectiveness and improved methodology, with a commitment to assessing effective teaching, has been established (Boyer, 1990; DiBenedetto & Whitwell, 2019; NRC, 2009). Professional development programs that allow faculty the opportunity to develop new skills and knowledge in teaching are needed to improve the instructional quality at agricultural institutions (Myers & Roberts, 2004; Rocca, 2010). To best achieve this, professional development should be designed to have the greatest educational impact and should be organized around the needs of faculty.

In a study examining the professional development needs of faculty in the College of Agricultural Science and Technology at California State University, Rocca (2010) investigated faculty's perceived skill in teaching and interest in improving teaching practice. Faculty indicated having adequate teaching skills, but sought professional development to improve their ability to motivate students, create more student interest, evaluate student learning, and stimulate students' use of critical thinking and problem solving skills. Wingenbach and Lander (2002) conducted a study that identified the professional development needs of faculty in the College of Agricultural and Life Sciences at Mississippi State University. The researchers found that faculty reported a higher need for professional development in using teaching methods compared to using new education technology.

In another study (Blickenstaff, Wolf, Falk, & Foltz, 2015), faculty reported a high efficacy in traditional teaching methods such as lecture and identified a need for professional development in ways to increase student engagement. The researchers recommended that professional development be offered to improve instructors' pedagogical knowledge and promote the use of active learning strategies. Professional development needs of faculty within agricultural programs and who teach online has also been determined. Bjelland and Sprecher (2014) completed a mixed-methods study to identify specific needs of instructors who were teaching online swine science courses. Instructors indicated a strong need for professional development focused on increasing student interaction in distance education courses. The study also indicated that time was a large perceived barrier to completing professional development.

In addition to content, the design and delivery of professional development programs should also be considered. Schlager and Fusco (2003) indicated professional development should be learner-focused, context-specific, and have practical applications. Lieberman and Mace (2010) argued that professional development in higher education should create professional learning communities and focus on the practice of teaching. Stedman, Roberts, Harder, Myers, and Thoron (2011) suggested that

demographic differences of faculty should be a consideration in the delivery of professional development.

Evaluation of Teaching and Learning

The evaluation of professional development is important to determine learning outcomes and to strive for teaching excellence in agriculture colleges (Lang, Habron, Holmes, Johnson, & Orth, 2010). Furthermore, the evaluation of teaching should be a critical component to improve instruction in higher education. One of the most common techniques to evaluate teaching in higher education is through the use of student evaluations. Student evaluations allow instructors to obtain feedback on their teaching and to improve their teaching effectiveness (Thompson & Serra, 2005). Student evaluations also serve as valuable sources of information for administrators to determine faculty teaching performance (Chen & Hoshower, 2003) and can be an important criterion in the promotion and tenure process (Cruse, 1987).

Kitchel, Robinson, and Jenkins (2007) examined student evaluations in the College of Agriculture at the University of Kentucky to make inferences on student perceptions of teaching quality. The researchers found that students were more likely to rate the value of courses higher when courses stimulated their interest, when they received comments from graded assignments, and when course materials were presented in an effective manner. Other research showed various instructor attributes impacted course evaluations. Best and Addison (2000) found faculty whose students perceived them to be more charismatic received higher course evaluation scores. Mitchell and Martin (2018) found students rated male professors higher than female professors and used different language to describe male and female professors.

Increasing the effectiveness of teaching in agricultural programs within higher education is a critical step towards meeting the new demands of college graduates. College graduates are expected to be critical thinkers, problem solvers, and innovators within their specialized disciplines (NRC, 2009). Teaching students these skills is not an easy task and educators have raised their concerns in their ability to do so, suggesting professional development needs in this area. Departments of agricultural education can serve as useful resources in the design, delivery, and evaluation of professional development programs in teaching and learning (Barrick, 1993). Beyond improving instruction, professional development opportunities in teaching and learning can lead to improvements in student evaluations, which can be used as an indicator of teaching performance.

This study examines the specific outcomes of one such program, Teacher's College, offered by the College of Agricultural and Life Sciences at the University of Florida. This 11- week program focuses on providing teaching faculty with the skills to be effective instructors. As Rockwell and Bennett (2004) noted, program outcomes can be measured at multiple levels, with the potential for immediate changes in knowledge, attitudes, skills, and aspiration. A longer-term outcome is changes in practices, which in this case would be changes in the way a faculty member teaches his/her classes. As a normal part of the Teacher's College program, participants are asked to self-report changes in knowledge and attitudes after completing the program. This study seeks to go further to determine changes in teaching practices, as determined by student perceptions of instructor teaching behaviors.

Theoretical Framework

This study was guided by Desimone's (2009) path model of teacher professional development. Desimone said to effectively study professional development of educators, researchers must identify a set of critical features that are characteristic of effective professional development, as well as operationalize a theory of how professional development may influence behavior change in teachers

and their students. The five features that she identified as "critical components of effective professional development" included content focus, active learning, coherence, duration, and collective participation.

In addition to the five critical features of educator professional development, Desimone (2009) proposed a core conceptual model which outlines the effects of professional development on teachers and students. She posits that as a result of teachers participating in effective professional development, teacher knowledge, attitudes, skills, and beliefs may change to reflect the core features of the professional development. From these changed attitudes, teachers then use their newly acquired knowledge and skills to adjust their instructional approach, and as a result of these adjusted teaching strategies, students demonstrate greater learning outcomes. Desimone's conceptual framework can be seen illustrated in Figure 1. This study specifically sought to examine the adjusted teaching strategies (teaching behaviors) as a result of participating in the Teacher's College program, as perceived by students.

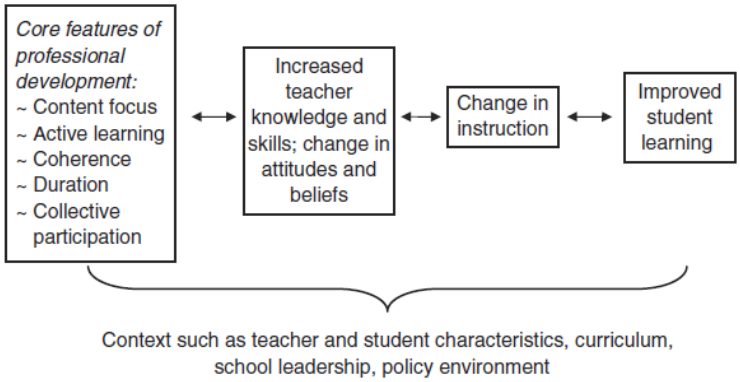

Figure 1. Core conceptual framework for studying the effects of professional development on teachers and students (Desimone, 2009).

Purpose and Objectives

The purpose of this study was to examine how students perceived instructor teaching behaviors after participating in the Teacher's College program at the University of Florida. Teaching behaviors were operationalized as participant results from required student course evaluations. The objectives described below framed this study.

1. Compare each participant's student evaluation scores before the professional development with their evaluation scores after the professional development.
2. Compare each participant's student evaluation scores before the professional development with their evaluation scores during the professional development.
3. Compare all participants' student evaluation scores before, during, and after the professional development with department student evaluation averages.

Methods

Teacher's College Program

The Teacher's College program in the College of Agricultural and Life Sciences (CALS) at the University of Florida was started in 2007 to address a perceived need for targeted professional development for newly hired teaching faculty. The program was developed under the assumption that

most faculty received little/no training for teaching as a part of their graduate programs. The program has evolved over time and in its' current form consists of 11 two-hour sessions conducted weekly during the fall semester. Topics include an overview of: how people learn; instructional design; assessment; active learning; distance education; creating a teaching philosophy; teaching in labs; the Scholarship of Teaching and Learning; and the promotion and tenure process at the University of Florida. Instructors include faculty from the Department of Agricultural Education and Communication, the CALS Dean's office, and invited experts from across CALS. Faculty participants are selected based on nominations solicited each fall. The target population is newly hired faculty with at least a 30% teaching appointment. The number of participants varied each year, with 9 on the low end and 31 on the high end.

Population

The population of interest for this study were Teacher's College participants from 2012 to 2016. This five-year period was selected for two reasons: (a) the curriculum and instructors for Teacher's College was consistent and (b) it provided a full year (2017) after completion of Teacher's College for the 2016 participants. This resulted in 105 participating faculty. Data were available from all participants.

Data Collection

Data for this study were the published course evaluation results for each participant made publicly available through the University of Florida's course evaluation system. The course evaluation system was developed by the University of Florida and approved by Faculty Senate. At the end of each semester, students were asked to provide an assessment of their instructor's teaching and course organization. Students were asked to respond to a series of items using a rating scale of: 1=Poor, 2= Below Average, 3=Average, 4=Above Average, 5=Excellent. A single item "Overall Assessment of Instructor" is designed to be an overall indicator of teaching performance and was used as the data point for our analysis. For comparisons, departmental and college means for undergraduate and graduate courses for each semester were also gathered. This study was deemed exempt from the University of Florida Institutional Review Board.

We do acknowledge a few limitations in this approach. First, student course evaluations are at-best a secondary indication of teaching behaviors. A more robust approach would have been classroom observations, but we did not have sufficient resources to watch 105 faculty teach. Second, the response rate for each class section was quite variable. We examined a total of 2,542 class sections and the response rate varied from 1% to 100%. Approximately 70% (1,774 sections) had at least a 50% response rate. Third, the design of this study does not allow for a true cause and effect determination of changes in instructor teaching behaviors. Observed differences could be caused by things other than participation in Teacher's College.

Data Analysis

For objectives 1 and 2, paired-sample t-tests were used to compare individual faculty member's evaluation scores for the same course before, during, and after Teacher's College. For objective 3, t-tests were again used to compare faculty member's mean evaluation scores with the mean evaluation scores from each faculty member's department for the same semesters. Evaluation data from faculty were compared to department evaluation means before, during, and after faculty attended Teacher's College. The actual number (*n*) included in each analysis depended on the objective and is explained in the results section below.

Results

Objective one sought to compare each participant's student evaluation scores before and after completion of Teacher's College. Fifty-three (n = 53) participants had taught classes and received student evaluation scores for semesters that included both prior and after Teacher's College and were included in this analysis. On average, participants' "Overall Assessment of Instructor" student evaluation scores were higher after completion. Participants received an average student evaluation of 4.30 (SD = .48) for semesters prior to the Teacher's College and an average student evaluation of 4.44 (SD = .30) for semesters following Teacher's College. There was a statistically significant difference between before and after their participation (t = 2.51, p = .015).

Table 1

Student Evaluation Score Comparisons for Before and After Teacher's College

Student Evaluations	*n*	Mean[1]	*SD*	*t*	*p*
Prior to Teacher's College	53	4.30	0.48	2.51	.015
After Teacher's College	53	4.44	0.30		

[1]Scale for evaluations: 1=Poor, 2= Below Average, 3=Average, 4=Above Average, 5=Excellent

Objective two sought to compare each participant's "Overall Assessment of Instructor" student evaluation scores during Teacher's College with their student evaluation scores prior to Teacher's College. Fifty-one participants (n = 51) had taught courses that included semesters both during and prior to their participation. The mean score for participants' student evaluation scores during Teacher's College was 4.51 (SD = .46) and prior was 4.33 (SD = .50). There was a statistically significant difference between participants' student evaluation scores (t = 3.63, p = .001).

Table 2

Student Evaluation Score Comparisons for Before and During Teacher's College

Student Evaluations	*n*	Mean[1]	*SD*	*t*	*p*
Prior to Teacher's College	51	4.33	0.50	3.63	.001
During Teacher's College	51	4.51	0.46		

[1]Scale for evaluations: 1=Poor, 2= Below Average, 3=Average, 4=Above Average, 5=Excellent

The third objective sought to compare all "Overall Assessment of Instructor" evaluation scores of participants before, during, and after Teacher's College with their department's evaluation averages. Each participant's course evaluation means were compared against the same semester and grade-level (graduate and undergraduate) evaluation means for their department. Departmental means were calculated by the University of Florida based on the undergraduate, graduate, and all courses listed as taught by the department for a given semester. The total number of courses taught in each department for each semester was not readily available. Student evaluation score means were collected from 271 courses (151 undergraduate courses and 120 graduate courses) taught by Teacher's College participants. Each course's instructor evaluation mean was compared to its department evaluation mean. Results indicate that on average prior to Teacher's College participants had very similar or slightly lower evaluation scores, but not significantly different, compared to department evaluation means (M = 4.45, SD = .57 compared with M = 4.47, SD = .19).

Table 3

Teacher's College Participants Compared to their Departments Before Participation

		Participant Evaluations		Department Evaluation Means			
Student Evaluations	*n*	Mean[1]	*SD*	Mean[1]	*SD*	*t*	*p*
Undergraduate Courses	151	4.44	0.53	4.43	0.19	.16	.873
Graduate Courses	120	4.47	0.62	4.52	0.18	.92	.359
All Courses	271	4.45	0.57	4.47	0.19	.56	.577

[1]Scale for evaluations: 1=Poor, 2= Below Average, 3=Average, 4=Above Average, 5=Excellent

One hundred and eight (n = 108) student evaluation means were examined for courses that were taught during the semester of participating in Teacher's College. Of the 108 course means examined, 66 were undergraduate level and 42 were graduate level. Course evaluation means for all courses were slightly higher, but not statistically different, for participants compared to their department mean averages (difference +.06). Participants had an average evaluation of 4.53 (SD = .48), compared to their same semester average department mean of 4.47 (SD = .26). For undergraduate level courses, participants had an average evaluation of 4.49 (SD = .48) compared to their same semester average department mean of 4.39 (SD = .29). A statistical difference was found for undergraduate level courses (t = 2.01, p = .049). No significant differences were found for graduate level courses.

Table 4

Teacher's College Participants Compared to their Departments During Participation

		Participant Evaluations		Department Evaluation Means			
Student Evaluations	*n*	Mean[1]	*SD*	Mean[1]	*SD*	*t*	*p*
Undergraduate Courses	66	4.49	0.48	4.39	0.29	2.01	.049
Graduate Courses	42	4.59	0.49	4.58	0.12	.02	.983
All Courses	108	4.53	0.48	4.47	0.26	1.46	.148

[1]Scale for evaluations: 1=Poor, 2= Below Average, 3=Average, 4=Above Average, 5=Excellent

One thousand one hundred and eleven (n = 1,111) "Overall Assessment of Instructor" student evaluation means were examined for courses that were taught after participants completed Teacher's College. Of the 1,111 course means examined, 676 were undergraduate level and 435 were graduate level. Student evaluation means of all courses were slightly higher for Teacher's College participants (M = 4.40, SD = .63), compared to department evaluation means of the same semesters (M = 4.37, SD = .28). Undergraduate course means for Teacher's College participants were slightly higher (M = 4.36, SD = .64) compared to department averages (M = 4.29, SD = .25). However, graduate level course means for Teacher's College participants were slightly lower (M = 4.46, SD = .61) compared to department averages (M = 4.50, SD = .27). Observed differences were statistically significant (t = 2.64, p = .008) for undergraduate courses, but not for graduate level courses or all courses combined.

Table 5

Teacher's College Participants Compared to their Departments After Participation

		Participant Evaluations		Department Evaluation Means			
Student Evaluations	*n*	Mean[1]	*SD*	Mean[1]	*SD*	*t*	*p*
Undergraduate Courses	676	4.36	0.64	4.29	0.25	2.64	.008
Graduate Courses	435	4.46	0.61	4.50	0.27	.99	.325
All Courses	1,111	4.40	0.63	4.37	0.28	1.45	.149

[1]Scale for evaluations: 1=Poor, 2= Below Average, 3=Average, 4=Above Average, 5=Excellent

Conclusions, Implications, and Recommendations

Several conclusions can be drawn about the Teacher's College program at the University of Florida, based on this group of participants. These conclusions should be reviewed with caution based on the limitations of the study noted earlier. First, participants had statistically higher student course evaluation scores *during* and *after* their participation. It is plausible participants were applying concepts learned in Teacher's College and making changes in the way they taught. This would be consistent with Desimone's (2009) assertion that professional development can lead to changes in instructor teaching behaviors. It is interesting to note that scores for courses taught during participation were even higher than scores from courses taught afterwards. Perhaps the immediacy of topics covered in Teacher's College caused faculty to make immediate changes in their teaching (Desimone, 2009), which would also support Schlager and Fusco's (2003) assertion about the importance of focusing a professional development program on practical applications. It would be interesting to conduct interviews or focus groups with participants to explore why this happens. Perhaps the weekly discussions on teaching and learning create an internal desire to focus on one's teaching.

Data also showed that participants' student course evaluation scores went from slightly below their department averages prior to Teacher's College to slightly higher than their departmental averages after Teacher's College. These changes were not large and there was some variability between graduate and undergraduate courses. Most notably, participants had statistically higher evaluation scores compared to same-semester department averages for undergraduate level courses both during and after completion of Teacher's College. Differences in course evaluations at the graduate level were insignificant. Perhaps, the design and content of Teacher's College is more geared toward teaching undergraduates, and therefore faculty successfully had higher evaluations by undergraduate students compared to department means. Adding a component about teaching graduate-level courses in Teacher College could be beneficial to improve teaching at the graduate level.

Although only a slight difference was observed, it is noteworthy that faculty went from being below their departmental means to above their departmental means, and in fact may show positive changes in faculty teaching behaviors (Desimone, 2009; Rockwell & Bennett, 2004). Teacher's College appears to provide an opportunity for faculty to develop new teaching skills (Myers & Roberts, 2004; Rocca, 2010).

Results of this study should be communicated with department chairs in CALS at the University of Florida to show the potential positive impacts of the program. This would provide stronger evidence to the benefits of participation and chairs could encourage even more participation for their faculty. Results could also inform the Dean of CALS about the value of the program and the importance of continued investment. Beyond the University of Florida, colleges of agriculture at other universities may wish to explore the feasibility of introducing a program like Teacher's College to

support their newly hired faculty. DiBenedetto and Whitwell (2019) found academic deans in colleges of agriculture are supportive of this idea.

Results should also be communicated with potential faculty participants. Bjelland and Sprecher (2014) found faculty perceived the time commitment as a barrier for participating in professional development. It is reasonable to assume CALS faculty at the University of Florida perceive the time commitment of participating in Teacher's College may be a detriment to their normal activities would benefit from knowing course evaluations tend to increase during the semester they are enrolled. It would be worthwhile to conduct interviews with past participants of Teacher's College to better understand how they feel their participation impacted other aspects of their jobs.

As noted previously, student course evaluations may not be the most robust measure of teaching performance. It is recommended to follow up with a manageable sample of Teacher's College participants to conduct classroom observations to assess actual teaching behaviors. This could be set up using a longitudinal design by observing before, during, immediately after, and then several years later. This could be further enhanced by conducting interviews or focus groups with students during each of the same time periods. Desimone (2009) claimed that as a result of engaging in effective professional development, teachers would have increased knowledge and skills, and their attitudes and beliefs toward teaching and learning would be changed, resulting in changes in their instructional practices. Evaluations could also assess the change in Teacher's College participants' knowledge, attitudes, and beliefs related to quality instructional behaviors and design after completion of Teacher's College compared to their initial knowledge, attitudes, and beliefs at the onset of their enrollment in Teacher's College. Core features of effective professional development (Desimone, 2009) include a content focus, active learning, coherence, duration, and collective participation. Other areas to expand the evaluation of Teacher's College might address the focus of the professional development within specific content areas, such as "animal sciences faculty" or "social sciences faculty," as well as the length of time over which Teacher's College is addressed. Considering that the final outcome of Desimone's (2009) model is improved student learning, it would be important to address the change in student learning over the course of the semester compared for those teachers completing Teacher's College versus those who did not.

The results also provide some feedback to the Teacher's College instructors. The biggest gains were made in student evaluation scores for undergraduate classes. Perhaps the current curricula for Teacher's College favors instructional techniques more appropriate for teaching undergraduate students. The instructors should consider changes to better address teaching graduate students. Overall, improving Teacher's College can have ripple effects. Ultimately, the goal of Teacher's College is improved instruction, which leads to better learning experiences for students and ultimately a better-prepared workforce in agriculture and natural resources. As noted by Barrick (1993), agricultural education faculty should explore how they might use their teaching and learning expertise to enhance teaching at their own universities.

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