Journal of Agricultural Education
Volume 47, Number 2, pp. 81-92
DOI: 10.5032/jae.2006.02081

A LONGITUDINAL EXAMINATION OF TEACHING EFFICACY OF AGRICULTURAL SCIENCE STUDENT TEACHERS

T. Grady Roberts, Assistant Professor
Julie F. Harlin, Assistant Professor
Texas A&M University
John C. Ricketts, Assistant Professor
University of Georgia

Abstract

The purpose of this study was to longitudinally examine the teaching efficacy of agricultural science student teachers throughout the student teaching experience. The population of interest for this study was all agricultural science student teachers at Texas A&M University. The accessible sample of the population was all student teachers during the Fall 2004 semester (n = 33). Using the Teachers' Sense of Efficacy Scale instrument (Tschannen-Moran & Woolfolk Hoy, 2001), efficacy in student engagement, instructional strategies, and classroom management were measured: 1) the first day of the 4-week on-campus portion of the student teaching semester; 2) the last day of the 4-week on-campus block; 3) the middle of the 11-week student teaching experience; and 4) the final day of the student teaching experience. It was concluded that efficacy in student engagement and instructional strategies changed, while efficacy in classroom management did not. Overall teaching efficacy also changed. Student teachers had "Quite a Bit" of teaching efficacy at the beginning of the semester, which slightly increased four weeks later, then decreased to its lowest level at the middle of the 11-week student teaching experience, and then rebounded by the end of the experience.

Introduction

The number of agricultural science teaching positions has increased by over 12% in the last decade (Camp, Broyles, & Skelton, 2002). Since the low number of agricultural science teaching positions was observed in 1992, the total number of positions has increased by just over 134 per year (Camp et al.). If this trend continues, an additional 1608 new agricultural science teaching positions will exist in 2013, bringing the total positions to 12,797. This growth would represent 14% more agricultural science teaching positions in 2013 than in 2001. In comparison, the total number of elementary, middle, and high school teachers in the United States is projected to increase by five percent to 3.6 million in 2013 (National Center for Educational Statistics, 2003).

Complicating, or perhaps inhibiting, this growth is the de-facto shortage of agricultural science teachers (Camp et al., 2002). Currently, the shortage is attributed to the discrepancy between the total number of qualified graduates of agricultural science teacher preparatory programs and those who actually enter teaching (Camp et al.). In 2001, 20% of newly qualified graduates did not want to teach, additionally, another 20% wanted to teach but did not enter teaching (Camp et al.).

In examining this shortage, three solutions to this dilemma come to mind: 1) increase the number of students enrolled in agricultural science teacher preparatory programs; 2) increase the percentage of those currently enrolled who choose to enter teaching; or 3) find alternative sources for agricultural science teachers. The underlying focus of this study was on the second solution, increasing the percentage of students currently enrolled in agricultural science teacher preparatory programs who choose to enter teaching.

Given the plethora of available majors in most colleges of agriculture, including both hard and social science majors, it is reasonable to assume that students who entered agricultural science teacher preparatory programs considered teaching as a possible career choice. Further, once enrolled, students that eliminated teaching as a career choice likely had the option of changing to another major. So why do students who choose to enter and remain in a preservice agricultural science teacher program not enter teaching?

Perhaps part of the answer is contributed by the actual structure of the program – namely the sequencing of experiential components. For example, the student teaching experience often occurs during the last semester of the program. The importance of student teaching has been documented by many researchers (Borne & Moss, 1990; Deeds, Flowers, & Arrington, 1991; Edwards & Briers, 2001; Harlin, Edwards, & Briers, 2002; Norris, Larke, & Briers, 1990). Anecdotal evidence suggests that the experiences had during student teaching affect the student teacher's decision to enter teaching. However, beyond our own observations of a few individual student teachers during the student teaching experience, what do we know about what they are experiencing during this important part of their professional preparation? More importantly, what do we know about their own beliefs of their abilities to be successful agricultural science teachers?

Theoretical Framework

This study was framed using two complimentary theories: self-efficacy (Bandura, 1997) and experiential learning (Kolb, 1984). Self-efficacy is a person's beliefs about their abilities to be successful in a given situation. This study focused on a more specific form of self-efficacy, teaching efficacy, which is a teacher's belief about their capabilities to produce the desired outcome of student learning (Tschannen-Moran & Woolfolk Hoy, 2001). Theory asserts that teaching efficacy affects behavior (Tschannen-Moran & Woolfolk Hoy), and that outcomes as a result of those behaviors affect teaching efficacy (Pajares, 1996). Teaching efficacy is often further delineated into sub-constructs. For example, Gibson and Dembo (1984) posited that teaching efficacy is determined by a dichotomous measure of 1) the intrinsic attitude of 'I can' called personal teaching efficacy and 2) the external concept that 'I can't' called general teaching efficacy. While Tschannen-Moran and Woolfolk Hoy postulated that overall teaching efficacy is determined by examining efficacy in student engagement, instructional strategies, and classroom management. Student engagement refers to the ability to persuade students to want to learn, instructional strategies are those behaviors associated with the mechanics of teaching, and classroom management skills are associated with maintaining an orderly learning environment.

Experiential learning theory asserts that learning is a cyclical process that occurs as learners interact with their environment, reflect on those experiences, develop generalizations, and then test those generalizations through further experiences (Kolb, 1984; Roberts, 2006). The student teaching experience is a paradigmatic example of the application of experiential learning theory. Student teachers face countless concrete experiences based on complex interactions with the cooperating teacher, university supervisor, and the students they teach (Roberts, 2005) (Figure 1).

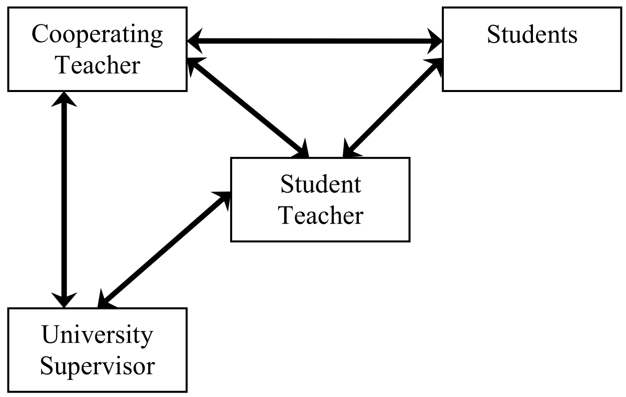

Figure 1. Model of Interactions in the Student Teaching Experience (Roberts, 2005)

Conceptually, combining teaching efficacy theory and experiential learning theory, produced the model that guided this inquiry (Figure 2). Preservice teachers enter the student teaching semester with a certain level of teaching efficacy (beliefs), based on their previous coursework, observations, and teaching experiences. Based on interactions with their cooperating teacher, university supervisor, and the students they teach, student teachers transform their experiences through reflection, develop generalizations and subsequently test those generalizations through further experiences, which in turn, affect their teaching efficacy. Thus theoretically, teaching efficacy is not a static phenomenon, but a dynamic measure affected by the student teaching experience, which is affected by teaching efficacy. This presumption is consistent with Harlin et al.'s (2002) explanation of the relationship between belief and behavior, as well as Knobloch's (2001) assertion that the development of teaching efficacy is cyclical.

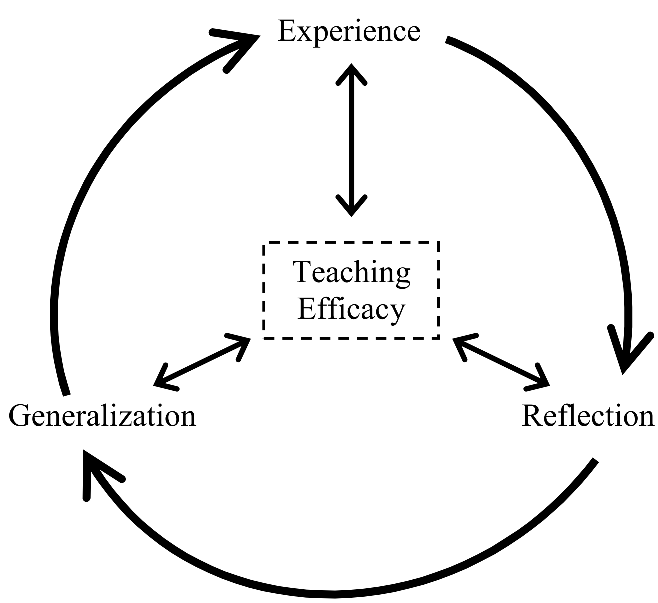

Figure 2. Conceptual Model to Study Teaching Efficacy During the Student Teaching Semester

Previous research has examined teaching efficacy in a variety of contexts. However, limited knowledge exists about teaching efficacy of preservice agricultural science teachers, largely due to the paucity of research in this area. Existing research has largely been conducted by just a few researchers, in only a few states. Although limited, their findings are helpful in establishing this knowledge base within agricultural education.

Similarities exist in teaching efficacy of preservice and beginning agricultural science teachers. Rodriguez (1997) compared personal and general teaching efficacy of preservice and beginning agricultural science teachers in Ohio. No differences were found between the groups of teachers on either personal or general teaching efficacy. However, personal teaching efficacy was higher than general teaching efficacy.

Although not examined in preservice teachers, teaching efficacy of agricultural science teachers seems related to career commitment. Teachers with a greater commitment to their career maintain higher levels of teaching efficacy (Knobloch & Whittington, 2003). The researchers reported that over a ten week period that teachers with higher career commitment had relatively stable teaching efficacy (6.88 to 6.89, effect size = .05), while teachers with lower career commitment experienced lower teaching efficacy at the end of the ten week period (6.83 to 6.49, effect size = .55).

The effects of experiential activities (other than student teaching) in preservice programs are inconclusive. Knobloch (2001) examined changes in teaching efficacy as a result of early field experience and peer teaching (defined as practice teaching to their peers) of two groups of students at the Ohio State University. Results indicated no change in personal or general teaching efficacy after early field experience. Further, one group of students showed no change in personal or general teaching efficacy after peer teaching. However, the other group showed an increase in personal teaching efficacy and no change in general teaching efficacy.

In contrast to the above mentioned study, Knobloch (2002) found that teaching efficacy increased slightly from the beginning to the end of the student teaching experience from student teachers at the Ohio State University and the University of Illinois. Using the *Teachers' Sense of Efficacy Scale* instrument (Tschannen-Moran & Woolfolk Hoy, 2001), Knobloch reported overall teaching efficacy scores of Ohio State student teachers to be 6.92 before student teaching and 7.03 after. Similarly, scores at the University of Illinois were 6.89 before and 6.94 after. Small effect sizes were reported for differences between the universities on scores before and after student teaching (.03 and .12, respectively). Although this study sheds light on teaching efficacy at the beginning and end of the student teaching experience, it does not provide an understanding of what happens during the experience, which led Knobloch (2002) to recommend that longitudinal studies be conducted to examine teaching efficacy throughout teacher development.

Purpose

The purpose of this study was to longitudinally examine the teaching efficacy of agricultural science student teachers as they develop throughout the student teaching experience. Three objectives guided this inquiry.

1. Describe the sample of agricultural science student teachers.
2. Describe the teaching efficacy in student engagement, instructional strategies, classroom management, and overall teaching efficacy of student teachers throughout the student teaching semester.
3. Determine if teaching efficacy in student engagement, instructional strategies, classroom management, and overall teaching efficacy change during the student teaching semester.

Methodology

The population of interest for this study was all agricultural science student teachers at Texas A&M University. The accessible sample of the population was all student teachers during the Fall 2004 semester

(n = 33). Complete data were collected from 31 (94%) of the sample. Demographic data and anecdotal evidence confirmed that this sample was representative of the population. Therefore, this research team's position is congruent with that of Gall, Gall, and Borg (2003, p. 176), who asserted that, "inferential statistics can be used with data collected from a convenience sample if the sample is carefully conceptualized to represent a particular population." Readers are encouraged to examine the description of the sample and make their own determination about generalizing the findings to other populations of agricultural science student teachers.

This ex post facto study captured teaching efficacy using the *Teachers' Sense of Efficacy Scale* instrument (often referred to as the *Ohio State Teacher Efficacy Scale*), which measures efficacy in student engagement, instructional strategies, and classroom management (Tschannen-Moran & Woolfolk Hoy, 2001). The instrument consisted of 24 items (8 items per construct), accompanied with a 9 point rating scale, framed around the question, "How Much Can You Do?" (1 = Nothing, 3 = Very Little, 5 = Some Influence, 7 = Quite a Bit, and 9 = A Great Deal). Scores for each construct were calculated by using the grand mean for the items within the construct. Overall teaching efficacy scores were determined by the mean of all 24 items in the instrument. Tschannen-Moran and Woolfolk Hoy (2001) reported that content validity was established by an expert panel and consultation of existing literature. Construct validity was verified by factor analysis and comparison to existing instrumentation. Face validity was established through a series of pilot tests, which also established reliability, as a measure of internal consistency. Cronbach's α values for each construct were .87, .91, and .90, respectively.

Data were collected during the 15 week student teaching semester at Texas A&M University, which consisted of a four week block held on campus, where student teachers received instruction in and applied a variety of pedagogical and technical content. The remaining portion of the semester consisted of an eleven week student teaching experience. All student teachers met face-to-face at the mid-point and on the final day of the experience. Data were collected face-to-face by the researchers at four points: 1) the first day of the 4-week on-campus portion of the semester, referred to as the 'block'; 2) the last day of the block; 3) the mid-point conference; and 4) the final day of the experience (Figure 3).

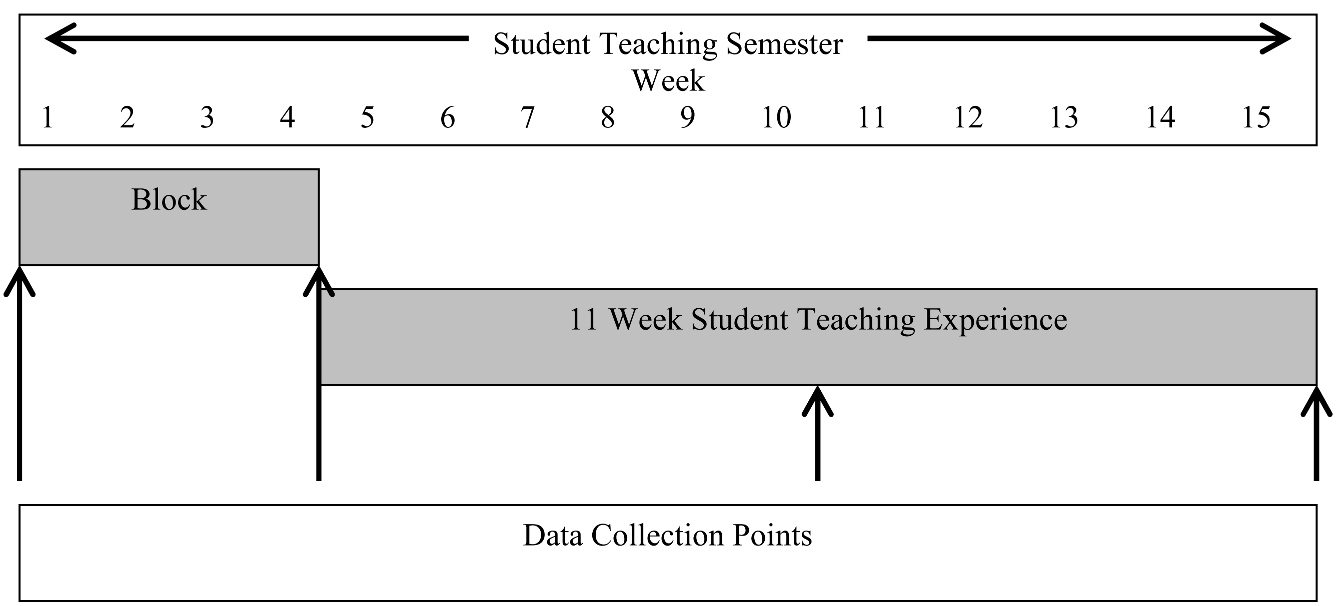

Figure 3. Data Collection Points

Results

Objective 1: Describe the sample of agricultural science student teachers

The average student teacher was just over 23 years old (*M* = 23.71, *SD* = 5.09). The majority of the sample (*n* = 29) ranged between 21 and 25 years old, however, two individuals were somewhat older (36 and 47 years old). Additionally, the majority of the sample where females (*n* = 18, 58%). Over 90% (*n* = 28) described themselves as being white, while two described themselves as Hispanic and one as either native Hawaiian or other pacific islander.

The greatest percentage (*n* = 22, 71%) of the student teachers were undergraduate students, six were postgraduates working on certification, and three were graduate students. The majority (*n* = 23, 74%) had been enrolled in high school agricultural science courses. When asked to describe their previous agricultural work experience, 19 (61%) indicated either part-time or full-time employment in agriculture. An additional ten (32%) indicated they occasionally helped others "feed cows" or had a backyard garden. Two indicated no agricultural experience.

Objective 2: Describe the teaching efficacy in student engagement, instructional strategies, classroom management, and overall teaching efficacy of student teachers throughout the student teaching semester

Student engagement scores on the first day of the block averaged 7.06 (*SD* = .98) and ranged from 5.13 to 8.75 (Table 1). Four weeks later, at the end of the block, average student engagement scores had increased to 7.31 (*SD* = .96) with a range from 5.38 to 9.00. Approximately five weeks later, during the middle of the school-based student teaching experience, average student engagement scores decreased to 6.67 (*SD* = 1.06) and ranged from 4.38 to 8.38. At the conclusion of the eleven-week student teaching experience, mean student engagement scores increased to 7.24 (*SD* = 1.05), which represented levels greater than the first day of the block (7.06), but not quite as high as the last day of the block (7.31). It is interesting to note that at this time, student engagement scores had the broadest range (4.25 to 9.00) and two individuals were greater than two standard deviations below the mean.

Table 1
Descriptives of Teaching Efficacy Student Engagement Scores

Time	Min	Max	*M*	*SD*
First Day of 4 Week Block	5.13	8.75	7.06	.98
Last Day of 4 Week Block	5.38	9.00	7.31	.96
Middle of 11 Week Experience	4.38	8.38	6.67	1.06
End of 11 Week Experience	4.25	9.00	7.24	1.05

Note. Scale: 1 = Nothing, 3 = Very Little, 5 = Some Influence, 7 = Quite A Bit, 9 = A Great Deal

Average instructional strategies scores on the first day of the block were 7.21 (*SD* = .91), with a lowest observed score of 5.25 and a highest of 9.00 (Table 2). Four weeks later, at the end of the block, the mean instructional strategies score had risen to 7.46 (*SD* = .98). Scores ranged from 5.63 to 9.00. Roughly 5 weeks later, during the middle of the student teaching experience, the average instructional strategies score fell to 7.01 (*SD* = 1.12) and the greatest variation was observed (4.80 to 8.80). When finished with the student teaching experience, the average preservice teacher's instructional strategies score had risen to 7.52 (*SD* = 1.06), the highest level observed. At this time, instructional strategies scores ranged from 5.25 to 9.00.

Table 2
Descriptives of Teaching Efficacy Instructional Strategies Scores

Time	Min	Max	*M*	*SD*
First Day of 4 Week Block	5.25	9.00	7.21	.91
Last Day of 4 Week Block	5.63	9.00	7.46	.98
Middle of 11 Week Experience	4.80	8.80	7.01	1.12
End of 11 Week Experience	5.25	9.00	7.52	1.06

Note. Scale: 1 = Nothing, 3 = Very Little, 5 = Some Influence, 7 = Quite A Bit, 9 = A Great Deal

On the first day of the block, mean classroom management scores were 7.37 (*SD* = .88) and varied from 5.63 to 8.88 (Table 3). At the conclusion of the block (4 weeks later), average classroom management scores increased to 7.46 (*SD* = .96) and ranged from 5.63 to 9.00). One preservice teacher fell greater than two standard deviations below the mean. During the middle of the student teaching experience, classroom management scores decreased to 7.05 (*SD* = 1.13), with a range from 5.38 to 9.00. At the end of the student teaching experience, mean classroom management scores increased to 7.40 (*SD* = 1.09), representing a net increase since the first day of the block, but not as high as the last day of the block. The greatest range in scores were observed at this time (5.00 to 9.00) and two preservice teachers were greater than two standard deviations below the mean.

Table 3
Descriptives of Teaching Efficacy Classroom Management Scores

Time	Min	Max	*M*	*SD*
First Day of 4 Week Block	5.63	8.88	7.37	.88
Last Day of 4 Week Block	5.63	9.00	7.46	.96
Middle of 11 Week Experience	5.38	9.00	7.05	1.13
End of 11 Week Experience	5.00	9.00	7.40	1.09

Note. Scale: 1 = Nothing, 3 = Very Little, 5 = Some Influence, 7 = Quite A Bit, 9 = A Great Deal

Overall teaching efficacy scores are presented in Table 4. For comparison purposes, results reported by Knobloch (2002) from preservice teachers at the Ohio State University and the University of Illinois are included. Overall teaching efficacy scores at the beginning of the block averaged 7.21 (*SD* = .85). The lowest observed score was 5.67 and the highest was 8.88. Four weeks later, a greater range was observed (5.58 to 9.00) and the mean teaching efficacy score was 7.41 (*SD* = .94).

At the midpoint of the 11-week student teaching experience, mean teaching efficacy scores had dropped to 6.91 (*SD* = 1.04), the lowest observed score dropped to 5.00, and the highest observed score also dropped to 8.63. At the end of the student teaching experience, average teaching efficacy scores had risen back to 7.39 (*SD* = 1.03), which was slightly lower than the scores observed at the end of the block. At this measurement point, the greatest range in scores was observed (5.04 to 9.00).

Table 4
Descriptives of Overall Teaching Efficacy Scores

	Current Study		Ohio State (Knobloch, 2002)		Illinois (Knobloch, 2002)	
Time	*M*	*SD*	*M*	*SD*	*M*	*SD*
First Day of 4 Week Block	7.21	.85				
Last Day of 4 Week Block	7.41	.94	6.92	1.00	6.89	.87
Middle of 11 Week Experience	6.91	1.04				
End of 11 Week Experience	7.39	1.03	7.03	.83	6.94	.91

Note. Scale: 1 = Nothing, 3 = Very Little, 5 = Some Influence, 7 = Quite A Bit, 9 = A Great Deal

Objective 3: Determine if teaching efficacy in student engagement, instructional strategies, classroom management, and overall teaching efficacy change during the student teaching semester

Repeated Measures Analysis of Variance was used to determine if a statistical difference in mean teaching efficacy scores existed over time. Sphericity assumptions were tested using Mauchley's W and met for all four tests, so adjustments to degrees of freedom were not made.

As reported in Table 5, results revealed that mean student engagement scores were statistically different ($F_{(3,\ 90)}$ = 9.08, p = .00). The effect size for the observed difference was small (η_p^2 = .23) (Cohen, 1988). Similarly, results indicated that instructional strategies scores also differed statistically ($F_{(3, 90)}$ = 4.56, p = .01). For this test, a small effect size was observed (η_p^2 = .13). In contrast, results indicated that classroom management scores did not differ significantly ($F_{(3,\ 90)}$ = 2.53, p = .06). However, examining the overall teaching efficacy scores revealed a statistical difference ($F_{(3,\ 90)}$ = 5.78, p = .00), which represented a small effect size (η_p^2 = .16).

Table 5
Repeated Measures Analysis of Variance of Teaching Efficacy Scores

	1st Day of Block	Last Day of Block	Middle of 11 Week Experience	End of 11 Week Experience			
Teaching Efficacy	*M*	*M*	*M*	*M*	*F*	*p*	η_p^2
Student Engagement	7.06	7.31	6.67	7.24	9.08	.00	.23
Instructional Strategies	7.21	7.46	7.01	7.52	4.56	.01	.13
Classroom Management	7.37	7.46	7.05	7.40	2.53	.06	.08
Overall Teaching Efficacy	7.21	7.41	6.91	7.39	5.78	.00	.16

Pairwise comparisons confirmed that teaching efficacy scores were statistically lower during the middle of the eleven week experience for student engagement, instructional strategies, and overall teaching efficacy (Table 6). Classroom management scores were lower, but not statistically significant.

Examining a visual representation of teaching efficacy scores reveals a general trend (Figure 4). Scores in all three constructs, along with overall teaching efficacy, increased during the four week block, then decreased by the mid point of the student teaching experience, and finally increase again by the conclusion of the experience. Please note that the scale in Figure 4 is expanded to increase readability and does not show the full range (1 to 9) of possible scores. Interestingly, teaching efficacy in student engagement scores were the lowest of the three constructs at all four measurement points.

Table 6
Pairwise Comparisons of Teaching Efficacy Scores during the Middle of the 11-week Field Experience with Other Observed Points

	Student Engagement		Instructional Strategies		Classroom Management		Overall Teaching Efficacy	
	Diff	*p*	*Diff*	*p*	*Diff*	*p*	*Diff*	*p*
1st Day of the Block	-.39	.04*	-.20	1.00	-.32	.31	-.30	.21
Last Day of the Block	-.65	.00*	-.45	.03*	-.41	.14	-.50	.00*
End of 11 Week Experience	-.57	.00*	-.51	.01*	-.35	.31	-.48	.01*

Note. Bonferroni adjustments used when determining p values.
*$p < .05$

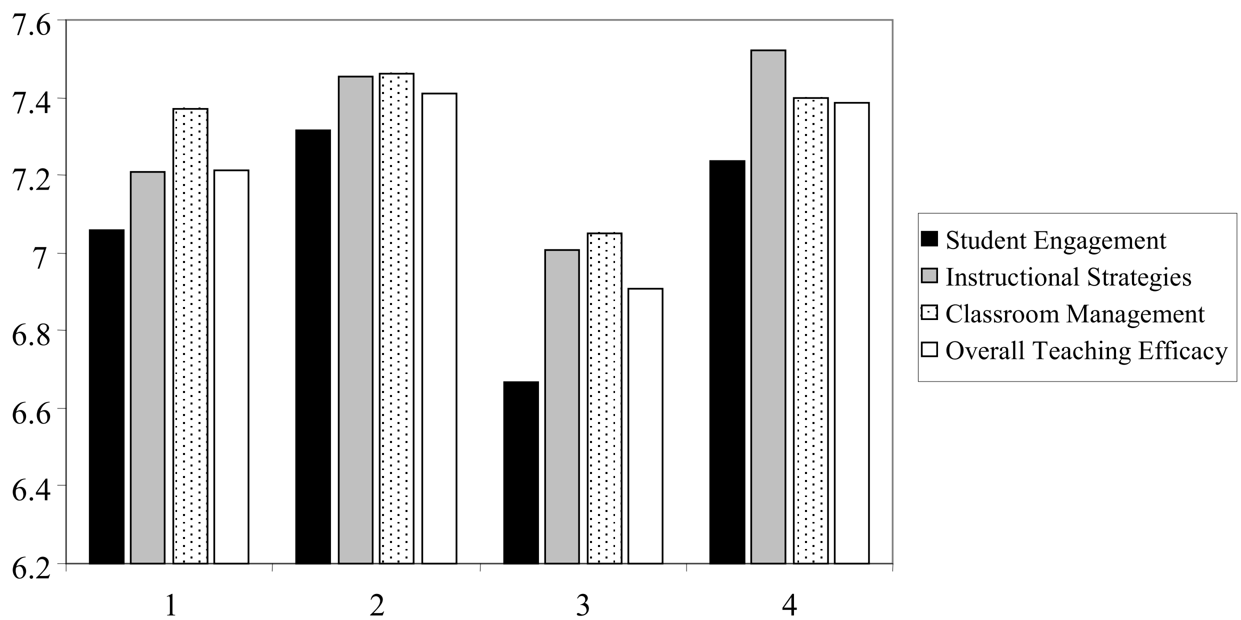

Figure 4. Student Engagement, Instructional Strategies, Classroom Management, and Overall Teaching Efficacy

Conclusions, Implications, and Recommendations

Based on the findings of this study, it was concluded that the average student teacher at Texas A&M University was a 23 year old white female. Additionally, she was an undergraduate student who had been enrolled in high school agricultural science classes and had at least part-time employment in the agriculture industry. This conclusion was consistent with those reported by Harlin et al. (2002).

Teaching efficacy in student engagement changed during the student teaching semester. Student teachers began the semester with "Quite a Bit" of teaching efficacy in student engagement, increased slightly in efficacy by the end of the block, decreased by the middle of the 11-week student teaching experience, and then increased again by the end of the experience. Interestingly, when examining the sub-constructs of teaching efficacy, student teachers were least efficacious in student engagement.

No previous research was found that examined the sub-constructs of teaching efficacy (student engagement, instructional strategies, and classroom management) of agricultural science teachers to compare the current results. However, given the complex nature of interacting and connecting with diverse youth, coupled with a novice teacher's attention to the mechanics of instruction and classroom management, it is reasonable to expect efficacy in student engagement to be slightly lower than the other constructs. The observed change in efficacy is consistent with anecdotal observations of the "ups and downs" faced by many student teachers.

Teaching efficacy in instructional strategies also changed during the student teaching experience. Student teachers began the semester with "Quite a Bit" of efficacy in instructional strategies, increased slightly by the end of the block, decreased slightly by the middle of the 11-week student teaching experience, and then increased to its highest level at the end of the experience. By the conclusion of the student teaching experience, student teachers were most efficacious in instructional strategies.

As mentioned above, previous research to compare these findings to was not found. However, given the peer teaching that occurred during the block, coupled with constructive feedback, it was reasonable to expect efficacy in instructional strategies to increase. Although not measured with the same instrument, this seems consistent with the increase in personal teaching efficacy after peer teaching observed by Knobloch (2001). Further, given the countless hours of implementing instructional strategies during the 11-week student teaching experience, one would expect student teachers to be more efficacious at the conclusion of the experience.

Teaching efficacy in classroom management did not change through the student teaching semester. Student teachers began the semester with "Quite a Bit" of efficacy and maintained those levels throughout. At the beginning of the semester, student teachers were most efficacious in classroom management, while by the end of the semester, efficacy in classroom management had fallen below efficacy in instructional strategies.

No previous research could be found to compare these results. However, the observed somewhat high levels of efficacy in classroom management seem to contradict apprehension displayed by many student teachers towards classroom management and discipline issues. Further, the lack of change in classroom management efficacy seems to disagree with anecdotal evidence that suggests much growth in classroom management throughout the student teaching experience. Perhaps the differences between what was observed and what would likely be expected can be explained by differences in efficacy and ability. Conceivably, student teachers began the semester with moderate abilities in classroom management, but had somewhat high efficacy levels. While by the end of semester, their abilities had increased to somewhat high levels, which now paralleled their somewhat high levels of efficacy.

Overall teaching efficacy changed during the student teaching semester. Student teachers had "Quite a Bit" of teaching efficacy at the beginning of the semester, which slightly increased by the end of the block, then decreased to its lowest level at the middle of the 11-week student teaching experience, and then rebounded by the end of the experience.

The overall trend of an increase from beginning to end of the experience is consistent with the findings of Knobloch (2002). However, examining the current data from the two data collection points used by Knobloch, a different set of conclusions could be made (see Table 4). Interestingly, student teachers in the current study had slightly higher overall efficacy scores at the last day of the block than they did at the very end of the experience. Whereas Knobloch (2002) reported slight increases for student teachers at the Ohio State University and the University of Illinois. It is, however, interesting to note that overall scores of the current study were higher than scores of student teachers at the other institutions.

The findings, conclusions, and discussion presented in this study produce several interesting questions that warrant further investigation. Will the observed changes in efficacy be seen in other populations of agricultural science student teachers? In other populations are student teachers most efficacious in instructional strategies and least efficacious in student engagement? Are there differences in abilities and efficacy in classroom management? Why is teaching efficacy in student engagement lower than the other areas? Why are student teachers in this study more efficacious than at other institutions? If teaching efficacy were measured continuously through the semester (perhaps daily or weekly) would similar results be observed? How does teaching efficacy relate to decision to enter the profession? How does teaching efficacy relate to novice teachers' decisions to remain in the profession?

References

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: W. H. Freeman.

Borne, C., & Moss, J. W. (1990). Satisfaction with agricultural education student teaching. *Journal of Agricultural Education, 31*(2), 29-34.

Camp, W. G., Broyles, T., & Skelton, N. S. (2002). *A national study of the supply and demand for teachers of agricultural education in 1999-2001.* Blacksburg, VA: Virginia Polytechnic Institute and State University.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Deeds, J. P., Flowers, J., & Arrington, L. A. (1991). Cooperating teacher attitudes and opinions regarding agricultural education student teaching expectations and policies. *Journal of Agricultural Education, 32*(2), 2-9.

Edwards, M. C., & Briers, G. E. (2001). Cooperating teachers' perceptions of important elements of the student teaching experience: A focus group approach with quantitative follow-up. *Journal of Agricultural Education, 42*(3), 30-41.

Gall, M. D., Gall, J. P., & Borg, W. R. (2003). *Educational research: An introduction* (7th ed.). Boston: Allyn and Bacon.

Gibson, S., & Dembo, M. (1984). Teacher efficacy: A construct validation. *Journal of Educational Psychology, 76*(4), 569-582.

Harlin, J. F., Edwards, M. C., & Briers, G. E. (2002). A comparison of student teachers' perceptions of important elements of the student teaching experience before and after an 11-week field experience. *Journal of Agricultural Education, 43*(3), 72-83.

Knobloch, N. A. (2001). The influence of peer teaching and early field experience on teaching efficacy beliefs of preservice educators in agriculture. *Proceedings of the 28th Annual National Agricultural Education Research Conference, 28*, 119-131.

Knobloch, N. A. (2002). A comparison of personal factors, environmental factors, and student teachers' efficacy between two agricultural education student teacher programs. *Proceedings of the 29th National Agricultural Education Research Conference*.

Knobloch, N. A., & Whittington, M. S. (2003). Differences in teacher efficacy related to career commitment of novice agriculture teachers. *Journal of Career and Technical Education, 20*(1), 87-98.

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development.* Upper Saddle River, NJ: Prentice Hall.

National Center for Educational Statistics. (2003). *Projections of education statistics to 2013*. Washington DC: Author.

Norris, R. J., Larke, A., Jr., & Briers, G. E. (1990). Selection of student teaching centers and cooperating teachers in agriculture and expectations of teacher educators regarding these components of a teacher education program: A national study. *Journal of Agricultural Education, 31*(1), 58-63.

Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research, 66*, 543-578.

Roberts, T. G. (2005). Developing a model of cooperating teacher effectiveness. *Proceedings of the 2005 American Association for Agricultural Education National Research Conference, 32*, 297-309.

Roberts, T. G. (2006). A philosophical examination of experiential learning theory for agricultural educators. *Journal of Agricultural Education*, *47*(1), 17-29.

Rodriguez, J. F. (1997). Self-efficacy of preservice and beginning agricultural education teachers in Ohio. *Dissertation Abstracts International, 58*(7), 2496.

Tschannen-Moran, M., & Woolfolk Hoy, A. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education, 17*, 783-805.

T. GRADY ROBERTS is an Assistant Professor in the Department of Agricultural Education at Texas A&M University, MS 2116, 104A Scoates Hall, College Station, TX 77843-2116. E-mail: groberts@tamu.edu.

JULIE F. HARLIN is an Assistant Professor in the Department of Agricultural Education at Texas A&M University, MS 2116, 104B Scoates Hall, College Station, TX 77843-2116. E-mail: j-harlin@tamu.edu.

JOHN C. RICKETTS is an Assistant Professor in the Department of Agricultural Leadership, Education, and Communication at the University of Georgia, 110 Four Towers, Athens, GA 30602-4355. E-mail: jcr@uga.edu.