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Examining Oregon Agriculture Teachers' Professional Development Needs by Career Phase

Tyson J. Sorensen[1], Misty D. Lambert[2], and Aaron J. McKim[3]

Abstract

Agriculture teachers face challenges at every stage of their career, creating a need for professional development to meet their individual needs. Additionally, research suggests the need for periodic needs assessments to be conducted within individual states. The purpose of this study was to identify and describe, using the Borich needs assessment model, the inservice needs of agriculture teachers in Oregon by career phase. A list of 49 agricultural education competencies were developed from existing research, and responses were analyzed using mean weighted discrepancy scores (MWDS). We found induction-phase teachers (0-5 years of experience) had the highest inservice needs for the following competencies: (a) writing grant proposals for external funding, (b) utilizing a local advisory committee, and (c) utilizing the AET record book system. Non-induction phase agriculture teachers (6 or more years of experience) were most in need of: (a) balancing priorities to make time for career and family/personal life, (b) utilizing the AET record book system, and (c) utilizing techniques and skills to stay organized. Additionally, differences and similarities between inservice needs of induction and non-induction teachers were identified and discussed. Implications of these findings and recommendations are presented.

Keywords: professional development; inservice; induction; non-induction; career stage; needs assessment; MWDS

Skilled teachers are critical to student achievement (Hargreaves & Fullan, 1992; McCaffrey, Lockwood, Koretz, & Hamilton, 2003). The positive relationship between teacher quality and student success has been corroborated by a number of studies, including research conducted by Kaplan and Owings (2004) which found as students' time spent with successful teachers increased, so did their achievement level. Teacher professional development experiences are designed to positively impact behaviors of teachers to improve their effectiveness as educators (Darling-Hammond & Richardson, 2009; Wenglinsky & Silverstein, 2006). Therefore, the need to provide effective professional development is essential for improving student learning.

Teachers possess varying degrees of skills, come from many different programs of preparation, and navigate varied career challenges, creating a need for professional development which is equally varied (Huberman, 1995). Teachers are sometimes offered professional development and inservice by their employers; whether school or local educational agency. Hargreaves and Fullan (1992) found professional development offered at these levels tended to focus on larger, mainstream areas within the curriculum, such as mathematics and English, leaving out the techniques used by teachers of smaller or more focused disciplines. Agricultural education

[1] Tyson J. Sorensen is a graduate student in the Department of Agricultural Education and Agricultural Sciences at Oregon State University, 112 Strand Agriculture Hall, Corvallis, OR 97331, Tyson.Sorensen@oregonstate.edu
[2] Misty D. Lambert is an Assistant Professor in the Department of Agricultural Education and Agricultural Sciences at Oregon State University, 112 Strand Agriculture Hall, Corvallis, OR 97331, Misty.Lambert@oregonstate.edu
[3] Aaron J. McKim is a graduate student in the Department of Agricultural Education and Agricultural Sciences at Oregon State University, 112 Strand Agriculture Hall, Corvallis, OR 97331, Aaron.McKim@oregonstate.edu

is certainly one of those focused disciplines often overlooked within school based professional development. This leaves agriculture teachers to seek professional development within their professional associations, the agriculture industry, and from the agriculture teacher education institutions in their state.

The research on what constitutes an effective professional development experience has drawn some varied conclusions. Some studies conclude professional development is best when initiated by individual teachers (Lambert, 1988), while others suggest individual teachers and school officials lack the capacity to plan high quality professional development on their own (Clune, 1991). One conclusion, however, is clear. Individuals likely to be involved in, or affected by, a professional development experience should be the starting point from which programs emerge (Newcomb, McCracken, Warmbrod, & Whittington, 2004; Sofranko & Khan, 1988). In fact, Garton and Chung (1996) found the perceptions of teacher needs by teacher educators and state supervisors were not consistent with the needs identified by teachers themselves. Therefore, assessing the professional development needs of teachers by involving them in the process is essential, and is the primary goal of this study.

Literature Review

"Throughout the careers of teachers, new challenges emerge. Some of these challenges come from changes in the work environment and some from changes in personal needs and conditions" (Fessler & Christensen, 1992, p. 20). These challenges can be particularly shocking for beginning teachers (Maciejewski, 2007). "Entry into the profession is sudden: From one day to the next the beginning teacher has the same responsibility as a teacher with 40 years of service" (Veenman, 1984, p. 167). Therefore, when planning professional development, organizers should consider these challenges, especially the challenges faced by beginning agriculture teachers, and their origins.

A meta-analysis of studies related to challenges faced by beginning teachers across disciplines found the most reoccurring problems were: classroom discipline, motivating students, dealing with individual differences, assessing students' work, relationships with parents, organization of class work, inadequate teaching materials and supplies, and dealing with problems of individual students (Veenman, 1984). Consistent with findings from the larger education literature (Joiner & Edwards, 2008; McLeskey & Waldron, 2002), Joerger (2002) argued "access to appropriate and timely inservice education activities is critical to the initial success, effectiveness, continued development, and retention of beginning agricultural education teachers" (p. 11).

To develop programs for the professional development of agricultural education teachers, researchers have conducted studies to assess teacher needs. Although different methods have been used to assess the needs of teachers, researchers suggest the Borich (1980) model provides a more robust assessment when compared to more direct assessments (Edwards & Briers, 1999). The basis of the Borich needs assessment model was to identify the discrepancy between what teachers should be able to do and what teachers can do by determining a) the relevance or importance of each competency to their job and b) their perceived ability to perform each competency.

While needs assessments are valuable, they can also be arduous and time consuming (Washburn, King, Garton, & Harbstreit, 2001). In an effort the limit the number of needs assessments necessary in a given region, researchers attempted to compare results from neighboring states to see if co-planning was appropriate (Washburn et al., 2001). The researchers concluded "sufficient differences exist between states to warrant individual periodic needs assessments in each individual state" (p. 408). These differences exist because not only are the teacher education programs different from state to state, but also the agricultural enterprises and classroom course offerings. Washburn et al. (2001) reinforced this idea "needs assessments should be conducted at

regular intervals to accurately reflect the changing needs of teachers, students, and the agriculture, food, fiber, and natural resource industry" (p. 397).

Research also suggests that within a state, specific groups of teachers should be considered differently. Researchers identify a teachers' work and personal environments change over the course of their careers (Christensen & Fessler, 1992). Therefore, one could assume agriculture teachers at the beginning of their career differ from experienced teachers regarding their professional development needs. Research supports this notion; Kahler (1974) concluded beginning teachers within agricultural education were indeed different from their more experienced peers. Birkenholz and Harbstreit (1987) and Myers, Dyer, and Washburn (2005) recommended focused professional development programs should be used to meet the unique needs of beginning agriculture teachers. With his study of beginning agriculture teachers in Idaho, Mundt (1991) indicated that expecting a beginning teacher to perform as if they were a veteran was unrealistic and called for research to be done to determine what can reasonably be expected of beginning teachers. This research supports assessing the needs and providing professional development experiences unique to early career agriculture teachers.

Numerous studies have been conducted within agricultural education to specifically identify the needs of beginning teachers, with some of those conducted as needs assessments (Edwards & Briers, 1999; Garton & Chung, 1996; Joerger, 2002; Layfield & Dobbins, 2002), others being direct assessments (Birkenholz & Harbstreit, 1987; Claycomb & Petty, 1983; Kahler, 1974; Miller & Scheid, 1982), Delphi panels (Mundt & Connors, 1999; Myers et al., 2005) or qualitative studies (Boone & Boone, 2007; Mundt, 1991; Talbert, Camp, & Heath-Camp, 1994).

Studies conducted to identify the needs of early career agriculture teachers have identified a consistent need for professional development related to classroom instruction. Three of the most commonly identified early career agriculture teacher needs related to classroom instruction are managing the classroom (Boone & Boone, 2007; Mundt, 1991; Myers et al., 2005), motivating students and maintaining student interest (Farrington, 1980; Joerger, 2002), and the use of technology (Joerger, 2002; Layfield & Dobbins, 2002). Additionally, Farrington (1980) found adapting instruction for students with low academic ability as a need for beginning teachers, while later studies found a need for professional development related to instruction of students with special needs across experience levels (Sorensen, Tarpley, & Warnick, 2005). The task of providing a diverse curriculum has also been identified as one of the top professional development needs among beginning agriculture teachers (Duncan, Ricketts, Peake, & Uesseler, 2006; Miller & Scheid, 1982).

In addition to classroom instruction, research has continually identified professional development needs related to the facilitation of both Supervised Agricultural Experience (SAE) and FFA opportunities. SAE recordkeeping emerged as a need in studies of both beginning teachers (Miller & Scheid, 1982) and experienced teachers (Layfield & Dobbins, 2002). In assessments which combined both beginning and experienced teachers, developing student SAE projects was identified as a high professional development need area (Layfield & Dobbins, 2002; Sorensen et al., 2005). Managing the FFA program has also been a consistent need identified by agricultural education research. Myers et al. (2005) identified organizing and planning FFA events as a need while Layfield and Dobbins (2002) identified specific FFA components like FFA fundraisers and FFA career development event (CDE) team training as needs. Additionally, teachers across experience levels have been found to need support with FFA degree and proficiency applications (Joerger, 2002; Layfield & Dobbins, 2002; Sorensen et al., 2005).

In addition to the traditional aspects of the agriculture teaching profession, FFA, SAE, and classroom instruction, research has identified professional development needs in the broader programmatic context. Research has identified beginning agriculture teachers perceive high professional development needs in managing an advisory board (Joerger, 2002; Myers et al., 2005). Facility management has also been identified as a professional development need for beginning agriculture teachers (Boone & Boone, 2007; Mundt, 1991). Additional programmatic concerns,

including the management of young farmer groups and/or adult education programs (Farrington, 1980; Layfield & Dobbins, 2002; Miller & Scheid, 1982) and grant writing (Roberts & Dyer, 2004), have been identified.

Research has also recognized the importance of need areas outside the technical aspects of the agriculture teaching profession. Roberts and Dyer (2004) sought to compare and contrast inservice needs of traditional and alternatively certified teachers of all experience levels, but found both groups were dealing with stress and time management issues. Furthermore, the skills related to the startup and management of support structures to help agriculture teachers has repeatedly emerged as a professional development need (Joerger, 2002; Layfield & Dobbins, 2002; Myers et al., 2005; Sorensen et al., 2005).

Previous research in agricultural education recommends the specific evaluation of professional development needs for beginning teachers. Therefore, we analyzed the professional development needs of beginning and experienced agriculture teachers in Oregon separately. Additionally, research in agricultural education has identified professional development needs in the areas of instruction, FFA and SAE, program management, and personal (e.g., stress and time) management. Therefore, our comprehensive analysis of the professional development needs for Oregon agriculture teachers included specific items related to each of these need areas.

Theoretical Framework

Teacher development is a dynamic process extending throughout a teacher's career (Fessler, 1992). Beginning in the 1970s, teacher education researchers began to wonder if teacher development occurred in similar phases across teaching careers. The idea was if all teachers traveled through the same career milestones, targeted interventions and developments could be put into place to address challenges and increase retention. These studies of teacher development were sporadic and involved small sample sizes and teachers across a range of experiences and used varied methodologies; however, findings were remarkably similar (McDonald & Elias, 1983). This suggests the problems of teachers cannot simply be attributed solely to the teachers' characteristics or the workplace environment, but are inherent in the profession of teaching, and solutions to these problems must look at the combination of teacher and environment (Veenman, 1984). It wasn't until the work of Huberman and Grounauer (1993) with Swiss teachers, Sikes (1985) with UK teachers, and Fessler and Christiansen (1992) in the United States, that sound theories evolved (Day et al., 2009).

The model of teacher development created by Fessler and Christensen (1992) guides this study and borrows heavily on social systems theory (see Figure 1). Fessler and Christiansen proposed eight stages, moving from pre-service and induction to career wind-down and exit. However, it is important to note a teacher's movement in and between these stages is both dynamic and flexible and not all teachers enter all stages. Lynn (2002) was clear the most significant contribution of the Fessler and Christiansen model is the implication teachers move in and out of career stages in response to personal and organizational environmental conditions.

This model has been used within the agricultural education profession (Greiman, Walker, & Birkenholz, 2005) to investigate the influence of the organizational environment on induction stage teachers. Huberman (1989) indicated teachers would stay in an induction phase for the first one to three years, but, depending on their development, a teacher could be in induction until their sixth year of teaching before moving to career stabilization, or career exit. Teachers who move districts, subjects, or grade levels typically respond by re-entering the induction phase.

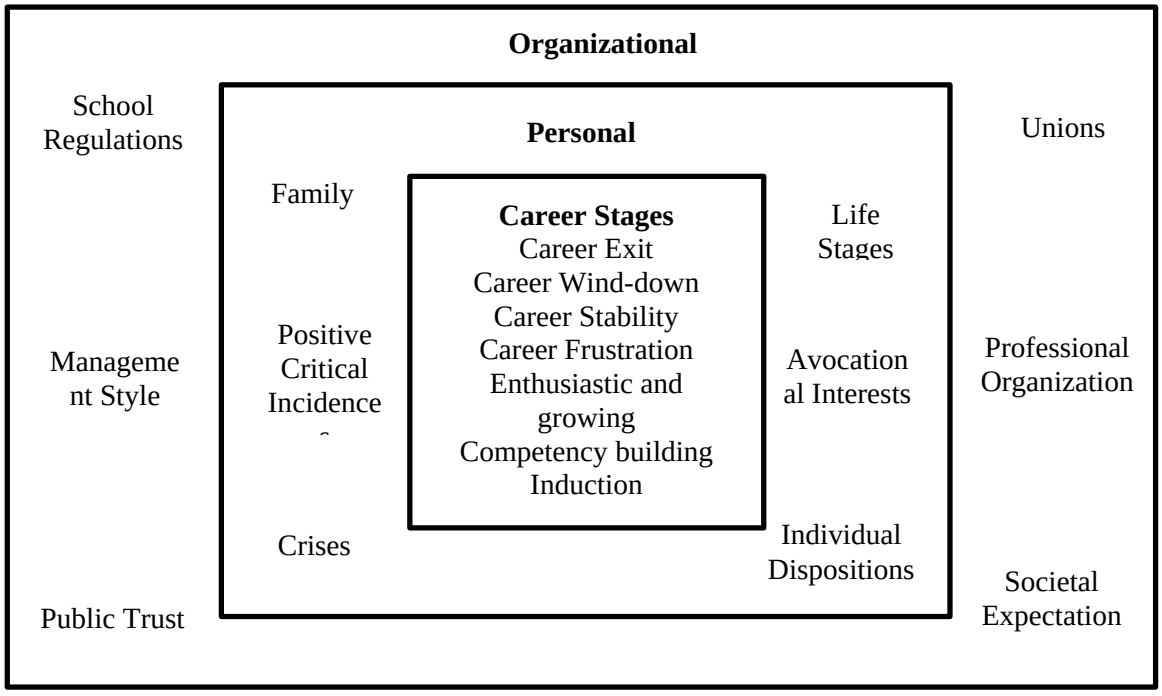

Figure 1. Teacher Career Cycle Model from "The teacher career cycle: Understanding and guiding the professional development of teachers" by R. Fessler & J. Christensen (Eds.), 1992, Allyn & Bacon and adapted by Greiman (2010)

According to the teacher career cycle model (Fessler & Christensen, 1992; Greiman, 2010), agriculture teachers of different career stages encounter varying environments and therefore possess varying needs. Consequently, according to Huberman (1995), this creates a need for professional development to meet those various needs. Oregon offers professional development to agriculture teachers through the teachers' association at two annual statewide conferences offered during the summer and fall. Additionally, Oregon Team Agricultural Education offers an early career workshop annually for teachers in years one through five of teaching agriculture. This inservice is open to all teachers regardless of preservice training or career experience outside of agriculture. In order to meet the specific needs of agriculture teachers through these various professional development experiences, identification of those needs is essential.

Purpose and Objectives

The purpose of this study was to identify and describe the inservice needs of agriculture teachers in Oregon and compare induction phase and non-induction phase teachers by competency and inservice need. This study aims to gather valuable information for determining teacher professional development topics for the various teacher inservice opportunities and to gain a better understanding of inservice needs across career stages. According to Research Priority 4 of the American Association of Agricultural Education National Research Agenda, a primary area of scientific focus is to "Deepen our understanding of effective teaching and learning processes in all agricultural education environments" (Doerfert, 2011, p. 18). Therefore, by determining inservice needs of teachers, effective professional development opportunities can be developed to improve teaching and learning in all agricultural education environments. The following research objectives guided this study:

1. Describe the demographic profile and program characteristics of Oregon agriculture teachers.
2. Identify and prioritize inservice needs by career phase.
3. Identify the inservice needs of the total population of agriculture teachers.
4. Compare induction and non-induction phase agriculture teachers by inservice needs.

Methods and Procedures

The population of this study included all school-based agriculture teachers in Oregon (N = 111) during the 2013-2014 school year. We obtained the names and contact information of agriculture teachers using the 2013-2014 Oregon Agriculture Teacher Directory. In order to reduce frame error, a panel of experts in the field of agricultural education in Oregon scrutinized the information in the directory to insure its accuracy.

We attempted a census of agriculture teachers in Oregon during the 2013-2014 school year; therefore, we make no attempt to generalize beyond the population of this study. The instrument consisted of two parts: agricultural education competencies and demographics. We developed the agricultural education competencies section of the instrument based on the Borich (1980) needs assessment model to assess the perceived ability and importance for each of the competencies. A list of 49 agricultural education competencies were developed from previous research (Boone & Boone, 2007; Duncan et al., 2006; Garton & Chung, 1996; Layfield & Dobbins, 2002; Mundt & Connors, 1999; Myers et al., 2005; Sorensen et al., 2005) and modified to meet the needs of agriculture teachers in Oregon. Teachers were asked to rate their perceived importance and perceived ability for each of the 49 competencies using a five-point Likert-type scale ranging from 1 "very low" to 5 "very high."

A panel of experts in the field of agricultural education established face and content validity for the instrument. Reliability measures of other needs assessment studies in agricultural education utilized a coefficient of internal consistency for the needs assessment items (Barrick & Doerfert, 1989; Birkenholz & Harbstreit, 1987; Garton & Chung, 1996; Joerger, 2002; Layfield & Dobbins, 2002; McDonald & Lawver, 1997; Sorensen et al., 2005), therefore we determined a coefficient of internal consistency for the 49 agricultural education competencies in the current study. The coefficient of internal consistency was identified, using a Cronbach's alpha, as .95.

We administered the instrument and collected data in December of 2013 using the online survey program Qualtrics. Using Dillman's (2007) tailored design method, we made five points of contact with participants to elicit responses. The first point of contact was a notification e-mail, the three subsequent points of contact were e-mails requesting participation in the research study; these were sent at one-week intervals. The final point of contact was a phone-call to individuals who had not yet responded. A total of 80 useable responses were completed, yielding a 72% response rate. There is no attempt to generalize the findings of this study so non-response error was not a concern.

We analyzed the data using the Statistical Package for Social Science (SPSS) version 20. Research objective one was descriptive in nature, therefore we reported the results as frequencies and percentages. To accomplish research objectives two and three, we calculated mean weighted discrepancy scores (MWDS) for each of the 49 agricultural education competencies for the different groups of teachers separately: induction phase teachers (n =27), non-induction phase teachers (n = 53), total teachers (n = 80). For purposes of this study, induction phase teachers were considered to have up to five years of teaching experience. In order to calculate a MWDS we first calculated the discrepancy score for each teacher by subtracting the ability score from the importance score for each agricultural education competency. Then, a weighted discrepancy score was calculated by multiplying the discrepancy score by the mean importance rating for each competency. The MWDS was calculated by taking the sum of the weighted discrepancy scores and dividing them by the number of participant responses for each competency. Finally, using the MWDS, the 49 agricultural education competencies were ranked.

Results and Findings

For the first research objective, we sought to describe the demographic profile and program characteristics of Oregon agriculture teachers. The average teacher in Oregon was 38 years old and male (56%). The average number of years teaching was 11, with the median of eight years and the mode of one year. Thirty-six percent (n = 27) of teachers were categorized as induction phase (0-5 years of teaching experience). Fifty-two percent of teachers reported being certified to teach Curriculum for Agricultural Science Education (CASE) content with 27% being certified to teach CASE Plant Science followed by CASE Agriculture, Food, and Natural Resources (19%) and CASE Animal Science (16%), with no teachers being certified in CASE Animal and Plant Biotechnology. Thirty-five percent of the CASE certified teachers were induction phase. Eighty-four percent of responding teachers were certified to teach agriculture through a university licensure program, while 16% were alternatively certified. The most common class taught in the last five years by agriculture teachers was Introduction to Agriculture (70%), followed by Plant Sciences (68%), Animal Sciences (65%), Agricultural Mechanics (61%), Agribusiness (36%), Environmental Sciences (31%), and Food Sciences (17%). Respondents' class sizes ranged from 4-40 students with 21 being the average class size. Teachers reported participating in professional development activities in the past year offered by their school or district (95%), followed by the summer agriculture teacher's conference (80%), university course offerings (31%), and the National FFA (29%).

Objectives two and three sought to identify and prioritize inservice needs of induction and non-induction phase agriculture teachers as well as for all responding teachers. We used the Borich (1980) needs assessment model to calculate mean weighted discrepancy scores (MWDS) for each of the 49 agricultural education competencies. A higher MWDS indicates a higher need for inservice; additionally each competency is ranked according to inservice need within the reported group (see Table 1).

Table 1

Professional Development Needs of Oregon Agriculture Teachers (n = 80)

	Induction Phase		Non-Induction Phase		Total Teachers	
Competency	Rank	MWDS	Rank	MWDS	Rank	MWDS
Writing grant proposals for external funding	1	5.93	6	4.87	6	5.22
Utilizing a local advisory committee	2	5.58	8	3.64	7	4.29
Utilizing the AET record book system	3	5.49	2	6.80	1	6.37
Training CDE teams	4	5.11	39	1.45	25	2.59
Balancing priorities to make time for career and family/personal life.	5	5.10	1	6.87	2	6.24
Teaching agricultural mechanics	6	5.09	43	1.22	31	2.45
Managing student SAE record books	7	5.03	9	3.59	8	4.06
Managing the greenhouse	8	4.94	36	1.66	22	2.72

	Induction Phase		Non-Induction Phase		Total Teachers	
Competency	Rank	MWDS	Rank	MWDS	Rank	MWDS
Helping students prepare FFA award applications	9	4.97	27	2.07	18	2.98
Managing time effectively	10	4.90	4	5.98	4	5.61
Utilizing techniques and skills to stay organized	11	4.78	3	6.18	3	5.69
Managing work related stress	12	4.62	5	5.81	5	5.40
Utilizing community partners	13	4.35	13	3.24	9	3.62
Motivating students to learn	14	3.92	12	3.30	10	3.51
Preparing chapter FFA award applications	15	3.92	40	1.44	36	2.22
Teaching using experiments	16	3.88	15	2.99	12	3.27
Maintaining agricultural equipment	17	3.75	32	1.89	28	2.51
Evaluating student performance	18	3.59	28	2.05	29	2.51
Recruiting quality students	19	3.54	21	2.77	16	3.03
Developing SAE opportunities for students	20	3.50	19	2.91	13	3.10
Determining the content for specific courses	21	3.38	24	2.30	24	2.65
Teaching food science	22	3.36	26	2.18	26	2.55
Developing an effective public relations program	23	3.35	10	3.43	11	3.41
Organizing fundraising activities	24	3.28	42	1.27	39	1.90
Teaching the plant and soil sciences	25	3.26	31	1.90	33	2.35
Working with parents	26	3.11	33	1.84	34	2.27
Developing positive community relations	27	3.05	14	3.04	14	3.04
Developing effective lesson plans	28	3.00	35	1.77	40	1.89
Teaching agribusiness	29	2.98	22	2.58	23	2.71
Teaching students problem solving skills	30	2.95	16	2.98	19	2.97
Developing an FFA program of activities	31	2.87	23	2.34	30	2.51
Managing student behavior	32	2.87	29	1.93	35	2.24
Retaining quality students	33	2.79	18	2.95	20	2.90
Teaching in laboratory settings	34	2.79	25	2.18	32	2.38
Teaching students with learning disabilities	35	2.67	37	1.60	37	1.94
Working with students for Agriscience fair	36	2.54	20	2.83	21	2.74

	Induction Phase		Non-Induction Phase		Total Teachers	
Competency	Rank	MWDS	Rank	MWDS	Rank	MWDS
Locating instructional resources and materials	37	2.39	11	3.36	15	3.04
Teaching about agriculture's relationship with the environment	38	2.33	41	1.35	42	1.67
Teaching diverse populations of students	39	2.16	34	1.82	38	1.93
Conducting local FFA chapter activities	40	2.06	44	0.91	44	1.28
Teaching the animal sciences	41	1.78	47	0.29	47	0.79
Using technology for instruction	42	1.71	17	2.96	27	2.54
Supervising students' SAE programs	43	1.67	30	1.91	41	1.83
Teaching about public issues regarding agriculture	44	1.66	38	1.45	43	1.52
Conducting adult programs	45	1.58	45	0.52	45	0.86
Teaching agriscience – integrating science in agriculture	46	1.47	7	3.83	17	3.00
Planning field trips	47	1.46	46	0.49	46	0.81
Planning banquets	48	1.44	48	-0.15	48	0.39
Exhibiting Livestock	49	0.40	49	-0.66	49	-0.31

Note. MWDS = Mean Weighted Discrepancy Score

Among induction teachers, we found the top five perceived inservice needs to be: writing grant proposals for external funding (5.93), utilizing a local advisory committee (5.58), utilizing the AET record book system (5.49), training CDE teams (5.11), and balancing priorities to make time for career and family/personal life (5.10). Among the non-induction teachers, the top five perceived inservice needs were: balancing priorities to make time for career and family/personal life (6.97), utilizing the AET record book system (6.80), utilizing techniques and skills to stay organized (6.18), managing time effectively (5.98), and managing work related stress (5.81).

Among all responding teachers, we found the top inservice needs to be: utilizing the AET record book system (6.37), balancing priorities to make time for career and family/personal life (6.24), utilizing techniques and skills to stay organized (5.69), managing time effectively (5.61), and managing work related stress (5.40).

Objective four sought to compare induction and non-induction teachers by inservice needs. Both groups responded with similar perceived inservice needs for highest and lowest MWDS rankings. Five of the top ten ranked inservice need competencies were shared by both induction and non-induction teacher groups while six out of ten of the bottom ranked competencies were also shared. When comparing induction and non-induction teachers, we found large differences in MWDS for various competencies (see Table 2). Large differences in MWDS indicate large differences when comparing induction teachers to non-induction teachers as it relates to inservice needs. Eight of the top ten largest differences involved high inservice needs of induction teachers with low needs for non-induction teachers. The competency with the largest MWDS difference

between the two teacher groups was teaching agricultural mechanics. Competencies that were high needs for non-induction teachers, but low needs for induction teachers included teaching agriscience – integrating science in agriculture and balancing priorities to make time for career and family/personal life.

Table 2

The Ten Largest Differences in MWDS between Teacher Groups

Competency	Induction MWDS	Non-Induction MWDS	Difference MWDS
Teaching agricultural mechanics	5.09	1.22	3.87
Training CDE teams	5.11	1.45	3.66
Managing the greenhouse	4.94	1.66	3.28
Helping students prepare FFA award applications	4.97	2.07	2.9
Preparing chapter FFA award applications	3.92	1.44	2.48
Teaching agriscience – integrating science in agriculture	1.47	3.83	-2.36
Organizing fundraising activities	3.28	1.27	2.01
Utilizing a local advisory committee	5.58	3.64	1.94
Maintaining agricultural equipment	3.75	1.89	1.86
Balancing priorities to make time for career and family/personal life	5.10	6.87	-1.77

Note. MWDS = Mean Weighted Discrepancy Score

Conclusions, Implications and Recommendations

The purpose of this research was to explore the professional development needs of agriculture teachers in Oregon. Additionally, using the teacher career cycle model (Fessler & Christensen, 1992; Greiman, 2010), we sought to compare the professional development needs of teachers in the induction and non-induction phases of their career. By completing this research we sought to provide valuable knowledge with a practical application for inservice development, yet still grounded in a relevant theory. Although the teacher career cycle model (Fessler & Christensen, 1992; Greiman, 2010) comprised a framework of eight career stages, due to sample limitations, we combined stages to form two independent groups of induction and non-induction phase teachers. We recommend future studies employ the use of all eight stages of the career cycle model from which to examine agriculture teachers.

Four of the top five need areas identified for all responding teachers as well as the non-induction phase teachers (6 or more years of teaching experience) were in areas of personal management, including career and family balance, organization skills, time management, and stress management. These findings support the work of Roberts and Dyer (2004) who also found stress and time management needs were high for agriculture teachers. Teaching agriculture entails a wide variety of job responsibilities, therefore it is no surprise teachers identified high needs in areas related to managing their time, stress, and balance between career and family responsibilities. Based on these findings, we recommend consideration toward implementing professional development experiences related to personal management as well as the inclusion of personal

management aspects in future assessments of agriculture teachers' professional development needs.

The top professional development needs for induction phase teachers (0-5 years of teaching experience) did not include such an emphasis on areas of personal management. Induction phase teachers identified higher professional development needs in the more technical aspects of the agriculture teaching profession. Previous research in agricultural education has identified the induction phase teachers in this study are not alone in their needs for professional development in the technical aspects of the agriculture teaching profession. Specifically, research has identified writing grants (Roberts & Dyer, 2004), using an advisory board (Joerger, 2002; Myers et al., 2005), and managing record books (Miller & Scheid, 1982) – three areas identified in the top five need areas for induction phase teachers in this study – as areas of high professional development need among other populations of agriculture teachers.

In comparing the professional development needs of agriculture teachers in the induction and non-induction career phases, we found a wide array of similarities and differences. For those professional development need areas that were similarly high among both groups, specifically utilizing the AET record book system, balancing priorities to make time for career and family/personal life, writing grant proposals for external funding, utilizing a local advisory committee, and managing student SAE record books, we recommend professional development experiences in Oregon which can provide all teachers the opportunity to build their skills in these important areas. Alternatively, those professional development areas with large differences between the induction and non-induction groups, specifically teaching agricultural mechanics, training CDE teams, managing the greenhouse, helping students prepare FFA award applications, and preparing chapter FFA award applications, may be best suited for specific professional development experiences with teachers only in the induction phase.

In addition to the practical implications of the discrepant need areas are the theoretical implications for large perceived differences among induction and non-induction teachers. One important conclusion is, for the five need areas with the largest difference between the two groups, induction phase teachers held a higher perceived need. These findings support the idea, for these professional development need areas, induction teachers have not yet reached the competency building or enthusiastic and growing teacher stages (Greiman, 2010).

However, a number of professional development areas shared very similar levels of perceived needs among induction and non-induction teachers. Furthermore, a total of 13 of the 49 competencies measured were identified as a higher need among non-induction teachers than induction teachers, with the two largest of these areas being teaching agriscience – integrating science in agriculture and balancing priorities to make time for career and family/personal life. These findings identify that, for certain professional development need areas, additional years of teaching experience do not equate to a lack of professional development needs. In addition to providing specific professional development experiences for induction phase teachers, facilitators should also consider providing professional development experiences for non-induction agriculture teachers based on the specific competencies in which they identified higher needs.

This research provides important information regarding the professional development needs of agriculture teachers in Oregon. From a practical standpoint, this study provides valuable information for the consideration of professional development experiences targeted toward different subgroups within the population of agriculture teachers in Oregon. We recommend states consider the value of providing professional development opportunities for teachers in specific career stages and recommend the continued investigation of professional development needs by career stage. Additionally, we recommend research into the potential effectiveness of career specific professional development opportunities.

As we look to the future of agricultural education, we understand the importance of meeting the needs of agriculture teachers through professional development experiences. We also acknowledge the importance of making these professional development experiences tailored to the

specific needs of the teachers within those experiences. Therefore, as we consider strategies for optimizing professional development in agricultural education, we recognize the importance of career stage research and the continued use of needs assessments in the agricultural education profession.

References

Barrick, R. K., & Doerfert, D. L. (1989, December). Assessing performance and planning inservice needs of first-year vocational agriculture teachers. *Proceedings of the Sixteenth Annual National Agricultural Education Research Meeting*. Orlando, FL.

Birkenholz, R. J., & Harbstreit, S. R. (1987). Analysis of the inservice needs of beginning vocational agriculture teachers. *Journal of the American Association of Teacher Educators in Agriculture, 28*(1), 41-49. doi: 10.503/jaatea.1987.01041

Boone, H. N., & Boone, D. A. (2007). Problems faced by high school agricultural education teachers. *Journal of Agricultural Education, 48*(2), 36-45. doi: 10.5032/jae.2007.02036

Borich, G. D. (1980). A needs assessment model for conducting follow-up studies. *Journal of Teacher Education, 31*(3), 39-42. doi:10.1177/002248718003100310

Claycomb, D. M., & Petty, G. C. (1983). A three year longitudinal study of the perceived needs for assistance as ranked by vocational agriculture instructors. *Journal of the American Association Teacher Educators in Agriculture, 42*(4), 28-33. doi: 10.5032/jaatea.1983.04028

Clune, W. H. (1991). *Systemic educational policy*. Madison, WI: Wisconsin Center for Educational Policy, UW-Madison.

Darling-Hammond, L., & Richardson, N. (2009). Teacher learning: What matters? *Educational Leadership, 66*(5), 46-53.

Day, C., Sachs, J., Bayer, M., Brinkkjær, U., Plauborg, H., & Rolls, S. (2009). *Teachers' career trajectories and work lives.* London: Springer.

Dillman, D. A. (2007). *Mail and internet surveys: The tailored design method* (2nd ed.). Hoboken, New Jersey: John Wiley & Sons, Inc.

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. Retrieved from: http://aaaeonline.org/files/research_agenda/AAAE_NRA_Priority_4_Meaningful_Engaged_Learning.pdf

Duncan, D. W., Ricketts, J. C., Peake, J. B., & Uesseler, J. (2006). Teacher preparation and in-service needs of Georgia agriculture teachers. *Journal of Agricultural Education, 47*(2), 24-35. doi: 10.5032/jae.2006.02024

Edwards, M. C., & Briers, G. E. (1999). Assessing the inservice needs of entry phase agriculture teachers in Texas: A discrepancy model versus direct assessment. *Journal of Agricultural Education 40*(3), 40-49. doi: 10.5032/jae.1999.03040

Farrington, W. S. (1980). *Problems of beginning vocational agriculture teachers in the southern region. A project of the Southern Research Conference in Agricultural Education*. Gainesville, FL: University of Florida, Agricultural and Extension Education. (ERIC Document Reproduction Service No. ED203005)

Fessler, R. (1992). The teacher career cycle. In R. Fessler & J. Christensen (Eds.), *The teacher career cycle: Understanding and guiding the professional development of teachers* (pp. 21-44). Boston, MA: Allyn & Bacon.

Fessler, R., & Christensen, J. (1992). Teacher development as a career-long process. In R. Fessler & J. Christensen (Eds.), *The teacher career cycle: Understanding and guiding the professional development of teachers* (pp.1-20). Boston, MA: Allyn & Bacon.

Garton, B. L., & Chung, N. (1996). The inservice needs of beginning teachers of agriculture as perceived by beginning teachers, teacher educators, and state supervisors. *Journal of Agricultural Education, 37*(3), 52-58. doi: 10.5032/jae.1996.03052

Greiman, B. C. (2010). Continuing professional development. In R. M. Torres, T. Kitchel, & A. Ball (Eds.), *Preparing and advancing teachers in Agricultural Education*. Columbus, OH: Curriculum Materials Services.

Greiman, B. C., Walker, W. D., & Birkenholz, R. J. (2005). Influence of the organizational environment on the induction stage of teaching. *Journal of Agricultural Education, 46*(3), 95-106. doi: 10.5032/jae.2005.03095

Hargreaves, A., & Fullan, M. G. (1992) Introduction. In A. Hargreaves & M. G. Fullan (Eds.), *Understanding Teacher Development.* Columbia, NY: Teacher College Press.

Huberman, M. (1989). The professional life cycle of teachers. *Teachers College Record, 91*(1), 31-57.

Huberman, M. (1995). Professional careers and professional development. In T. Guskey and M. Huberman (Eds.), *Professional Development in Education: New Paradigms and Practices.* New York: Teachers College.

Huberman, A. M., & Grounauer, M. M. (1993). *The Lives of Teachers*. Columbia University: Teachers College Press.

Joerger, R. M. (2002). A comparison of the inservice education needs of two cohorts of beginning Minnesota agricultural education teachers. *Journal of Agricultural Education, 43*(3), 11-24. doi: 10.5032/jae.2002.03011

Joiner, S., & Edwards, J. (2008). Novice teachers: where are they going and why don't they stay? *Journal of Cross Disciplinary Perspectives in Education, 1*(1), 36–43.

Kahler, A. A. (1974). *Organization and instructional problems of beginning teachers of vocational agriculture*. Ames: Iowa State University, Department of Agriculture Education.

Kaplan, L.S., & Owings, W.A., (2004). Introduction to special issue: Teacher effectiveness. *NASSP Bulletin, 88*(638), 1-4.

Lambert, L. (1988). Staff development redesigned. *Educational Leadership, 45*(8), 665-668.

Layfield, K. D., & Dobbins, T. R. (2002). Inservice needs and perceived competencies of South Carolina agricultural educators. *Journal of Agricultural Education, 43*(4), 46-55. doi: 10.5032/jae.2002.04046

Lynn, S. (2002).The winding path: Understanding the career cycle of teachers. *The Clearing House, 75*(4), 179-182.

Maciejewski, J. (2007). Supporting new teachers: Are induction programs worth the cost? *District Administration, 43*(9), 48–52.

McCaffrey, J. R., Lockwood, D. F., Koretz, D. M., & Hamilton, L. S. (2003). *Evaluating value added models for teacher accountability* [Monograph]. Santa Monica, CA: RAND Corporation. Retrieved from http://www.rand.org/content/dam/rand/pubs/monographs/2004/RAND_MG158.pdf

McDonald, B., & Lawver, D. E. (1997, December). Laboratory safety inservice needs of Texas agricultural science teachers. *Proceedings of the Twenty-Fourth Annual National Agricultural Education Research Meeting*. Las Vegas, NV.

McDonald, F. J., & Elias, P. (1983). The *transition into teaching: The problems of beginning teachers and programs to solve them.* (Summary report). Princeton, NJ: Educational Testing Services.

McLeskey, J., & Waldron, N. (2002). School change and inclusive schools: Lessons learned from practice. *Phi Delta Kappan, 84*(1), 65–72.

Miller, W. W., & Scheid C. L. (1982). Problems of beginning teachers of vocational agriculture in Iowa. *Journal of the American Association of Teacher Educators in Agriculture, 25*(4), 2-7. doi: 10.5032/jaatea.1984.04002

Mundt, J. (1991). The induction year: A naturalistic study of beginning and secondary teachers of agriculture in Idaho. *Journal of Agricultural Education, 32*(1), 18-23. doi: 10.5032/jae.1991.01018

Mundt, J. P., & Connors, J. J. (1999). Problems and challenges associated with the first years of teaching agriculture: A framework for preservice and inservice education. *Journal of Agricultural Education, 40*(1), 38-48. doi: 10.5032/jae.1999.01038

Myers, B. E., Dyer, J. E., & Washburn, S. G. (2005). Problems facing beginning agriculture teachers. *Journal of Agricultural Education, 46*(3), 47-55. doi: 10.5032/jae.2005.03047

Newcomb, L. H., McCracken, J. D., Warmbrod, J. R., & Whittington, M. S. (2004). *Methods of Teaching Agriculture* (3rd ed.). Upper Saddle River, NJ: Pearson Prentice Hall.

Roberts, T. G., & Dyer, J. E. (2004). Inservice needs of traditionally and alternatively certified agriculture teachers. *Journal of Agricultural Education, 45*(4), 57-70. doi: 10.5032/jae.2004.04057

Sikes P. J. (1985). The life cycle of the teacher. In S. Ball & I. Goodson (Eds.), *Teachers' Lives and Careers* (pp. 27-60). Lewes: Falmer.

Sofranko, A. J., & Khan, A. (1988). It's not that simple. *Journal of Extension, 26*(4), 1-5. Retrieved from http://www.joe.org/

Sorensen, T. J., Tarpley, R., & Warnick, B. K. (2005). Inservice needs of Utah agriculture teachers. *Journal of Agricultural Education, 51*(3), 1-11. doi: 10. 5032/jae.2010.03001

Talbert, B. A., Camp, W. G., & Heath-Camp, B. (1994). A year in the lives of three beginning agriculture teachers. *Journal of Agricultural Education, 35*(2), 31-36. doi: 10.5032/jae.1994.02031

Veenman, S. (1984). Perceived problems of beginning teachers. *Review of Educational Research, 54*(2), 143-478. Stable URL: http://www.jstor.org/stable/1170301

Washburn, S. G., King, B. O., Garton, B. L., & Harbstreit, S. R. (2001). A Comparison of the Professional Development Needs of Kansas and Missouri Teachers of Agriculture. *Proceedings of the 28th Annual National Agricultural Education Research Conference,* 396-408.

Wenglinsky, H., & Silverstein, S. (2006). The science training teachers need. *Educational Leadership, 64*(4), 24-29.