

Multicultural Teaching Concerns: A Comparison Between Disciplines at the Secondary Pre-service Level

Stacy K. Vincent, Assistant Professor
University of Kentucky

Justin L. Killingsworth, Assistant Professor
Arkansas Tech University

Robert M. Torres, Professor
University of Arizona

Cultural diversity in secondary and postsecondary agricultural education programs lags behind recent demographic shifts in the general U.S. population. An examination of the literature provides inquiries into the need for teaching of multicultural awareness and reducing the achievement gap between students of various cultures. This research sought to summarize current concern levels secondary pre-service teachers have toward teaching in a multicultural classroom. Multicultural Teaching Concern was calculated based upon the summation of four constructs: familial/group knowledge, strategies and techniques, cross-cultural competencies, and school bureaucracy. Results indicate sex, home residency, and academic major play a role in the overall concern displayed. Secondary agricultural education pre-service teachers are not as concerned as secondary pre-service teachers from other disciplines. Recommendations for the selected institution include the development of an agricultural education multicultural course; the implementation of cultural immersion projects for students within the major; and professional development in multiculturalism among teacher educators.

Keywords: multicultural education, teaching concerns, teacher education, secondary

Introduction

The population of the United States continues to grow and expand more diverse in cultures (United States Census Bureau, 2006) over the last five years.. In 2000, the United States Census Bureau issued a report detailing population numbers by ethnicity for 1980, 2000, and predicted values for 2020. Data analysis predicts the White population to be the only race to decline over the 40-year time-period. Identified with the largest increase in population growth within the United States is the Hispanic population with an 11.5% difference; followed by Asian (3.5%) and African-American (1.3%) populations.

Although the population of the United States continues to diversify, the same diversity trend is not observed among teachers within U.S. schools. In 2009, 6.9% of the total public school teacher population was African American while African American students constituted 15.7% of the total enrollment in public schools (Coopersmith, 2009; Keigher, 2009). Similar discrepancies are observed for other racial populations. These discrepancies are further amplified when research revealed in 2002 that nearly 40% of all schools in the United States do not have a single teacher of color (National Education Association, 2002). Bireda and Chait (2011) reported that the percentage of public schools now exceeds the 40%, which was reported in 2002. The nation's largest urban public school systems (e.g. Chicago, Memphis,

Atlanta, Milwaukee) reported that in 2002, 69% of the student population was of color represented by only 35% teachers of color, (NCES, 2003). Now, teachers of color represent only 17% of the public school teacher population (Bireda & Chait, 2011).

Although race is an identifiable facet of culture, it is not the only identifier. In fact, culture is explained as the explicit statement of aspects such as the learned, socially shared, and variable nature of one's experiences (Betancourt & López, 1993). Rohner (1984) proposed that culture represents design and ways of life and that each are transmitted from one generation to another. With these thoughts in mind, one could include economic status as a cultural element in a student population. The National Center for Education Statistics (2006) reported that 41.6% of the U.S.'s school-based student population qualifies for free or reduced price lunch.

Large gaps between the ethnic demographics of teachers and students in agricultural education, including the agriculture industry's two largest states, California (Trexler et al., 2004) and Texas (Talbert & Larke, 1995). In addition to the lack of diversity in agriculture education and the major shift in the American culture, fair warning has been issued to the profession. Bowen and Rumberger (2002) reported that within this cultural shift comes a fundamental challenge: either aggressively pursue methods to draw a diverse pool of new teachers into the discipline, or remain a course of study with teachers whose demographics do not reflect the students they teach.

Throughout the agricultural education profession, presumptions can be made about the culture of pre-service agricultural education majors based upon former research (Joerger & Boettcher, 2000; Kantrovich, 2010; Rocca & Washburn, 2006). Roberts and Dyer (2002) developed 40 characteristics to describe the effective agriculture teacher. In the characteristics, none of the 40 represented a culturally competent teacher of diverse populations. Connors and Elliott (1995) concluded that although students enrolled in agriculture science classes did as well on state science examinations as students not enrolled in agriculture science; however, no increase was apparent with students from low socio-

economic backgrounds. The outcome raises questions if pre-service agricultural education teachers are concerned, aware, or even preparing to teach students who are culturally different (i.e. ethnicity, SES, ability) than themselves.

Agriculture educators need to be alarmed about the level of concern that a pre-service teacher has in teaching culturally diverse populations. Spanierman et al. (2008) indicated that many students are arriving at racially diverse college settings, from mostly homogeneous White high schools, with little knowledge of or experience with people from diverse ethnic backgrounds. This should bring concern to teachers as they prepare students for a future beyond high school. In fact, Wehlage and Rutter (1986) attributed the student dropout rate to teacher concern levels. Fritz and Miller (2003) may have revealed a key contribution to the agricultural education profession in a 2003 study. They concluded that one in four female, pre-service teachers had concerns for self-adequacy, described primarily as survival concerns, in their teaching impact. Although valuable, these studies did not identify, nor did it seek, a level of concern among pre-service teachers toward teaching students of diverse cultures.

Conceptual/Theoretical Framework

The conceptual model is derived from Fuller, Parsons, and Watkins (1973). Francis Fuller, a clinical psychologist, developed a two-stage teaching concern model for the concerns of self and pupil (Fuller, 1969). Fuller's research focus was on stages of concern in pre-service teachers and beginning teachers. Fuller identified numerous categories in teaching concern, and then grouped the specific categories into three stages: self-concerns, task concerns, and impact concerns (Fuller, Parsons, & Watkins, 1973).

Self-concerns relate to the teachers' own worries about their ability to adequately perform and survive in the school environment (Marshall, 1996b). Task concerns regard daily teaching duties that pertain to the teaching methods and performance of the teacher. The final level of concern, impact, describes the

teacher's apprehension toward the outcomes of the students learning needs (Srivastava, 2007).

The research literature has described the cultural elements of race and class by how teachers interact with students of a different race and class (Junor Clarke & Thomas, 2009; Kozol, 1992; Dusek & Joseph, 1985). In addition, research within the education profession has described how teachers' concerns relate to what approaches they take in the delivery of content to students. Included in the literature are various areas of teaching concerns in pre-service science education (Gunstone, Slattery, Baird, & Northfield, 1993), horticulture teachers exploring mathematics enhancement (Jansen, Enochs, & Thompson, 2006), individuals teaching or not teaching five years after graduation (Marso & Pigge, 1995), and mathematics education teachers (Christou, Eliophotou-Menon, & Philippou, 2004). Although many of the sources are incredible references to enhance the performance of teacher education, none discuss the concerns that pre-service agriculture teachers have for teaching students of different cultures (sources studying cultural concerns)

Purpose/Research Objectives

The purpose of this descriptive-correlational study was to examine the level of concern toward teaching students of multiple cultures among pre-service teachers in agricultural education. The following research objectives and hypotheses guided the study:

1. Describe pre-service (agriculture and other secondary areas) teachers, at the University of Missouri in terms of race, sex, home residency, and family's household income.
2. Describe pre-service teachers, at the University of Missouri, level of multicultural teaching concern within the four constructs (Familial/Group Knowledge, Strategies and Techniques, Cross-Cultural Competencies, and School Bureaucracy).
3. Describe the multicultural teaching overall concerns by the selected student characteristics (sex, race, home residency, and perceived family income).

Additionally, nine hypotheses were tested. For brevity, four hypotheses are collapsed into one and four into another.

H01, 02, 03, 04: The proportion of variance in the constructs (Familial/Group Knowledge01, Strategies and Techniques02, Cross-Cultural Competencies03, and School Bureaucracy04) of multicultural teaching concerns cannot be predicted by the linear combination of selected student characteristics (sex, race, home residence, and predicted family income).

H05, 06, 07, 08: There was no statistically significant difference in the construct area (Familial/Group Knowledge05, Strategies and Techniques06, Cross-Cultural Competencies07, and School Bureaucracy08) for teaching multicultural students between secondary pre-service agricultural education teachers and other secondary pre-service teachers.

H09: There was no statistically significant difference in the overall level of concerns for teaching multicultural students between secondary agriculture pre-service teachers and the other pre-service teachers.

Methods/Procedures

The assessable population of this descriptive-correlational study was secondary pre-service teachers at the University of Missouri whom were entering phase III (student teaching) of three teacher developmental program phases. The sample consisted of secondary pre-service teachers whom had completed their phase II of the teacher development program during the 2009 spring semester ($n = 113$). The pre-service teachers represented the seven secondary teacher certification areas (Agriculture, Art, English, Mathematics, Music, Science, and Social Studies) offered at the University of Missouri. The Associate Dean of Academic Programs in the College of Education granted access to pre-service teachers outside of Agricultural Education. Confirmation of participation was received following the approval of the lead faculty member of each phase II course. Faculty members from each phase II course set a desired meeting time and date for the researchers to distribute and collect the data collection instrument. The researchers began the collection

of data after receiving approval from the university's Institutional Review Board.

The Multicultural Teaching Concerns Survey (MTCS) was used to measure the level of multicultural teaching concern as expressed by the pre-service teachers (Marshall, 1996a). Marshall (1996b) developed the MTCS, with modifications and further developments to Locke's (1988) multicultural awareness model and Fuller and Brown's (1975) three-stage teaching concern conceptualization: self, tasks, and impact. Four constructs comprised the MTCS and included measures reflecting teaching concerns related to Familial/Group Knowledge (the culture among diverse students' families), Strategies and Techniques (effective teaching methods among different cultures), Cross-Cultural Competencies (teacher's knowledge, skills, and beliefs toward different cultures), and School Bureaucracy (identifying attitudes of intolerance toward diverse cultures within a school). After an extensive amount of reliability testing, the MTCS revealed 34 questions: 14 in Familial/Group Knowledge, 10 in Strategies and Techniques, six in Cross-Cultural Competence, and four in School Bureaucracy (Marshall, 1996b).

A panel of experts ($n = 6$) with a similar research focus involving statistical and/or multicultural education at the University of Missouri reviewed the MTCS for face and content validity. To determine the reliability of the MTCS, it was piloted with pre-service students enrolled in a multicultural diversity education course at the same university who were not included in the study ($n = 20$). Reliability estimates were determined using a Cronbach's alpha. The overall reliability estimate for the MTCS was .90. Reliability estimates were also determined for the four concern constructs: .73 for Familial/Group Knowledge, .82 for Strategies and Techniques, .87 for Cross-cultural Competence, and .51 for School Bureaucracy. The results were satisfactory, according to Nunnally and Bernstein (1994), except for School Bureaucracy. A panel of experts reexamined the School Bureaucracy anchor and restructured wording and sentence structure to minimize error, but did not develop critical change that would affect the overall score of the instrument.

Following revision, the School Bureaucracy construct received a new reliability estimate of .68. Pre-service teachers completing the questionnaire were asked to rate their concern level to various questions on a 5-point Likert scale ranging from "extremely important" to "extremely unimportant".

Following the data collection period, data were coded and entered into SPSS. Descriptive statistics of central tendency and variability were calculated to summarize the data. According to Oliver and Hinkle (1982), it is reasonable to argue that a well-established cohort of subjects in any given year is likely to be representative of a cohort of similar nature and location in near future years. Inferential analyses were applied to the data in an effort to predict the concern of similar cohort grouping of pre-service teachers within the same university.

Independent sample t -tests and ANOVA were conducted to test differences on the MTCS, and stepwise multiple linear regressions was calculated to estimate the variance in the four constructs for teaching multicultural students (Familial/Group Knowledge, Strategies and Techniques, Cross-Cultural Competencies, and School Bureaucracy) as explained by pre-service teacher selected predictor characteristics. Effect sizes were calculated using Cohen's (1988) d coefficients and interpreted by Thalheimer and Cook (2002): negligible effect size ($d < 0.15$, small effect size ($d < 0.40$), medium effect size ($d < 0.75$), large effect size ($d < 1.10$), very large effect size ($d < 1.45$), and huge effect size ($d > 1.45$). An alpha level of .05 was established a priori for tests of significance.

Because the sample of pre-service teachers were unequally represented across disciplines, assumptions of normality and equal variance were tested. A two-sample Kolmogorov-Smirnov test was conducted to validate the assumptions of normality. The results indicated ($p = .62$) that the data were indeed normal, thereby allowing for the use of two-sample t -test. A normal probability plot indicated that the variables met the assumptions of normality, thereby allowing the use of ANOVA.

Results/Findings

Research objective one sought to describe the selected characteristics (race, gender, home residency, and family's household income) by secondary agriculture ($n = 24$) and other secondary pre-service teachers ($n = 89$). Female pre-service teachers outnumbered male pre-service teachers in both secondary agriculture ($n = 17$; 70.80%) and other secondary pre-service teachers ($n = 52$; 58.40%). Secondary agriculture pre-service teachers were homogenous in race (White; $n = 24$; 100.00%) while other secondary pre-service teachers had a slight diverse composition with White as the dominant race ($n = 75$; 84.30%) followed by Asian ($n = 5$; 5.60%), African American ($n = 5$; 5.60%), Hispanic ($n = 3$; 3.40%), and American

Indian ($n = 1$; 1.10%). All pre-service secondary agriculture teachers ($n = 24$; 100.00%) considered their home residence to be located in a rural setting, while the majority of other secondary pre-service teachers identified home residence as suburban ($n = 60$; 67.40%) rather than rural ($n = 19$; 21.30%) and urban ($n = 10$; 11.20%). A discrepancy in perceived family income existed between the two pre-service teachers grouping. Thirteen of the 24 (54.20%) agricultural education pre-service teachers perceived their family's household income to be within the range of \$35,000 to \$49,999, while the majority of other secondary pre-service teachers ($n = 31$; 34.80%) perceived their family household income to be \$100,000 or greater (see Table 1).

Table 1
Descriptive Characteristics of Agriculture and Other Secondary Pre-service Teachers (n = 113)

Characteristic	Agriculture Pre-service		Other Pre-service	
	<i>f</i>	%	<i>f</i>	%
Sex				
Female	17	70.80	52	58.40
Male	7	29.20	37	41.60
Race				
White	24	100.00	75	84.30
African American	0	0.00	5	5.60
Asian	0	0.00	5	5.60
Hispanic	0	0.00	3	3.40
American Indian	0	0.00	1	1.10
Home Residence				
Rural	24	100.00	19	21.30
Suburban	0	0.00	60	67.40
Urban			10	11.20
Perceived Family Income				
< \$35k	0	0.00	2	2.20
\$35k – \$49,999	13	54.20	12	13.50
\$50k – \$74,999	7	29.20	24	27.00
\$75k – \$99,999	2	8.30	20	22.50
\$100k ≥	2	8.30	31	34.80

The majority of the secondary pre-service teachers who were completing Phase II at the University of Missouri were agriculture ($f = 24$; 21.20%) and social studies ($f = 24$; 21.20%) followed by English ($f = 19$; 16.80%), math ($f =$

15; 13.30%), science ($f = 13$; 11.50%), music ($f = 10$; 8.80%), and art ($f = 8$; 7.10%). To gain a better view of the pre-service teachers' certification area, Table 2 serves as a summary of the academic areas represented in the study.

Table 2
Certification Area of Secondary Pre-service Teachers (n = 113)

Secondary Certification Area	<i>f</i>	%
Agriculture	24	21.20
Social Studies	24	21.20
English	19	16.80
Math	15	13.30
Science	13	11.50
Music	10	8.80
Art	8	7.10

For research objective two, pre-service teachers' levels of concern were broken down into the four constructs (Familial/Group Knowledge, Strategies and Techniques, Cross-Cultural Competence, and School Bureaucracy). According to the grand mean scores, pre-service teachers at the University of Missouri revealed

the highest concern in the construct area of Familial and Group Knowledge ($m = 4.07$; $SD = 0.59$) followed by Concerns for Strategies and Techniques ($m = 3.98$; $SD = 0.64$), School Bureaucracy ($m = 3.65$; $SD = 0.80$), and Cross-Cultural Competence ($m = 3.20$; $SD = 0.95$), which is provided in Table 3.

Table 3
Familial/Group Knowledge; Strategies & Techniques; Cross-Cultural Competence; and School Bureaucracy Mean Concern Scores (n = 113)

Cultural Competency	Mean Score	<i>SD</i>	Grand Mean ^c	Grand <i>SD</i>	Range
Familial/Group Knowledge ^a	24.40	3.53	4.07	0.59	14.00 – 30.00
Strategies and Techniques ^b	55.71	8.95	3.98	0.64	20.00 – 70.00
School Bureaucracy ^c	14.61	3.19	3.65	0.80	6.00 – 20.00
Cross-Cultural Competence ^d	32.02	9.54	3.20	0.95	10.00 – 50.00

^aOut of 30 Points; ^bOut of 70 Points; ^cOut of 20 Points; ^dOut of 50 Points; ^eScale based on: 1 = Extremely Unimportant to 5 = Extremely Important

Research objective three sought to describe the overall concern level of the pre-service teachers based upon the characteristics of gender, race, home residence, and perceived family income (see Tables 4 and 5). In teaching multicultural students, Female pre-service teachers are overall more concerned ($M =$

130.04 ; $SD = 18.48$) than male pre-service teachers ($M = 121.55$; $SD = 21.92$) (see Table 4). An independent samples (two-tailed) t – test revealed a significant difference ($t = 2.22$; $p < .05$) in level of concern held by female and male pre-service teachers with a medium effect size ($d = 0.43$).

Table 4
Two-Tailed Independent Sample t-test on Level of Teaching Concern by Sex (n = 113)

Sex	<i>n</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	Cohen's <i>d</i>
Female	69	130.04	18.48	2.22	.03*	0.43
Male	44	121.55	21.92			

* $p \leq .05$

In addition to the sex of pre-service teachers, the remaining characteristics were evaluated as multichotomous variables. To complete research objective three, an univariate linear 3-way ANOVA model was conducted to determine the differences in overall level of concern for teaching students of different cultures by race, home residence, and perceived

family income (see Table 5). No significant difference ($p > .05$) in overall level of concern was found among the pre-service teachers' family income, however, a significant difference ($p < .05$) in home residency was found. Due to concerns toward the unequal group size in race, a test of significance was not calculated rather, descriptive measures are provided in Table 5.

Table 5
ANOVA of Concern Scores by Pre-service Teacher Characteristics (n = 113)

Characteristic	n	M	SD	F	p
Race					
White	99	126.43	19.27		
Asian	5	133.80	28.82		
Black	5	127.20	34.39		
Hispanic	3	133.33	10.02		
American Indian	1	99.00	0.00		
Home Residence				4.23	.01*
Rural	43	122.81	19.75		
Suburban	60	126.85	20.09		
Urban	10	142.90	16.16		
Perceived Family Income				0.73	.57
< \$35k	2	125.00	28.28		
\$35k – \$49,999	25	128.28	16.47		
\$50k – \$74,999	31	129.13	18.66		
\$75k – \$99,999	22	126.41	20.20		
\$100k ≥	33	123.64	20.23		
Intercept				420.28	.01*

Home Residence: $F(2,110) = 4.23$, Adjusted $\eta^2 = .07$; $*p \leq .05$

A Levene's test revealed that an equal variance was assumed in the characteristic of home residency on the overall multicultural teaching concern score. Hochberg's GT2, post hoc, pair-wise comparison was utilized because of the unequal sample size between rural, suburban, and urban students. Hochberg's GT2

provides a calculation for the honest significant difference to address Type I error (Field, 2000). Results display a significant difference ($p < .05$) in the overall concern level among urban/suburban and urban/rural pre-service teachers (see Table 6).

Table 6
Hochberg's GT2 Post hoc Pair-wise Comparison of Overall Concern Level by Home Residence

Home Residence	Mean Difference	p
Suburban / Rural	4.04	.66
Urban / Suburban	16.05	.05*
Urban / Rural	20.09	.01*

* $p \leq .05$

To test hypotheses 01, 02, 03, and 04, stepwise multiple linear regressions were utilized to predict the antecedents of pre-service teachers' level of concern for teaching multicultural students in the four teaching concern constructs (Familial/Group Knowledge, Strategies and Techniques, Cross-Cultural Competencies, and School Bureaucracy) that can be predicted by their characteristics (race, certification area, sex, home residency, and family's household income). For race, subjects were dichotomized as either *White* or *Not White* (African-American, Asian, Hispanic, and Native American) and the academic certification areas were dichotomized as *Agricultural Education* or *Other Secondary Areas* (Social Studies, English, Mathematics, Science, Music, and Art). Intercorrelations were calculated to check for multicollinearity. According to Berry and Feldman (1991), bivariate correlations between independent variables yielding a .80 or higher were considered to display a high degree of

multicollinearity. No multicollinearity issues were observed in each of the multiple regression analyses. Tables 7 and 8 display the results of the analyses.

It was revealed that nine percent of the variance of pre-service teachers' concern in Familial/Group Knowledge (see Table 7) construct ($F(2,112) = 5.48; p \leq .05$) was predicted by their sex ($\beta = -.24; p \leq .05$) and certification area ($\beta = .21; p \leq .05$). Home residency, race, and perceived family income were non-significant predictors. Concern for using Strategies and Techniques (see Table 8) to teach multicultural students ($F(5,112) = 10.65; p \leq .05$) was predicted by their home residency ($\beta = .30; p \leq .05$), certification area ($\beta = .18; p \leq .05$), and sex ($\beta = -.25; p \leq .05$). Null hypotheses 01 and 02 were rejected in favor of the alternative hypotheses that the proportion of variance in Familial/Group Knowledge and Strategies and Techniques is explained by the linear combination of characteristics.

Table 7
Stepwise Regression of Familial Group Knowledge Concern (n = 113)

Variable	R	R ²	b	β	t	p
Characteristics	.30	.09				
Sex ^a			-1.71	-.24	-2.59	.01*
Certification ^b			1.83	.21	2.33	.02*
(Constant)			23.62		32.82	.01*

Note. Adjusted R² = .07; For Model: $F(2,112) = 5.48; *p \leq .05$; ^aSex Coded: Female = 0; Male = 1
^bCertification Area: Agricultural Education = 0; Other Secondary Areas = 1

Table 8
Stepwise Regression of Strategies and Techniques Concern (n = 113)

Variable	R	R ²	b	β	t	p
Characteristics	.40	.16				
Home Residence ^c			4.38	.30	3.48	.01*
Certification ^b			3.93	.18	1.56	.02*
Sex ^a			-4.49	-.25	-2.81	.01*
(Constant)			54.36		39.90	.01*

Adjusted R² = .15; For Model: $F(5,112) = 10.65; *p \leq .05$; ^aSex Coded: Female = 0; Male = 1;
^bCertification Area: Agricultural Education = 0; Other Secondary Areas = 1; ^cHome Residence: Rural = 0; Suburban = 1; Urban = 2

As noted in Table 7, the Familial/Group Knowledge construct is explained by sex and certification area. The table provides information that pre-service agriculture male teachers have significantly lower multicultural concern for familial/group knowledge than another group. Table 8 shows that home residence, certification area, and sex play a significant role in their multicultural concern for the strategies and techniques in teaching students of a different culture.

Hypotheses 03 and 04 state, the proportion of variance in the construct areas (Cross-Cultural Competencies and School Bureaucracy) of multicultural teaching concerns is not explained by the linear combination of the demographic characteristics. Using stepwise multiple linear regression, no unique variance was explained in each construct area resulting in a failure to reject null hypotheses 03 and 04.

Two-tailed, independent *t*-tests were calculated to test hypotheses 05, 06, 07, and 08. Each hypothesis sought to determine if significant differences existed between secondary pre-service agriculture teachers and other secondary pre-service teachers by each construct of multicultural teaching concern (Familial/Group Knowledge, Strategies and Techniques, Cross-Cultural Competence, and School Bureaucracy). Table 9 provides the results. As noted in the concern construct

Familial/Group Knowledge, other secondary pre-service teachers received a mean score of 24.74 (*SD* = 3.72) which is significantly (*p* < .05) higher than agriculture pre-service teachers (*M* = 23.13; *SD* = 2.38) with a medium effect size (*d* = 0.47). Therefore, for Familial/Group Knowledge, equal variance is assumed with a significant *t*-value of -2.02.

Other secondary pre-service teachers (*M* = 56.76; *SD* = 9.20) responded that they were more concerned than agriculture pre-service teachers (*M* = 51.79; *SD* = 9.20) in the construct area of Strategies and Techniques (see Table 9). The difference was significant (*p* < .05) with a medium effect size (*d* = 0.55). Equal variance was not assumed, yielding a significant *t*-value of -2.83.

Significant difference was found in the independent *t*-test on the construct areas of Familial/Group Knowledge and Strategies and Techniques. Null hypotheses five and six were rejected in favor of the alternative hypotheses which state differences do exist in the constructs of concern between pre-service secondary agriculture teachers and other pre-service secondary teachers. For the constructs of Cross-Cultural Competence and School Bureaucracy concerns, a significant difference was not found (*p* < .05). Therefore, null hypotheses 07 and 08 were not rejected.

Table 9
Two-Tailed Independent t-test on Multicultural Teaching Concern Constructs of Pre-service Secondary Teachers (n = 113)

Concern Constructs	<i>n</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	Cohen's <i>d</i>
Familial/Group						Medium
Agriculture	24	23.13	2.38	-2.02	.04*	0.47
Other Secondary	89	24.74	3.72			
Strategies/Techniques						Medium
Agriculture	24	51.79	9.20	-2.83	.01*	0.55
Other Secondary	89	56.76	9.12			
Cross Cultural Competence						Negligible
Agriculture	24	31.83	9.20	-0.11	.91	0.03
Other Secondary	89	32.07	9.68			
School Bureaucracy						Small
Agriculture	24	13.96	3.34	-1.09	.28	0.26
Other Secondary	89	14.79	3.14			

**p* < .05

Hypothesis 09 is better explained in Table 10, which includes the one-way ANOVA findings for overall multicultural teaching concern levels in pre-service teachers. The overall model was found to be significant ($p < .05$). The test of significance lead to rejecting null hypothesis 09 in favor of the alternative hypothesis suggesting there is a difference in the overall level of concerns for teaching multicultural students among the secondary pre-service teachers. A significant difference among

the group variance existed and as the result of the Levene's test, equal variance was assumed leading to performing a Tukey, post-hoc, pair-wise comparison (Table 11). Tukey post-hoc was utilized as a relatively conservative approach to addressing Type I error (Field, 2000). The Tukey post-hoc comparison revealed a significant difference in overall multicultural teaching concern scores between secondary Agriculture/Social Studies, Agriculture/Art, and Agriculture/English pre-service teachers.

Table 10
ANOVA of Overall Concern Scores by Certification Area ($n = 113$)

Certification Area	<i>n</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i>
				3.97	.01*
Agriculture	24	120.71	17.47		
Social Studies	24	133.08	17.12		
English	19	137.63	15.73		
Math	15	114.67	23.02		
Science	13	116.54	17.28		
Music	10	129.00	25.69		
Art	8	136.25	17.94		

Note. Certification Area: $F(6,112) = 3.97$; $*p \leq .05$; Adjusted $\eta^2 = .14$

Table 11
Tukey Post hoc Pair-wise Comparison of Pre-service Secondary Agriculture Teachers with Other Pre-service Secondary Teachers

Certification Area	Mean Difference	<i>p</i>
Agriculture / Math	6.04	.96
Agriculture / Science	4.17	.99
Agriculture / Music	-8.29	.90
Agriculture / Social Studies	-12.38	.05*
Agriculture / Art	-15.54	.04*
Agriculture / English	-16.92	.03*

* $p \leq .05$

Conclusions/Implications/Recommendations

An overall objective for agricultural education is to prepare youth for working in a diverse labor market (Doerfert, 2011). Although, the analysis of the current pre-service teachers enrolled in agricultural education (Kantrovich, 2010) can be identified with homogenous characteristics (i.e. rural and White) it does not imply that their classroom will mirror a similar culture (Bowen & Rumberger, 2002). Therefore,

it is imperative that a teacher gain an understanding for cultural awareness and be able to develop youth competency in diversity; but they must first have a concern for doing so (Marshall, 1996a). The purpose of this study was to see if pre-service agricultural education students at the University of Missouri were concerned for the diverse culture of their classroom, as compared to their other pre-service teaching colleagues.

The concern construct area of Familial/Group Knowledge received the highest concern score held by pre-service teachers; followed closely by their concern toward the Strategies and Techniques in teaching multicultural students. The College of Education at the University of Missouri places an emphasis on cultural teaching strategies and techniques through a teaching certification mandated course. Because of this effort, it implies Strategies and Techniques for teaching culturally diverse students are being addressed. The high concern scores towards a student's family and group knowledge is due to the emphasis the college makes on recognizing family and home backgrounds/lifestyles as a pivotal piece of teaching to diverse students. To capitalize on the two high concerns construct areas, it is recommended that the College of Education begin to address the constructs by preparing pre-service teacher's efficacy level in various classroom strategies and techniques that benefit different cultures as well as helping students realize that their own personal upbringing helped define their own characteristic and bias. The lowest two concern construct areas, School Bureaucracy and Cross-Cultural Competence, suggest that a greater level of awareness is needed before an efficacy level is addressed. To build pre-service teachers' concern levels, it is recommended that educators provide students with opportunities to work and observe in schools with various cultures that allow a stronger understanding. In addition, qualitative interviews of teachers, administrators, and students from schools of multi-cultures will help in the education process that will reflect a higher concern in cross-cultural competence and school bureaucracy.

Female and male pre-service teachers differ significantly on the overall concern level of teaching multicultural students, where females appear to have the higher level of concern. It is possible that females' concern scores are higher due to their nurturing character or their cautious behavior. Although research implies that race of a teacher affects the educational outcome of the teacher (King, 1993), there was no significant relationship between pre-service students' race and their overall concern level in teaching multicultural students. However, this might be

due to the homogenous nature of the pre-service teachers in the study. Urban students differ significantly on their overall level of concern from the suburban and rural pre-service teachers. This implies that rural pre-service teachers may have a narrow definition of *culture* as a subject of race, which they received minimal association with as opposed to students from an urban background. It is recommended that the college educators strengthen their efforts to educate students about various cultures in a classroom setting. In addition, it is recommended that male pre-service teachers at the University of Missouri receive additional opportunities to practice teaching in more diverse schools. It is further recommended that teacher educators at the University of Missouri provide all pre-service teachers with experiences in a culturally diverse school through service learning hours, field experience hours, and practical teaching experiences. Rehm and Allison (2006), provide a great example. They measured a high level of cultural competence among Family and Consumer Science students when service learning experiences, teaching observations, and teaching practices in multi-diverse schools were increased.

When attempting to predict students' teaching concern levels from the four concerns constructs (Familial/Group Knowledge, Strategies and Techniques, Cross-Cultural Competence, and School Bureaucracy), two were found to be significant (Familial/Group Knowledge and Strategies and Techniques) predictors. Female pre-service teachers in a certification area other than agriculture have the highest level of concern for the Familial/Group Knowledge construct area. This implies that agriculture pre-service teachers at the University of Missouri anticipate a teaching job similar or close to their home residence. This anticipation provides agriculture pre-service teachers with an assumption that the classroom students' family and group background will be similar to their own. The opposite appears to be true with secondary pre-service teachers that represent the other certification areas. These students showcase a higher concern toward the possibility that their students' family and group background could be different from their own.

In addition, the higher concern provides educators with the information that the pre-service teacher is more capable to obtain techniques that may address the concern (Marshall, 1996b). It is recommended that agriculture teacher educators at the University of Missouri help their pre-service teachers identify the cultures they are accustomed to and then immerse them in various family and group lifestyles. Possibilities for obtainment are through student teaching placements at multicultural communities or through the engagement of multicultural experiences.

The second concern construct that was significant addresses the strategies and techniques utilized in teaching students of different cultures (Strategies & Techniques). It is concluded that urban, female pre-service teachers from a certification area other than agriculture have the greatest level of concern. This implies that agriculture pre-service teachers who are male, at the University of Missouri, are disadvantaged versus their other content area colleagues. It is recommended that efforts be made to offer experiences that provide greater understanding of the different strategies and techniques that are successful among different cultures. Agriculture pre-service teachers, especially males, need experiences that allow each to practice the strategies and techniques among students of different cultures. It is recommended that these obtained strategies and techniques be practiced in classrooms representing diverse cultures. Opportunities to obtain strategies and techniques among diverse cultures include, but are not limited to: urban schools, study abroad experience, secondary classrooms in art, social studies, or English.

In the constructs of Familial/Group Knowledge and Strategies and Techniques, pre-service agriculture teachers are significantly less concerned than their other secondary colleagues are. A medium effect size exists in the variance of Familial/Group Knowledge and Strategies and Techniques, while a small effect size in the variance of School Bureaucracy exists between agriculture and other secondary pre-service teachers. Overall, this suggests that the agricultural education department at the University of Missouri should provide more opportunities for their pre-service teachers to

understand diverse cultures and identify the best practices for teaching students who are culturally different from themselves. It is recommended that teacher educators provide pre-service teachers with opportunities to obtain field experience hours at urban and rural secondary agriculture programs that showcases an enrollment of diverse cultures.

Although agriculture pre-service teachers provided an overall concern score lower than the majority of their peers, a significant difference was found between pre-service agriculture teachers and the pre-service teachers in the areas of social studies, English and art. This implies that the social studies, English, and art departments at the University of Missouri might be encouraging students to understand diverse cultures and understand the benefit of teaching to all students. Social studies and English pre-service teachers represent core content area classrooms that embody every student in a school. It would benefit agricultural teacher educators to collaborate with social studies, English, and art teacher educators in developing collaborative practices and professional development opportunities for agriculture pre-service teachers. The development of secondary courses, such as Global Agriculture, Agriculture Biology, and Rural Writing, could serve as a beneficial, cross-curricular, course that is co-taught by all disciplines.

A concern for teaching students of multiple cultures is a beginning step for obtaining cultural competence (Locke, 1988), but it is not the solution nor can it be developed in a simple course. Therefore, teacher educators at the University of Missouri are recommended to implement various techniques and methods, throughout a pre-service teacher's coursework that stimulates concerns and addresses techniques for implementation. Although, many teacher educators may not be competent in such practice, scholars provide a plethora of theoretical development in the progression of building teachers' cultural awareness and competence (Banks & Banks, 2010; Timpson, Canetto, Borrayo, & Yang, 2003).

Recommendations for Further Research

Further research should examine why differences exist among multicultural teaching concern levels in the academic areas. Other independent variables that may have an effect on an individual's concern level (i.e. interaction with students of different culture, cumulative grade point average, and whether the student continues to commute from home or not) needs

to be examined. Based upon the literature review, it is assumed that higher concern for teaching students of a different culture will result in an increased enrollment of students from diverse cultures. Some pre-service agriculture teachers may lack concern due to a lack of interaction with culturally different students in their upbringing. Qualitative research should be conducted to determine this phenomenon.

References

- Banks, J. A., & Banks, C. A. M. (2010). *Multicultural Education: Issues and Perspectives* (7th ed). Hoboken, NJ: John Wiley & Sons
- Berry, W. D., & Feldman, S. (1991). *Multiple Regression in Practice*. Newbury Park, CA: Sage Publications.
- Betancourt, H., & López, S. R. (1993). The study of culture, ethnicity, and race in American Psychology. *American Psychologist*, 48(6), 629–637.
- Bireda, S., & Chait, R. (2011). *Increasing teacher diversity: Strategies to improve the teacher workforce*. Washington, DC: Center for American Progress
- Bowen, B. E., & Rumberger, C. L. (2002). Advancing agricultural education within the context of an increasingly diverse society. *Journal of Agricultural Education*, 43(1), 1–11. doi:10.5032/jae.2002.01001
- Christou, C., Eliophotou–Menon, M., & Philippou, G. (2004). Teachers' concerns regarding the adoption of a new mathematics curriculum: An application of CBAM. *Educational Studies in Mathematics*, 57(2), 157–176.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.
- Connors, J. J., & Elliott, J. (1995). The influence of agriscience and natural resources curriculum on students' science achievement scores. *Journal of Agricultural Education*, 36(3), 57–63. doi:10.5032/jae.1995.03057
- Coopersmith, J. (2009). *Characteristics of public, private and bureau of Indian education elementary and secondary school teachers in the United States: Results from the 2007–08 schools and staffing survey (NCES 2009–324)*. Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education
- Doerfert, D. L. (Ed.) (2011). *National research agenda: American Association for Agricultural Education's research priority areas for 2011–2015*. Lubbock, TX: Texas Tech University, Department of Agricultural Education and Communications
- Dusek, J. B., & Joseph, G. (1985). The bases of teacher expectancies. In J. B. Dusek (Ed.), *Teacher Expectancies* (pp. 229–250). Hillsdale, NJ: Lawrence Erlbaum.

- Field, A. (2000). *Discovering statistics using SPSS for Windows: Advanced techniques of the beginning user*. London, England: Sage.
- Fritz, C. A., & Miller, G. S. (2003). Concerns expressed by student teachers in agriculture. *Journal of Agricultural Education*, 44(3), 47–53. doi: [10.5032/jae.2003.03034](https://doi.org/10.5032/jae.2003.03034)
- Fuller, F. (1969). Concerns of teachers: A developmental conceptualization. *American Educational Research Journal*, 6(2), 207–226.
- Fuller, F., Parsons, J. S., & Watkins, J. E. (1973, December). Concerns of teachers: Research and reconceptualization. *Paper presented at the 59th annual meeting of the American Educational Research Association*. Chicago, IL.
- Fuller, F. F., & Brown, O. H. (1975). Becoming a teacher. In K. Ryan (Ed.), *Teacher education* (pp. 25–52). Chicago, IL: National Society for the Study of Education.
- Gunstone, R. F., Slattery, M., Baird, J. R., & Northfield, J. R. (1993). A case study exploration of development in pre-service science students. *Science Education*, 77, 47–73. doi: [10.1002/sci.3730770104](https://doi.org/10.1002/sci.3730770104)
- Jansen, D. J., Enochs, L. G., & Thompson, G. W. (2006, May). Mathematics enhancement in horticulture curriculum: An exploratory examination of teacher concerns during initial implementation. *Paper presented at the 33rd Annual National Agricultural Education Research Conference*. Charlotte, NC.
- Joerger, R., & Boettcher, G. (2000). A description of the nature and impact of teaching events and forms of beginning teacher assistance as experienced by Minnesota agricultural education teachers. *Journal of Agricultural Education*, 41(4), 104–115. doi: [10.5032/jae.2000.04104](https://doi.org/10.5032/jae.2000.04104)
- Junor Clarke, P. A., & Thomas, C. D. (2009). Teachers' perceptions of connections and disconnects between their alternative preparation and teaching in urban classrooms. *Urban Education*, 44(2), 144–159.
- Kantrovich, A. J. (2010). *A national study of the supply and demand for teachers of agricultural education from 2007–2009*. American Association for Agricultural Education.
- Keigher, A. (2009). *Characteristics of public, private, and bureau of Indian education elementary and secondary schools in the United States: Results from the 2007–08 schools and staffing survey* (NCES 2009–321). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.
- King, S. H. (1993). The limited presence of African American teachers. *Review of Educational Research*, 63(2), 115–149. doi:[10.3102/00346543063002115](https://doi.org/10.3102/00346543063002115)
- Kozol, J. (1992). *Savage inequalities: Children in America's schools*. New York, NY: Harper Perennial.
- Locke, D. C. (1988). Teaching culturally-different students: Growing pine trees or bonsai trees? *Contemporary Education*, 59, 130–133.
- Marshall, P. L. (1996a). Multicultural teaching concern: New dimensions in the area of teacher concerns

- research? *Journal of Educational Research*, 89, 371–379.
- Marshall, P. L. (1996b). Teaching concerns revisited: The multicultural Dimension. In F. Rios (Ed). *Teacher thinking in cultural contexts* (pp. 239–259). Albany, NY: SUNY Press.
- Marso, R. N. & Pigge, F. L. (1995, November). Characteristics associated with teacher attrition: Pre- and post-preparation teaching concerns of candidate teaching or not teaching five years after graduation. *Paper presented at the annual meeting of the Midwestern Educational Research Association*. Chicago, IL.
- National Center for Education Statistics. (2006). *Number and percent of students in city, suburban, town, and rural public elementary and secondary schools with membership who are eligible for free or reduced-price lunch, by state or jurisdiction: School year 2005–2006*. Washington, DC: US Government Printing Office
- National Center for Education Statistics. (2003). *The Condition of Education 2002*. Washington, DC: U.S. Department of Education.
- National Education Association. (2002). *Becoming a Culturally Competent Educator*. Retrieved from <http://www.nea.org/home/10841.htm>
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd Ed). New York, NY: McGraw–Hill.
- Oliver, J. D., & Hinkle, D. E. (1982). Occupational education research: Selecting statistical procedures. *Journal of Studies in Technical Careers*, 4, 199–208.
- Rehm, M. L., & Allison, B. (2006). Positionality in teaching culturally diverse students: Implications for family and consumer science teacher education programs. *Family and Consumer Sciences Research Journal*, 34(3), 260–275. doi: [10.1177/1077727X05283593](https://doi.org/10.1177/1077727X05283593)
- Roberts, T. G., & Dyer, J. E. (2004). Characteristics of effective agriculture teachers. *Journal of Agricultural Education*, 45(4), 82-95. doi: [10.5032/jae.2004.04082](https://doi.org/10.5032/jae.2004.04082)
- Rocca, S., & Washburn, S. (2008). Pre-service agriculture teachers' perceptions of career barriers and support. *Journal of Agricultural Education*, 49(2), 38-49. doi: [10.5032/jae.2008.02038](https://doi.org/10.5032/jae.2008.02038)
- Rohner, R. P. (1984). Toward a conception of culture for cross-cultural psychology. *Journal of Cross-Cultural Psychology*, 15, 111–138. doi: [10.1177/0022002184015002002](https://doi.org/10.1177/0022002184015002002)
- Spanierman, L. B., Oh, E., Poteat, V. P., Hund, A. R., McClair, V. L., Beer, A. M., & Clarke, A. M. (2008). White university students responses to societal racism. *The Counseling Psychologist*, 36(6), 839–870.
- Srivastava, D. K. (2007). Measuring stages of concern of management academia about information technology based education. *Advances in Competitiveness Research*, 15(1), 116-127.
- Talbert, B. A., & Larke, A., Jr. (1995). Factors influencing minority and non-minority students to enroll in an introductory agriscience course in Texas. *Journal of Agricultural Education*, 36(1), 38–45. doi: [10.5032/jae.1995.01038](https://doi.org/10.5032/jae.1995.01038)
- Thalheimer, W., & Cook, S. (2002, August). *How to calculate effect sizes from published research*

articles: *A simplified methodology*. Retrieved from http://worklearning.com/effect_sizes.htm

Timpson, W. M., Canetto, S. S., Borrayo, E. A., & Yang, R. (2003). *Teaching diversity: Challenges and complexities, identities and integrity*. Madison, WI: Atwood Publishing

Trexler, C., Mike, S., Dodson, B., Vaughn, R., Freeman, F., & Bellah, K. (2004, May). *California and its new teachers: Prisms through which to view the future of agricultural education*. Paper presented at the 31st Annual National Agricultural Education Research Conference, St. Louis, MO.

United States Census Bureau (2006). *Current population reports*. Retrieved from <http://www.census.gov/population/www/socdemo/school.html>

United States Census Bureau. (2006). *Annual estimates of the population by sex, race and Hispanic or Latino origin for the United States: April 1, 2000, to July 1, 2005* (NC-EST2005-03). Washington, DC: U.S. Government Printing Office.

Wehlage, G. G., & Rutter, R. A. (1986). Dropping out: How much do schools contribute to the problem? *Teachers College Record*, 87, 374-392.

STACY K. VINCENT is an Assistant Professor of Agricultural Education in the Department of Community and Leadership Development at the University of Kentucky, 505 Garrigus Building, Lexington, KY 40546, stacy.vincent@uky.edu

JUSTIN L. KILLINGSWORTH is an Assistant Professor of Agricultural Education in the Department of Agriculture at Arkansas Tech University, 123E Dean Hall, 402 West O Street, Russellville, AR 72801, jkillingsworth2@atu.edu

ROBERT M. TORRES is the head of the Department of Agricultural Education and the Neely Family Endowed Professor for Excellence in Agriculture and Life Sciences at the University of Arizona, 205E Saguaro Hall, PO Box 210033, Tucson, AZ 85721, rtorres@cals.arizona.edu