

TEACHER EFFICACY OF NOVICE TEACHERS IN AGRICULTURAL EDUCATION IN OHIO AT THE END OF THE SCHOOL YEAR

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Abstract

The purpose of the study was to describe teacher efficacy at the end of the school year in novice (first through third-year) teachers in agriculture in Ohio related to stage of development, summer activities, classroom variables, and their future plans in teaching. The study was survey research comprised of multiple one-shot case studies. Demographics were collected as part of a previous study, at the beginning of the school year. A mailed questionnaire generated a 74% response rate (N = 73). First, second, and third-year teachers were similarly efficacious at the end of the school year. Although stage of development is theoretically important (Richardson & Placier, 2001), there was not enough variability in teacher efficacy across the three stages of development to find a significant relationship. Forty-two teacher characteristic variables were correlated with the summed efficacy score and six were found to have significance. Out of these six variables, only two—the teachers' agreement with the statement that their student teaching experience was excellent, and the number of class preparations for which the teacher is responsible—were found to have significant relationships to teaching efficacy. When the teacher characteristics and demographics were reviewed, it was found that novice teachers in agriculture were efficacious at the end of the school year. It was also found that teachers in the study who had mentors felt that their mentors were competent and supportive, that teachers had generally chosen teaching as a long-term career goal, felt that their job matched their personal and family needs, and felt confident about teaching in agriculture.

Introduction

Nationally, there is a 75% reduction rate from the beginning of undergraduate teacher education through the third year of teaching (National Commission on Teaching and America's Future, 1996). Seventeen percent of new public school teachers leave the profession within the first three years of teaching (National Center for Educational Statistics, 1997). New teachers are often assigned the most difficult-to-teach students, given the greatest number of preparations and extracurricular duties, and given the most challenging teaching assignments (National Commission on Teaching and American's Future) and thus, leave the profession.

Novice teachers in Agricultural Education are no different than teachers in other disciplines. The first year of teaching is exceptionally challenging for most beginning agriculture teachers (Talbert, Camp, & Heath-Camp, 1994). In an early study by Wardlow, Barrick, and Warmbrod (1985), it was found that one out of every four agricultural education teachers in Ohio left the teaching profession after their first year. In multiple studies it was found that beginning agriculture teachers were stressed, dissatisfied (Joerger & Boettcher, 2000), quiet, reserved, and hesitant to act, had low self-esteem, low self-confidence (Mundt, 1991), and low morale (Henderson & Nieto, 1991).

Teachers have greater job satisfaction when they believe they can teach and make positive impacts (Hoy & Miskel, 2001). Evidence supports the idea that teachers who leave teaching have lower teacher efficacy (a belief that teachers have in their ability) scores than those who remain (Burley, Hall, Villeme, & Brockmeier, 1991; Glickman & Tamashiro, 1982).

Purpose and Objectives of the Study

The purpose of the study was to measure teacher efficacy at the end of the school year in novice teachers in agriculture in Ohio related to stage of development, gender, and teacher activities. The following research objectives guided the researcher.

1. Describe the difference in teacher efficacy between stages of development of first-year teachers, second-year teachers, and third-year teachers in agriculture in Ohio at the end of the school year.
2. Explain the variance in teacher efficacy at the end of the school year related to stage of development, gender, and teacher activities.
3. Describe the population of the study using selected teacher characteristics and perceptions.

Theoretical Framework

The framework of the study was grounded on Bandura's (1986, 1997) social cognitive and self-efficacy theories. When people self-reflect on their own beliefs about their capacity to perform certain tasks in specific situations, this is known as self-efficacy. According to Hoy (2001), self-efficacy is a type of belief that is a concept of teacher motivation.

Teacher efficacy is a type of self-efficacy and is the belief that a teacher has in his or her ability to organize and execute courses of action that are required to successfully accomplish a specific teaching task in a particular context (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998). A teacher with high efficacy is a teacher who

will persist when faced with setbacks and will exert more effort in order to overcome difficulties (Woolfolk, 2001). The three central components of the conceptual framework: personal factors, environmental factors, and behaviors, all interact in the beginning of the teaching career, and affect teacher efficacy (Knobloch, 2001).

This study was focused on the personal factors related to stage of development and environmental factors related to interactions with students and colleagues of novice agriculture teachers. The development of teachers, and their performance as teachers, influences and is influenced by the interaction of personal and environmental factors of the situations in which they teach (Knobloch, 2001).

Personal Factors

This study focuses on the level of development (years of teaching) when studying the influence of personal factors on efficacy (Bandura, 1986) in intact groups of first-year teachers, second-year teachers, and third-year teachers. This area relates to developmental theories of cognition, conceptualization, moral development, ego development, consciousness, and concerns (Glickman, Gordon, Ross-Gordon, 2001).

Environmental Factors

The major area of interest for this study in environmental factors (Bandura, 1986) relates to teachers' interactions with people and the varied roles they play during these interactions. For this study, these factors deal mainly with teacher interactions with students (participation at fair, attendance at camp) and colleagues (attendance at summer conferences).

Review of Related Literature

The theories that built the framework are briefly reviewed: social cognitive theory, self-efficacy theory as a motivational construct, teacher beliefs, and teacher efficacy theory.

Social Cognitive Theory

Bandura's (1986) social cognitive theory provided the basis for the study.

Social cognitive theory can be useful to understand and predict individual and group behavior; identify ways in which behavior can be modified or changed; and serve as an intervention tool for psychological and sociological cases (Stone, 1998). According to Bandura (1986), “what people think, believe, and feel affects how they behave” (p. 25).

Self-Efficacy Theory

Self-efficacy theory is derived from Bandura’s social cognitive theory. Bandura (1997) defined self-efficacy as “beliefs in one’s capabilities to organize and execute the course of action required to produce given attainments” (p. 3). Self-efficacy influences a person’s choices, actions, the amount of effort they give, how long they persevere when faced with obstacles, their resilience, their thought patterns and emotional reactions, and the level of achievement they ultimately attain (Bandura, 1986). Self-efficacy also determines how well knowledge and skills are learned.

Teacher Beliefs

Teacher efficacy is a belief (Tschannen-Moran et al., 1998), and teacher beliefs influence how people teach, and how people learn. Beliefs and knowledge are difficult to define (Alexander & Dochy, 1995). According to Pajares (1992) beliefs are based on evaluation and judgment, while knowledge is based on objective fact. Palmer (1998) asserted that teachers’ knowledge of students and content depends heavily on self-knowledge. This knowledge, and all knowledge, is filtered through beliefs to be interpreted (Pajares). Once beliefs are set, they are very hard to change.

Teacher Efficacy

Teacher efficacy is defined as “the teacher’s belief in his or her capability to organize and execute courses of action required to successfully accomplish a specific teaching task in a particular context” (Tshannen-Moran et al., 1998, p. 233). Guskey and Passaro (1994) defined teacher efficacy as “teachers’ belief or conviction that they can influence how

well students learn, even those who may be difficult or unmotivated” (p. 4). Woolfolk (2001) added that teacher efficacy is the teachers’ motivation to persist when faced with obstacles, and the willingness to exert effort to overcome those obstacles. Personal teaching efficacy has been found to increase during the first year of teaching, while outcome expectancy fell after student teaching (Woolfolk Hoy, 2000). Brown and Gibson (1982) found that teachers with 5 to 10 years of experience had the highest teacher efficacy.

Little research has been conducted related to teacher efficacy in agricultural education. Rodriquez (1997) found that although the groups were not significantly different, second-year teachers had lower teaching efficacy than first-year teachers. Mundt (1991) found that beginning agriculture teachers lacked self-confidence and were stressed, frustrated, and isolated. Knobloch (2001) found that there was no significant difference in efficacy between first, second, and third-year teachers at the beginning of the school year, though in the first 10 weeks of classes, first-year teachers’ efficacy scores dropped a greater amount than second and third-year teachers, whose efficacy scores also dropped.

Methods

Type of Research

The study was a multiple one-shot case study with a natural treatment (Trochim, 2000).

First-Year Novice Teachers	X ₁ O ₁

Second-Year Novice Teachers	X ₂ O ₁

Third-Year Novice Teachers	X ₃ O ₁

The treatment time was the academic year, (approximately 32 weeks of classes). The survey (O₁) was then conducted. The design has one independent variable: the stage of development (years of experience)—first-year novice teacher (X₁), second-year novice teacher (X₂), and third-year novice teacher (X₃). The dependent variable of the study was teacher efficacy.

Population

The target population was novice teachers in agriculture in the first three years of teaching in Ohio in 2002. The Ohio Department of Education Bureau of Career, Technical, and Adult Education's Agricultural Education Service provided the frame for the accessible population.

Dependent Variable Measures

The dependent variable of teacher efficacy was measured using the Ohio State Teacher Efficacy Scale (OSTES by Tschannen-Moran and Woolfolk Hoy, 2001). This instrument measured teacher efficacy using Bandura's (1997) efficacy scale based on 24 items. Each item was measured using a 9-point Likert-type scale, with anchors at: (1) Nothing; (3) Very Little; (5) Some Influence; (7) Quite A Bit; and (9) A Great Deal. The reliability of the OSTES instrument has ranged from 0.92 to 0.95 in previous studies. The OSTES was pilot-tested and field-tested with 42 undergraduate and graduate students in agricultural education courses as a part of Knobloch's (2001) study. The Cronbach's alpha coefficient for reliability was found to be 0.94. Validity was established using a panel of experts from the Department of Human and Community Resource Development. Threats to internal validity were considered and strategies were used to either explain potential threats or to control for them. Data were collected using Dillman's (2000) tailored design method.

Procedures

Demographic and teacher characteristics of novice teachers were collected previous to the study through Knobloch's (2001) pretest. In April, teachers were mailed a hand-written prenotice message on a postcard informing them that they would receive a questionnaire within the next week. A complete packet including the cover letter, instrument, a key chain as an incentive, and a pre-addressed, stamped envelope were mailed. Eight days after the first questionnaire mailing, a thank you

postcard was mailed. The postcard thanked those who had participated in the study and also reminded those who had not yet responded to complete and return their questionnaires. Non-respondents were contacted by telephone. In May, a replacement questionnaire packet and cover letter were mailed. Response rates were 73 teachers out of 99, but six were not usable, yielding a usable response rate of 67 out of 99 or 67.7%.

Data Analysis

The data were analyzed using the Statistical Package for the Social Sciences Personal Computer version (SPSS/PC+). Negative items were reverse coded and subscales were aggregated into composite scores before analyzing the data. Participants whose responses were incomplete were automatically excluded by SPSS. Population means, standard deviations, and effect sizes were rounded to the nearest 1/100th.

Descriptive statistics were used to analyze the data for this census study. Effect sizes were calculated using Cohen's *d* (1988). A full model multiple linear regression analysis was used to explain the percent variance in teacher efficacy related to teacher characteristics and activities. Relationships were described using the Pearson product-moment coefficient. The alpha level was established *a priori* at 0.05. The assumptions of multiple regression were met. Appropriate descriptive statistics—frequencies, percentages, means, and standard deviations—were used to describe the accessible population of novice teachers in agriculture in Ohio.

Results

Differences in Teacher Efficacy

The teachers ranged from 6.65 to 6.85 on a 9-point scale on teacher efficacy at the end of the school year (Table 1). The population standard deviations (σ) are reported in parentheses under each population mean (μ). The three stages of

development had mean differences of 0.02 to 0.20 (Table 2). The effect sizes on these differences were small and ranged from 0.02 to 0.15 (Cohen, 1988). At the end of the school year, second-

year teachers possessed the highest teacher efficacy (6.85) and the first- and third-year teachers reported lower efficacy (6.67 and 6.65 respectively).

Table 1
Means and Standard Deviations for Teacher Efficacy at the End of the School Year

	Teacher efficacy
First-year teachers ($N = 23$)	6.67 (0.86)
Second-year teachers ($N = 22$)	6.85 (0.86)
Third-year teachers ($N = 22$)	6.65 (0.81)

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

Table 2
Descriptive Statistics for Mean Differences of Teacher Efficacy by Stages of Development

Stage of development (I)	Stage of development (J)	Mean difference (I-J)	Effect size	Cohen's index
First-year teacher ($N = 23$)	Second-year	.18	.14	Small
	Third-year ($N = 22$)	.02	.02	Small
Second-year teacher ($N = 22$)	Third-year	.20	.15	Small

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

Teacher Efficacy Related to Stage of Development, Gender, and Teacher Activities

Forty-two items related to stage of development, gender, and teacher activities were correlated to the summed teacher efficacy score for each teacher. Six were found to have significant relationships to

teacher efficacy (Table 3). The alpha level was established *a priori* at 0.05. Note that planning to teach for five years had the strongest relationship (.435) to teacher efficacy for these beginning teachers. Number of class preparations (-.363) and not planning to teach the following year (-.270) negatively influenced teacher efficacy.

Table 3
Relationship of Teacher Efficacy to Teacher Activities

Variable	ρ
Number of Students Enrolled in Ag Ed ($N = 64$)	.269
Number of Class Preparations ($N = 61$)	-.363
Excellent Student Teaching Experience ($N = 60$)	.393
Do Not Plan to Teach Next Year ($N = 65$)	-.270
Plan to Teach for at Least Five Years ($N = 65$)	.435
Feel Confident about Teaching Ag Ed ($N = 65$)	.327

Six items (number of students enrolled in agricultural education, number of class preparations, excellent student teaching experience, plans to teach next year, plans to teach for at least five years, and perceived confidence in teaching agricultural education) were entered into a linear regression model (Table 4). Two variables were found to have significant relationships to teacher efficacy. For each additional class preparation for which a teacher was responsible, the predicted teacher efficacy

score was lowered by 4.16 points when all other variables in the model were held constant. For each unit increase of agreement with the statement that the teacher had an excellent student teaching experience, the predicted teaching efficacy score was raised by 4.81 points when all other variables in the model were held constant. The full model (adjusted for shrinkage) explained 34.0% of the variance in teacher efficacy.

Table 4
Regression of Teacher Efficacy Score on Teacher Activities

Variables	Unstandardized		Full Model Standardized		
	<i>b</i>	<i>SE</i>	Beta	<i>t</i>	<i>p</i>
Number of Students Enrolled in Ag Ed	.05	.05	.12	.98	.33
Number of Class Preparations	-4.16	1.74	-.28	-2.40	.02
Excellent Student Teaching Experience	4.81	2.28	.29	2.11	.04
Do Not Plan to Teach Next Year	2.40	3.22	.14	.74	.461
Plan to Teach for at Least Five Years	6.32	3.55	.38	1.78	.081
Feel Confident about Teaching Ag Ed	.84	2.74	.05	.31	.76
(Constant)	103.72				

Note. Full Model: $R = .64$; $R^2 = .41$; $R^2_{adj} = .34$; $F = 5.64$; $SE = 16.91$; $p \leq .001$

Teacher Characteristics and Perceptions

Based on the teachers who completed the demographics questionnaire 34% ($N = 23$) were first-year teachers, 33% were second-year teachers, and 33% ($N = 22$) were third-year teachers (Table 5). Three percent ($N = 2$) were returning teachers who had retired or left the teaching profession and had previous teaching experience. Fifty-six percent ($N = 36$) were male and 44% ($N = 28$) were female. The average age of teachers in the study was 26.6 ($N = 64$, $\sigma = 6.92$), ranging from 21 to 58 years. Fifty-eight percent ($N = 37$) of teachers taught in a single teacher program, 26% ($N = 17$) taught

in a two-teacher program, 11% ($N = 7$) taught in a three teacher program, and 5% ($N = 3$) of teachers taught in a program with four or more teachers. The average number of class preparations reported was 3.4 ($N = 61$, $\sigma = 1.41$) and ranged from 0 to 7.

Two percent ($N = 13$) of the teachers did not have a degree beyond a high school diploma, 82% ($N = 51$) of the teachers had majored in agricultural education, 55% ($N = 35$) of the teachers grew up in a farming community (Table 6).

Table 7 shows study participants' level of previous FFA and SAE experience.

Table 5
Frequencies on Stage of Development

Stage	<i>f</i>
First-year novice teachers (<i>N</i> = 23)	34%
Second-year novice teachers (<i>N</i> = 22)	33%
Third-year novice teachers (<i>N</i> = 22)	33%

Table 6
Types of Communities in Which Teachers Were Raised and Taught

Type of community	Raised	Taught
Urban	5%	3%
Suburban	6%	11%
Small Town	12%	35%
Rural	22%	21%
Farm	55%	30%

Table 7
Teachers' Years of Involvement in a High School Agricultural Education Program, FFA, and SAE projects

Years	HS ag. ed. program	FFA	SAE
None	16%	15%	14%
One	3%	3%	3%
Two	2%	3%	3%
Three	6%	5%	3%
Four	73 %	74%	77%

Nineteen percent (*N* = 12) of the teachers were members of the local teachers' association, 67% (*N* = 42) of the teachers attended the technical agriculture update conference (Tech Update) that year while 37% (*N* = 23) of teachers attended FFA

camp with their students. Eighty-eight percent (*N* = 56) of the teachers interacted with their students at the county fair while 84% (*N* = 52) of the teachers participated in summer activities with their students (Table 8).

Table 8
Attendance at Technical Update, FFA Camp, County Fair, and Summer Activities

Events	Yes	No
Technical update	67%	33%
FFA camp	37%	63%
County fair	88%	12%
Summer activities	84%	16%

The average number of students enrolled per agricultural education program was 85 students ($N = 64$, $\sigma = 52$). Sixty-one percent ($N = 40$) of the teachers

had a mentor. Of those teachers who had a mentor ($N = 40$), 50% ($N = 20$) strongly agreed that their mentor was competent (Table 9).

Table 9
Teachers' Perceptions of Mentor Competence and Support

Variable	Strongly disagree	Moderately disagree	Slightly disagree	Slightly agree	Moderately agree	Strongly agree
Competence	0.0%	2.5%	2.5%	20.0%	25.0%	50.0%
Support	0.0%	0.0%	7.5%	7.5%	35.0%	50.0%

Sixteen percent ($N = 10$) of teachers strongly agreed that their first year of teaching was excellent, while 41% ($N = 23$)

of teachers strongly agreed that their student teaching experience was excellent (Table 10).

Table 10
Teachers' Perceptions of Excellence of First-year and Student Teaching Experiences ($N = 64, 65$)

Variable	Strongly disagree	Moderately disagree	Slightly disagree	Slightly agree	Moderately agree	Strongly agree
First year	2%	6%	19%	23%	34%	16%
Student teaching	4%	2%	5%	9%	39%	41%

Eighteen percent ($N = 12$) of the teachers who responded to the questionnaire strongly agreed that their teacher education program was a high quality program (Table 11). Fourteen percent ($N = 9$) strongly agreed that their teacher education program prepared them to teach. Thirty-one percent ($N = 20$) of the teachers strongly agreed that that being a high school agriculture teacher has been their long-term career goal. Fifty-

nine percent ($N = 38$) strongly agreed with that statement that they planned to teach for at least five years. Three percent ($N = 2$) strongly agreed, moderately agreed, slightly agreed, and slightly disagreed to the statement that they do not plan to teach next year. Forty percent ($N = 26$) of teachers strongly agreed that they feel confident about teaching in agricultural education.

Table 11
Teachers' Perceptions of Career and Career Preparation

Variable	Strongly disagree	Moderately disagree	Slightly disagree	Slightly agree	Moderately agree	Strongly agree
My TE program was high quality	0%	8%	11%	30%	33%	18%
My TE program prepared me to teach	3%	11%	14%	24%	34%	14%
My long-term career goal is teaching	0%	8%	18%	18%	25%	31%
I plan to teach for 5 years	3%	0%	7%	15%	16%	59%
Job matched personal & family needs	2%	6%	11%	11%	44%	26%
I do not plan to teach next year	75%	13%	3%	3%	3%	3%
My program has adequate funding	6%	9%	11%	20%	31%	23%
I am confident about teaching	2%	5%	3%	11%	39%	40%

Conclusions/Discussion/ Recommendations

Differences in Teacher Efficacy Related to Stage of Development

Conclusion: First-year, second-year, and third-year teachers are similarly efficacious at the end of the school year.

Conclusion: Novice teachers in agricultural education in Ohio were efficacious at the end of the school year.

The novice teachers measured between 100 and 216 for summed scores on the teacher efficacy scale at end of the school year. This equaled a range of 4.16 to 9.00 for mean scores. All differences between stages of development were small (.02 to .15) in effect size. This evidence supports Knobloch's (2001) findings that stage of development did not have a significant impact on teacher efficacy. It is not necessarily experience that affects teacher efficacy, but a variety of factors.

Teacher Efficacy Related to Stage of Development, Gender, and Teacher Activities

Conclusion: The greatest influences on teacher efficacy were the number of class preparations the teacher was responsible for and the perceived excellence of the student teaching experience.

Six variables were entered into the regression equation; Two variables, student teaching experience and number of preparations explained more than one-third of the variance in teacher efficacy at the end of the school year.

Teacher Characteristics and Perceptions

Conclusion: Novice teachers in Ohio are primarily 26 year old males from farms who teach in single teacher departments with adequate funding. They have a degree in agricultural education, and teach 85 students per day with three different preparations. Novice teachers completed four years of high school agriculture, FFA, and SAE, and

were pleased with their student teaching experience. They interact with their students during the summer, attend the summer technical update, and have good mentors. They plan to teach for the next five years and consider themselves confident to teach.

This conclusion supported Knobloch's (2001) conclusion, and Rodriguez's (1997) findings that novice teachers in agricultural education in Ohio were midly-to-moderately efficacious. This finding did not support Mundt's (1991) finding that beginning agriculture teachers lacked confidence.

Recommendations for Further Research

The only two factors found to have significant impact on teacher efficacy were the number of class preparations the teacher was responsible for and the perceived excellence of the student teaching experience. While the number of class preparations taught is easily quantified, excellence in student teaching is not. The definition of an excellent student teaching experience should be studied in more depth.

Student teaching experiences and teacher efficacy should be studied across fields of study (agricultural education, general education, and special education). The design of these experiences, their length, how cooperating teachers are chosen, and the responsibilities of student teachers should all be investigated.

This study should be replicated and a longitudinal study should continue with this novice teacher group. Also, the study should be expanded to other novice teacher groups and should be replicated outside of agricultural education.

Comparing the novice teacher efficacy scores from this group with those teachers under the new Ohio teacher licensure program could offer insight into preservice curriculum.

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