



# IDENTIFYING TEACHING AND LABORATORY INSTRUCTION CONCERNS OF ILLINOIS AGRICULTURE TEACHERS

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## Abstract

Concerns of teachers must be identified to provide quality teacher education programs and professional development. The theoretical framework of this study was the Teacher Career Cycle (Fessler & Christensen, 1992). The theory explains that as teachers move through the cycle, their characteristics and professional needs change. The purpose of this study was to identify the concerns of Illinois agriculture teachers of different experience levels. A multi-part instrument of demographic information, two teacher concern statements, and a Likert-type scale of concerns was administered. The sample was divided into three experience groups: early career, mid-career, and late career. The results indicate that certain concerns do change with the level of experience and that mid-career teachers in this sample have the most concerns. We recommend that these results be shared with the Illinois Association of Vocational Agriculture Teachers, universities, state agricultural education staff, and other stakeholders. Those leading professional development should consider years of experience when planning for workshops. Professional development topics on student motivation, funding for supplies, and student safety should be explored.

## Keywords

Teacher Concerns; Agricultural Education; Teacher Career Cycle; Early Career; Mid-Career; Late Career

The 1980's and beyond ushered in an era of educational research and reform that focused on preparing teachers, teacher recruitment and retention, and providing quality professional development (Borman & Dowling, 2008). As education changes, so do the needs and challenges of teachers. The issues encountered by teachers among all experience levels has been studied extensively. Early literature identifies three concern stages: pre-service concerns, early teaching concerns, and late teaching concerns (Fuller, 1969). Fuller's work shows that as teachers gain experience, their concerns change. Past research indicates teachers are affected by challenges outside of the classroom as well. Fessler and Christensen (1992) explain that the characteristics of teachers are influenced by the organizational environment as well as the personal environment. Current concerns of teachers must be identified to improve current professional development and teacher education practices. The results of this study will provide a better understanding of the concerns of agriculture teachers in the state of Illinois and allow stakeholders to evaluate current professional development offerings and teacher education programs.

It is identified that pre-service teachers typically have concerns about self-abilities and survival as a teacher and in-service teachers become more concerned for the benefit of the student (Fuller et al., 1974). Current research reflects these concerns. Teachers often begin their career concerned with their classroom and teaching and later become concerned with their role in the school and profession (Aarts et al., 2020). Research on the concerns of the different teachers has been conducted specifically within agricultural education. Stair et al. (2012) observed

the level of concerns and their relationship to the stage of teaching of 65 individuals. The study compared the concerns expressed by early pre-service, late pre-service, and first year agriculture teachers. The number of concerns increased with teaching experience and the largest number of concerns was expressed by first year agriculture teachers (Stair et al., 2012) This again can be explained by the results of Fuller's research that teaching concerns increased with experience (Fuller et al., 1974).

Teaching school-based agriculture involves responsibilities outside of the general classroom that require the attention of the teacher. One of the challenges of teaching agriculture is curriculum that requires the use of specialized laboratory equipment and facilities. According to the 2022 Illinois Agricultural Education report, 81% of agriculture programs in Illinois have mechanics shops and 75% of schools have greenhouse facilities. Some schools in Illinois also have spaces for gardens, animals, and aquaculture. In Illinois, most agriculture programs have some type of specialized laboratory space. As a result, there are issues that concern the management of these spaces. On a positive note, some agriculture teachers view adequate laboratory spaces as motivational factors to stay in the profession (Rice et al. 2011). In a professional development study, one of the most requested professional development topics by teachers in the 1-5 years of experience category was managing instructional facilities (Figland et al., 2019). A previous study from Oregon also identified that beginning teachers need more professional development in laboratory teaching. In the study of Oregon teachers, teaching agricultural mechanics and managing the greenhouse were among the top professional development needs of induction phase teachers (Sorensen et al., 2014).

Other content area teachers also have needs when concerning laboratory-based instruction. In one study, Biotechnology instructors viewed adequate facilities as more important than other CTE instructors (Adams, 1999, Kirby & LeBude, 1998). Another group of Biotechnology instructors shared concerns of money, time, equipment, teacher knowledge, and student abilities (Borgerding et al., 2012). Some science teachers also have concerns in project-based teaching in the areas of time, staffing, equipment, and funding. Adams (1999) discussed how vocational teachers who had the least amount of preparedness had the largest amount of stress. Teachers, especially those with labs or specialized equipment, need adequate professional development, facilities, and supplies in order to increase their preparedness.

When not addressed, these concerns related to teaching, laboratory instruction, experience levels, can have lasting effects on education. The effects of not addressing these issues can include lower teacher retention and recruitment rates. In one case study of former Illinois agriculture teachers, a common reason for leaving the profession was unrealistic expectations concerning FFA Events. In the study, several former teachers discussed the pressure they felt to do more outside of the classroom and typical instructional day (Solomonson et al., 2019). Another case study on teacher attrition showed that some former agriculture teachers felt their job had a negative impact on their personal lives (Lemons et al., 2015). In the last 50 years, on average, between 50% and 60% of agricultural education graduates chose to enter teaching during their first year after graduation (Eck & Edwards, 2019). It is essential that teacher education programs address the issues faced by their students to prepare them for the career ahead.

Though multiple studies on the topic have been conducted, it is necessary to continue research on current issues affecting agriculture, CTE, and science teachers. One item that requires more research includes the concerns of teachers who are in different stages of their careers. More research should also be conducted on how concerns affect teachers of different genders, ages, and degree type held. Research on laboratory spaces, equipment, and professional development should also be conducted to explore the issues that teachers face when working in lab spaces.

## Theoretical and Conceptual Framework

The theoretical framework for this study is based on the ideas of Fessler and Christensen (1992) and their Teacher Career Cycle. Previous studies, including the works of Fuller (1969) identified stages in teaching with significant characteristics, laid the foundation of the Teacher Career Cycle. The teacher career cycle is influenced by two environmental conditions: personal environment and organizational environment. The organizational environment contains factors like school regulations, professional organizations, and societal expectations. The Fessler and Christensen Model expands on the influences the teacher's personal environment has on the experiences of the teacher. The authors consider items like family, crises, and life stages; they address their impact on the teacher. When supportive, the organizational and personal environment will likely be a source of encouragement for the teacher.

Fessler and Christensen (1992) identify eight stages in the Teacher Career Cycle. These stages are Pre-Service, Induction, Competency Building, Enthusiastic & Growing, Career Frustration, Career Stability, Career Wind-Down, and Career Exit. In each stage, the teacher has certain characteristics and professional development needs. Some attributes include acclimation to the school and skill acquisition (Induction or Competency Building), exploring new enhancements for their instruction (Enthusiastic and Growing), teacher burn-out or stagnant growth (Career Frustration or Career Stability), and transitioning to leaving the profession (Career Wind-Down).

While the Teacher Career Cycle does have beginning and ending stages, the model is not necessarily linear. As a response to positive or negative environmental factors, teachers may move from stage to stage at any time. In the literature, Fessler and Christensen outline some of the needs of teachers at the different stages. The authors stress that “traditional in-service paradigms will not work in the professionalization process” (Fessler & Christensen, 1992). In a previous study of agriculture teachers in Louisiana, it was decided that there were different professional development needs among the teacher experience groups that were studied. (Figland et al., 2019). This supports Fessler and Christensen’s claim that teachers in different stages within the career cycle have their own unique needs.

## Purpose and Objective

The goal of this research was to identify problem areas or areas of concern in teaching agriculture and when teaching with land, horticultural, and mechanics labs. The expected outcome is to gain more knowledge of how teacher preparation programs can improve by addressing teacher concerns both in and outside of laboratory instruction. This survey was administered to agriculture teachers in the state of Illinois who were in various stages of teaching. The study focused on three objectives:

1. Identify the main concerns of Illinois agriculture teachers.
2. Identify the main concerns of Illinois agriculture teachers when teaching laboratory instruction.
3. Identify the level of concerns among Illinois agriculture teachers based on years of experience.

## Methods and Procedures

### *Data Collection*

The study focused on the concerns of current agricultural education teachers across all stages of teaching to understand the concerns they have with teaching and when teaching labs. This research study collected data via the internet survey instrument SurveyMonkey. The target population consisted of current agricultural educators of all ages and experience levels in Illinois (N=432). The link for the survey was distributed initially by email to all Illinois agriculture teachers using the 2019-2020 Illinois Agricultural Education Listserv directory. Another e-mail with the survey link was sent the following week. Two more reminder emails were sent through the Listserv and the response rate of the survey instrument was 36%.

### *Instrumentation*

The instrument had three main sections. In the first, demographic data such as gender, age, years teaching, degree held, and agricultural education experience as a student, was gathered.

The second section of the survey asked two open-ended questions based upon the literature (Stair et al., 2012; Fuller & Case, 1972). Question one was: “When you think about teaching, what are you concerned about? (Do not say what you think others are concerned about but only what concerns you now.) Please be frank and elaborate.” The second open-ended question was: “When you think about teaching laboratory classes, about what are you most concerned? (Do not say what you think others are concerned with but only what concerns you now.) Please be frank and elaborate.”

In the third section, the Likert-type scale questions from Stair et al. (2012) were used. The scale contained 20 common areas of concern for agriculture teachers which have been identified in previous literature. The areas of concern were: organizing an effective alumni chapter, organizing an effective advisory committee, organizing FFA activities, managing student discipline in the classroom, recruiting and retaining alumni members, balancing personal and professional responsibilities, recruiting and retaining students, building support of faculty, counselors and administrators, time management, managing finances of the agricultural program, making special education/ESL accommodations, class preparation, developing and managing effective SAE programs for students, motivating students, completing paperwork, developing community support, self-confidence, reputation of the previous teacher, multi-teacher issues, and managing and developing program facilities. The participants were directed to rate each concern on a scale of one to five with one being not concerned and five being extremely concerned. Part three was reviewed for validity by a panel of teacher educators in agricultural education. The instrument was determined to have a Chronbach’s alpha reliability coefficient of .912.

### *Data analysis*

The quantitative data was analyzed using descriptive statistics of mean, standard deviation, frequencies, and percentages in Microsoft Excel. The qualitative data from the open response questions used open coding to categorize the concerns expressed by the teachers (Merriam & Tisdell, 2016). Open coding was conducted manually using Microsoft Excel. After the initial open coding, axial coding was conducted to combine like

responses into the concerns shown in Table 2 and 3. It was decided that inductive analysis rather than deductive analysis would be used to determine the most pressing concerns of teachers at the time.

## Findings/Results

Demographic data such as gender, age, years teaching, degree held, and agricultural education experience as a student, was collected from the sample. The demographic data of the participants are displayed in Table 1. Of the Illinois teachers who participated, 55.1% were female (n=86), 38.5% were male (n=60), and 6.4% were undisclosed (n=10). 62.8% of the participants (n=98) held a bachelor's degree and 35.3% (n=55) had obtained a master's degree. The participants were categorized into groups based on their years of experience. The categories were Novice (1- 5 years of experience), Mid-Career (6-15 years), and Late Career (16+ years). These were the same categories used in Huberman's (1989) model of the professional life cycle of teachers.

Variable	N	%
Gender		
Male	60	38.5
Female	86	55.1
Non-Disclosed	10	6.4
Age		
18-29	54	34.6
30-44	59	37.8
45-59	36	23.1
60+	7	4.5
Highest Degree Held		
Bachelor's Degree	98	62.8
Master's Degree	55	35.3
Doctoral Degree	0	0
Non-Disclosed	3	1.9
Years of Experience Categories		
1-5 years	58	37.2
6-15 years	45	28.8
16+ years	51	32.7
Non-Disclosed	2	1.3

**Table 1 Demographic Information of Illinois Agriculture Teacher Respondents (n=156)**

### Objective One

For the responses to the first question "When you think about teaching, what are you concerned about? (Do not say what you think others are concerned about but only what concerns you now.) Please be frank and elaborate.", teachers provided a variety of concerns. Those responses listed most frequently are provided in Table 2. Student motivation was the most mentioned concern among the teachers with a total of 29 responses. Concerns relating to remote learning/COVID-19 and parent concerns were mentioned 11 times. Other major concerns include Maintaining a 3-circle program, student achievement, work/life balance, and curriculum.

Concern	Number of Mentions*
Student Motivation	29
Remote Learning/COVID-19	11
Parent Concerns	11
Maintaining a Three-Circle Program	10
Student Achievement	10
Work/Life Balance	8
Curriculum	7

**Table 2 Main Concerns of Agriculture Teachers**

*Note. Total number of times the concern was listed was counted.*

### Objective Two

For the second question "When you think about teaching laboratory classes, about what are you most concerned? (Do not say what you think others are concerned with but only what concerns you now.) Please be frank and elaborate.", teachers provided 23 different concerns. A summary of the main concerns is provided in Table 3.

Student safety was the number one concern of teachers when teaching in a laboratory setting, with 54 mentions. A lack of resources and/or funding was expressed by 39 teachers. 26 teachers were concerned they did not know enough about the content or the equipment to teach the content effectively. Other concerns included student behavior and discipline, student engagement and achievement, and the time to plan and prepare land, horticultural, and mechanics labs. Twelve of the teachers stated they did not have any concerns with teaching in a lab setting.

Concern	Number of Mentions*
Student Safety	54
Lack of Resources and/or Funding	39
Lack of Content/Technical Knowledge	26
Student Behavior and Discipline	14
Student Engagement and Achievement	13
Time to Plan and Prepare Labs	9

**Table 3 Main Concerns of Teaching in the Laboratory Setting**

*Note.* Total number of times the concern was listed was counted. Some teachers listed multiple concerns.

### Objective Three

Objective Three used a five-point Likert-type scale to determine the level of concern of the twenty identified items that were utilized in previous research by Stair et al., 2012. Table 4 provides a summary of the concerns of agriculture teachers grouped by experience. In a previous study, only concerns above a mean of 4 were considered areas of concern (Stair et al., 2012). Since none of the means in this study were above the 4.00 threshold, researchers focused on concerns with a mean score of 3.5 or higher. The teachers within the 1-5 years of experience category had only one concern above a 3.5; Motivating Students (3.55). In the 6-15 years of experience group, 4 concerns were identified. They were: Recruiting and Retaining Students (3.86), Time Management (3.67), Balancing Personal and Professional Responsibilities (3.59), and Motivating Students (3.58). Teachers with 16 or more years of experience had one category of concern, which was Balancing Personal and Professional Responsibilities (3.53).

Statement	1-5 Years of Experience		6-15 Years of Experience		16+ Years of Experience	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Motivating students	3.55	1.15	3.58	1.21	3.42	1.24
Developing and managing effective SAE programs for students	3.47	1.25	3.32	1.24	3.41	1.24
Balancing personal and professional responsibilities	3.44	1.22	3.59	1.45	3.53	1.21
Recruiting and retaining students	3.38	1.20	3.86	1.16	3.32	1.37
Managing student discipline in the classroom	3.23	1.23	2.77	1.46	2.76	1.44
Time Management	3.18	1.16	3.67	1.27	3.29	1.44
Developing community support	3.18	1.24	3.27	1.27	3.05	1.36
Organizing FFA activities	3.06	1.33	3.09	1.51	3.29	1.53
Managing finances of the agricultural program	3.06	1.29	2.85	1.30	2.97	1.22
Building support of faculty, counselors, and administrators	3.03	1.14	3.17	1.28	3.11	1.33
Managing and developing program facilities	2.96	1.14	3.36	1.31	3.10	1.25
Making special education/ESL accommodations	2.95	1.01	2.76	1.15	2.77	1.18
Class preparation	2.93	1.18	2.92	1.25	3.09	1.26
Completing paperwork	2.87	1.16	2.92	1.11	3.11	1.11
Recruiting and retaining alumni members	2.80	1.29	3.01	1.23	2.71	1.30
Organizing an effective advisory committee	2.75	1.23	2.70	1.28	2.49	1.34
Organizing an effective alumni chapter	2.65	1.31	2.51	1.21	2.45	1.34
Self-confidence	2.64	1.25	2.60	1.26	2.33	1.30
Reputation of previous teacher	1.97	1.28	1.87	1.20	1.85	1.19
Multi-teacher issues	1.90	1.30	1.76	1.20	2.24	1.28

**Table 4 Summary of Likert-type Concerns Scale**

*Note.* 1 = not concerned, 2 = slightly concerned, 3 = somewhat concerned, 4 = moderately concerned, and 5 = extremely concerned

## Conclusions and Discussions

### **Objective One**

The goal of objective one was to determine the main concerns of agriculture teachers in Illinois. Among the teachers, motivating students was their most mentioned concern. One teacher said, "I'm concerned about finding ways to interest my students. I worry that many of my students are preoccupied with so many things outside of school, and even outside of their own lives (obsessing over internet celebrities and trends, etc.), that they have limited capacity for caring about learning. They truly believe that school has no purpose because they can 'Just Google it' for all of life's answers." Previous research on school-based agriculture education teachers indicated that professional development on the topic of student motivation was needed (Smalley et al., 2019).

11 responses to the question in objective one was related to remote learning during the COVID-19 pandemic. One concern was "Remote Learning - how to prepare curriculum comparable to in-person classes." This concern was not specifically addressed in the Likert-type scale. It is not known what kind of instruction the survey respondents were facilitating at the time and what the specific concerns were.

### **Objective Two**

The goal of objective two was to determine the concerns of agriculture teachers in Illinois that were specific to the laboratory environment. 34.6% (n=54) of teachers stated they were most worried about student safety, especially when working in the shop. This was related to previous literature that suggested some agriculture teachers have a lack of preparation in safety training and safety instruction (Dyer & Andreasen, 1999; McKim & Saucier, 2011; Chumbley et al., 2018).

Some teachers who were surveyed (n=39) also responded that they have concerns teaching in the lab setting because of a lack of resources or funding. One teacher specifically responded, "Money for consumable supplies." Previous literature from Touchstone (2015), Burke and Hillison (1991), and Sorensen et al., (2014), suggests that lack of funding is a concern for agriculture teachers. The Illinois Agricultural Education Incentive Funding grant is an incentive-based grant for Illinois school-based agricultural education programs. The Illinois State Board of Education states, "Contingent on the availability of funds, an amount will be allocated for incentive grants to fund local agricultural education program improvement efforts." However, only 10% of the grant funds can be used for consumables (Illinois State Board of Education, n.d.). It is unknown if the survey respondents have available funds outside of the incentive funding grant.

Another group of teachers expressed a lack of content or technical knowledge to competently teach the subject material. A teacher explained, "My biggest concern is not knowing a lot about mechanics and taking on a mechanics class. I want to feel confident in the shop but somehow, I feel that universities are lacking in helping teach in this area." This sentiment has been identified among the needs of beginning agriculture teachers in other literature (Figland et al., 2019; Sorensen et al., 2014).

### **Objective Three**

The goal of objective three was to determine the level of concern of Illinois agriculture teachers based on years of experience. The group with the greatest number of concerns was the 6-15 years of experience group. Based on previous work by Fessler and Christensen (1992), these teachers are most likely in the Enthusiastic and Growing, Career Frustration, or Career Stability stages of the teacher career cycle. In these stages, the teachers are confident in the classroom and seeking opportunities to hone their skills and possess leadership roles (Fessler & Christensen, 1992). This finding contrasts with another study where fewer experienced teachers had the most perceived needs (Figland et al., 2019). Overall, the mean concern among all respondents and concern areas was low. Motivating students (mean = 3.86) was the highest mean concern value among the three experience groups. Two similar studies found at least one area of concern above a 4.0 (Stair et al., 2012; Smalley et al., 2019). The concerns that scored a mean above a 3.5 are similar to findings in past agricultural education research. Motivating students (Smalley et al., 2019; Clemons et al., 2018; Duncan et al., 2006; Solomonson et al., 2018; Sorensen et al., 2014; Stair et al., 2012; Figland et al., 2019), balancing personal and profession responsibilities (Myers et al., 2005; Solomonson et al., 2018; Solomonson et al., 2019; Sorensen et al., 2014; Stair et al., 2012; Touchstone, 2015) recruiting and retaining students (Myers et al., 2005, Touchstone, 2015 and time management (Burke and Hillison 1991; Myers et al., 2005; Smalley and Smith 2017; Sorensen et al., 2014; Touchstone, 2015) were the highest mean concerns in this study.

The five concerns below a mean of 3.0 were reputation of previous teacher, self-confidence, multi-teacher issues, organizing an effective alumni chapter, and organizing an effective advisory committee. A low mean in the concerns of reputation of previous teacher and self-confidence may suggest that these Illinois agriculture teachers were confident in their abilities to perform the expectations of the job. Concerning multi-teacher issues, the survey instrument did not ask the participants if they were employed in a multi-teacher program. Furthermore, only 57 programs in the state of Illinois employ two or more agriculture teachers (Illinois Ag Ed Report, 2023). It is not known if this is a low concern of teachers or if the concern is not at all relevant to the teacher. Considering alumni

and advisory committees, the survey did not ask if these teachers have active support groups. It is unknown if the respondents maintain these support groups.

When comparing all demographic groups, those in the age ranges of 44-59 and 60+ had the highest mean concern level when averaged among all 20 concern statements ( $m = 3.27$  and  $3.31$  respectively). Teachers in the 60+ age group had a mean above a 3.5 on ten of the twenty concern statements. Teachers in this age group are most likely in the Career Wind-Down stage of the career cycle. These individuals are preparing to leave the profession and transition to other careers or retirement. For some teachers, this stage could bring out negative thoughts of frustration or past experiences (Fessler & Christensen, 1992). Other literature indicates teachers in the late career stage are more resistant to changes in teaching assignments and the work environment as compared to early or mid-career teachers (Hargreaves, 2005).

## Recommendations

The results of this study offer a better understanding of the concerns of agriculture teachers in Illinois. The Illinois Association for Vocational Agriculture Teachers, State FFA Staff, university teaching faculty, FCAE, and other stakeholders should be informed of these specific concerns. Since teachers have different needs at different career stages, these stakeholder groups should consider tailoring professional development to different groups of teachers to eliminate one-size fits all in-services (Fessler & Christensen, 1992). In Illinois, professional development specifically for the first- and second-year agriculture teachers should continue. The Professional development and university course curriculum in the areas of ag mechanics and safety, remote learning, motivating students, external funding, recruitment, and retention of students, balancing personal and professional life, and time management, should continue to be implemented. Motivating students was the highest concern in both objectives one and three. To support teachers, future research should be conducted on the student motivation concern. The group with the lowest concern for student motivation was female teachers with 16+ years of experience. It is recommended that the IAVAT or other stakeholders contact these teachers to assist with professional development workshops on student motivation. Although not a high concern in objective three, teachers in Illinois have concerns with safety and a lack of funding or resources when implementing laboratory instruction. It is recommended that teacher education programs evaluate the current curriculum as it applies to agricultural mechanics and safety to meet the needs of pre-service teachers. To help with lack of resources, state agricultural education staff should continue to look at external scholarships and funding for consumables and other supplies for agriculture teachers. Scholarship and grant information should continue to be distributed through the email Listserv.

There are still gaps in understanding the concerns of Illinois agriculture teachers. 36% of Illinois teachers responded to the survey instrument. This response rate is not high enough to have a clear understanding of the concerns of all Illinois agriculture teachers. The instrument did not inquire if respondents worked in multi-teacher programs or if their programs maintain alumni chapters and advisory committees. Future studies should be conducted with a larger data set and more agricultural program specific questions to get a more accurate representation of Illinois agriculture teachers.

Teachers in the age groups of 44-59 and 60+ had the highest mean of concerns overall. This is contrary to past research. If these teachers have been teaching for some time, they are most likely in the Career Stability or Career Wind-Down stage of the teacher cycle and should have a solid confidence in their skills (Fessler & Christensen, 1992). More research is needed with a larger sample size to have a more accurate representation of their concerns. It is concerning that teachers indicated that organizing an effective alumni chapter and organizing an effective advisory committee are a low concern. Do teachers in Illinois not value these stakeholder organizations or are these groups already implemented and successful? The study of agriculture teachers from Myers, Dyer, and Washburn (2005) indicated that organizing these two groups was a large concern. Future studies should explore the relationships between agriculture teachers and these groups in Illinois.

Studies about laboratory instruction needs such as safety, funding, and content knowledge should also be explored in future research as these were the highest lab teaching concerns. Solving these concerns could lead to a higher level of teacher satisfaction and retention (Rice et. al, 2011). A replicated study that includes science and other CTE teachers could also be beneficial to determine their specified needs when teaching in specialized laboratory situations.

## References

- Aarts, R., Kools, Q., & Schildwacht, R. (2020). Providing a good start. Concerns of beginning secondary school teachers and support provided. *European Journal of Teacher Education*, 43(2), 277–295. <https://doi.org/10.1080/02619768.2019.1693992>
- Adams, E., 1999. Vocational Teacher Stress and Internal Characteristics. *Journal of Vocational and Technical Education*, 16(1). <http://doi.org/10.21061/jcte.v16i1.70>
- Borgerding, L. A., Sadler, T. D., & Koroly, M. J. (2013). Teachers' concerns about biotechnology education. *Journal of Science Education and Technology*, 22(2), 133-147. <https://doi.org/10.1007/s10956-012-9382-z>
- Borman, G. D. & Dowling, N. M. (2008). Teacher attrition and retention: A meta-analytic and narrative review of research. *Review of Educational Research*, 78(3), 367-409. <https://doi.org/10.3102/0034654308321455>
- Burke, S. R. & Hillison, J. (1991). Practicing agriculture education teachers' concerns and their implications for improving the profession. *Journal of Agricultural Education* 32(2), 10-15. <https://doi.org/10.5032/jae.1991.02010>
- Chumbley, S. B., Hainline, M. S., & Haynes, J. C. (2018). Agricultural mechanics lab safety practices in south Texas. *Journal of Agricultural Education*, 59(3), 309-323. <https://doi.org/10.5032/jae.2018.03309>
- Clemons, C. A., Heidenreich, A. E., & Lindner, J. R. (2018). Assessing the technical expertise and content needs of Alabama agriscience teachers. *Journal of Agricultural Education*, 59(3), 87-99. <https://doi.org/10.5032/jae.2018.03087>
- Duncan, D. W., Ricketts, J. C., Peake, J. B., & Uessler, J. (2006). Teacher preparation and in-service needs of Georgia agriculture teachers. *Journal of Agricultural Education*, 47(2) 24-35. <https://doi.org/10.5032/jae.2006.02024>
- Dyer, J. E. & Andreasen, R. J. (1999). Safety issues in agricultural education laboratories. *Journal of Agricultural Education*, 40(2). <https://doi.org/10.5032/jae.199902046>
- Eck, C. J. & Edwards, M. C. (2019). Teacher shortage in school-based, agricultural education (SBAE): A historical review. *Journal of Agricultural Education*, 60(4), 223-239. <https://doi.org/10.5032/jae.2019.04223>
- Fessler, R. & Christensen, J. C. (1992). *The teacher career cycle: Understanding and guiding the PD of teachers*. Boston, MA: Allyn and Bacon
- Figland, W., Blackburn, J., Stair, K., & Smith, E. (2019). What do they need? Determining differences in the professional development needs of Louisiana agriculture teachers by years of teaching experience. *Journal of Agricultural Education*, 60(2), 173-189. <https://doi.org/10.5032/jae.2019.02173>
- Fuller, F. F. (1969). Concerns of teachers: A developmental conceptualization. *American Educational Research Journal*, 6(2), 207-226. <https://doi.org/10.2307/1161894>
- Fuller, F. F., & Case, C. (1972). A manual for scoring the teacher concerns statement (2<sup>nd</sup> ed., No. ED079361). Austin, TX: Research and Development Center for Teacher Education. Retrieved from <https://files.eric.ed.gov/fulltext/ED079361.pdf>
- Fuller, F. F., Parsons, J. S., & Watkins, J. E. (1974). Concerns of teachers: A developmental research and reconceptualization. Retrieved from <http://www.eric.ed.gov/PDFS/ED091439.pdf>
- Hargreaves, A. (2005). Educational change takes ages: Life, career and generational factors in teachers' emotional responses to educational change. *Teaching and Teacher Education*, 21, 967-983. <https://doi.org/10.1016/j.tate.2005.06.007>
- Huberman, M. A. (1989). The professional life cycle of teachers. *Teachers College Record*, 91(1), 31-57. Retrieved from <https://eric.ed.gov/?id=EJ398425>
- Illinois Ag Ed Report (2023). 2022 Illinois Agricultural Education Report. Retrieved from [https://www.ilaged.org/docs/IL%20AFNR%20Annual%20Report%202022-23\\_17976.pdf](https://www.ilaged.org/docs/IL%20AFNR%20Annual%20Report%202022-23_17976.pdf)
- Illinois State Board of Education (n.d.) Agricultural Education Incentive Funding Grant Specific program information and instructions. Retrieved from <https://www.isbe.net/Documents/IncentiveFundingInstructions-Secondary0817.pdf>
- Kirby, B.M. and LeBude, A.V., 1998. Induction strategies that work: Keeping agricultural, health and biotechnology career development beginning teachers in the classroom. *Journal of Vocational and Technical Education*, 15(1). DOI: <http://doi.org/10.21061/jcte.v15i1.692>
- Lemons, L. L., Brashears, M.T., Burriss S., Meyers, C., & Price, M. A. (2015). Factors contributing to attrition as reported by leavers of secondary agriculture programs. *Journal of Agricultural Education*, 56(4), 17-30. <https://doi.org/10.5032/jae.2015.04017>
- McKim, B. R. & Saucier, P. R. (2011). Agricultural mechanics laboratory management professional development needs of Wyoming secondary agriculture teachers. *Journal of Agricultural Education* 52(3), 75–86. <https://doi.org/10.5032/jae.2011.03075>
- Merriam, S. B. & Tisdell, E. J. (2016). *Qualitative Research: A Guide to Design and Implementation (4th ed.)*. San Francisco, CA: Jossey Bass.



- Myers, B.E., Dyer, J.E., & Washburn, S.G. (2005). Problems facing beginning agriculture teachers. *Journal of Agricultural Education*, 46(3), 47-55. <https://doi.org/10.5032/jae/2005.03047>
- Rice, J.E., LaVergne, D.D., & Gartin, S.A., (2011.) Agricultural Teacher Perceptions of School Components as Motivational Factors to Continue Teaching and Demotivational Factors to Discontinue Teaching. *Journal of Career and Technical Education*, 26(2). <http://doi.org/10.21061/jcte.v26i2.529>
- Smalley, S., Hainline, M. S., & Sands, K. (2019). School-based agricultural education teachers' perceived professional development needs associated with teaching, classroom management, and technical agriculture. *Journal of Agricultural Education*, 60(2), 85-98. <https://doi.org/10.5032/jae.2019.02085>
- Smalley, S. W., & Smith, A. R. (2017). Professional development needs of mid-career agriculture teachers. *Journal of Agricultural Education*, 58(4), 282-290. <https://doi.org/10.5032/jae.2017.04282>
- Solomonson, J. K., Korte, D. S., Thieman E. B., Retallick, M. S., & Keating K. H. (2018). Factors Contributing to Illinois School-Based Agriculture Teachers' Final Decision to Leave the Classroom. *Journal of Agricultural Education*, 59(2), 321-342. <https://doi.org/10.5032/jae.2018.02321>
- Solomonson, J. K., Thieman, E. B., Korte, D. S., & Retallick, M. S. (2019). Why do they leave and where do they go? A qualitative study of Illinois school-based agriculture teachers who left the profession. *Journal of Agricultural Education*, 60(4), 115-131. <https://doi.org/10.5032/jae.2019.04155>
- Sorensen, T. J., Lambert, M. D., & McKim, A. J. (2014). Examining Oregon agriculture teachers' professional development needs by career phase. *Journal of Agricultural Education*, 55(5), 140-154. <https://doi.org/10.5032/jae.2014.05140>
- Stair, K. S., Warner, W. J., & Moore, G. E. (2012). Identifying concerns of preservice and in-service teachers in agricultural education. *Journal of Agricultural Education* 53(2) 153-164. <https://doi.org/10.5032/jae.2012.02153>
- Touchstone, A. J. L. (2015). Professional development needs of beginning agricultural education teachers in Idaho. *Journal of Agricultural Education*, 56(2), 170-187. <https://doi.org/10.5032/jae.2015.02170>