

Exploring Relationships Between Teaching Efficacy and Student Teacher – Cooperating Teacher Relationships

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Teaching efficacy beliefs of agricultural science student teachers, and their relationship with their cooperating teachers during field experiences, are variables that may affect the number of student teachers entering the profession. The purpose of this study was to examine the effects implementing structured communication between student teachers and cooperating teachers on student teachers' self-perceived teaching efficacy, and the relationship between the student teacher and cooperating teacher. This study employed a quasi-experimental design with a non-random sample in a multiple time-series design. The average respondent in this study was a 23 year old white undergraduate female placed at a multiple placement cooperating center. Based on data from this study, it was concluded that structured communication did not affect teaching efficacy or the relationship between the student teacher and cooperating teacher.

Keywords: teaching efficacy, relationships, communication, student teacher, cooperating teacher

Introduction

There are not enough qualified candidates seeking employment as agricultural science teachers to fill all the vacancies (Kantrovich, 2007). On the surface, this may seem like a critical issue that the profession must immediately address. Yet, aside from a period of time from the mid 1980s to the early 1990s when overall position numbers declined, this defacto teacher shortage has existed for some time (Camp, Broyles, & Skelton, 2002), and in effect has become the status quo for the profession. In fact, internal and external observers of the profession acknowledged this shortage as early as 1988 (National Council for Agricultural Education, 2000; National Research Council, 1988). Although this situation has existed for at least 20 years, and perhaps as many as 40 (Kantrovich, 2007), the general trends since the early 1990s have been an

increase in both the number of agricultural science teaching positions and the number of newly qualified agricultural science teachers (Kantrovich, 2007). Thus, despite concerns raised over the last 20 years about teacher supply, the profession has grown. It would appear the impact of a teacher shortage may not have been as critical as first thought. However, two emerging factors could create a tremendous shortage of qualified teachers that would likely have an impact: (a) a large portion of current teachers nearing retirement eligibility (Kantrovich, 2007) and (b) a national initiative to increase the number of agricultural science programs, and thus the number of agricultural science teaching positions as described by the 10 x 15 initiative (Team Ag Ed, 2007). The projected number of new teachers needed between now and 2015 is unknown, but should these two factors proceed as expected, it is

reasonable to assume that the shortage of teachers would be greatly increased.

So where will these new teachers come from? Some reasonable strategies are: (a) reduce the number of teachers who leave the profession for reasons other than retirement, (b) increase the number of students who enter (and complete) preservice teacher education programs, or (c) increase the percentage of newly qualified teaching candidates who elect to seek an agricultural science teaching position. In reality, improvement in all three aforementioned solutions would likely be needed. The research presented in this article address the last solution, increasing the percentage of newly qualified teaching candidates who elect to seek agricultural science teaching positions. It is hypothesized that the student teaching experience is a contributing factor in a candidate's decision to enter teaching. Thus, interventions that improve the experience would increase the number of candidates that elect to enter the profession.

Theoretical/Conceptual Framework

This study was conducted under the premise that learners actively construct meaning from their experiences (Fosnot, 1996; Schuman, 1996). More specifically, those experiences do not occur in isolation, but rather in complex social contexts rich in interactions (Doolittle & Camp, 1999). Termed social constructivism, this theory recognizes that learning occurs as a result of dynamic interplay between learners, their environment, and other learners. This study was further defined with Bandura's (1986, 1997) social cognitive theory and his concept of triadic reciprocity. Bandura posited that personal factors (cognitive, affective, and biological), behavior, and the environment are all related which influence each other. Accordingly, a change in one would cause changes in the others. Of importance to this study was the personal factor of self efficacy, or more specifically teaching efficacy, or "the teacher's

belief in his or her capability to organize and execute action required to successfully accomplishing a specific teaching task in particular context" (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998, p. 22). An additional personal factor of interest in this study was the student teacher's attitude or belief about the quality of the relationship with their cooperating teacher.

Recognizing the importance of social interactions, or exchange of information, the Source-Message-Channel-Receiver (SMCR) communications model (Berlo, 1960) was also used to frame this study. In this model, the *source* is where communication originates; the *message* is the content communicated; the *channel* is the medium used to communicate; and the *receiver* is the intended target (Guth & Marsh, 2006). The model also includes *feedback*, or the receiver's reaction to the message. Additionally, the model acknowledges *noise*, which is anything that inhibits any part of the SMCR process from occurring. In this study, the cooperating teacher was primarily the source and the student teacher was the receiver for communications related to assessment of the student teacher's performance. Thus, for a student teacher, the cooperating teacher would be an environmental factor that may influence behavior and personal factors (teaching efficacy and perceptions of relationship).

Based on the above-mentioned theories and models, a conceptual model was developed (Edgar, 2007) which postulates variables associated with teaching efficacy of student teachers during student teaching field experiences can be evaluated (Figure 1). This model incorporates Tschannen-Moran's et al. (1998) model of efficacy combined with Berlo's (1960) SMCR model of communication to effectuate a model that encompasses the effects of communication within the social context of efficacy postulated by Bandura (1997). A major component of the model is the teaching context, as outlined by Dunkin and Biddle (1974), involving the variables of presage and context.

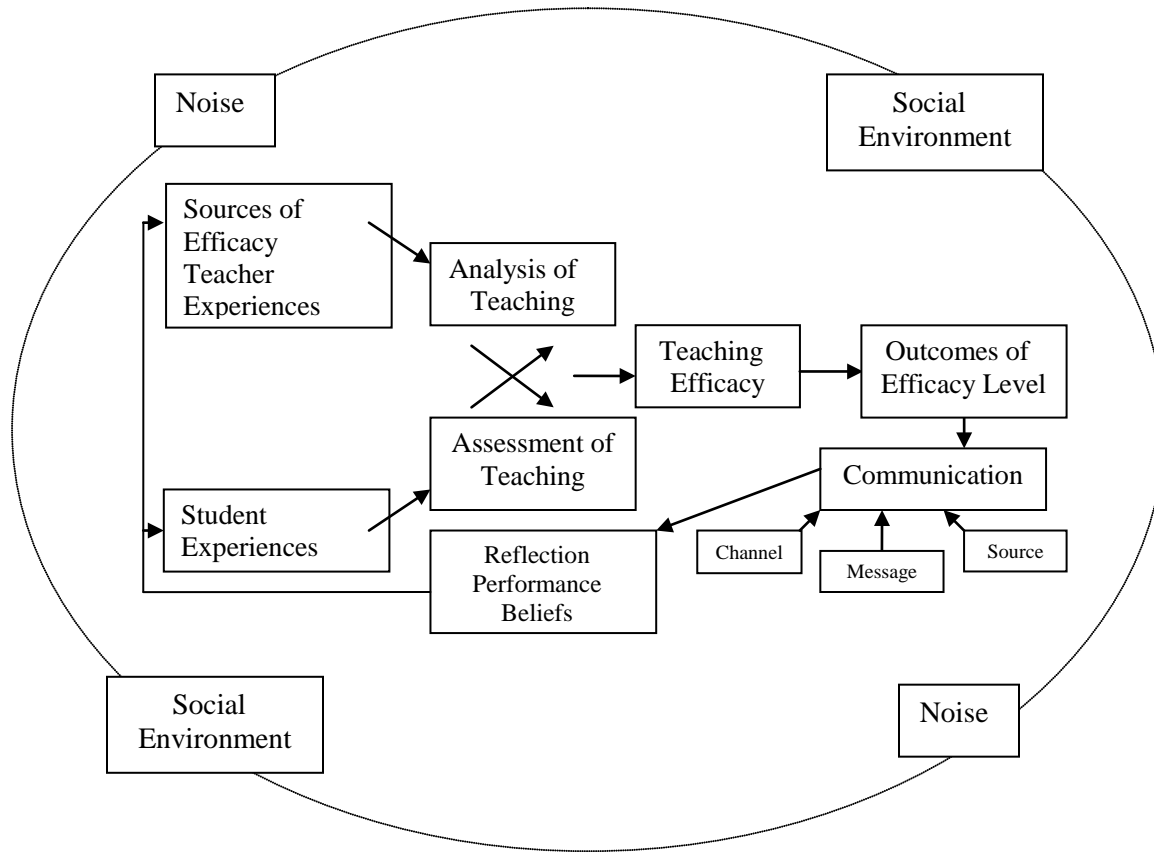


Figure 1. Conceptual model of teaching efficacy affected through structured communication.

Teaching efficacy of student teachers has been examined by numerous researchers. Roberts, Harlin, and Ricketts (2006) conducted a longitudinal examination of teaching efficacy of agricultural education student teachers. This study investigated the sub-constructs (student engagement, instructional strategies, and classroom management) and overall teaching efficacy of preservice teachers. Preservice teachers in the study had “quite a bit” of teaching efficacy at the beginning of the semester. By the middle of the 11-week field experience efficacy levels had dropped, but the levels increased at the conclusion of the experience. In a follow-up study, Harlin, Roberts, Briers, Mowen, and Edgar (2007) reported similar changes in teaching efficacy. This trend, of increasing from first measurement to the last, is consistent with earlier work conducted by Knobloch (2002). Unfortunately, none of these studies examined the effects of communication on teaching efficacy, nor if there

was an interaction between teaching efficacy and the relationship between student teachers and cooperating teachers.

Other research has examined the relationship between the student teacher and cooperating teacher. Kasperbauer and Roberts (2007a) found that student teachers’ perceptions of student teacher and cooperating teacher relationship were not predictive of a decision to teach. It was further concluded that the student teacher and cooperating teacher relationship is important to student teachers involved in field experiences (Kasperbauer & Roberts, 2007a). This finding implies that student teachers value their relationships with cooperating teachers. Another study conducted by Kasperbauer and Roberts (2007b) evaluated changes in student teacher perceptions of the cooperating teacher and student teacher relationship during field experiences. This study concluded that student teachers’ perceptions of their relationship with cooperating teachers decreased throughout the

student teaching experience (Kasperbauer & Roberts, 2007b). These studies did not examine the effect communication had on the relationship between student teachers and cooperating teachers.

Purpose

The purpose of this study was to examine the effects of implementing structured communication on teaching efficacy and on the relationship between the student teacher and cooperating teacher during the student teaching experience. Based on this review of the literature, the following hypotheses were developed to be tested *a priori* at the .05 level.

Ho₁: There is no significant relationship between teaching efficacy and student

teacher’s perception of their relationship with cooperating teacher.

Ho₂: There is no difference in teaching efficacy and student teacher’s perception of their relationship with the cooperating teacher when cooperating teachers use a communication tool to structure their communications with student teachers.

Methodology

To address the purpose of this study and to test null hypotheses, a quasi-experimental design with a non-random sample in a multiple time-series design was employed (#14) (Campbell & Stanley, 1963). The design of this study was employed as follows:

Fall 2006 student teachers (n= 20)	O ₁	X ₁	O ₂	X ₁	O ₃
Fall 2005 student teachers (n= 27)	O ₁		O ₂		O ₃
Fall 2004 student teachers (n= 35)	O ₁		O ₂		O ₃

Figure 2. Quasi-experimental design

Threats to internal validity were addressed in the design of this study (multiple time-series design #14) (Campbell & Stanley, 1963). Tuckman (1999) stated “internal validity depends, in part, on the condition that the effect attributed to a treatment is a function of the treatment itself, rather than a function of some other unmeasured and uncontrolled differences between treated and untreated persons” (pp. 9–10).

The first measurement of teaching efficacy (O₁) was taken at the end of the first four weeks of the semester participants were involved in field experiences (student teaching). The second measurement of teaching efficacy (O₂) was taken during the fifth week of the 11-week field experience during the mid-semester conference between student teachers and teacher education faculty. The third (O₃) and final teaching efficacy measurement was taken at the end of the 11-week field experience. The intervention, or experimental variable (X₁), was introduced

during the full field experience of the fall 2006 teacher education student teaching semester.

A purposive sample was chosen to represent student teachers engaged in field experiences at Texas A&M University. The purposive sample included three semesters of enrolled preservice students during student teaching. Control groups consisted of student teachers enrolled in student teaching for fall semesters of 2004 (n = 35) and 2005 (n = 27). Treatment group consisted of student teachers enrolled in student teaching during the fall semester of 2006 (n = 20). Therefore, the researcher makes the assumption that the results from this study can be inferred and inferential statistics were employed (Oliver & Hinkle, 1982). Subsequently, judgments based on the findings from this study should be made with caution when generalizing to other groups of student teachers in agricultural education (Oliver & Hinkle, 1982).

The communication form employed was an adaptation of a form used by the Department of Education at Florida State University. The

communication form contains 12 sections of accomplished practices of the student teacher. Accomplished practices included: assessment, communication, continuous improvement, critical thinking, diversity, ethics, human development and learning, subject matter knowledge, learning environment, planning, role of the teacher, and technology. The cooperating teacher rated the student teacher based on their observation of prescribed practices each week. Comments and recommendations fields were available for each accomplished practice to further describe observations of the student teacher. Directions on using the communication tool and the submission process were outlined in both a short and long form provided to cooperating teachers in the study.

Communication form data were collected during the fall 2006 semester only. Data were used to validate the implementation of the treatment in the study (fall 2006, $n = 20$). Data were collected each of the 11 weeks of the field experience using the communication form available to cooperating teachers via the Internet or through print. The researcher contacted each cooperating center, via land line to ascertain the best method to receive and send data on structured communication. The tailored design method (Dillman, 2000) was employed to collect data pertaining to implementation of the communication form. Follow-up reminders were sent to non-respondents each Tuesday after the week the communication form was due. Follow up contacts were made via phone the following Friday.

Tschannen-Moran and Woolfolk Hoy (2001) developed the Teacher's Sense of Efficacy Scale, often referred to as the Ohio State Teacher Efficacy Scale (OSTES). The OSTES consists of 24 items comprising three constructs, each of which contains eight items. The three constructs are quantified through scales named engagement, instruction, and classroom management. The reliability coefficient (Cronbach's Alpha) for each is as follows: Engagement = .87, Instruction = .91, and Classroom Management = .90. Subscale and total scores using the OSTES can be used to assess teacher efficacy (Tschannen-Moran, 2000). Content validity of the OSTES was established through an expert panel and consulting existing literature (Tschannen-Moran & Woolfolk Hoy, 2001). Construct validity was

established through factor analysis and comparison to existing instrumentation. Face validity was established through a series of pilot tests.

A researcher-developed instrument (Roberts, Harlin, & Ricketts, 2006; Kasperbauer & Roberts, 2007b) was utilized to collect background and demographic data to coincide with the teaching efficacy instrument used in this study. The instrument consisted of seven items: gender, age (years), ethnicity, placement at cooperating center, semesters of high school agricultural education courses completed, academic standing, and agriculture work experience. Face and content validity were established through an expert panel in the Department of Agricultural Leadership, Education, and Communications at Texas A&M University. Dillman (2000) stated that questions having ready-made answers, such as demographic questions gain more accurate responses.

Data were analyzed using SPSS® 15.0 for Windows™ statistical package. Demographics and background characteristics were assessed using descriptive statistics – means, frequencies, and standard deviations. MANOVA and discriminant analysis procedures were utilized to further delineate the findings of this study. Discriminant analysis can determine the most parsimonious way to distinguish among groups and further explains the variance in the dependent variables by the independent variable (Garson, 2008). Data were analyzed for normalcy and an outlier was identified when descriptive statistics were employed. Further investigation revealed, through box plot analyses, the specific case contained in the treatment group ($n = 20$). This case was removed from further data analysis ($N = 81$, treatment group ($n = 19$).

Findings

The average respondent in this study was a 23 year old white undergraduate female placed at a multiple placement cooperating center. Data showed similar make-up of control and treatment groups in gender, age, and placement. The treatment group was composed of all white respondents but the control group included two Hispanic and one Hawaiian or other Pacific Islander. Differences in demographics were

noted in agricultural sciences taken in secondary schools. A greater percentage of the control group respondents had never been enrolled in secondary agricultural science classes.

Null hypothesis one stated there is no significant relationship between teaching efficacy and student teacher's perception of their relationship with cooperating teacher. This hypothesis was tested using Pearson product-moment correlations and described based on relationships found (Davis, 1971). Correlational data were examined for the control group ($n=62$) and treatment group ($n=19$).

Significant differences found among variables for the control group ($n=62$) are

described ($p < .05$) in Table 1. There was a significant low positive relationship found in the control group based on the relationship level exhibited by the cooperating teacher as described by the student teacher and the student teacher's efficacy level as measured by the Teachers Sense of Efficacy scale including all measurement (engagement, instruction, and management) constructs ($r = .27$) and a negative moderate correlation with age ($r = -.33$). Semesters of secondary agricultural science taken during secondary education was also positively correlated to agricultural work experience showing a moderate positive correlation ($r = .34$).

Table 1
Correlations of Variables in Control Group

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Relationship Level Exhibited (1)	–	.27*	-.33*	.23	-.08	.01
Teaching Efficacy (2)		–	-.06	-.19	-.06	-.20
Age (3)			–	-.17	.21	.23
Semesters of Secondary Ag Sc (4)				–	.20	.34*
Academic Standing (5)					–	.07
Agriculture Work Experience (6)						–

Note. * denotes that p significant $< .05$

A significant difference was found among variables for the treatment group ($n = 19$) using Pearson Product correlations (see Table 2). A negative moderate correlation (Davis, 1971) was found in the treatment group in the relationship

level exhibited by the cooperating teacher as described by the student teacher and age ($r = -.48$). Furthermore, a moderate correlation ($r = .38$) existed between relationship level exhibited and teaching efficacy.

Table 2
Correlations of Variables in Treatment Group

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Relationship Level Exhibited (1)	–	.38*	-.48*	.27	.04	-.43
Teaching Efficacy (2)		–	-.04	-.23	.03	.12
Age (3)			–	-.25	.34	.42
Semesters of Secondary Ag Sc (4)				–	-.05	-.33
Academic Standing (5)					–	.21
Agriculture Work Experience (6)						–

Note. * denotes that p significant $< .05$

Null hypothesis one stated there is no significant relationship between teaching efficacy and student teacher's perception of their relationship with cooperating teacher. As a result of the findings, the null hypothesis is rejected.

Null hypothesis two stated there is no difference in teaching efficacy and student

teacher's perception of their relationship with cooperating teacher of student teachers when cooperating teachers use a communication tool. This hypothesis was tested using the MANOVA procedure. Teaching efficacy and student teacher's perception of the relationship with the cooperating teacher were the dependent

variables of study. The independent variable was the use of a communication tool by the cooperating teachers. The Box's M test was not significant ($p = .73$). Levene's test was not significant ($p = .64$ and $p = .23$). Table 3 shows the effects of the independent variable (structured communication) upon the dependent variables (teaching efficacy (TE) and

relationship level (RL) measured at the beginning and the end of the data collection period was shown with Pillai's Trace significance value of .06 with an $F = 2.881$. Effect size (η^2) was calculated at .07 and power at .55. The overall model was not significant. The null hypothesis was held tenable and retained.

Table 3
MANOVA Analysis of Variables of Study

Source		<i>df</i>	SS	MS	<i>F</i>	<i>p</i>	η^2	Power
TE	TE	1	5.39	5.39	9.89	.00	.12	.87
	RL	1	.03	.03	.03	.86	.01	.05
RL	TE	1	1.55	1.55	2.84	.10	.04	.38
	RL	1	9.93	9.93	10.60	.00	.13	.90
Treatment	TE	1	2.86	2.86	5.25	.03	.07	.62
	RL	1	.05	.05	.06	.81	.01	.06
Error	TE	73	39.79	.55				
	RL	73	68.43	.94				
Total	TE	77	4134.44					
	RL	77	1230.33					

To further investigate the findings of this study, discriminant analysis was implemented to further describe the population of study regarding relationships and teaching efficacy. Discriminant analyses were conducted on variables of study at the beginning and ending data points. Wilks' Lambda showed significance at the final measure of teaching efficacy ($p = .015$) but no significance was seen regarding perceptions of relationships. Furthermore, log determinants (-1.20, -.40) and Box's M tests showed no significant findings ($F = 2.75, 2.68$). Eigenvalues showed small canonical discriminant functions (.053 and .083) with all of the variance explained and significance seen only at the last measure ($p = .05$).

Conclusions, Discussion, and Implications

The capstone experience of student teaching is a critical period for future professionals in agricultural education. Insight into this varied and highly differentiated field experience can provide valuable knowledge to determine best practices for teacher education programs.

Additionally, emerging factors of retirement eligibility (Kantrovich, 2007) and possible increases in the number of agricultural science programs (Team AgEd, 2007) suggest the need to engage future agricultural science teachers in positive field experiences is increasingly important.

Positive correlations were found in all groups studied between the variables of relationship level exhibited and teaching efficacy and age. Additional positive correlations were found between semesters of secondary agricultural science classes taken and agricultural work experience. Findings suggest perceived teaching efficacy and age are related to the relationship between the student teacher and cooperating teacher. The held belief of the student teacher about their teaching efficacy was shown to be positively correlated with their relationship towards the cooperating teacher. Additionally, as the age of the student teacher increased, their relationship with the cooperating teacher also increased. Data showed no impact of implementing structured communication on the relationship level held or teaching efficacy of

student teachers. It is interesting to note that academic standing (undergraduate or graduate level) was not related to the student teacher's perception of the relationship level held or teaching efficacy.

Further explanation was sought through discriminant analysis of the variables of study. No significant effects were seen through data analysis in relation to perception of relationships held but significance was displayed on teaching efficacy. The effect of structured communication on perceived belief of teaching efficacy should be further studied to determine its influence during this critical time of development by student teachers.

Although implementation of structured communication was not seen to significantly impact teaching efficacy and perceptions of relationships between the student teacher and cooperating teacher, a relationship existed between these two variables without the effect of the treatment. Correlations between the two variables of study in the treatment ($r = .27$) and control ($r = .38$) group showed significance. It was further revealed through MANOVA analysis that teaching efficacy was significant ($F = 9.89$, $p = .00$), but implementation of structured communication had no significant effect on teaching efficacy and perceptions of

relationships between the student teacher and cooperating teacher.

In order to better understand the relationship and efficacy levels held by student teachers about the variables of study, additional research should be conducted. Variables outlined in this study with positive correlations (age, teaching efficacy and secondary agricultural classes taken) should be further studied to understand their effects on the relationship between the cooperating teacher and the student teacher during field experiences. Additional understanding of the effects of these variables on teaching efficacy and the relationship between the student teacher and cooperating teacher could help inform placement of student teachers in field experiences. Further research addressing the effect of structured communication during field experiences at other universities involved in teacher education should be conducted. It is also recommended that preservice students be educated about effective communication to benefit more from the feedback received from supervisors during field experiences. Furthermore, cooperating teachers need in-service instruction on proper methods of providing feedback to student teachers during the field experience.

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