SELECTED VARIABLES RELATED TO EXPECTED LONGEVITY IN TEACHING OF ENTRY-PHASE AGRICULTURE TEACHERS

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ABSTRACT

An ongoing shortage of secondary-level teachers is a problem, including career and technical educators who teach agriculture. The purposes of this study were to determine selected characteristics of entry-phase agriculture teachers, examine those characteristics for relationships, and determine which characteristics explain teachers' expectations of teaching longevity. Teachers responded to eight items describing personal, professional, and situational characteristics and to 51 items assessing their perceived competence. Significant relationships were found between the variable "additional years expect to teach" and the variables gender, agricultural work experience, and departmental size. Regression analysis identified gender and agricultural work experience as valuable predictors of additional years a teacher expected to teach. These variables explained 17% of the variation; work experience was the more substantial predictor.

Heath-Camp and Camp (1992) stated, "No period is more critical to the success of a beginning teacher than the induction phase" (p. 35). Garton and Chung (1995) maintained, "Research is needed to assess the inservice needs of today's beginning agriculture teachers" (p. 78). However, Darling-Hammond and Rustique-Forrester (1997) stated, "Of the teachers in classrooms in the year 2006, more than half will have been hired in the next 10 years" (p. 1). Further, Huling-Austin (1986) found that 15% of all new teachers leave the profession after one year of service, "in excess of two-thirds of those [leaving] will do so in the first four years" (p. 3), and by year seven 40 to 50% of a beginning teacher cohort had left the profession. This trend continued through the decade of the '90s (National Center for Education Statistics, 1997). It appears the profile of today's entry-phase teachers—including those who teach agriculture—may be changing rapidly.

Historically, agricultural teacher educators have examined the backgrounds of teachers of "vocational agriculture." For example, Farrington (1981) found beginning agriculture teachers in the Southern Region were 93% male, and 80 and 81% had been vocational agriculture students and Future Farmers of America (FFA) members, respectively. Findlay and Drake (1989), in a study that included both beginning and experienced teachers, found similar results for high school enrollment but that only 61% of teachers had participated in the FFA. Camp (1995) reported males comprised nearly 90% of the profession nationally, while only 57 (4%) of the 1,450 agriculture teachers in Texas were female.

Several researchers have found a relationship between experience and perceived level of competence (Borne & Moss, 1988; Cole, 1984; Findlay, 1992; Findlay & Drake, 1989). However, Findlay and Drake found that there were significant differences in the "demographic experiences" (p. 52) of high school vocational agriculture teachers who perceived themselves as having higher levels of competence versus those teachers who perceived their level of competence as lower. These researchers suggested the possibility that differences in teacher performance "could be explained by demographic experience" (p. 52). Finally, they recommended further examination of "mitigating factors" (p. 52) involved in the relationship between preservice experience and perception of competence. So, the literature suggests that experiences are indeed related to perceived competence.

Moreover, Findlay (1992) stated that there was "some evidence that certain methods by which teachers acquire professional agricultural education competencies may be more effective than others in terms of developing higher levels of competence" (p. 32). For example, Borne and Moss (1988) found that agriculture teachers perceived their "overall preparedness" (p. 4) level to be between "acceptable preparation" and "well prepared" (p. 4); and teachers identified "on-the-job/self study" (p. 3) as making the "greatest overall contribution to [their] preparation" (pp. 3-4).

However, DeMoulin (1993), in describing the role of (self) efficacy and student teacher effectiveness, asserted that

> …individuals [entry-phase teachers] can enter their first job assignment with a false sense of preparedness which can lead to heightened frustration in the crucial first few years of teaching and could be one explanation why these individuals enter the teaching profession with moderate to low efficacy. (pp. 160-161)

DeMoulin conceptualized "efficacy" as being a product of two psychological perspectives—"locus of control and efficacy expectation" (p. 155). Drawing on research of Greenwood, DeMoulin stated that "locus of control is a belief that a behavior will lead to a given outcome," and that "efficacy expectation is one's belief that s/he can successfully perform the operations needed to produce the desired outcome" (p. 155). Similarly, Henson (2001) argued that "self-efficacy beliefs are, by definition, judgments of expected performance at a task at sometime in the future" (p. 7).

Joerger and Boettcher (2000) found support for DeMoulin's concept of "locus of control" among beginning agriculture teachers in Minnesota. The teachers perceived that the "event" (experience) "I feel in control of my program" (p. 110) had the greatest "critical impact…on their teaching" (p. 109). Concomitantly, Brown (1999) stated that if one holds low self-efficacy expectations for a given behavior, "they…are more apt to give up at the first sign of difficulty," that is, "their efficacy beliefs serve as barriers to their career development" (p. 1).

DeMoulin's (1993) "Effectiveness Theory" (p. 157) posits a relationship between "low performance-high stress" and feelings of "low efficacy" (p. 158). Further, DeMoulin said that the forces of "motivation and confidence (performance)" are "vital component[s]" (p. 157) for the establishment of high efficacy, and the absence of these "forces" can be attributed "to inaccurate job placement, to inadequate career choice or to the adverse effects of burnout" (p.157). Moreover, investigators (Joerger & Boettcher, 2000), focusing on entry-phase agriculture teachers, identified teachers' perceived levels of "self-confidence" and "personal

satisfaction," as well as their self-reported "high levels of stress" early in their first year of teaching, "as having a major impact on their initial teaching experience" (p. 112). Further, these and other findings supported the theoretical framework propounded by Super, Crites, Hummel, Moser, Overstreet, and Warnath in their 1957 monograph *Vocational Development: A Framework for Research* (as cited in Joerger & Boettcher), regarding an individual's vocational (career) development, i.e., the transition sub-stages of "exploratory-trial" and "establishment-trial" (p. 112).

Concerning teacher work-related stress and role preparedness, Adams (1999) surveyed vocational teachers in Virginia and concluded that "with regard to role preparedness vocational teachers who feel unprepared or incompetent in their teaching occupations encounter stress" (p. 17), and that a teacher's self-perceived role preparedness or level of professional "competence" was a significant predictor of his/her level of work-related stress.

Regarding the preparation of agriculture teachers and its role in their career longevity, Cole (1984) suggested that there was a relationship between the "quality of technical agriculture preparation" (pp. 2-3) that early-career agriculture teachers had received and their decision to remain in or leave the teaching profession. Moreover, Cole stated "…that both technical knowledge and hands-on skills are important criterion [sic] to vocational agriculture [teacher] placement [initial teaching position] and retention" (p. 11), and that a primary reason teachers remain in teaching was their "acquisition of technical skill (from whatever source)" (p. 8).

Finally, Findlay and Drake (1989) hypothesized "that selected experiences of secondary vocational agriculture teachers are related to their perceived levels of competence" (p. 46). To this end, experience is often viewed as a determinant of competence, while inexperience may be seen as an indicator of need for inservice education to develop competence further. However, one must remain in the profession to receive inservice, to gain experience, and to develop competence (Borne & Moss, 1988). So, for entry-phase teachers, their plans to remain in the profession or to exit it are critical, and their perceived level of competence and those variables (e.g., experiences) that were integral to the formation of those perceptions may be "mitigating factors" in their decision (Cole, 1984; Findlay & Drake; DeMoulin, 1993).

Therefore, understanding who these teachers are personally and professionally, knowing the fundamental components of their work setting, and gaining insight into their perceptions of their professional future may be instructive to those who advise preservice students (Edwards & Briers, 2000), who conduct induction programs (Joerger & Boettcher, 2000), who provide early-career inservice education, and who are concerned with factors influencing teacher retention. Yet, what are selected characteristics and perceptions of entry-phase agriculture teachers, do significant relationships exist, and how are the teachers' perceived levels of competence and factors that may have influenced formation of competence related to their expectations for career longevity?

Purpose and Research Questions

The purpose of this study was to determine which personal factors influence how long current entry-phase agriculture teachers expected to remain in teaching. These research questions guided this study: (a) What were selected personal, professional (e.g., perceived level of competence), and situational characteristics of entry-phase agriculture teachers? and (b) How well did selected personal, professional, and situational characteristics explain (i.e., predict) expectation of longevity in teaching of entry-phase agriculture teachers?

Methods and Procedures

The Department of Agricultural Education at Texas A&M University in cooperation with the Texas Education Agency (TEA) conducted a descriptive study to assess inservice needs of entry-phase agriculture teachers in Texas (Briers & Edwards, 1998). The target population for the study consisted of entry-phase teachers. "Entry-phase" was defined as teachers who began teaching during the school years 1995-96 or 1996-97. Those surveyed consisted of "additions" to the *Directory: Texas Teachers of Agricultural Science and Technology* for academic years 1995-96 and 1996-97. One question permitted the researchers to identify respondents who were not entry-phase instructors (e.g., experienced teachers re-entering the profession or teachers who may have moved to Texas from another state) and thus exclude their responses from analyses. Accordingly, 133 teachers were identified as "entry-phase" teachers.

A component of this study was to determine selected demographic characteristics of these entry-phase agriculture teachers. Teachers responded to eight items describing selected personal, professional, and situational characteristics (Findlay & Drake, 1989; Garton & Chung, 1995), and to 51 items to assess their perceived level of competence (Briers & Edwards, 1998) in teaching agriculture (i.e., classroom and laboratory instruction, the FFA, and supervised agricultural experiences) (Findlay & Drake). The conceptual framework for competencies originated from the DACUM (Developing A Curriculum) process for occupational analysis (Norton, 1995). That is, the questionnaire items were job-related tasks which undergird the general areas of competence (constructs) assessed. Faculty members of the Texas A&M University Department of Agricultural Education and Texas Education Agency staff members established content validity for the items.

The first mailing, in March 1997, included an instrument, a cover letter explaining the purpose of the survey, and a return envelope coded to determine non-respondents. A reminder postcard was sent to non-respondents (Gall, Borg, & Gall, 1996). Next, a second instrument, a slightly altered cover letter, and a second return envelope were mailed to non-respondents. An attempt was made to contact non-respondents via telephone. Some contacted requested a third questionnaire; one was mailed to each of them. The return rate was 68% (90 of 133). A comparison of early and late respondents (Miller & Smith, 1983) did not reveal any statistically significant differences between the two groups; therefore, the results were generalized to the sample.

Descriptive statistics were used to profile the subjects, and correlation statistics were used to examine relationships. Relationships were described using conventions set forth by Davis (1971). Researchers used multiple regression to further explain relationships, basing order of entry of the independent variables on their chronological order of occurrence.

Results and Findings

More than one-third (32 of 90) of teachers were female (Table 1). (The sampling frame revealed that 39 (29.3%) of the 133 identified entry-phase teachers were female.) Nearly 80% of teachers had considerable agricultural work experience (e.g., full-time temporary or full-time employment). High school FFA involvement was relatively high, with 91% of teachers reported to have been at least "somewhat involved." Tenure as an agriculture teacher was evenly split between being a first- or second-year teacher. Also, 18% had earned a Master's degree, and the remainder held a Bachelor's degree. More than two-thirds of the teachers were working in multiple teacher departments, and the remaining one-third comprised single teacher programs.

Perceived competence is often used as an important element in determining inservice education needs (Briers & Edwards, 1998). A measure of perceived competence might be a determinant of a teacher's decision to remain in or to leave the profession (Cole, 1984; DeMoulin, 1993; Findlay & Drake, 1989). Competence was measured on a 1 to 5 scale; each teacher's score was an average of 51 statements of specific tasks. Teachers responded to each item by "grading" themselves with "F" = failing (1), "D" = low pass (2), "C" = average (3), "B" = good (4), and "A" = excellent (5). (For reporting descriptively only, this continuous variable of teacher competence was grouped into three categories in Table 1.) A mean score was calculated to quantify perceived competence; the internal consistency of this scale as measured by Cronbach's coefficient alpha was .86. Twenty-six teachers graded their overall level of competence as "average" or below; 37 teachers graded themselves as having "good" competence, and 27 teachers reported their competence as approaching "excellent." One-fourth of respondents expected to be teaching agriculture for an additional 1 to 5 years while over one-half (52%) expected to make agriculture teaching a career.

Table 1

Selected Personal, Professional, and Situational Characteristics of Entry-Phase Agriculture Teachers (N = 90)

Characteristic	Frequency	Percentage
Gender[a]		
Male	57	63.3
Female	32	35.6
Agricultural Work Experience		
Full-time employment (more than six months)	52	57.8
Full-time temporary employment (e.g., one or more summers)	19	21.1
Part-time employment (e.g., after school/weekends)	11	12.2
Mostly avocational	8	8.9
High School FFA Involvement		
Very involved	49	54.4
Above average involvement	22	24.4
Average involvement	7	7.8
Somewhat involved	4	4.4
No involvement	8	8.9
Tenure as an Agriculture Teacher		
Second year	45	50.0
First year	45	50.0
Highest Degree		
Master's	16	17.8
Bachelor's	74	82.2

Table continues

Number of Teachers in Department		
3 or more	18	20.0
2	43	47.8
1	29	32.2
Level of Competence		
Average < 3.5	26	28.9
Good = 3.5 – 4.0	37	41.1
Excellent > 4.0	27	30.0
Expectation to Teach Agriculture[a]		
16 or more years	47	52.2
11 – 15 years	8	8.9
6 – 10 years	11	12.2
3 – 5 years	15	16.7
1 – 2 years	8	8.9

Note: [a]One subject did not respond to this item.

Pearson correlation coefficients (point biserial in the case of gender) were calculated to determine relationships between selected personal, professional, and situational characteristics (Table 2). There was a low relationship (Davis, 1971) between gender and the variables agricultural work experience ($\underline{r}$ = -.21) and expected years to teach agriculture ($\underline{r}$ = -.21) (Table 2). Because "male" was coded "0" and "female" "1," the negative correlations mean that females tended to have less agricultural work experience and expected to teach agriculture for a fewer number of years. Further, there was a low relationship between gender and FFA involvement ($\underline{r}$ = .26), while a moderate relationship (Davis) existed between gender and departmental size ($\underline{r}$ = .31) (Table 2). Females had more FFA involvement and were more likely to be teaching in a multiple teacher program.

There was a moderate relationship between agricultural work experience and departmental size ($\underline{r}$ = -.39) (Table 2). Thus, the more agricultural work experience entry-phase teachers had, the less likely they were to teach in a multiple-teacher department. In addition, there was a moderate relationship between a teacher's agricultural work experience and their expected years to teach agriculture ($\underline{r}$ = .38). The more agricultural work experience teachers had, the more likely they were to anticipate teaching agriculture for more years.

Perceived competence has been shown to be related to on-the-job training, departmental size, program enrollment, prior enrollment in agriculture, and FFA membership (Borne & Moss, 1988; Shippy, 1981). In this study, it was found that there was a moderate relationship between a teacher's perceived competence and their FFA involvement ($\underline{r}$ = .30) (Table 2), meaning that the more FFA involvement entry-phase agriculture teachers had in high school, the higher they perceived their level of competence. Finally, there was a low relationship between the characteristic departmental size and a teacher's expected years to teach agriculture ($\underline{r}$ = -.21) (Table 2). As the size of a teacher's department increased, teachers expressed that they were likely to teach for fewer years.

To examine whether characteristics or perceptions of entry-level teachers could predict their plans for additional years of teaching, the researchers performed a multiple regression analysis. The dependent variable, "additional years expect to teach," was regressed on the independent variables gender, agricultural work experience, FFA involvement, size of department, and perceived competence. The variables were entered "chronologically" using a hierarchical method of entry. The "chronological" order was determined by the researchers in terms of *when* that characteristic or variable was most likely to "occur" in the subjects of this research. Gender was entered in step one, followed in order by agricultural work experience, FFA involvement, size of department, and perceived competence, respectively. (The magnitudes of the zero order correlations were small for FFA involvement and perceived competence; if the goal was to develop an efficient prediction model, then the variables may have been left out of the regression model. However, given that these variables were entered *after* the variables gender and agricultural work experience, it could not be known if the *partial* correlations were statistically significant. Thus, the variables were "allowed" in the model.)

The multiple regression analysis identified two variables of value in predicting how many additional years an entry-level teacher expected to teach; these variables were gender and agricultural work experience. Being male was related to an entry-level teacher's expectation to teach longer; however, the zero order correlation of $r = -.21$ (Table 2) suggests that gender is of little practical value. After gender, level of agricultural work experience adds considerably to the explanation of variance for the dependent variable. The R^2 moves from .046 for the one variable model to .168 (Table 3) for the two variable model. Approximately 17% of the variation in additional years to teach is explained by a combination of gender and agricultural work experience. The remaining variables explain almost no additional variation (Table 3).

Table 2

Correlation Matrix of Selected Personal, Professional, and Situational Characteristics of Entry-Phase Agriculture Teachers (N=90)

	Characteristics					
	Gender[a]	Ag Work Experience	FFA Inv't	Size of Dep't	Perceived Competence	Add'l Years Expect to Teach
Ag Work Experience	-.21*	-				
FFA Involvement	.26*	-.05	-			
Size of Department	.31**	-.39**	.11	-		
Perceived Competence	.11	.04	.30**	.20	-	
Add'l Years Expect to Teach	-.21*	.38**	-.09	-.21*	-.04	-

Note: [a]Male = 0; female = 1.
*$p < .05$. **$p < .01$.

Table 3

Multiple Regression of "Additional Years Expect to Teach" on Selected Variables, Hierarchical Order of Entry

Step	Variable	R	R^2	R^2 change	F change	prob.
1	Gender	.213	.046	.046	4.104	.046
2	Ag Work Experience	.410	.168	.122	12.500	.001
3	FFA Involvement	.413	.170	.002	.250	.619
4	Size of Department	.413	.171	.001	.029	.864
5	Perceived Competence	.413	.171	.000	.008	.929

Discussion, Implications, and Conclusions

Contrary to research for all early-career teachers (Huling-Austin, 1986), entry-phase agriculture teachers have a stronger commitment to remain in the profession beyond the induction phase (first three years). More than half of the teachers expected to teach for 16 or more additional years (Table 1). Agricultural work experience and FFA involvement were experiences common to most beginning agriculture teachers. More than 70% of these entry-phase teachers perceived their level of competence as "Good" or "Excellent," while the remainder rated themselves as "Average" or below. A multiple-teacher department was the work setting for two-thirds of these teachers. Moreover, this study revealed that nearly one-third of beginning agricultural science teachers in Texas are female.

Few studies previously have contained sizeable numbers of female teachers. For example, Farrington in 1981 surveyed 13 states and received responses from only 15 females; Cole in 1984 queried 60 practicing teachers, representing Oregon State University's agricultural education teacher certification graduates for the years 1971-1982, and only 10% or six were females. More recently, Joerger and Boettcher (2000) reported responses from 13 female early-career agricultural education instructors in Minnesota, which represented a majority of that beginning teacher cohort. Yet, historically, it has been difficult to assess any influence of gender in the ranks of beginning agriculture teachers. A substantial number of females (n = 32) in this study allowed such analysis.

Gender was related to agricultural work experience, FFA involvement, departmental size, and additional years expected to teach. Females were found to have had less agricultural work experience but more FFA involvement, and to teach in departments with more teachers; they also expected to teach for fewer years than did their male counterparts. Females perceived their

FFA involvement to be of a higher level than did males. On the other hand, females perceived their agricultural work experience to be less substantial than did males. This may establish a premise for determining if these two frames of "experience" are qualitatively different and if they play different roles in perception of competence and perceived career longevity of entry-phase teachers. Increasing numbers of female teachers suggest that differences may be accentuated if this trend continues.

Agricultural work experience was related to the number of teachers in a department; with more work experience, entry-phase teachers were more likely to teach in a department with fewer teachers. Also, more work experience in agriculture was positively related to additional years one expected to teach. Similarly, Cole (1984) found that years of work experience and high quality work experience were linked to longer teaching tenure. However, in this study, agricultural work experience was not related to perceived competence in teaching. In addition, FFA involvement was not related to the additional number of years one expected to teach. On the other hand, FFA involvement was related to perceived competence. These results tend to reflect the findings of Findlay and Drake (1989) who found that "a complex interplay between certain selected demographic experiences and perceived levels of competence as indicators of the teachers' ability to effectively perform professional work roles" (pp. 51-52) existed and merited further study. Moreover, regarding experiences related to the induction phase of early-career agriculture teachers, Joerger and Boettcher (2000) called for additional investigation to further "explore how the nature, impact, and occurrence of desired forms of assistance and the events experienced by beginning teachers of agricultural education differ or remain the same…" (p. 113), when compared to beginning agriculture teachers in the future.

Dewey (1923) stated, "Getting an idea of how the experience proceeds indicates to us what factors must be secured or modified in order that it may go on more successfully," and that "these conditions, stated in an orderly sequence, would constitute the method or way or manner of its growth" (pp. 196-197). Perhaps a better understanding of experiences and the sequence or "how" in which they unfold would answer the question of cause and effect, that is, experiences of entry-phase agriculture teachers and their expectations for teaching longevity.

In this study, a chronological order was hypothesized with the "affective" variable, "additional years expect to teach," hypothesized as dependent on the other variables. When this variable was regressed on the independent variables with hierarchical method of entry, additional conclusions could be drawn. Gender is a weak correlate of the additional years one expects to teach. A more substantial predictor of additional teaching years is an entry-phase teacher's agricultural work experience. None of the other variables contributed to the explanation of variance in additional years to teach—not FFA involvement, not size of the department, and not perceived competence.

Recommendations

The results of this study appear to be interesting and potentially important to the profession, and to varying degrees are supported by the findings of previous researchers (Cole, 1984; Findlay, 1992; Findlay & Drake, 1989; DeMoulin, 1993). Yet, without additional corroborative evidence that better synthesizes the components of this phenomenon (i.e., expected teaching longevity of entry-phase agriculture teachers) and offers a greater degree of clarity, the researchers are unable to make with confidence recommendations for practice.

However, recommendations for future research include the following: (a) It is arguable that chronological ordering of independent variables is unnecessary. Yet, to determine causal relationships, chronological order may be important. Therefore, it is recommended that future research examine these variables in a causal order relationship (i.e., a path analysis). (b) Are relationships of background variables to measures of competence or longevity in teaching causal or spurious? (c) What role should unalterable attributes (e.g., gender) play in our professional practice and research? (d) Why is perceived competence related only to FFA involvement? (e) If increased agricultural work experience is related to longer tenure, and if longer tenure is indeed good, then how can we "manipulate" the agricultural work experience of future teachers to ultimately cause them to remain in teaching (Edwards & Briers, 2000; Joerger & Boettcher, 2000; Maurer, 2001)? (f) Moreover, future research should involve a qualitative study (i.e., individual interviews and/or focus groups) asking the "early leavers" of agriculture teaching to identify and describe their specific reason(s) for exiting the profession. Concomitantly, a similar study could be conducted involving those entry-phase teachers electing to remain in the profession. Perhaps a comparison and analysis of the responses of both groups would provide a more valid theoretical base for the future study of this important phenomenon.

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