

COMPARISON OF TEACHER EFFICACY AMONG TRADITIONALLY AND ALTERNATIVELY CERTIFIED AGRICULTURE TEACHERS

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Abstract

The shortage of qualified teachers in agricultural education has led to the hiring of uncertified teachers to fill vacancies. Many states have resorted to alternative certification routes to fill the need for teachers. In Florida, alternatively certified teachers represent over half of all new teachers in agricultural education. This situation has created uncertainty about the status of agricultural education in Florida and provided the motivation for this study. The purpose of this study was to describe traditionally and alternatively certified Florida agriculture teachers, compare their perceptions of teacher efficacy, and examine the relationship between teaching experience and teacher efficacy. Data analysis found that traditionally and alternatively certified teachers differed in age, education level, agricultural occupational experience, and gender and ethnic proportions. Comparison of teachers' self-efficacy found no notable difference between the two groups. Results also showed a low positive association existed between agriculture teaching experience and teacher efficacy. Suggestions for future research include the need for replication of the study with other beginning teachers, increased recruitment of underrepresented populations into teacher preparation programs, and investigation of the curriculum and teaching practices of traditionally and alternatively certified teachers as they may impact teachers' perceptions of efficacy and student achievement.

Introduction/Theoretical Framework

Agricultural education faces an ongoing shortage of qualified teachers to accept positions in the profession (Camp, Broyles, & Skelton, 2002). This dilemma is no more apparent than in Florida, where in 2002, 11 agricultural education students completed undergraduate requirements for certification and entered the teaching profession. In the meantime, the number of agricultural teaching openings grew to approximately 40 statewide (J. Dyer, personal communication, September 23, 2003). Due to this lack of sufficient university-prepared teacher candidates, school administrators hired uncertified teachers to fill vacancies that might otherwise go unfilled (Roberts & Dyer, 2003). This phenomenon is not unique to agricultural education in Florida where in 2001, 20 percent of newly hired vocational teachers were not certified in the field to which they were assigned to teach.

This represents a significant increase from prior years as this percentage has nearly doubled in the past decade (Florida Department of Education, 2002).

This situation has created uncertainty about the state of agricultural education in Florida, particularly in regard to uncertified teachers' abilities to effectively deliver curricula, supervise agricultural experience programs, and advise FFA leadership programs and events (McLean & Camp, 2000). Unfortunately, agricultural education is not unique in facing this challenge. The Florida Department of Education (2002) reported critical secondary teacher shortages existed in the subjects of mathematics, science, special education, English for speakers of other languages (ESOL), foreign language, and technology education/industrial arts.

To meet the demand for teachers, many states have resorted to alternative means of teacher certification in hopes of recruiting

more teachers into the field. In 2005, 47 states and the District of Columbia reported having some type of alternative certification process for elementary and secondary teachers. These states reported approximately 538 certification programs other than traditional university teacher education programs exist in the United States (National Center for Education Information, 2005).

The influx of alternatively certified teachers entering the teaching profession has stimulated researchers to investigate possible implications, with many studies reflecting better performance from traditionally certified teachers (Nakai & Turley, 2003). In their study of 3,000 beginning teachers, Darling-Hammond, Chung, and Frelow (2002) found that traditionally prepared teachers were more successful and more highly rated than teachers who entered teaching through alternative programs or without preparation. Furthermore, traditionally prepared teachers were found to be superior to alternatively prepared teachers in nearly every dimension of teaching, classroom management, curriculum and assessment development, use of teaching strategies, awareness of differing learning styles, and their knowledge of students. Ashton (1996) came to a similar conclusion finding that state certified teachers received higher supervisor ratings and had higher student achievement than those who did not meet state certification standards.

Conversely, Miller, McKenna, and McKenna (1998) concluded from their comparison of traditionally and alternatively certified teachers that after a three-year period, no distinguishable differences in observable teaching behaviors, student achievement, or self-perceived teacher competence were evident. In their examination of numerous teacher characteristics and student achievement studies, Wayne and Youngs (2003) found that while students learned more from teachers with certain characteristics, results for teacher certification were inconclusive in all subjects except mathematics. Goldhaber and Brewer found that students whose teachers had a bachelor's degree in mathematics learned

more than students whose teachers had bachelor's degrees in nonmathematical subjects (as cited by Wayne & Youngs, 2003).

Although the aforementioned studies have shown to be inconclusive in many fields of education, a review of the agricultural education literature revealed no such research. Agricultural education is a unique field requiring various competencies not typical in other academic areas (Harper, Weiser, & Armstrong, 1990). The comprehensive agricultural education program includes experiential learning and leadership development components not found in any other discipline (Phipps & Osborne, 1988). These additional program components provide unique challenges for agriculture teachers. The added expectations make agriculture teachers different from any population studied in other disciplines.

Even with additional expectations and responsibilities, effective agricultural teachers feel capable of handling the challenges associated with teaching agriculture and they cope easily with the changing situations in the classroom environment (Miller, Kahler, & Rheault, 1989). Furthermore, Miller and colleagues reported that effective agriculture teachers were found to be older than the average agriculture teacher and possessed more teaching experience.

Knobloch and Whittington (2002) found novice agriculture teachers who had teaching and student teaching experience were more confident than teachers with a lack of such experience. These findings were consistent with a 2003 analysis of the School and Staffing Survey (SASS) data, in which Ingersoll found that new teachers who had pedagogical preparation as well as more clinical practice before they began teaching were more likely to stay in teaching (as cited by Dow & Webb, 2003). Yet, Wilson, Floden, and Ferrini-Mundy (2001) reported that over twenty percent of new teachers in Florida had no student teaching experience, a component of preparation that most novice teachers rate as the most essential.

What effect, if any, does a lack of teacher training and experience have on a teacher's confidence and beliefs about their

teaching abilities and effectiveness? The educational theorist, Albert Bandura, has conducted extensive research in this area related to social learning theory and self-efficacy. This study used Bandura's theory of teacher efficacy as its theoretical frame. The conceptual framework constructed in this study was based on the premise that teachers with higher levels of perceived teacher efficacy tend to be more motivated, effective, engaging, persistent, and remain in the profession longer than those with low levels of perceived teacher efficacy.

Teacher efficacy is defined as a self-perceived belief of one's capabilities to bring about desired outcomes, even with students who are unmotivated or present discipline problems (Bandura, 1977). Teacher efficacy has been found to be related to teacher behavior, effort, enthusiasm, innovation, planning, perseverance, resilience, willingness to work with difficult students, and their commitment to the teaching profession (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998). Teacher efficacy has implications on learning environment management as well. Teachers who believe strongly in their teaching efficacy tend to rely on persuasory means rather than authoritarian control, and to support development of students' intrinsic interest and academic self-directedness (Bandura, 1997). Miller et al. (1989) found motivated and confident teachers were more effective. Teacher efficacy has also been found to impact student performance. Students exhibited greater motivation, achieved more, and had a higher level of self-efficacy when their teacher possessed a higher level of teacher efficacy (Ashton & Webb, 1986; Guskey & Passaro, 1994).

Bandura (1997) also found that teachers' perceptions of the school environment and culture affected their beliefs about their ability to be effective in the classroom. Ashton and Webb (1986) found heavy workloads, bureaucratic practices, variable quality of leadership, insufficient resources and pay, lack of advancement opportunities, problematic students, and low occupational status are just some of the common problems faced by all educators. These challenging school conditions coupled with a lack of confidence may have detrimental

effects on a teacher's perceived ability to be effective in the field and may led to the end of a struggling teacher's career. This loss of teaching professionals further compounds the teacher shortage and ultimately provided the impetus for this study.

Purpose/Objectives

The purpose of this study was to describe and compare traditionally and alternatively certified Florida agriculture teachers, and examine the relationship between teaching experience and teacher efficacy. To achieve this purpose, the study had three objectives:

1. To describe traditionally and alternatively certified teachers based on selected demographic characteristics and years of agriculture teaching experience.
2. To compare traditionally and alternatively certified teachers based on their perceptions of teacher efficacy.
3. To examine the relationship between years of agriculture teaching experience and level of perceived teacher efficacy for traditionally and alternatively certified teachers.

Procedures

This descriptive census study utilized a target population of agriculture teachers in their first five years of teaching agriculture (N = 122) in Florida. The accessible population was identified from the 2003-2004 Florida Agricultural Teachers Directory (Myers & Dyer, 2003). This group of teachers was selected due to the high attrition rate, nearly 50%, during the first five years of teaching (Ingersoll, 2002). Furthermore, teachers with five years experience or less were selected based upon Miller's et al. (1998) findings that no significant differences in teaching behavior, student output, or attitude existed between traditionally and alternatively prepared teachers after three years in the profession.

The survey instrument was adapted from the Teachers' Sense of Efficacy Scale (TSES) developed by Tschannen-Moran and

Woolfolk Hoy (2001) and demographic questions were added for additional analysis. The 12-item TSES asked respondents to rate their beliefs about how well they could perform in various teaching situations using a 5-point Likert-type scale. The scale ranged from "Not at All" (1 point) to "Excellent" (5 points). An expert panel was used to determine the instrument's face and content validity. The instrument was pilot tested with a sample of 10 agriculture teachers from California in their first five years of teaching. Post hoc reliability analysis of the pilot instrument resulted in a Cronbach's alpha of .90, which is equal to the estimate provided by Tschannen-Moran and Woolfolk Hoy (2001).

Data were collected by a mailed questionnaire using Dillman's (2000) tailored design method consisting of five contacts during the spring semester of the 2003-2004 school year. Completed questionnaires were received from 66 of the 122 teachers in the accessible population for a 54% response rate. Given the response rate, a comparison of the early to late responders was conducted to ensure that results were representative of the target population, as suggested by Lindner, Murphy, and Briers (2001), and Miller and Smith (1983). Results of the comparison yielded no notable differences between early and late responders on age, years of teaching agriculture, and summated mean scores on the TSES.

Descriptive statistics were used to analyze data for Objective 1. Categorical data were reported as frequencies and

interval data were reported as means and standard deviations. Objective 2 was accomplished by calculating individuals' summated scores for the TSES (Clason & Dormody, 1994). Pearson's product moment coefficient of correlation (Ary, Jacobs, & Razavieh, 2002) was used in Objective 3 to indicate whether a relationship existed between years of teaching experience and teacher efficacy.

For the purposes of this study, a traditionally certified agriculture teacher was operationally defined as a teacher who qualified for certification by completing an undergraduate degree program in Agricultural Education. Teachers who earned their teaching certification through other means were considered to be alternatively certified (Roberts & Dyer, 2003).

Findings

Respondents consisted of 39 alternatively certified teachers and 27 traditionally certified teachers. Alternatively certified teachers were almost evenly split between males (51%) and females, while the traditionally certified teachers were nearly 67% female. As shown in Table 1, both groups were predominately Caucasian. However, alternatively certified teachers did represent a more ethnically diverse group with over 20% being African American, Hispanic/Latino, or other ethnicities. Traditionally certified teachers were nearly all Caucasian (96.3%) with only one respondent reporting Hispanic/Latino.

Table 1
Ethnicity of Traditionally and Alternatively Certified Agriculture Teachers

Ethnicity	Traditionally Certified		Alternatively Certified	
	<i>f</i>	%	<i>f</i>	%
African-American	0	0.0	2	5.1
Caucasian	26	96.3	31	79.5
Hispanic/Latino	1	3.7	4	10.3
Other	0	0.0	2	5.1
Total	27	100.0	39	100.0

On average, alternatively certified teachers were 10 years older than their traditionally certified counterparts (Table 2). The mean age of traditionally certified teachers was 25 years versus 35 years for the alternatively certified group. Alternatively certified teachers also exhibited a greater

range of age (22 to 59 years) compared to traditionally certified teachers who ranged from 22 to 37 years of age. Furthermore, results of the analysis showed greater variability of age in alternatively certified teachers (*SD* = 12.24) when compared to traditionally certified teachers (*SD* = 3.03).

Table 2
Age of Traditionally and Alternatively Certified Agriculture Teachers

Certification	<i>n</i>	Min	Max	<i>M</i>	<i>SD</i>
Traditional	27	22	37	25.63	3.03
Alternative	39	22	59	35.46	12.24

In addition to being an older group of individuals, alternatively certified teachers possessed more advanced degrees than the traditionally certified teachers (Table 3). Over 28% of the alternatively certified

teachers had earned Master's or other advanced degrees. Conversely, only 15% of the traditionally certified group had received a Master's degree and no other advanced degrees were reported.

Table 3
Educational Level of Traditionally and Alternatively Certified Agriculture Teachers

Degree(s)	Traditionally Certified		Alternatively Certified	
	<i>f</i>	%	<i>f</i>	%
Bachelors	23	85.2	28	71.8
Masters	4	14.8	8	20.5
Other	0	0.0	3	7.7
Total	27	100.0	39	100.0

Since alternatively certified teachers were operationally defined as those who earned their bachelor's degree in a subject other than Agricultural Education, the respondents were asked to indicate their undergraduate majors. Table 4 shows that respondents earned degrees in 15 different academic areas. Over half of the

alternatively certified teachers received degrees in one of the following three majors: Animal Science, Agricultural Business/Economics, and Environmental Horticulture. Approximately 28% of the alternatively certified teachers reported degrees in non-agricultural fields.

Table 4
Bachelor's Degree Major of Traditionally and Alternatively Certified Agriculture Teachers

Major(s)	<i>f</i>	%
Animal Science	11	28.2
Agricultural Business/Economics	7	18.0
Environmental Horticulture	4	10.3
Liberal Studies	2	5.1
Plant Science	2	5.1
Physical Education	2	5.1
Other agricultural majors ^a	2	5.1
Other non-agricultural majors ^b	7	18.0
No-response	2	5.1
Total	39	100.0

^aOther agricultural majors include: Agricultural Communications and Agricultural Science

^bOther non-agricultural majors include one respondent each in Engineering, Environmental Science, History, International Studies, Marketing, Medical Science, and Psychology

Table 5 shows differences in traditionally and alternatively certified teachers were also apparent in terms of their years of occupational experience in agriculture. The alternatively certified teachers averaged 7.6 years of agriculturally related experience while traditionally certified teachers had a mean of only one year. Alternatively certified teachers were

also found to have a wider range of experience with 0 to 30 years, while traditionally certified teachers ranged from 0 to 7 years. Similar to the findings for age, alternatively certified teachers were found to have greater variability in their years of experience (*SD* = 8.7) in comparison to the traditionally certified group (*SD* = 1.9).

Table 5
Years of Agriculturally Related Occupational Experience of Traditionally and Alternatively Certified Agriculture Teachers

Certification	<i>n</i>	Min	Max	<i>M</i>	<i>SD</i>
Traditional	27	0	7	1.00	1.86
Alternative	39	0	30	7.63	8.69

An examination of the years of agriculture teaching experience of traditionally and alternatively certified respondents found minimal differences (Table 6). First year teachers made up the largest proportion of teachers in both

groups. Furthermore, approximately 59% of teachers in both groups were first and second year teachers with the remaining proportion being third, fourth, and fifth year teachers. Overall, fifth year teachers were the fewest in number.

Table 6
Years of Agriculture Teaching Experience of Traditionally and Alternatively Certified Agriculture Teachers

Year	Traditionally Certified		Alternatively Certified	
	<i>f</i>	%	<i>f</i>	%
First	12	44.4	15	38.5
Second	4	14.8	8	20.5
Third	6	22.2	8	20.5
Fourth	4	14.8	4	10.3
Fifth	1	3.7	4	10.3

To accomplish the second objective, the summated group means from the TSES (Tschannen-Moran & Woolfolk Hoy, 2001) were compared for traditionally and alternatively certified teachers. Analysis of the data showed there were no notable differences between these two groups (Table 7). Traditionally certified teachers were

found to have a summated mean score of 45.30, while alternatively certified teachers had a summated mean of 45.19. The two groups were found to differ in variance of summated scores with alternatively certified teachers again having greater variability (*SD* = 7.9) than traditionally certified teachers (*SD* = 4.3).

Table 7
Perceived Teacher Efficacy of Traditionally and Alternatively Certified Agriculture Teachers

Certification	<i>n</i>	Min ^a	Max ^a	<i>M</i> ^a	<i>SD</i>
Traditional	27	33	55	45.30	4.26
Alternative	39	29	60	45.19	7.89

^a Summated score: 12 = lowest possible score, 60 = highest possible score

The final objective of the study was to determine if a relationship existed between years of agriculture teaching experience and perceived teacher efficacy. Results of the correlation matrix yielded a coefficient of .133 when all respondents were included in the analysis. When respondents were divided into their designated certification groups, a slight difference was found. The relationship between years of teaching experience and teacher efficacy was slightly higher for traditionally certified teachers ($r = .224$) than for the alternatively certified teachers ($r = .105$).

Conclusions

Based on the objectives and results of this study, several conclusions can be drawn. First, over half of the teachers in this study received their certification through alternative means. This proportion is much greater than the national average of 13% reported by Camp et al. (2002). These results were consistent with the findings of Roberts and Dyer (2003) who in a similar sample found that approximately half of the teachers in Florida were alternatively certified.

The first objective sought to describe traditionally and alternatively certified teachers in terms of their years of agriculture teaching experience and selected demographic characteristics. Alternatively and traditionally certified teachers were found to differ in the proportion of male and female teachers in each group. Teachers receiving their certification through traditional means were predominately female while alternatively certified teachers were nearly equal in gender numbers. Although both groups of teachers were primarily Caucasian, a greater number of minorities were observed in the alternatively certified group. When compared by their

mean age, alternatively certified teachers were found to be 10 years older than their counterparts. The difference in age was also reflected in the years of occupational experience possessed by teachers. The younger group of traditionally certified teachers had little to no occupational experience in agriculture, while alternatively certified teachers brought an average of seven years of occupational experience into the classroom. The additional age and experience of the alternatively certified teachers may account for their higher than expected efficacy beliefs. The literature led the researchers to anticipate that the experience gained through a university teacher preparation program would have caused traditionally certified teachers to have greater self-efficacy than their counterparts who received no such training. This may be true, however it appears that the additional life and occupational experience of the alternatively certified group may have impacted their level of efficacy. This conclusion is consistent with Bandura's (1986) belief that learning experiences shape an individual's perceptions of self-efficacy.

Objective 2 compared traditionally and alternatively certified teachers' perceptions of self-efficacy related to teaching. Data analysis resulted in nearly equal summated mean scores for the two groups of teachers. Therefore, traditional and alternatively certified agriculture teachers were not distinguishable when compared on their perceived teacher efficacy. Alternatively certified teachers' lack of formal instruction in agricultural education, teaching methods, and pedagogy did not manifest into lower feelings of teacher efficacy. This leads to the conclusion that alternatively and traditionally certified teachers had similar beliefs in their ability to teach effectively.

The final objective examined years of agriculture teaching experience and teacher efficacy. The findings for both traditionally and alternatively certified teacher groups showed that these variables shared only a low positive association (Miller et al., 1998). This conclusion is contradictory to Miller et al. (1989) who found that effective teachers possessed more teaching experience; however the limited range of teaching experience of the population may have contributed to this finding.

Implications and Recommendations

Although no notable differences were revealed in teacher efficacy between traditionally and alternatively certified teachers, the results did show that both groups had high efficacy scores considering that nearly 80% of respondents were in their first three years of teaching. Over 50% of new teachers in Florida are alternatively certified and feel highly efficacious about their teaching. Since these teachers do not have a connection with the University's Agricultural Education faculty, this has strong implications for their participation in University delivered professional development activities. Do these alternatively certified teachers feel the need for further education and professional development specific to agricultural education? These findings necessitate future studies to determine whether other groups of beginning teachers are equally efficacious and to determine alternatively certified teachers' willingness and perceived need to participate in the professional development activities provided by teacher educators.

Traditionally certified teachers tend to be younger and enter the profession with little practical agricultural experience. Conversely, the alternatively certified teachers are typically those who pursue agriculture teaching as a second career choice. The additional life, education, and occupational experience possessed by alternatively certified teachers may have provided them with greater confidence in their abilities to teach agriculture. This conclusion has implications not only for alternative certification programs, but also for traditional teacher preparation programs

as well. The importance of advanced degrees and occupational experience should not be overlooked as they may contribute to the efficacy beliefs of all agriculture teachers and deserve the attention of researchers in future studies. Additionally, the age and experience differences found in this study also indicate the potential for an additional option within the University's teacher preparation program that would allow those who wish to pursue teaching as a second career to earn a Master's degree and teaching certification simultaneously.

The demographic differences between these two groups raised some interesting questions. For instance, why are more females choosing the traditional teacher preparation route than males? This appears to be a trend not only in teacher education programs but also in secondary agriculture programs as well. Additionally, why do minority teachers tend to enter agriculture teaching through alternative certification programs? The gender and ethnicity distribution results of this study indicate that more men and minorities are interested in teaching agriculture, but they are not attracted to the University's undergraduate program. Further research is needed to investigate preservice teacher recruitment efforts and how to encourage more men and minority students to enter the agriculture teacher preparation program.

Given that the comparison of teacher efficacy between traditionally and alternatively certified teachers did not reveal any differences, one would assume that these two groups were equally confident in their teaching ability. However, given the inconclusive nature of the literature and the limited amount of research involving this population of teachers the researchers believe more studies are needed to understand the differences between these two groups of teachers. For instance, do traditionally and alternatively certified teachers have similar perceptions of their job responsibilities and expectations of performance? Roberts and Dyer (2003) stated that alternatively certified teachers might not recognize their own deficiencies since they received no formal training. Traditional teachers may look at their teaching performance more critically due to

their pedagogical knowledge, while alternatively certified teachers base their feelings of efficacy on their subject matter knowledge and experience. Is it possible that these two groups of teachers have differing views of what is expected of them as agriculture teachers? This may be an indication of the type of curriculum being taught by alternatively certified teachers. Are they teaching the state approved curriculum or are they teaching what they know based on their experience? This warrants future studies to examine the teaching practices and curriculum delivered by alternatively certified teachers to determine what causes their high level of teacher efficacy and if they view their job expectations in a similar manner as traditionally certified teachers.

In this age of school accountability, people entering the agriculture teaching profession from industry must be prepared to teach the agricultural curriculum and the requisite math, science, and reading skills needed by all students. Without formal preparation in pedagogy, do alternatively certified teachers have the necessary teaching skills needed to do so effectively? This has serious implications for student performance at a time when all elective programs are under a magnifying glass. Future studies should investigate whether students of alternatively certified agriculture teachers perform as well as students of traditionally certified teachers on standardized assessments.

This study examined traditionally and alternatively certified agriculture teachers in Florida. Findings determined that these two groups had similar efficacy beliefs, but were different in terms of their age, educational level, and occupational experience. Recommendations for future research called for the replication of the study with other beginning teachers, increased recruitment of underrepresented populations into teacher preparation programs, and investigation of the curriculum being delivered and teaching practices used by traditionally and alternatively certified teachers as they may impact teachers' perceptions of efficacy and student achievement.

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