

**A Mixed Methods Study of On-Farm Apprenticeship Learning in Virginia**

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**ABSTRACT**

The average age of principal farm operators rose from 50.3 years in 1978, to 57.1 years in 2007, as farmers retire and new farmers do not enter farming (NASS, 2013). With declining numbers of entrants into farming, agricultural educators and service providers must better understand strategies for effectively preparing beginning farmers. On-farm apprenticeships in the U.S. show promise as a means to prepare farmers and are increasing in number (Niewolny & Lillard, 2010). Lave (1988) writes “knowledge-in-practice, constituted in the settings of practice, is the locus of the most powerful knowledgeability of people in the lived-in world” (p. 14). Thus, farming, as a complex set of interwoven skills, is best learned *in situ*, as situated learning. On-farm apprenticeships therefore may allow learners to construct knowledge in context, and build identities as farmers. In this thesis, I share findings from a mixed methods study that explored what kinds of on-farm apprenticeships are available, and to whom; and important educational practices, structures, and institutions that support on-farm apprenticeship learning. This study comprises data from a survey (N=45) of Virginia farmers who host apprentices, and interviews (N=12) with farmers and on-farm apprentices. Findings describe who undertakes on-farm apprenticeships, and suggest that apprentices develop expert identities through situated learning with farmers. Findings describe how farmers participate as educators, and how farms function as sites of situated learning. This study also found that on-farm apprenticeships are embedded within alternative food movements, with social reproduction potentially occurring. I also explore broader implications for preparing beginning farmers.

## **DEDICATION**

I dedicate this thesis document to my husband and muse, David T. Hewett, for his immense, incredible, unflinching, and humbling support, through my struggle, renewal, and newfound inspiration in life. This would not have been possible without your love.

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## CHAPTER 1: INTRODUCTION

### Introduction

On-farm apprenticeships are on the rise. Apprenticeships have emerged as a promising strategy for training beginning farmers (Niewolny & Lillard, 2010). National Sustainable Agricultural Information Service (ATTRA), which maintains a U.S. national database for on-farm apprenticeships, has apprenticeships in every U.S. states, and lists 118 apprenticeships in Virginia, and over 2,700 in the United States (ATTRA, 2014). Pilgeram (2011) suggests that younger beginning farmers did some form of apprenticeship before starting their own farms, and suggests that on-farm apprenticeships are becoming an important strategy for training farmers. In a Kansas City apprenticeship program, 8 of 11 apprentices were engaged in agricultural vocations in the year following completion (Carey, Kelly, Hendrickson, Nagengast, Quinn, Volland & Kumar, 2006). Other countries, notably Australia (Blum, 1991), New Zealand (Sligo, Tilley, & Murray, 2011), and Germany (Evanciew, 1994), have established federal agricultural apprenticeship programs as a strategy to train beginning farmers. Student farms at colleges and universities are also increasing in number, and present a valuable, effective means for preparing college students of agriculture through experiential learning (Birnbaum, Thorp & Ngouajio, 2006; Leis, Whittington, Bennet & Kleinhenz, 2011; Parr & Van Horn, 2006; Ratasky, 2012; Shroeder, Creamer, Linker, Mueller & Rzewnicki, 2006).

In addition to their rise in popularity, on-farm apprenticeships show promise to be effective in beginning farmer training. Farmers themselves have recommended apprenticeship or internship training programs as a good strategy for training beginning farmers (Maxey, 2006). Trexler, Parr, and Khanna (2006) report that agricultural practitioners cite apprenticeships on a farm or a variety of farms as the most important element within a university program to prepare

future agricultural practitioners. Agricultural apprenticeship programs have also been shown to increase overall confidence in applying the learning and ownership of the material (Salomonsson, Nilsson, Palmer, Roigart & Francis, 2009). Agricultural apprenticeships may thus offer an effective strategy for preparing beginning farmers with the knowledge and skills necessary for farming.

Also, farmers prefer experiential learning opportunities. A recent survey has found that 99% of farmers prefer hands-on learning to other common educational programming strategies, including online learning, books/texts, meetings, lectures, and newsletters (Franz, Piercy, Donaldson, Westbrook & Richard, 2010). Another review finds that many farmers seek out informal learning opportunities, and access a variety of learning opportunities, often supplementing formal training with observation and experience (Kilpatrick, Johns, Murray-Prior & Hart, 1999). Skills that are identified by farmers as most essential to farming include decision-making, time management, and flexibility (Kilpatrick, et al, 1999), and hands-on learning on student farms has been found to be an effective means through which to acquire these skills (Parr & Trexler, 2011). An on-farm apprenticeship program offers a conduit for experiential learning.

Experiential education has been noted to be one of the most important learning theories in agricultural education (Roberts, 2006), and is typically understood as hands-on learning, or learning by doing (Kolb, 1984; Roberts, 2006). Through his life's work, John Dewey founded the theory behind experiential learning, and argued for education to be situated in the context that the knowledge will later be applied (Garrison, 1994). Dewey, in other words, advocated that education to be largely experiential in order to more effectively apply knowledge.

Relatedly, on-farm apprenticeship learning is also a form of situated learning. Situated learning, although occasionally conceptualized as a form of experiential learning (Schunk, 2012),

is its own animal, and constitutes a departure from other learning theories (Greeno and MMAP Group, 1997; Lave, 1991; Niewolny & Wilson, 2009). Situated learning is a related (but not transmutable) theory that offers a lens through which to theorize on-farm apprenticeships. Situated learning is the concept that learning happens within a relationship between a mind and a particular context, constructed within an exchange with the situation or environment (Schunk, 2012). In her seminal work, *Cognition in Practice*, Jean Lave (1988) established situated learning theory. She noted the oft overlooked pervasiveness of the functionalist perspective of education, with the dominating assumption that, by removing knowledge from its conditions of use makes it more widely transferrable to other contexts. Lave (1988) argues against this assumption, and for educational endeavors to be situated in context. She writes, “knowledge-in-practice, constituted in the settings of practice, is the locus of the most powerful knowledgeability of people in the lived-in world” (p. 14). On-farm apprenticeships, as situated learning, may offer this “powerful knowledgeability.”

Although on-farm apprenticeship learning is becoming more common, is prevalent in other countries, and creates learning opportunities of an experiential, situated kind, the literature is largely silent on this form of learning farming when it occurs outside of academia. As long as one-hundred years ago, Liberty Bailey, signer of the report to Theodore Roosevelt which started the educational activities in Extension, called for farms to become schools in order to teach the trade of farming (1911). Today, on-farm apprenticeship learning may present the next great development in beginning farmer training. Through this descriptive study of on-farm apprenticeship learning, our collective understanding of this phenomenon may be improved. Greater analysis of on-farm apprenticeship learning is therefore one step towards a full consideration of this promising, potentially potent means for learning how to farm.

## **Problem Statement**

Study of on-farm apprenticeships will potentially help us address several issues. First, our farmer population is aging, and new and beginning farmers are not entering farming at the same rate as older farmers retire. The average age of principal farm operators rose from 50.3 years of age in 1978, to 57.1 years of age in 2007 (National Agricultural Statistics Service, 2013). According to Gillespie and Johnson (2010), the “increasing average age of farmers reflects the trend of farming households not replacing themselves in agriculture” (p. 32). In 1982, 38% of all farmers were beginning farmers by USDA definition, while in 2007, only 26% of farmers were beginning farmers (Ahearn, 2013). The U.S. Census of Agriculture calls the aging farmer population in the United States a “long term trend” (Dimitri, Effland & Conklin, 2005, p. 1). With declining numbers entering farming as a profession in the United States, we must better understand ways to train beginning farmers.

This aging farmer population trend has occurred in context of the long trajectory of U.S. farm youth leaving the farm to seek employment opportunities in other industries or in urban or peri-urban areas (Kennedy, Cohen & Bailey, 2005). This echoes a general worldwide trend, as the majority of rural areas continue to experience long-term negative population decline in relation to increased urban and peri-urban areas (Buhaug & Urdal, 2013), many leaving farming behind. It follows that one way to stabilize or reverse these trends is to inspire and train urban and peri-urban individuals to effectively begin farming. U.S. Extension agents have noted anecdotally that many beginning farmers are from urban or peri-urban areas and do not have backgrounds in agriculture, although they are highly educated (Meyer, Hunter, Katchova, Lovett, Thilmany, Sullins & Card, 2011). These urban and peri-urban, would-be-beginning farmers have had limited access to farming, yet are motivated to enter farming as a profession. Also, if these



individuals are already holders of college degrees, they may be unlikely to seek enrollment in a college or university agricultural program of study. As I have suggested above, farming may be best learned experientially, on the farm. So, these urban or peri-urban, would-be-beginning farmers may benefit greatly from experiential learning on a farm, such as an apprenticeship program would allow.

At the same time, the average number of different crops produced annually on farms in the United States is 1.1, down from an average of 4 crops, a century ago (USDA, 2005). Although single-product farming has come to dominate agriculture, it is also heavily criticized for creating physical environmental degradation, such as topsoil loss, and so reducing the future physical productive potential of farmland (Carolan, 2012). To prevent further future losses to productivity of farmland, single-product farming could be phased out, and more diversified, integrated farm systems should increase in number and market share (Doran, 2008). However, as noted by Doran, diversified, integrated farm systems demand farm owner-operators, managers, and workers, that are knowledgeable about a wider array of farm practices and products than is the norm in agriculture today. More diversely skilled workers can respond in a more knowledgeable way to varying conditions of rainfall, pests, soil quality, etc., for a more complex farm management scheme. In an atmosphere of uncertainty, more generalists are needed in agriculture to allow farms to be more diversified and resilient to changing weather, crop, blight, disease, political, and economic conditions (Jayaraj, 1992). MacRae, Martin, Juhasz and Langer (2009) observe that if farms are less mechanized, as diverse, integrated farm systems often are, more diversely skilled laborers are needed, as they must manually handle a wider variety of crops in a flexible manner. Lave would term this a “deep knowledgability” (Lave, 1991, p. 65)

among beginning farmers. If more diversely skilled farm owners, managers, and workers are needed, it is reasonable to consider an appropriate approach to identify and train them.

Publicly-funded, national on-farm apprenticeship programs are present in at least ten industrialized nations, and in Australia, graduates of the on-farm apprenticeships outnumber graduates of agricultural colleges (Blum, 1991). Yet in the United States, our national apprenticeship program does not include farming, although it has partnered with agricultural educators to create apprenticeships in other vocations, such as youth development (Bailey & Deen, 2007). Additionally, as Hamilton (2010) details, on-farm apprenticeships may sometimes violate U.S. minimum wage laws and farm worker housing laws, which could be addressed through policy instruments. The field is ripe for a more serious consideration of apprenticeship programs as a possible official national strategy for preparing beginning farmers in the United States.

Experiential education is often cited as the most important theory applied to agricultural education, but the literature leaves the theory unarticulated into useful forms. In agricultural education, experiential learning is rarely deconstructed to go beyond the notion that experiential education is to provide a hands-on experience to learners, or learning by doing (Roberts, 2006). This does not provide much helpful guidance to the practitioner of agricultural education. Are all forms of experiential education equal? If all forms are not equal, which ones are more likely to develop farmers who are the deeply knowledgeable farmers and laborers that U.S. agriculture needs for the future?

### **Research Purpose and Questions**

The overall aim of this concurrent mixed-methods descriptive study has been to learn about on-farm apprenticeship learning by exploring the lived experiences of individuals involved

with on-farm apprenticeship learning, and to describe and situate these experiences within a larger survey of on-farm apprenticeship program offerings in Virginia. My current working definition of on-farm apprenticeship learning is when a novice farmer enters a situation of learning on the job from an expert farmer, the farmer educator. On-farm apprenticeship learning can take place on a farm and labeled an apprenticeship or internship, but may also be working for pay, if the farmer educator is explicitly and ostensibly committed to an educational component for the worker. Thus, the expert farmer is here termed a “farmer educator,” who may be the farm owner-operator, or a farm manager, or other farm leader who supervises the novice. For sake of simplicity, the novice to farming will be called an “apprentice.”

The guiding research questions for this study of on-farm apprenticeship learning are:

1. How do on-farm apprenticeships provide learning opportunities for beginning farmers in Virginia?
  - a. What kinds of on-farm apprenticeships are available and to whom?
  - b. What are the most important educational practices, structures, or institutions that support on-farm apprenticeship learning?
  - c. How do expert farmers participate as educators in these on-farm apprenticeships?
  - d. How do farm novices adopt expert identities through on-farm apprenticeships?

### **Conceptual Framework**

This study is informed by situated learning. Situated learning, also often used synonymously with situated cognition, is the concept that learning happens within a relationship between a mind and a particular context, in an exchange with the situation or environment (Schunk, 2012). Situated learning, for educational theorists, is sometimes understood as constructivist learning. As Schunk (2012) explains, “constructivism stresses situated cognition

and the importance of taking the context of environments into account to explain behavior” (p. 254). Constructivism is the idea that knowledge is not discovered or found, but rather sense-making happens as a strategy to cope with and make order with his/her environs (Lincoln and Guba, 2013). The concept of constructivism, therefore, holds that knowledge is co-created within complex relationships with context.

One important idea from situated learning is that of context. Context, much more than mere physical conditions. This conceptualization of context reminds the educational scholar that context is more than a container for instances of individualized experiences (Niewolny & Wilson, 2011), and takes place within the highly involved relationships between people, objects, and institutions that comprise the whole of everyday life. Context can also be understood socially, and relates to a learner’s “position with regard to circumstances in the world of social affairs” (Cobb & Bowers, 1999, p. 5).

Related to situated learning is the community of practice (CoP) construct. The CoP construct can be thought of as a type of situated learning, which takes place as learners are given legitimate peripheral participation in a community of practice, where they mutually engage in joint enterprises (Wenger, 1998). This study is particularly concerned with Lave’s (1991) concept of identity formation, which, in the CoP construct, occurs through progression from a novice to expert within a CoP (Wenger, 1998). According to Lave (1991), “developing an identity as a member of a community and becoming knowledgeably skillful are part of the same process” (p. 65).

Additionally, Vygotsky’s philosophy on inner speech guides this study, as a parallel and related theory to situated learning. Vygotsky developed the concept that our inner, mental speech is a critical part of articulating ideas into thought (Schunk, 2012). Vygotsky’s philosophy of the

zone of proximal development (ZPD) dictates that learning happens within social interaction between a novice and master, informed by intersubjective tacit emotionality, where the master is placing some level of emphasis on teaching the novice, as guided participation (Schunk, 2012).

These concepts from the sociocultural learning lexicon: constructivism, Lave's situated learning, community of practice, and identity formation; and Vygotsky's inner speech, intersubjectivity, and ZPD; are important in describing phenomena in this study. Apprenticeship learning is clearly situated in context, within a community of practice where identity formation plays a key role. Apprenticeship learning occurs socially in relation to a master practitioner and others, where language, emotions, and communication with an expert, is an important part of the learning process.

## **Methodology**

Because little is understood about on-farm apprenticeship learning, a concurrent mixed methods study was appropriate to describe on-farm apprenticeship learning in the literature. Before one might determine the 'why' of on-farm apprenticeship learning, one must first get a sense of 'what' exists in the way of on-farm apprenticeship learning. Thus, this study is a descriptive study to add to the scholarly literature on the phenomenon.

I chose a mixed methods study design to conduct this research. Through a Deweyan pragmatist orientation to research, I used multiple means to determine the likely true reality of the phenomenon, and place it within its sociocultural context. By utilizing a dual method approach, quantitative and qualitative elements interact complementarily to paint a picture of on-farm apprenticeship learning in Virginia.

Quantitative data allows me to draw conclusions about common general structures present in on-farm apprenticeship learning programs in Virginia, and to place on-farm

apprenticeship learning within the larger context of agriculture. Qualitative data allows me to form an in-depth understanding, drawing from the core of actual lived experiences of apprentices and farmers, to establish if/how apprenticeship learning is occurring on farms. For the quantitative element, I conducted a cross-sectional, self-administered survey of all farms advertising apprenticeship programs on a national listing of on-farm apprenticeships (N=45). For the qualitative element, I interviewed 12 farmers and farm apprentices, in semi-structured interviews that lasted approximately 60 minutes apiece.

The quantitative and the qualitative data both informed my conclusions equally. The survey data was compiled in Statistical Package for Social Sciences (SPSS) software, descriptive statistics were employed, and statistical tests were applied to arrive at conclusions. The interviews were transcribed verbatim and coded using Atlas.ti software, and then counted, compiled, and analyzed to determine results. The results of both the quantitative and qualitative data were then mixed and analyzed together, in order to derive meaningful conclusions.

### **Significance of the Study**

There are four aspects to this study's significance. First, the study contributes to understanding practice of an emerging pedagogy in training beginning farmers. Second, theoretically, this study demonstrates how situated learning offers more detailed description of apprenticeship learning than does experiential learning. Third, this study can ultimately lead to insights into policy that may influence on-farm apprenticeship learning. Finally, this study highlights how a mixed methods study is helpful to describe a complex emergent phenomenon.

First, this study seeks to inform on-farm apprenticeship practice. Apprenticeship learning, as a type of situated learning and experiential education, is a promising approach to develop the highly skilled labor force demanded by diverse, integrated farm systems. However, as I discuss

in Chapter Two, on-farm apprenticeships are poorly understood in scholarly literature. What little collective knowledge that the literature does present comes from on-farm apprenticeships at academic institutions of higher learning, at student farms (Biernbaum, Thorp & Ngouajio, 2006; Leis, Whittington, Bennet & Kleinhenz, 2011; Parr & Van Horn, 2006; Ratasky, 2012; Shroeder, Creamer, Linker, Mueller & Rzewnicki, 2006). However, very little research has been conducted into on-farm apprenticeships that take place outside the network of land grant institutions, and even fewer outside the web of academia. What little research has been done on apprentices outside academia has focused on how apprentices are a part alternative food networks through actor network theory (Barnett, 2012), legal aspects (Hamilton, 2011), or how apprentices may be a crucial supply of free/cheap labor to sustainability-oriented farmers (Maxey, 2006; Pilgeram, 2011). Studies have not been conducted that more comprehensively describe on-farm apprenticeship learning, or how they fit into the larger schemata of agriculture. This study aims to depict this phenomenon. In doing so, the study seeks to benefit practitioners, who can create and implement on-farm apprenticeship programs from a greater depth of understanding. In making these programs better informed, they are likely to be more effective in reducing barriers to entry into farming.

Second, this study can contribute to the development of a theoretical base from which one can analyze the on-farm apprenticeship phenomenon. In social sciences, describing a phenomenon is a crucial step before a phenomenon can have theory developed around it (McInerney, Walker & Liem, 2011). Schunk (2012) notes that “future research should evaluate the factors that influence the success of apprenticeships as a means for fostering skill acquisition” (p. 247). Before we can evaluate factors, however, the literature needs to first recognize this form of learning through description. As Lave (1991) notes, “these forms of

learning also require first recognition, then explanation” (p. 65). On-farm apprenticeship learning must be first recognized as a learning strategy in agricultural education, and described, if it is to be analyzed, modeled, and then theory is to be developed. This study draws on situated learning theory to describe, through a mixed methods approach, how apprenticeship learning is occurring on farms in Virginia. By better understanding this form of learning, this study can pave the way towards a fuller, deeper consideration of this strategy for training the next generation of farmers. This can ultimately contribute to the development of a theoretical base surrounding on-farm apprenticeships.

Third, this study may ultimately allow for deeper political considerations, although this would be after the aforementioned ‘deeper understandings’ in practice and theory have been developed. As I discuss in Chapter Two, the land grant system is charged with the social contract for training the next generation of agriculturalists, among other things (Francis, Poincelot & Bird, 2006). Certain publicly funded programs have emerged to address the dearth of new farmers entering agriculture (Government Accounting Office, 2011; Sureshwaran & Ritchie, 2011). At the same time, training programs have emerged in academia, the nonprofit sector, and public-private partnerships that offer experiential learning and farm mentorship opportunities (Niewolny & Lillard, 2010). Because similar programs are already implemented, this study, and others examining on-farm apprenticeships, are relevant to possible future allocation of public funds to train beginning farmers. If on-farm apprenticeships prove effective (in future research that may be informed by this study), then similar public programs may be more critically considered.

Finally, this study is of importance as an example to mixed methods researchers. In particular, mixed methods research is helpful in describing a phenomenon at a point where the



researchers are first developing descriptions of the phenomenon, and triangulation of data is needed (Creswell, 2009). Thus, more than one dataset from differing methodologies will inform the description and lend credibility to the study (Lincoln & Guba, 1986). This study is important as an example of this way to arrive at a credible study, in naturalistic inquiry, within the scope of a Master's level graduate program.

In sum, this study is of importance for four reasons. The study is important to inform on-farm apprenticeship practice, progress towards a theoretical base, to allow for future policy considerations, and to offer an example of a Master's level mixed methods study. Thus, this study is significant in these areas..

### **Clarification of Terminology**

The below are current working definitions for important terms used in this research proposal. It is important to note that because this study pulls from several research traditions (primarily agricultural education, agricultural history, and educational theory), some terms can be expected to be slightly incommensurable with other terms. Incommensurable terminology has been noted as an ongoing challenge for social learning researchers, since multiple disciplines are consulted (Lincoln and Guba, 2000, in Denzin & Lincoln; McInerney, Walker & Liem, 2011). Through analysis of the lived experiences of participants involved in on-farm apprenticeship learning, these definitions are slightly altered to reflect accurately their meaning to participants. A review of the literature reveals the below definitions that bear the most relevance to on-farm apprenticeship learning.

**Activity System** – An activity system is “the minimal unit of analysis for the understanding of cognitive development, human participation, and change... at its heart it affirms that all human practice is mediated by symbolic, cultural, and communal, as well as material, resources, or

tools; it is through these forms of mediation that human practice is understood as both dynamic and historical” (Sawchuk, Duarte & Elhammoumi, 2006, p. 2).

**Alternative Agri-Food Movement (AFM); also Alternative Agri-Food Institution (AFI) –**

According to Allen (2008), alternative agrifood movement is an oppositional body of theories, practices, and movements that challenge the dominant agrifood institutions. She notes the growing popular interest in improving food systems, which comprises a social movement. AFIs are institutions (organizations and groups) that work as a part of this social movement. Guthman notes that AFMs, may have a somewhat blurry theoretical focus, but is mainly centered around issues of localism and justice in the food system. Sbicca (2012) has found that AFMs have “anti-oppression ideology premised on notions of social justice and autonomy” (p. 464).

AFMs and AFIs are related concepts with the discourse of sustainable agriculture (see below). For example, the values, beliefs, practices, and theories, are overlapping. AFMs and AFIs, by comparison, are movements and institutions that use that sustainability discourse, and more.

**Apprentice** – An apprentice is an adult learner, who is a novice, who learns on the job and receives direction from a master. Apprenticeships are typically defined as programs of study that involve some length of time, often one to three years, working under an expert in a particular art, trade, or craft, receiving instruction on-the-job, and potentially incorporating some structured lessons (Gray & Herr, 1998). However, I use this term in a much more theoretical way to describe an indentured novice learner who works alongside, pitches in, observes and interacts with an expert/master, and thus knowledge transfers from expert to novice to ultimately lead the novice to mastery in a given set of skills and knowledge (Paradise & Rogoff, 2009). In much of industry, including farming, this concept can also be applied to the term ‘intern’ as engaged in an

‘internship.’ According to Jones (1999), on-farm apprenticeship programs may often use the term internship due to strict legal definitions regarding apprenticeships. However, this study seeks to engage the discourse on apprenticeship learning discussed by Lave (1988), Rogoff (1990), and Vygotsky (Schunk, 2012). Hence, the use of the term ‘apprentice’ is used synonymously with ‘intern,’ and ‘apprenticeship’ is used synonymously with ‘internship.’ This may also include work for pay, often staying residentially on the farm during their indenture, as long as the above Paradise and Rogoff’s definition still holds true, and an express arrangement exists that the farmer educator will teach the novice apprentice how to farm. The phenomenon of interest in this study is the mode of learning.

Additionally, for the purposes of this study, an on-farm apprentice is an adult individual that meets the above definition of an apprentice, where the apprenticeship takes place on a farm, during an indentured agreement with an expert farmer, where the apprentice is fully immersed in the learning experience. Because those who qualify for the aforementioned definition of beginning farmer/rancher are adults, this study will focus on adult learners (over 18 years of age).

**Beginning Farmer/Rancher** – The USDA defines beginning farmers/ranchers as farmers/ranchers who have been in operation ten years or less (Ahearn, 2013). However, as some have pointed out (National Family Farm Coalition, 2011), this definition is problematic because it does not include those actively seeking farming as an occupation who are not yet principal owners/operators. Therefore, this study uses the term more broadly to include those who are exploring farming as an occupation, or are actively planning their own farm enterprise, in addition to those farmers/ranchers who have been in operation ten years or less.

**Identity** – In this text, the term is meant in the Laveian tradition to mean one’s self-image which is constructed socially in practice with others through the learning process (Lave, 1991). Lave writes, “developing an identity as a member of a community and becoming knowledgeably skillful are part of the same process, with the former motivating, shaping, and giving meaning to the latter, which it subsumes” (p. 65).

**Farmer Educator** – A farmer educator is an individual who is explicitly and ostensibly committed to an educational component for an apprentice. The farmer educator may be the farm owner, farm manager, or other farm leader who supervises and teaches the novice.

**On-Farm Apprenticeship Learning** – the experience(s), or process(-es), of development and knowledge creation that result in learning, which is described as “an enduring change in behavior, or in the capacity to behave in a given fashion, which results from practice or other forms of experience” (Schunk, 2012, p. 3). For the purposes of this study, on-farm apprenticeship learning occurs in an adult individual that meets the above definition of an apprentice, where the apprenticeship takes place on a farm, during an indentured agreement with an expert farmer, where the apprentice is fully immersed in the learning experience, often through a residential stay.

**Sustainable Agriculture** – The United Nations defines sustainable development as “development that satisfies the need of present generations without affecting the capacity of future generations to provide their own needs” (Gasto, Vera, Vieli & Montalba, 2009). The Sustainable Agriculture Research and Education (SARE), a division of the USDA, has stated that three pillars of sustainable agriculture are “profit, stewardship, and quality of life” (SARE, 2014). Sustainability is, however, better understood as a ‘banner’ under which many somewhat

different ideological orientations can unite (Hermans, Horlings, Beers & Mommaas, 2009; Gasto, et al, 2009).

Although “sustainable agriculture is used to denote a more environmentally sound *and* socially responsible system of agricultural production than has traditionally existed in most Western societies” (Lyson, 2004, p. 78, italics added), the “socially responsible” part of the conversation often gets left out. As Allen (2004) points out, discourse on sustainable agriculture often centers around the physical environmental impact of production or even defined as a set of farm practices, which misses key social aspects needed to be an internally consistent ideology. While sustainable agriculture remains a contested concept (Connelly, 2007), most sustainability authors speak mainly of farms that are small in scale, diversified, and have flexible marketing strategies (Lyson, 2004). Lyson has suggested that concept of “civic agriculture” replaces sustainability discourse, as it at once emphasizes the “social, economic, political, and cultural” (p. 62).

Many studies that have sought to address topics of sustainable agriculture per se, include analyses of on-farm apprenticeships within that context. Sustainability-oriented farms seem to be likely sites for the majority of apprenticeships, as per the literature (see, for example, Barnett, 2012; Endres & Armstrong, 2013; Hamilton, 2011; Maxey, 2006; Pilgeram, 2011). Some concepts used within the sustainable agriculture discourse (e.g., integrated farm systems, future farmland productivity) are discussed in the literature as background rationale for labor considerations (Doran, 2008; MacRae, et al., 2009). Although the available literature on on-farm apprenticeships has been hitherto associated with sustainability, this study sought to address all on-farm apprenticeship programs that met the criteria for inclusion provided in this definition section, regardless of farm type.

This study did not seek to frame on-farm apprenticeship learning within the sustainability discourse. Rather, the discourse surrounding sustainable agriculture quickly emerged as a theme that would be important to this study. Through analysis of the data itself, it proved undeniable that concepts of sustainable agriculture would be a vital piece to understanding on-farm apprenticeship learning in Virginia.

## CHAPTER 2: LITERATURE REVIEW

### Introduction

The purpose of this literature review is to present a background of scholarly literature that is relevant to this descriptive study of on-farm apprenticeships. I pull from several different scholarly traditions because, as Schoen (2011) writes, “due to multiple domains of factors implicit in the sociocultural perspective, it is incumbent on the sociocultural researcher to survey multiple literatures to obtain an overview of the key factors involved, from a variety of perspectives” (as cited in McInerney, Walker, & Liem, p. 19). With this approach, my literature review is intended to be broad in scope and involves literature from multiple disciplines, ranging from agricultural history, to educational theory, workforce education, sociology, and ultimately to literature from agricultural education, as specific as is available to the subject matter of on-farm apprenticeship learning. A review of the scholarly literature finds, overall, that very little literature directly pertains to the topic of on-farm apprenticeship learning, with the noteworthy exception of research on student farms operated by a college or university. Overall, a review of available scholarly literature demonstrates the need for more academic inquiries about on-farm apprenticeship learning.

### Socio-Historical Context for Study

#### *Agricultural Education Traditions*

As far back as 1796, United States founding father George Washington stated that “with reference either to individual or national welfare agriculture is of primary importance... [agriculture should be] an object of public patronage. Institutions for promoting it grow up, supported by the public purse” (in Rassmussen, 1989, p. 17). Washington’s vision became a reality with the signing of the 1862 Morrill Land-Grant College Act, where the primary goal was

to promote agricultural education (Bailey & Kennedy, 1994). Most states established “new agricultural and mechanical colleges,” (Rasmussen, 1989, p. 23), the public land-grant university system of today. Throughout the 1800’s, agriculture had become increasingly sophisticated and mechanized, and the land grant system was established, in part, as a way to provide training to farmers (USDA, 2005). The land grant universities have a mission to provide “research and education in an effort to solve everyday problems” (Colasanti, Wright & Reau, 2009, p. 2). In 1914, it was the so-called ‘golden age’ of American agriculture, where one-third of the U.S. population lived on farms, farms were relatively efficient, and there was mild inflation (Rasmussen, 1989). The Smith-Lever Act of 1914 established the Extension Service as it is known today (Bailey & Kennedy, 1994). According to Rasmussen, by the 1930s, a relatively coherent pedagogy had developed within Extension, centered around demonstration, which remained the most important pedagogy through the end of the golden age sometime in the early 1970s (Buttel, 2005). Extension was originally charged with serving all U.S. citizens, but it has historically focused its efforts in rural areas (Rasmussen, 1989).

The golden age for agriculture is also called by some the “golden age” of agricultural research (Buttel, 2005, p. 276; Jenkins, 1991, p. 134). During this time, agriculture experienced a period of expansion of public agricultural research, housed primarily within the land grant system. In the golden age, public trust in researchers was high, and there was an acceptance that public research was affiliated with what Buttel calls “the hegemony of productivist ideology” (p. 277). With a productivist ideology, public research, through the land grant system, often partnered with private businesses to produce innovations in agriculture, a practice it was later sharply criticized for (Hightower, 1973). Hightower criticized land grant research for often benefitting the very large farms and large private companies rather than the small farmer or small



agricultural company. The productivist ideology contributed to the development of innovations that would drive farms and agricultural businesses to become larger, and the food system (including aggregators, processors, distributors, retailers) more concentrated and centralized. This follows a trend seen throughout the last century up to the present, of farms themselves becoming larger in size, more highly mechanized, less diversified (Dimitri, Effland & Conklin, 2005), and less autonomous (Lyson, 2004).

At the time of the Morrill Act, approximately 60% of the working individuals in the United States were employed in agriculture (USDA, 2005). By the Smith-Lever Act, it was one-third (Rasmussen, 1989). Throughout that time, those aspiring to work in agriculture knew the subject matter through direct experience, as it was woven into the larger culture in the United States (Carolan, 2012). However, after a steady farm worker population decline, currently only approximately 1% of the workforce of the United States is working in agriculture (USDA, 2005). Agriculture is no longer a dominant part of the sociocultural landscape in which a significant portion of people operate on an everyday basis. As few now have direct experience with agriculture, even many potential beginning farmers may also lack direct experience with agriculture.

The public land grant system has been occasionally criticized for focusing less on preparing beginning farmers than serving currently operating large scale farmers (Hightower, 1973). However, one of its central initiatives is farm youth programs, such as Future Farmers of America and 4-H (Rasmussen, 1989). The land grant system is positioned to work on initiatives to aid beginning farmers.

### ***Beginning Farmers and Ranchers Initiatives***

As mentioned previously, the U.S is seeing a long-term trend of aging in the farmer population (National Agricultural Statistics Service, 2013), and fewer beginning farmers are present in agriculture each year (Ahearn, 2013), as fewer new farmers are able to successfully gain entry into farming. To have a stable food supply, a country needs to be a stable farmer population to grow food. Hamilton (2011) calls future farmer training arguably the most important single effort to sustain social stability. Extension in the 1990s did not specify beginning farmers as a specific initiative (Rasmussen, 1989). However, Niewolny and Lillard (2010) point out that, accordingly, there is a growing response to this trend on the part of the public sector, agricultural service providers, and practitioners, in program development to “maintain the viability of new farms, and the economic, social, and environmental fabric of which they are a part” (p. 69).

Since 1992, the USDA has considered beginning farmers and ranchers a distinct group to which to provide assistance (Ahearn, 2013). Ahearn also found that beginning farmers are likely to have more diversified operations, more likely to be direct marketing, and more likely to be women. In the same report, Ahearn also points out that beginning farmers depend more on off-farm income, and earn less income, even accounting for the same farm size. This would suggest that beginning farmers, even after starting their farm, are still learning how to make the farm profitable. She also finds beginning farmers experience significant challenges with land access. This aligns with other findings that many who are currently entering farming are not from a farming background (Meuleners, 2013)

In 1998, Trede and Whitaker, in their study of Iowa beginning farmers who had recently received startup loans, report that beginning farmers have a positive opinion of Extension, and

recommends that Extension consider beginning farmers a differentiated client group. The same study showed that beginning farmers value experiential learning opportunities and verbal, over written, information. While this may not be a representative sample, as it only represents those Iowa farmers who received loans, the study highlighted this group as distinct, with its own educational needs.

The USDA has been steadily gaining an understanding of the needs of beginning farmers as a group. The Government Accountability Office (GAO) (2007) reports: “in 2006, USDA took a step to better recognize the importance of assisting beginning farmers by including beginning farmers in its existing departmental policy designed to maintain the viability of small farms.” They also find that “beginning farmers are younger than established farmers, operate smaller farms, and are slightly more ethnically diverse and female than other farmers” (p. 5). The same report indicates that Farm Service Agency (FSA) loans to beginning farmers have also increased. Additionally, the Natural Resources Conservation Service (NRCS) has begun offering incentives to retiring farmers who transition their conservation land to beginning farmers through the Conservation Reserve Program (CRP) (Sureshwaran & Ritchie, 2011). The attention to beginning farmers is a sign that educational needs may be addressed.

The USDA’s Beginning Farmer and Rancher Development Project (BFRDP) is another way in which educational needs of beginning farmers are being met (Niewolny & Lillard, 2010). This program allows for individual states to apply for competitive funding of projects that aid beginning farmers. In Virginia, Virginia’s Beginning Farmer and Rancher Coalition Program (VBFRCP) is one such project. The VBFRCP includes, in its suite of projects to serve beginning farmers, a mentor program, where they enlist experienced farmers to mentor beginning farmers through a small stipend (VBFRCP, 2014). Gillespie and Johnson (2010), in their analysis of

factors that influence whether beginning farmers will continue farming, conclude that “in some cases, one experienced farmer mentor with the appropriate background, orientation, and commitment to the start-up might well be all that [is] needed” (p. 44-45). Apprenticeship programs and other experiential programs based on the mentor-mentee relationship (such as farm incubator programs) are increasingly offered by other agricultural organizations, as well (Niewolny & Lillard, 2011). Mentoring, such that may occur in on-farm apprenticeships, is starting to be offered in response to the need for beginning farmers.

### ***Public Apprenticeship Programs***

Today, apprenticeship programs are utilized as part of our U.S. federally sanctioned strategy for workforce training in various trades, although the importance of apprenticeships overall is modest compared with other countries (Lerman, 2013). The United States Department of Labor’s Registered Apprenticeship Program began in 1911, and enrolls approximately 400,000 apprentices annually. The Registered Apprentice Program trains individuals in such fields as carpentry, plumbing, machining, etc., but specifically bars involvement in agricultural trades (Department of Labor, 2012). Public apprenticeship programs are a successful strategy to train farmers in Germany, Austria, Switzerland, the United Kingdom, Australia, and New Zealand (Elbaum and Sigh, 1995). Germany’s public apprenticeship program has been regarded as especially effective (Evanciew, 1994). So, the apprenticeship model is utilized in other trades, and in other countries. As U.S. educators call for post-secondary education to incorporate “bridging apprenticeships” (Resnick, 1987, p.17) into many different instructional programs to mediate experience with abstract concepts, one can envision apprenticeships as a publicly funded national stratagem for beginning farmer preparation.

Increased mechanization has led to decreased need for farm labor (Rasmussen, 1989). The land grant system has been criticized for allocating more resources to mechanization approaches throughout its history, (Hightower, 1972). Hightower points out that by de-emphasizing beginning farmer training, and instead emphasizing development and implementation of labor-replacing technologies for established farmers, the land grant system has inadvertently contributed to farmers leaving the farm. This results in larger farms' – who can afford expensive machinery – ability to outcompete smaller and beginning farmers. Hightower argues that this sustained effort by land grant institutions has had an impact on the farmer population, as beginning farms simply don't have the financial capital at start-up to cover costs, much of which is the machinery.

Agricultural education, as we know it (the land grant strategy) has been operating for a century (celebrating its 100th year at the time of this writing), and agricultural, during this time, has seen many changes (Rasmussen, 1989). The land grant system must stay abreast of current trends in agriculture in order to ensure a safe, secure food supply. This study seeks to illuminate one piece of the puzzle that adds to the dialogue on the need for beginning farmers.

### **Experiential Education and Learning**

Experiential education theory is considered the most important and widely applied educational principle in agricultural education (Kolb, 1984; Roberts, 2006). Experiential education theory postulates that “knowledge is constructed when learners resolve tensions between abstract conceptualization and concrete experience, reflective observation, and experimentation” (Parr & Trexler, 2011, p. 426). Kolb (1984) defines experiential learning as "the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience" (p. 41). Thus,

experiential learning is a constructivist form of learning (Roberts, 2006). This theory is often implemented through providing the learner with direct, hands-on experience.

John Dewey, called “the father of experiential learning” (Robert, 2006, p. 19), argued for education to be situated in the context that knowledge will later be utilized (Garrison, 1994). This idea has been modified by Kolb (1984), who writes “experiential learning will include cycles of concrete experience, reflective observation, abstract conceptualization and active experimentation” (p. 40). For Schunk (2012), it is not helpful to know theory without experience, as “theory without experience can be misguided because it may underestimate the effects of situational factors” (p. 20). Experiential education has been noted to be one of the most important learning theories in agricultural education, and is typically understood as hands-on learning, or learning by doing (Roberts, 2006).

However, a closer look at Dewey’s original philosophy reveals that what agricultural educators typically understand to be experiential education theory, attributed to John, does not bear much resemblance to John Dewey’s original philosophy Dewey (see Roberts, 2006). Dewey (1938) writes that “in actual experience, there is never any such isolated singular object or event; an object or event is always a special part, phase, or aspect, of an enviroing experienced world – a situation” (p. 37). To contrast, models that have been developed by Kolb (1984), and Joplin (1981) both still have a cognitive educational theorist approach, where the individual is the unit of analysis, and the experience is seen only as a stimulus, an input to the thinking, reflecting mind of an individual, in the form of new information to process. Kolb, Boyatzis, and Mainemelis,(2001) summarize their model of experiential learning as: “immediate or concrete experiences are the basis for observations and reflections. These reflections are assimilated and distilled into abstract concepts from which new implications for action can be drawn” (p. 3). By

this summation, the idea of ‘learning by doing’ bears weight in these models, but absent is the attention to the how complex interplay with contexts and situations creates learning. Lave (1991) would call this a “cognition plus” (p. 66) approach, a common misconception of experiential learning in context. Cobb and Bowers (1999) would surmise that this is just one of many common cognitivist mishandlings of learning in context. For Cobb and Bowers, the key difference is in using the individual as the unit of analysis. Dewey likely would have also complicated Kolb’s, et al. (2001), and Joplin’s (1981), individual-centric models of experiential learning. In essence, the power of experiential learning, as originally conceptualized by Dewey, is that knowledge is constructed in relationship with context, rather than learning occurring in a thinking mind as a response to external stimulus.

Excepting the few aforementioned cognitive-plus approaches, literature on experiential learning is surprisingly devoid of helpful deconstructions of the theory, although literature is replete with mention to the prevalence and importance of experiential learning in agricultural education (Franz, et al, 2010; Kilpatrick, et al, 1999; Knobloch, 2003; Kolb, 1984; Kolb, et al, 2001; Leis, et al, 2006; Ratasky, 2012; Robert, 2006; Trexler & Parr, 2001). Roberts (2006) notes that while much literature in agricultural education is focused on the *practice* of experiential education in agricultural education, not much attention has been paid to experiential education *theory*. Roberts reports that for youth in primary and secondary school, agricultural education typically provides experiential learning through activities such as farm visits, maintenance and upkeep of greenhouses and gardens, and supervised agricultural/occupational experiences. For farmers, educational experiences, provided to them by extension agents and other agricultural service providers, often apply this theory in farm visits, field days, demonstrations, and on-farm tests (Franz, et al, 2010). Experiential learning theory, though

seemingly used as a catch-all buzzword for any situated learning practice that involves one or more hands-on activities, must be carefully deconstructed and re-examined for its theoretical usefulness to agricultural education.

According to Dewey (1986), reformist educators tend to create a dichotomy between old and new education systems, and, as a result, they have relied heavily on the 'banner' of experiential learning. Dewey noted that educators desired a departure from traditional education systems, as an alternative to the 'old' way of doing things, without questioning the effectiveness of experiential education as a methodology. However, experiential education is often improvisational, and therefore dependent on specifics of implementation. Dewey (1986) calls for more structure, for "materials of experience" (p. 245) to be better utilized towards real education. Experiential education, he contends, if structure-less, could therefore be counterproductive to real education in certain situations, by reducing critical thinking and cognitive structuring/framing of material. Schunk (2012) agrees, adding that "experience without a guiding framework means that each situation is treated as unique" (p. 20), so no theory will develop. Dewey would recommend a revisiting of the theory commonly understood to be experiential education. That experiential education theory is so prevalent and often named in the field of agricultural education, yet curiously unexamined, deserves explanation.

One exception is Knobloch (2003), who compares/contrasts experiential learning with authentic learning. Effectiveness of experiential learning in providing true learning is compared/contrasted with principles of *authentic learning*, in which knowledge construction is based on true-to-life experiences and students then "engage in cognitive work that involves disciplined inquiry consisting of the use of a prior knowledge base, striving for in-depth understanding rather than superficial awareness" (Knobloch, 2003), which includes structured



reflection, articulation, coaching, and collaboration activities (Herrington & Oliver, 2000). Even though experiential education theory has been identified as the most important education theory in agricultural education, how do learners typically do “cognitive work” to structure their learning? This opens the conversation for a revisiting of the constructs of experiential learning theory, as its effectiveness used alone is not often analyzed. Dewey would have agreed with constant and constructive re-evaluation of the theory (Dewey, 1986).

For Dewey (1938), there were two fundamental constructs of experiential education: interaction and continuity. Dewey’s interaction construct simply tells us that the learner is fully immersed within the articles of knowledge, in the same context in which the articles of knowledge would be naturally applied, and able to affect and be affected by the context. On the farm, an apprentice is fully immersed, working within the context of the farm, and interacting fully with the farm. Dewey’s continuity construct tells us that the learner should have the ability to connect the articles of knowledge with those that s/he already has knowledge of, in order to be fully immersed and learning within that context, and for the learning to be fruitful. Since the experience within an on-farm apprenticeship is likely to be on the same farm each day and uses many of the same physical realities that the apprentice will already have experienced (e.g., the same hoe used repeatedly, the feel of wet soil, the delicate shell of an egg), the continuity principle is constantly enacted within an apprenticeship. Thus, on-farm apprenticeships apply principles of experiential education, as outlined originally by Dewey.

While agricultural education literature often cites Dewey’s experiential learning to explain its educational philosophy, it often does not go the next step of describing learning experiences within constructs of the theory. This leaves agricultural educators without a useful language through which to operationalize, explain, plan, or evaluate learning experiences. At the

same time, other educational theories have been developed that employ other useful constructs and languages, related to experiential learning, such as situated learning. In light of this, I will next consider the literature on situated learning.

### **Situated Learning**

Despite similarities in application, and theoretical overlap, of both theories, the discourse of experiential education has been somewhat removed from those who theorize about situated learning. Schunk (1991) conceptualizes situated learning as a form of experiential learning, while Greeno and the MMAP Group (1997) argue that situated learning as a theory is inclusive of cognitivist and behaviorist approaches. Suffice it to say that situated learning can be another way to view what might more often be called experiential learning.

Situated learning is a broad term that relates to social learning, sociocultural learning, activity theory, and cultural-historical activity theory, and social cognition. Situated learning is the concept that learning happens within a relationship between a mind and a particular context, in an exchange with the situation or environment (Schunk, 2012). Situated cognition tells us that a person's cognition adapts based on aspects of context (Smith & Semin, 2007). The idea of situated learning involves many different interpretations and applications, which can be helpful in analyzing learning experiences such as on-farm apprenticeships.

Situated learning is also often used to describe nonformal learning experiences. Lave (1982), however, in her early work with Liberian tailor apprentices, has challenged the strict definitions of nonformal and formal learning, arguing that these definitions relate to schooling, and school should not be seen as normative. In other words, school-based learning experiences should not be considered the norm against which other experiences are contrasted. She notes that learning experiences that are often labeled nonformal, such as on-the-job training or summer

camp, can also have very prescribed roles and/or formalities associated with those experiences. Her viewpoint challenges the dichotomous nature of theory of learning styles and prepares us to examine situated learning as neither formal nor nonformal.

In her seminal work, *Cognition in Practice*, Jean Lave (1988) demonstrates the often unremarked pervasiveness of the functionalist perspective of education, with the general assumption being that removing a piece of knowledge from its conditions of use makes it more widely transferrable to other contexts. Schunk (2012) describes this as the cognitive psychologist's assumption that "thinking resides in the mind rather than in interaction with persons and situations" (p. 230). In de-contextualized learning, the assumption is that the unadulterated theory is learned more basically because the mind is not distracted from other cues within the environment (Greeno and MMAP Group, 1997). Lave argues against this assumption, and for educational endeavors to recognize that learning necessarily occurs situated in context. School-based learning experiences happen within a school context, and the mind handles the information accordingly (by associating knowledge about the world with books and school). Knowledge learned within the context where the knowledge will be appropriately applied, she argues, is more easily integrated into use by learners, because many levels and types of associations are being built simultaneously during the learning experience. She writes "knowledge-in-practice, constituted in the settings of practice, is the locus of the most powerful knowledgeability of people in the lived-in world" (p. 14).

Lave's (1988) ideas of practice in a community inform us that experience is a complex, reciprocal relationship with everyday, routine activity, wherein learning transpires. She writes:

There may well be no polar category – a way of thinking or type of activity – to contrast with "everyday activity." This approach to the study of practice does not divide the construction of routine activity from the manufacture of change. Processes of reproduction, transformation, *and* change are implicated in the reproduction *or*

transformation or change of activity in all settings and on all occasions. This implies that it is not at the level of cognitive processes that the unique, the nonroutine, the crisis, the exception, the creative novelty, the scientific discovery, major contributions to knowledge, ideal modes of thought, the expert and the powerful, are brought into being and given significance and experienced as such. These are all matters of constitutive order – in practice. If everyday practices are powerful it is because they are ubiquitous. If ubiquitous, they are synomorphically organized and sites of the direct, persistent and deep experience of whole-persons acting. These seem to be crucial conditions for efficacious human activity” (p. 190).

Rogoff (1990) adds to our conceptualization of learning in context, pointing out that individuals are in a constant process of exchange with the world and others in which they “blend ‘internal’ and ‘external,’” (p. 195). For Rogoff, this is the essence of human communication and involvement in life, neither taking nor giving, but *participating*.

De-contextualized learning makes it harder for the learner to truly wield the knowledge as a dynamic tool with which to solve real-world problems (Herrington & Oliver, 2000). This creates situations such as that noted by one university professor who reported incompetencies among graduating architectural students, due to their inexperience with using simple hammers and nails (Louv, 2005). These students were unable to grasp properties of materials, even in an abstract way, because they had never undergone situated learning with the materials. As reports from the labor literature remind us, there is consensus among vocational education theorists that skills are meaningless unless executed in context, that “decontextualized knowledge is not functional” (Hamilton, 1999, p. 15).

### ***Communities of Practice Construct***

A helpful construct within situated learning, put forth by Lave and Wenger (1991), is that of communities of practice (CoPs). Lave and Wenger contend that learning occurs while situated within CoPs. A CoP is a group that shares a common practice, and socially interacts around this practice. Examples of CoPs are hobby clubs, trade organizations, workplaces, social cliques, etc.

According to the CoP construct, a newcomer is given legitimate peripheral participation, access to be present as a member of the community – in essence, to be someone who belongs to the CoP.

Being granted legitimate peripheral participation, the learner is given some leniency to make mistakes, to do things less efficiently or with less skill than the experts. Participation by newcomers also must be peripheral, meaning that the learner is granted access to experience from the periphery the knowledge and skill of the experts. The experts are the masters of the body of knowledge/skills, the oldtimers, those who are lynchpins of the community, looked to by others as more knowledgeable about the particular common practice, skill, or task that brings them together. Within this construct, through legitimate peripheral participation, a novice newcomer, through negotiating her/his mutual engagement in a joint enterprise with other CoP members, gradually moves toward forming her/his identity of being an expert in the skill or area of knowledge of interest. This identity formation happens through continual negotiation of identity and meaning in an exchange with the context. Identity formation is a way of making meaning around a particular thing, fully knowing, and fully becoming. Participation will be a dynamic negotiation, balanced with reification, or the creation of structured tools and artifacts, rules, traditions, institutions, etc., in a CoP. Objects and artifacts are sometimes used to solidify identity or to create boundaries within that community of practice, are created through participation, and can be reified as well. If the object or artifact is associated with a boundary, then it is known as a boundary artifact, or boundary object, which a participant, newcomer or oldtimer or in between, utilizes to establish where the edges of a given community of practice reside (Lave & Wenger, 1991).

One can envision the new store clerk, outside her comfort zone as she is being trained on her first day on the job. She is a legitimate (hired) participant, but still peripheral, and must be instructed (by the 'expert' store clerks) on how to do the job. Learning the job involves negotiation of her new self-image (identity) as a competent store clerk, in relation to, and in negotiation with, others. She experiences the nuanced daily facets of the work, performs the work in the presence of more knowledgeable others, and learns how she can perform her job duties in a way that is comfortable and appropriate for her unique personality (identity negotiation). After six months on the job, she is confident and self-assured in her identity as store clerk, having learned all she needs to perform the job, performing satisfactorily, and becoming a respected member of the store team, now training the new recruits.

The power of the CoP construct is that it highlights the importance of building knowledge socially with others, and being changed through full ownership of that knowledge through the learner's own identity shift, however great or subtle. Lave (1991) also points out that in the dominant forms of learning in schools and workplaces, we segmentize learning, which removes the situatedness of learning opportunities, such that becoming an expert is more challenging. Dominant formal learning structures, she argues, downplay and disrupt the natural and ingrained meaning making that occurs through humans coming together for a joint purpose, socially interacting. She points out that "without participation with others, there may be no basis for lived identity" (p. 74).

### ***Vygotsky's Thought and Language***

Vygotsky's theories of education fall within the framework of sociocultural constructivist learning, and many of his ideas run parallel to situated learning. Vygotsky tells us that language, both expressed and our inner, mental speech, is a critical part of articulating ideas into thought

(Schunk, 2012). Vygotsky (1986) defined inner speech as “a phenomenon of verbal thought, or meaningful speech – a union of word and thought” (p. 212). Vygotsky contended that:

“the relation of thought to word is not a thing but a process, a continual movement back and forth from thought to word and from word to thought. In that process, the relation of thought to word undergoes changes that themselves may be regarded as development in the functional sense. Thought is not merely expressed in words; it comes into existence through them” (Vygotsky, 1986, p. 218).

Vygotsky’s philosophy tells us that expressing thoughts as inner speech is a crucial part of the learning process, which may be facilitated by speech with others, as in a master-apprenticeship relationship.

Vygotsky’s philosophy of the zone of proximal development (ZPD) dictates that learning happens within social interaction between a novice and master, where the master is placing some level of emphasis on teaching the novice, as guided participation (Schunk, 2012). Vygotsky’s Marxist approach to learning shows attention to collective forms of interaction, including apprenticeship learning. Schunk’s (2012) explanation of how apprenticeship learning relates to Vygotsky’s philosophy is worth quoting in full:

“In apprenticeships, novices work with experts in joint-related work activities. Apprenticeships fit well with the ZPD because they occur in cultural institutions (e.g., schools, agencies), and thus help to transform learners’ cognitive development. On the job, apprentices operate within a ZPD because they often work on tasks beyond their capabilities. By working with experts, novices develop a shared understanding of important processes and integrate this with their current understandings. Apprenticeships represent a type of dialectical constructivism that depends heavily on social interactions” (Schunk, 2012, p. 247).

Rogoff (1990) advances this idea to point out that words are used in guided participation to bridge between the expert and novice in apprenticeship learning. She also noted the importance of intersubjectivity, which is the human ability for “shared understanding based on a common focus of attention and some shared presuppositions that form the ground for communication” (p. 71). So, the process of apprenticeship learning is inherently dependent on

social interactions in order to move the apprentice through many ZPDs in the process of becoming a master themselves. It is this passage into the ZPD, undertaken together between apprentice and master, as the master guides the novice, that helps to inform inner speech of the novice. The master, through the bridging of speech, helps to give words to the inner speech of the novice. The novice, as time passes and they build their own inner speech around the subject matter, uses their own words of inner speech (which, as Vygotsky informs us, is wholly changed, and bears little likeness to outer speech) to navigate and socially recreate new information. Thus, our inner speech, and hence all thought, is mediated by words, and our thought is affected by, and affects, our context. Inner speech is a mode of constructing knowledge about our world, while being simultaneously constructed by the world. Vygotsky's ideas on inner speech therefore explain the means for meaning – how our knowledge both mirrors and affects our context.

In Vygotsky's work, the teacher's role is one of assisting the learner to develop their own inner speech on a topic, as a kind of assisted development. This bears resemblance to apprenticeship learning, where the expert is intentionally assisting the novice learner. Vygotsky is a chief influence on Rogoff's (1990) work, where she argues for words as "cultural systems for bridging" (p. 70), and that this is an important part of guided participation in apprenticeship learning. Vygotsky showed us that verbal, outer speech is a great mediator of social interaction, which is a symbolic representation of humans' nonverbal, inner thought life, which Vygotsky called inner speech. For Vygotsky, fully knowing a subject matter was to develop one's own inner speech about it, which, as the learner becomes more adept with the subject matter, bears less resemblance to outer speech over time.

Vygotsky's notion has been recently demonstrated in Hobson's (2008) work with autistic children. Hobson holds that interpersonal relations may lead to revelations which ultimately



allow individuals to form abstract, symbolic thought, as our understanding of the actions and motivations of others drives our theorizing about the world, creativity, and imagination. Thus, for Hobson, understanding the minds of others is a first step towards being able to transfer knowledge. Vygotsky postulated that language is a vital component of the apprenticeship model, as words are used to explain knowledge to others and to one's self while on the job (Daniels, 2012), and is therefore a likely factor in apprenticeship learning.

Vygotsky also addresses a vital part of apprenticeship learning in his oft-cited theory of the Zone of Proximal Development (ZPD) (Schunk, 2012). When a learner has an expert teacher who intentionally aids their learning process, as in an apprenticeship relationship, the teacher can guide them through the ZPD. The teacher makes certain that the zone, or gap between the 'known' and the 'unknown' is only 'proximal' – only a small leap to get to the other side – so can be easily bridged by the learner. This process is often called assisted development, as the teacher assists the learner to develop new knowledge through social exchange. This theory is, needless to say, relevant in an apprenticeship situation, since both learner and teacher interact closely to ensure that the apprentice can perform tasks of mutual importance.

### ***Apprenticeship Learning***

Apprenticeship learning is a type of hands-on, sociocultural learning, in which learners participate in situated learning. An apprentice is an indentured novice learner who works alongside, pitches in, observes and interacts with a master, and thus knowledge transfers from expert to novice to ultimately lead the novice to mastery in a given set of skills and knowledge (Paradise & Rogoff, 2009). The apprenticeship model has also been used in settings where one can envisage the typical craft apprenticeship idea being applied to crafts of the mind, or rather, that the tools can be conceptualized as knowledge (Brown, Collins & Duguid, 1989). This has

been called cognitive apprenticeship, as it attempts to utilize the benefits of learning in a situated master-apprentice relationship. Schunk (2012) calls the literature in apprenticeship learning “promising” (p. 247), and points out that more academic research must be done on apprenticeship learning. Educators, meanwhile, have called for post-secondary education to incorporate “bridging apprenticeships” (Resnick, 1987, p.17) into many different instructional programs to mediate experience with abstract concepts for greater learner success.

Situated learning, with its subset of constructs including communities of practice, Vygotsky’s inner speech and ZPD, and a body of research and theory on apprenticeship learning, offers a richly descriptive framework from which to view on-farm apprenticeship learning. Experiential learning theory, while frequently cited as the most important theory to agricultural educators (Roberts, 2006), may not be as varied in application, nuanced in meaning, to be as helpful to informing agricultural education programs as is situated learning.

### **Situated Learning in Agriculture**

In this section, I review scholarly literature that examines how situated learning has been applied in an agricultural setting. In essence, it appears that some researchers have examined community conflict resolution within a situated learning framework. Two studies highlight the importance of learning in context.

One study of Dutch farmers and agricultural research scientists highlighted the importance of learning in context during times of conflict (Eshuis & Stuvier, 2003). In this case study, farmers disagreed with scientists on the proper way to apply manure, but what was finally discovered was that the quality of the manure, well-known by look, feel, etc., to farmers, was not consistent with what was used by the scientists. Because farmers had a situated and contextual understanding of the manure, and researchers did not, they were able to identify flaws in the

study. In essence, these farmers were demonstrating their CoP's situated knowledge was a powerful tool with which to inform inquiry.

Nettle, et al (2006) conducted a study of learning interventions to improve relations and settle disputes among farmer-employee groups. She finds that that working with the entire activity system of farmers and workers present on the farm was more conducive to changing norms, beliefs, attitudes. Here, because the learning was applied not to the individual, but to the entire CoP, they were able to change practice more efficiently and effectively. This study suggests that situated learning, and CoP-based learning, is important in a farm community context.

### **On-Farm Apprenticeship Learning**

Several studies also discuss situated learning specifically in the form of on-farm apprenticeship learning. Pilgeram (2011) suggests that many sustainable farmers may depend on low-paid apprentices or interns to staff the farms, due to the slimmer profit margins of operating budgets typical of these farms. He also notes that younger farmers on sustainability-oriented farms tended to have completed on-farm apprenticeships, although he admits the limitation of small sample size, as this was a qualitative study.

The Growing Growers on-farm apprenticeship program in Kansas City operates in affiliation with Collaborative Regional Alliance for Farmer Training (CRAFT) with technical assistance from the Extension service, so is only loosely tied to academia (Carey, et al, 2006). The program reportedly placed apprentices on sustainability-oriented host farms. They reported a high level of satisfaction from apprentices and farmers, and found that the benefit that farmers most often reported was the increased productivity resulting from unpaid extra laborers on the farm. As will be discussed elsewhere, this free or cheap labor, and the potential boost to small

farms, may be a significant impact of agricultural apprenticeships on agriculture. Most notable about the Growing Growers program is that 11 out of 12 of their apprentices were still engaged in the alternative food system, a year after they completed the program. They do not report, however, how many of the program's graduates were actually doing farming.

Barnett (2012) evaluates how on-farm apprentices can be viewed as actors in the alternative food system through actor network theory. He describes how available literature does not explain how the indenture and low pay experienced by apprentices would help them to overcome a significant barrier to farming – land access. According to Barnett, “apprenticeships present variable spaces that fail to produce neat, proscribed outcomes for participants. They exist at an intersection of undervalued labor, affordable education, technical training, and ethical/political ideals that require personal interpolation on the part of each apprentice and farmer” (p. 9). Barnett's results suggest that apprenticeships, while often seen as a mutually beneficial arrangement whereby a farm gets free/cheap labor and the apprentice gets an education, may be engaged in a more exploitative relationship than is commonly assumed.

Additionally, Hetherington (2005), in his anthropological study of sustainability-oriented farms in Canada, finds that many of these farmers often host apprentices. He notes that sustainability-oriented farmers in his study have difficulty integrating into their farming community due to different backgrounds, especially if they did not grow up on a farm or live in the farming community as a youth. Farmers in his study who were sustainability-oriented were perceived as somewhat of an “outsider,” by the farming community in which they were located. While an apprenticeship may be valuable to ease newcomers into a farming community, the farms that host apprentices are less likely to be socially positioned to integrate them into that community. Hetherington's findings agree with others (Barnett, 2012; Endres & Armstrong,

2013; Hamilton, 2011; Maxey, 2006; Pilgeram, 2011) to suggest that apprenticeships commonly take place on sustainable farms, which are in a different CoP than the larger farming community. Implications of this are presented in the Discussion section of this thesis.

Niewolny and Lillard (2010) report the emergence of on-farm apprenticeship programs in the United States. They report that on-farm apprenticeship programs have emerged from a base of advocacy, out of a desire to create greater socially just, physically ecologically sustainable, and community development-oriented food systems. They explain these apprenticeship programs are emerging independently from agricultural extension, and they focus on experiential learning with limited formal educational experiences. Overall, Niewolny and Lillard explain how on-farm apprenticeship programs, through agricultural nonprofits, independent farms, and a combination of both, are an emerging phenomenon.

### **Apprenticeship Learning on Student Farms at Colleges and Universities**

Situated learning in agricultural education is also on the rise on student farms to teach college and university students agriculture. A body of literature has been emerging on these student farms in a college and university setting (Keating, Bhavsar, Strobel, Grabau, Mullen & Williams, 2010; Leis, Whittington, Bennet & Kleinhenz, 2011; Ratasky, 2012; Wright, 2009). Surveys of managers of these student farms has yielded very promising results, reporting that experiential learning theory was applied, programs were well-liked by students, and programming seemed to be more effective than non-experiential approaches in teaching the intended subject matter (Leis, Whittington, Bennet & Kleinhenz, 2011; Ratasky, 2012).

Colleges and universities have used apprenticeship models to build experiential education back into the land-grant strategy for future farmer training. Research of university on-farm apprenticeships shows that the programs lead to horizontal knowledge co-construction, a

characteristic of the experiential learning approach, and suggests that these programs are more effective than coursework/workshop-type training programs in equipping new sustainable farmers with knowledge, skills and resources to be successful in future farming enterprises (Parr & Trexler, 2011). Apprenticeships have been utilized in these programs as an effective strategy for employing experiential learning theory in agricultural education in a university setting (Parr & Van Horn, 2006; Biernbaum, Thorp & Ngouajio, 2006; Shroeder, Creamer, Linker, Mueller & Rzewnicki, 2006). One review surveyed 50 farm managers at student farms at colleges and universities, most of which employed an apprenticeship type program, reported experiential learning theory to be the most important theoretical underpinning to their program (Leis, et al., 2011).

While these studies show the success and prevalence of student farms at colleges and universities, these studies are limited by the fact that they take place within institutions of higher education. A thorough examination of on-farm apprenticeships outside academia would be very helpful in determining if these educational successes transmute to the larger world of agriculture. Apprenticeship programs in a higher education setting, in essence, can be considered a pilot for the apprenticeship programming that could take place on farms all over the United States, since many who would aspire to farming may not have the time, funds, or inclination to devote to a four-year education. Success in these programs is therefore promising, but does this apply outside of academia?

### **Apprenticeship Learning: Promise and Challenges**

Apprenticeship learning, as a form of situated learning, allows development of a contextualized, nuanced, expert skill over time (Wolek & Klingler, 1998). If apprentices, as part of a community of practice, work towards being more of an oldtimer at farming through their

apprenticeship, then identity creation may well be an important part of the learning in on-farm apprenticeships (Wenger, 1998). However, there are some reports that show that situated learning, as a strategy to be potentially employed by educators, does not necessarily always produce the desired results.

For example, Eshuis & Stuvier (2003) report that contextual learning requires recognition of the heterogeneity in the landscapes of the learners – a community of practice cannot be assumed to be homogenous or harmonious. In their case study, they showed that conflict within a situated learning context effectively prevents learning from the other party. In their study of Dutch farmers, in a conflict over proper manure application, groups became only more deeply entrenched in their own camps, preventing the two groups from learning from each other. Groups became "cognitively closed" (p. 139), and discussions became a "dialogue of the deaf" (p. 139). In this case, the community of practice may have blocked advancement in knowledge, rather than promoting creative learning and thinking.

This finding resounds in a study of New Zealand farmers' apprentices in the state-run modern apprenticeship program. The study showed that social interaction with the oldtimers in their community of practice effectively blocked apprentices' obtaining literacy skills (Sligo, et al, 2010). In this case, although the state provided literacy tutors, and plenty of evidence shows that literacy is an important skill for farm management, the dominant attitude in the community of practice is that apprentices want to be practical people, not scholars. Farm apprentices therefore were shown to be resisting their free literacy tutoring. So, movement from novice to expert blocked obtaining better literacy skills, as novices build their identity as oldtimers. Here, resistance to change is displayed in the communities of practice, which can block new forms of learning (Lave and Wenger, 1998). If new information or skills are not valued in a community of

practice's shared repertoire, they may be disallowed, downplayed, or effectively debunked. Resistant to change can be both a strength and a weakness. This would suggest that communities of practice may not always contribute to optimal development of the learner and could effectively block important information or skills, and the presence of an intact community of practice does not always mean that learners are able to progress as overall learners. What it does mean is, by progressing from newcomer to oldtimer in a given community of practice, the learner becomes an 'expert' in those skills and knowledge that are valued and central, according to the rules of that community of practice.

Similarly, the presence of an apprenticeship program also does not guarantee that productive learning will occur in an apprentice's transition from novice to expert. Lave (1991) discusses the case of butchers' apprentices in a state-run apprentice training program (she does not state where). The apprentices, because they were assigned mainly to the job of packaging, were kept in a separate room, and they could not observe the expert butcher in the act of meat-cutting in the next room. So, while afforded a role as a legitimate participant, they were not given their place as peripheral participants. In other words, they were not given access to observe from a distance skills that they would later want or need to replicate. Because of this logistical issue, Lave conjectures that learning did not occur in the way apprenticeship learning is normally conceptualized.

Also, another large study of apprentices across different manufacturing firms in Ghana reports that the apprenticeships benefitted the host firm far more than the apprentice, because the firms trained the apprentices to do tasks that were very specific to the particular firm's needs, rather than teaching them how to be a full master in producing the firm's products (Frazer, 2006). The study reported that 77% of apprentices state that they would like to be self-employed



after completion of their apprenticeship, but the apprenticeship did not prepare them for this. Similarly, a large study of German horticultural apprentices concluded that apprentices want to have greater responsibility and participation in decision-making, and more training opportunities (Bitsch, 1996), which suggests these apprentices may be not be getting the sort of situated learning experience that the educational theorists' apprenticeship models typically set forth.

One study (Hendricks, 2001) applied principles of creating cognitive apprenticeship set forth in Brown, Collins, and Duguid (1989). These principles of cognitive apprenticeship involve a teacher guiding students in critical thinking and decision-making, as an expert teaches an apprentice. These experiences are performed through include modeling, coaching, scaffolding, and fading, during lessons, in a classroom setting. Hendricks (2001) reports that these tactics for applying the principles of cognitive apprenticeship in a school setting proved to be ineffective in increasing overall learning, which calls into question the usefulness of these tactics. Of course, the cognitive apprenticeship model may not be the equivalent of the model of apprenticeship learning defined and used in this thesis. It is interesting to note, however, that not all models of apprenticeship have been shown to be effective in all settings. This highlights the importance of properly applying the model of an apprenticeship.

So, suffice it to say that situated and apprenticeship learning may not always produce the intended outcomes, lest this section present an overwhelmingly favorable view of situated learning and apprenticeships. Dewey himself cautioned that "all learning is experiential, but all experiences are not educational" (Roberts, 2006, p. 17). In short, the existence of a situated learning experience does not always mean that learning will occur in a way that one might think of as positive, but it will always happen, and it will happen in context.

## **Situated Learning and Power Imbalances**

*Individuals transform culture as they appropriate its practices, carrying them forward to the next generation in altered form to fit the needs of their particular generation and circumstances. The shifts in societal practices over decades and centuries result from the transformation of institutions and technologies to fit current needs. (Rogoff, 1990, p. 198).*

If agricultural issues are reciprocal and related to how agricultural education is done, it has been influential in training agricultural practitioners that have subsequently shaped modern agriculture. This is the cyclical process of culture, and agricultural education is practiced as a part of our broader culture. So, the institutions we create, as Rogoff says, to fit to the circumstances of today, shapes the future. For Rogoff, this carries forward even after circumstances change. Power imbalances are therefore carried forward that may be vestiges of the past.

Niewolny and Wilson (2007), through discourse analysis, have shown that neoliberal commercialism in agricultural adult education is a pervasive and dominant discourse that “too often privileges the global elite at the expense of the farmer/learner” (p. 5). For Niewolny and Wilson (2009), much of the scholarship on social learning and cultural historical activity theory has historically ignored issues of power, in part due to its uncritical view of “context defined as container” (p. 33). The lack of considerations of power imbalances is found, for example, in models of experiential learning in agricultural education, which envisions the environment reduced to a stimulus for cognitive processes (see Roberts, 2006). Also, as Niewolny and Wilson (2009) point out, in the community of practice construct, the newcomer is dependent on the expert for the knowledge and skills they need to form an identity as an expert. However, there may be questions of social or political positions of the newcomer that may or may not ensure that they are legitimated, respected, given access to the activity that would result in mastery, or even

have access to the CoP in the first place. Niewolny and Wilson argue that this issue of power is ignored by most, but Jean Lave originally envisaged situated learning as “embedded and reproductive of sociopolitical conditions” (p. 36). They point out that by using activity theory, using activity systems as the unit of analysis (rather than the individual learner), there may be a framework for allowing issues of positioning and power to be evaluated as part of community of practice theory and situated learning overall.

Agricultural education often uses Kolb’s approach to experiential learning theory (Roberts, 2006) within formalized school-based programs through land grant institutions (such as FFA, 4-H, and land grant university degree programs). Lave (1991) tells us that in classroom learning, knowledge is commoditized into static and discrete units, divorced from the context in which it is found in life. Freire (2000) writes similarly, describing the typical “banking” (p. 93) form of education, in which students are considered as empty vessels (bank accounts) to be filled (gifted with money), and the knowledge is presented as dead, unquestionable, unchanging. Freire’s conceptualization agrees with Lave’s (1991), who argues that “to commoditize labor, knowledge and communication in communities of practice, is to diminish possibilities for sustained development of identities of mastery” (p. 65). In this vein, classroom experiences do not allow beginning farmers to develop identities of mastery within school-like (“formal”) learning experiences. According to Lave and Freire, more emphasis on situated learning would allow a more co-creative, dynamic, imaginative learning to occur, in which the learner emerges better able to make complex decisions, think critically, and innovate more deeply around the subject matter. Agricultural education, if based in a pedagogy of situated learning, would transform into a field that presents the world of agriculture as a reciprocating and dynamic,

ongoing, ever-changing body, where borders are fuzzy and possibilities are many (Dewey, 1938; Lave, 1991; Freire, 2000).

This line of questioning seems particularly relevant in agriculture, as there are clearly many issues of power imbalances between an “expert” in a land grant institution and farmers, who are considered recipients of expert knowledge. This is considering that Extension operates with an express mission to diffuse innovations (Rasmussen, 1989), with the implied sentiment being that farmers are non-experts that must learn the innovation. And, when that mission is successful, the agricultural landscape is changed to have the new innovation within it. This places a great deal of unexamined power within the hands of the land grant system. The land grant system should always therefore strive to examine its power relations and seek to balance power.

While the importance of spreading information cannot be overlooked, pedagogies can be powerful ways to empower learners, as well. In doing so, the learner would not simply be told recipes and prescriptions for the ‘correct way’ to do farming, but through the nuances of situated learning, would learn the processes bases and for making smart farming decisions based on sound context-based knowledge. In essence, through situated learning, beginning farmers would better develop identities as empowered farmers, able to do farming in many suitable ways that they are able to envision.

Along these lines, and considering schooling in general, some educational theorists have called for a “culturally sustaining pedagogy,” in which diverse cultural norms can be upheld, rather than eliminated, through education, since the dominant pedagogy is one which is explicitly and expressly monocultural and monolingual (Paris, 2012). Paris and Gutierrez (2002) argue that education must go beyond the retrofitting of culturally appropriate strategies onto a dominant

pedagogy that seeks to make learners and knowledge uniform. The use of entire activity systems as units of analysis has also been put forth as a way to reduce categorical and misleading approaches to cultural appropriateness in education, which starts to examine broader, deeper ways in which people learn by situating learning in context (Gutierrez, 2002). Lee (2010), in her annual presidential address to the American Educational Research Association, called for ways in which educational institutions can become more situated within the larger communities.

## **Conclusion**

Farming is a set of complex interwoven skills, much more than a memorization of tasks or knowledge from a book. To be a successful farmer, one not only needs mastery of the biological factors of a farm, but to simultaneously demonstrate financial skills, ability to complete complex paperwork, managerial skills, social skills, etc. Skills such as these require complex, interconnected processing that cannot necessarily be broken down into their constituent parts for formal lessons. Because complex, multi-layered skills cannot be divorced from the context in which they must be performed, learning these skills must take place *in situ*, as situated learning (Lave & Wenger, 1991).

Situated learning includes the communities of practice construct, identity formation, Vygotsky's inner speech, intersubjectivity, and ZPD. Situated learning theory may offer a richly descriptive way with which to view activity that is often referred to as experiential learning. Studies of student farms at colleges and universities reveal that situated learning occurs in apprenticeship learning, and these and other studies suggest they are likely effective ways to learn farming. Apprenticeship learning could also be conducted in less than effective ways, as well. Relatedly, a deeper look at how dominant pedagogy affects the structures, customs, and

institutions of life is warranted in agricultural education. Overall, by better understanding on-farm apprenticeship learning, we understand a likely effective way to train beginning farmers.

## CHAPTER 3: METHODOLOGY

### Introduction

This mixed methods study explores the lived experiences of individuals involved in on-farm apprenticeship learning, while elucidating the general common practices and structures of on-farm apprenticeships, with the goal of providing a depiction of on-farm apprenticeship learning in Virginia. The unit of analysis is the learning that occurs in on-farm apprenticeships. The geographical scope of this study is the state of Virginia, which I selected due to logistical concerns over the realistic time and resources needed for this study. As I discussed in Chapter One, greater understanding of the phenomenon of on-farm apprenticeship learning may lead to better practice, enhanced theoretical base, and ultimately policy considerations. Because these areas would benefit first from recognizing and explaining the phenomenon of on-farm apprentice learning, I elected to conduct a descriptive study, to add a timely critical next step to the general understanding of this form of learning.

The mixed methods approach allows more meaning to be generated from the quantitative and qualitative elements of the study for a more complete picture of the phenomenon. Mixed methods research is an approach that combines both qualitative and quantitative research elements to analyze phenomena. Creswell (2009) writes, “more than simply collecting and analyzing both kinds of data; it also involves the use of both approaches in tandem, so that the overall strength of a study in tandem is greater than either quantitative or qualitative research” (p. 4). So, using multiple methodological approaches allows the researcher to arrive at a whole that is greater than the sum of its parts. Qualitative interviews add to the quantitative data by offering an in-depth look at the exact, on-the-ground situations and experiences of the phenomenon. The

quantitative survey adds an overarching structure to determine how best to infer meaning from the qualitative data and allow the results to be accurately situated in the larger world. Schoen (2011) recommends that sociocultural research incorporate multiple levels of activity systems, offering as levels the personal, interpersonal, and broad community (as cited in McNerney, Walker, & Liem, p. 20).

My unit of analysis for the qualitative element is the individual, while the quantitative unit of analysis is the farm community. By examining on-farm apprenticeships from the two different levels of the personal (interviews), and the broad community (survey), I move towards analyzing more of the activity system, to gain a more complete understanding. Taken together, both elements complement each other.

To restate for clarity, my research question, with accompanying sub-questions, is:

1. How do on-farm apprenticeships provide learning opportunities for beginning farmers in Virginia?
  - a. What kinds of on-farm apprenticeships are available and to whom?
  - b. What are the most important educational practices, structures, or institutions that support on-farm apprenticeship learning?
  - c. How do expert farmers participate as educators in these on-farm apprenticeships?
  - d. How do farm novices adopt expert identities through on-farm apprenticeships?

## **Ontology**

Ontology is, in essence, the nature of reality (Lincoln & Guba, 2013). Research projects, then, can be said to be guided by an ontological perspective, which is a fundamental orientation taken by the researcher(s) toward what can be known to be real. Through this philosophical



questioning, we make plain and spoken that which could otherwise go unspoken: the assumptions of the ways in which a human can really 'know' things about their surroundings.

This research has been guided by the ontology of historical realism, as it is named in Lincoln and Guba (2000). Lincoln and Guba (2000) write that historical realism embodies the idea that reality is a "virtual reality... shaped by social, political, cultural, economic, ethnic, and gender values crystallized over time" (in Denzin & Lincoln, p. 168). My orientation towards academic research is that reality cannot be defined absolutely, because I believe that one cannot prove to any satisfaction that there is an objective reality outside human consciousness. Truth is an abstraction, because aspects of one's surroundings can mean different things to different people at different times for varying reasons. Reality is built by humans throughout this negotiation of abstractions, when we give form and function to the impressions of our surrounds, whether we are aware of this construction or not. In this belief, I align with Lincoln and Guba (2013), when they state, "Sense-making is an act of construal. Humans do not merely experience events, they create them. Construal, not discovery, is the critical act of perception and construction" (p. 45).

Facts, therefore, are ever-changing, approximate, and ephemeral, depending on how they are viewed. As a human, I can make sense of the world only through negotiating my impressions within the perceived socio-historical context in which I dwell. As Lincoln and Guba (2013) have it, research, "being conducted by humans who can never escape their emotions and values, can never be authentically objective" (p.50). So, my ontological orientation throughout this research informs me that I cannot presuppose to be able to be objective, but only through reflectively stating my assumptions and values, and addressing them throughout the whole of the research process, can I arrive at a more accurate approximation of possible truths.

## **Epistemology**

Additionally, this research has been guided by transactional/subjectivist epistemology. For Lincoln and Guba (2000), transactional subjectivists are those that believe that truth is not discovered, but is only given meaning through foundation in history and social institutions, and its qualification of situatedness in the world (as most of us understand the world to be, in any case). The meanings (which commonly become institutionalized facts), be they negotiated with symbolic representations of the truth, are made real only within a particular place and time, for all practical purposes. Because I have assumed, for purposes of this study, that the ‘reality’ presented to me by the data is necessarily, unintentionally, and despite my best efforts otherwise, influenced by my social experiences, positioning, my historical understandings, my preconceived notions, and other underlying facets of being, this report must be understood only within this epistemology. Please see the reflexivity section for full transparency of my position as researcher, with understanding that as a subjective being, a condition I as a human can never escape (Lincoln & Guba, 2013), there may be unconscious impressions that influenced this study, unbeknownst to me. In other words, transactional/subjectivist epistemology is the ‘grain of salt’ with which this study should be taken. Thus, this study is best read through the lens of Lincoln and Guba’s version of transactional/subjectivist epistemology.

## **Worldview/Paradigm**

Schoen (2011) writes that “a paradigm is a world view which carries with it a specific set of beliefs, values, and traditions” (as cited in McInerney, Walker & Liem, p. 20). This definition suggests, that inquiry, like other aspects of life, is not value-free. Thus, the researcher must state her/his values and perspective in a transparent manner, to allow audiences to determine how best

to read and interpret results from the study (see reflexivity section). So, in this section, I detail the Deweyan pragmatic research paradigm, which I hold in relation to this study.

Dewey (1938) called for “the fundamental unity of the structure of inquiry in common sense and science [to] be recognized, their difference being one in the problems with which they are directly concerned, not in their respective logics” (p. 79). Thus, inquiry is not divorced from common sense. For Dewey, there are multiple methods to answer a question, but as long as one applies appropriate logic, it is a good method.

As Garrison (1994) reports, one of the central themes in John Dewey’s lifework is the idea that experience has both depth and breadth for understanding and interpreting life and nature. He writes, “Deweyan pragmatism would require us to recognize that construct validity, like the theoretical construct and the attributes to be measured, are themselves all socially constructed in one way or another” (p. 11). I embrace Dewey’s philosophy in this study, as I believe that quantitative data is just as much influenced by social constructions as qualitative data. They are equally useful and informative, as are other types of data. Dewey was a functionalist, believing that human experience must be viewed holistically, and not broken down into the sum of its parts (Schunk, 2012). Thus, I follow with Dewey in that I understand reality holistically, drawing meaning from many sources. No source of information is credited above another.

I acknowledge that there is no one right way to ‘do research,’ and that multiple perspectives can be taken on any subject, which is congruent with the pragmatist paradigm, according to Schoen (as cited in in McInerney, Walker, & Liem, 2011). According to Creswell (2009), pragmatists are “not committed to any one system of philosophy” (p. 10), and believe in a truth both external and internal of the mind, depending on “what works at the time” (p. 11).

Dewey (1938) believed that “different types of problems demand different modes of inquiry for their solution, not to any ultimate division in existential subject-matter” (p. 76). Lincoln and Guba (1986) likewise recommend triangulation through multiple methodologies as one way to increase credibility within naturalistic inquiries. My desire to draw conclusions from as many information sources as possible leads me to follow this research paradigm. So, I therefore utilize both qualitative and quantitative information to derive meaningful conclusions about on-farm apprenticeship learning. In this, I have therefore aligned with the Deweyan Pragmatist worldview through this study.

### **Reflexivity Statement**

Dewey also believed that communication and social interaction naturally turned events into meaningful experiences (Garrison, 1994). Thus, in my role as researcher, I realize that I have naturally created meaning around social interaction with many who influence my understanding of the data in this study. Lived experiences through my personal history, my beliefs surrounding the future of agriculture, and my attitudes toward academic research have all been factors that may bear upon my role as researcher.

For full transparency in my role as researcher, before beginning this research, I myself have had previous exposure to apprenticeship learning, completed a non-farm apprenticeship myself in 2004 at the Wilderness Outdoor Learning Foundation (WOLF) to learn how to teach outdoor education. Also, as a seasonal farm worker, I have worked alongside apprentices, have had on-farm apprentices as friends, and met many apprentices and coordinators/farmers of apprenticeships in my experiences within alternative agrifood movements (at conferences, at farmers markets, community gardening, etc.). I realize now that I had greater likelihood to have these experiences through my social position as a college-educated, white U.S. citizen. My past

experience was certainly a factor which informed my theoretical framework for this study, and clearly influenced my selection of the topic as an important issue in agriculture to study. I have viewed apprenticeships as learning forms that have merit, which I perceived experientially as a practitioner within agricultural systems, before this study. That said, I have also had a critical eye towards on-farm apprenticeships, and queried whether they would truly lead to success at farm start-up.

While I worked with alternative food movements before entering a graduate program, I noticed that very few of the youth (who were K-12) intended to pursue farming. As I worked with underserved populations for several years, I became slowly aware of my own privilege and situation within the food system and broader society, a process that continues today. At the same time, for reasons stated in the problem statement sections, I became aware and critical of the program's effectiveness in training future farmers. I thus developed a strong bias towards effective programs, and examining program effectiveness in training future farmers. This affects this study through my focus on this element of on-farm apprenticeships and critical eye towards these programs. This process also affects my critical nature towards alternative food movements, of which I count myself a member.

Having stated the above, I must reflect that my past experience with on-farm apprenticeships and the farmers/coordinators of these programs influenced the study in several ways. My past experience enabled me to more comprehensively understand what was said in the interviews. I feel that the survey and interview protocols, while guided by theory, were also partially informed by my prior knowledge of on-farm apprenticeships, especially informing cultural appropriateness. I also feel that my orientation towards alternative food movements

enabled me to see clearly when affiliation with and knowledge of these movements was expressed.

Use of good methodology (for example, quantitative statistical tests and qualitative coding) has helped me to check my assumptions and help me to see clearly. Effort was taken to consider each angle, reflect to see if the converse was true, or reflect to see if there were pieces missing. Through reflection in my role as researcher, I feel that the entire study becomes a nearer approximation of reality.

### **Concurrent Mixed Methods Research Design**

This study is a concurrent mixed methods descriptive study. The study included, as a quantitative component, a survey of on-farm apprenticeship programs in Virginia. This study also included, as a qualitative component, interviews of on-farm apprentices and farmer educators.

Both quantitative and qualitative elements were executed concurrently in this study, rather than sequentially. Creswell (2009) writes that a sequential approach in mixed methods research is appropriate when results from one approach will inform the other, whereas a concurrent approach is best when data will act to inform overall results during the interpretation phase. Data from the survey was not a likely informant to the interview protocol and questions, and was instead intended to be surveillance data that will frame the inference from the interview data. Interview data was not necessary to inform survey questions (see the following section about survey instrument development). Because the two data forms were synthesized to produce meaningful conclusions during the data analysis phase, a concurrent mixed methods design was most appropriate.

### ***Quantitative Component: Survey Instrument***

I selected a self-administered, cross-sectional survey as the most appropriate methodology to determine if there are common attributes of on-farm apprenticeship programs in Virginia. According to Babbie (1990), a cross-sectional survey is an appropriate design if the aim is “a single-time description” (p. 62). As this is a descriptive study and meant to get a current snapshot of on-farm apprenticeship learning, the cross-sectional survey was therefore reasonable. Additionally, in order to determine common attributes of on-farm apprenticeship programs in Virginia, it is logical to gather a relatively large amount of data in order to then make inferences about the larger population. A self-administered survey is a practical tool through which to gather a large amount of data in a timely, cost-effective manner, and a well-designed survey is a fairly generalizable research method (Baker, 1999). Thus, the survey was self-administered.

According to Babbie (1990), reliability means repeatability, so that optimally, “a particular technique, applied repeatedly to the same object, would yield the same result each time” (p. 132). A well-designed survey is a generally reliable research method (Baker, 1999). Babbie (1990) defines validity as “the extent to which an empirical measure adequately reflects the *real meaning* of the concept under consideration” (p. 133). Threats to survey question validity will be mitigated through following the protocol for survey question development outlined in Baker (1999), pretested with individuals familiar with agriculture, then analyzed for validity during the analysis phase. Overall, proper survey question design sought to minimize threats to reliability and validity.

Survey instrumentation was a different process for each of the sections on the survey. Since the purpose of Part Three (see Appendix F) was to gather demographic data on farm/farmer characteristics, most of the questions were derived directly from the 2007

Agricultural Census (2013), and only very slightly altered. I also wanted to compare the data to Virginia's Agricultural Census Data, from which I could see how farms and farmers that host apprentices are similar or different from the average farm and average farmer. For Parts One and Two of the survey, since the goal was to gather information pertaining to apprentice characteristics, common structures, institutions, or practices, of on-farm apprenticeship programs, I had to design my own research questions. To guide these questions, I performed a content analysis on three handbooks for on-farm apprenticeship programs, Doug Jones' (1999) *Internships in Sustainable Farming: A Handbook for Farmers*, Maud Powell's (2007) *Western Sustainable Agricultural Research and Education: Farm Internship Handbook*, and Megan Mills-Novoa's (2011) *Sustaining Family Farming Through Mentoring: A Toolkit for National Family Farm Coalition Members*. These handbooks/guides are targeted to for farmers desiring to learn more about how to start their own on-farm apprenticeship programs, and expound upon the authors' conceptions of what makes a good on-farm apprenticeship program. Since these authors are knowledgeable about real apprenticeship programs, this was a good place to start to determine likely practices, structures, and/or institutions present in good apprenticeship programs. The content analysis came from a grounded approach of identifying key themes, tallying incidences of those themes, and selecting the most common themes that were pertinent to my study questions (I ignored, for example, too much emphasis placed on housing arrangements). I then designed survey questions using similar wording to that found in these handbooks, and in accordance with practices of proper survey question construction.

Baker (1999) provides a protocol for good practice in the authoring of survey questions for social research. She suggests that questions be clear, unbiased, and avoid wording that could have alternate meanings, or wording that suggests socially desirable answers, or negative



wording, or two-part questions. She points out that indirect questioning could be better when subject matter is sensitive. She also recommends keeping the survey as brief as possible and to keep the instructions clear and brief. Babbie (1990) recommends that survey questions be clear, relevant to participants, and that participants will readily know the answer (not have to think too hard). Survey questions for Parts One and Two were designed with Babbie's and Baker's recommendations as guidelines.

Baker (1999) recommends conducting a pretest of any new survey instrument. So, as a pilot, I administered the drafted survey in September of 2013 to five non-participants who are familiar with agriculture, farms, and on-farm apprenticeships. These pilot participants provided feedback on the readability and clarity of the survey. I then tweaked the wording of some of the questions, and added several similar questions. Their feedback was incorporated into the final instrument.

**Table 1: Constructs Related to Research Questions, Survey Questions**

<b>Construct</b>	<b>Supporting Literature</b>	<b>Research Question</b>	<b>Item(s) on Survey (Appendix F)</b>
<b>Apprenticeship Characteristics</b>	<p>A diverse range of beginning farmer training is available (Niewolny &amp; Lillard, 2010)</p> <p>Increasingly, beginning farmers are not from an agrarian background (Meyer, et al, 2012)</p>	What kinds of on-farm apprenticeships are available and to whom?	<p>See Part One of Survey:</p> <ol style="list-style-type: none"> <li>1. Word to describe apprentices</li> <li>2. Years farm has hosted apprentices</li> <li>3. Age of typical apprentice</li> <li>4. Total apprentices on farm since beginning</li> <li>5. How many male/female</li> <li>6. How many of each ethnic background</li> <li>7. How many of each education level</li> <li>8. Years typical farming experience of apprentice</li> <li>9. Number apprentices on farm at one time</li> </ol>
<b>Apprenticeship Program Elements</b>	<p>Best practices are put forward by practitioners through guides for farmers hosting apprenticeships (Jones, 1999; Mills-Novoa, 2011; Powell, 2007)</p> <p>Situated learning includes legitimate peripheral participation (Lave, 1988; 1991)</p> <p>Speech is a mediation of inner thought, learning, social negotiation; mentors teach through assisted development (Vygotsky, 1986)</p>	<p>What are the most important educational practices, structures, or institutions that support on-farm apprenticeship learning?</p> <p>How do expert farmers participate as educators in these on-farm apprenticeships?</p>	<p>See Part Two of Survey:</p> <ol style="list-style-type: none"> <li>10. Apprentices stay how may weeks?</li> <li>11. Motivations for wanting apprentices on farm.</li> <li>12. Advertising outlets</li> <li>13. Have you consulted handbook/guide?</li> <li>14. Have you consulted ag organization?</li> <li>15. Have you consulted another farmer?</li> <li>16. Have you consulted Extension Service?</li> <li>17. Formal practices, policies, procedures</li> <li>18. Type of housing provided</li> <li>19. Share kitchen? (y/n)</li> <li>20. Share bathroom? (y/n)</li> <li>21. Teaching strategies</li> <li>22. Apprentice attributes and performance</li> <li>23. Practices, polices, procedures after apprenticeship</li> <li>24. Have apprentices gone on to start their own</li> </ol>

			farms?
<b>Farm/Farmer Background</b>	Increasingly, beginning farmers are not from an agrarian background (Meyer, et al, 2012)  Apprenticeships may take place on farms identifying as sustainable (Barnett, 2012; Endres & Armstrong, 2013; Hamilton, 2011; Maxey, 2006; Pilgeram, 2011)	What kinds of on-farm apprenticeships are available and to whom?	See Part Three of Survey: 1. Principal Operator? (y/n) 2. Female/Male 3. Ethnic background 4. Year began farm operation 5. Farmer age 6. Years farming 7. Training in agriculture 8. Formal education 9. Approximate annual sales 10. Market Outlets 11. Farm Products 12. Business type of farm 13. County where farm is located 14. Acres leased and owned

Attempts were made to ensure that the sample size of the survey was similar to the number of actual apprenticeship programs in Virginia. Many on-farm apprenticeship programs choose to advertise on the National Sustainable Agricultural Information Service (ATTRA) website, and at the time of survey distribution, there were 104 farms in Virginia advertising apprenticeship programs (ATTRA, 2013). ATTRA is the only such listing of apprenticeship programs in Virginia. Thus, a survey was sent to each farm on ATTRA advertising an apprenticeship program in Virginia. Additionally, all extension agents in Virginia were contacted through a Virginia Tech listserv, in order to gather information on other on-farm apprenticeship programs, to subsequently disseminate the survey to these programs. Also, agricultural organizations were contacted to assist in distributing the survey to other apprenticeship programs in Virginia, including the Virginia Beginning Farmer and Rancher Coalition Project, Virginia Biological Farming Association, and Collaborative Regional Alliance for Farmer Training. Participants who received the emailed survey recruitment letter were asked to click a link to access the online survey.

Disseminating paper surveys was an attempt to reduce sampling bias, because as Babbie (2010) points out, online surveys may not be representative of the general population. So, a paper version of the survey was available to participants at a gathering of Collaborative Regional Alliance for Farmer Training, and the Virginia State University's Small Farmer Conference. Participants who receive the paper survey were asked to fill out and return the survey with the self-addressed, stamped envelope provided, although none did. Only one filled out the paper survey, and it was delivered by hand to the researcher. Thus, attempts were made to disseminate the survey to all known on-farm apprenticeship programs in Virginia, in order to be as inclusive as possible. By utilizing different venues through which to disseminate the survey, this study aimed to reach as close as possible to a sample of the full population of apprenticeship programs within the geographical scope.

That said, distribution lists were managed by agricultural service providers (the ATTRA database of farming apprenticeships and internships, the Virginia Cooperative Extension listserv, Virginia Beginning Farmer and Rancher Coalition list, the Collaborative Regional Alliance for Farmer Training, and the Virginia Biological Farming Association). There is no way to ensure the exact number of individuals the survey was sent to. Of those who received the recruitment materials, there is also no way to know how many were eligible participants, in other words, met the criteria for inclusion based on the definition of farmers who host or have hosted on-farm apprentices (see Appendix F: Survey Instrument). Thus, the exact sample frame size is unknown, as is the response rate. However, by seeing that there were 104 known apprenticeship programs in Virginia at the time of the survey dissemination, and 45 valid responses to the survey, I might tentatively suggest that the unknown response rate may have been sufficient.

### *Qualitative Component: Interviews*

The interviews (N=12) were semi-structured and consisted of open-ended questions. In order to understand apprenticeship learning, the most straight-forward approach is to interview the apprentice and hear their stories about how they learned during their apprenticeship. Additionally, by hearing the lived experiences of the farmer educators themselves, I heard a different and valuable perspective of how learning is occurring, from the expert's point of view. Of particular interest was the uncovering of the social interaction between novice and expert, which was explored through semi-structured interviews with both parties, so I interviewed both apprentices and farmer educators.

According to Fontana and Frey (in Denzin & Lincoln, 2000), semi-structured interviews allow the researcher some degree of flexibility to respond to new ideas presented by the interviewee, while giving the interviewer some guiding questions to keep the conversation focused on the phenomenon under study. Babbie (2010) suggests that the interview questions be predetermined in order to critically reflect beforehand that there is no inherent bias in the wording of the question. I crafted interview questionnaires for both Farmer Educators (see Appendix G) and On-Farm Apprentices (see Appendix H), which guided the interviews. But, as these were semi-structured interviews, the interview script was occasionally deviated from, according to lines of interest revealed throughout the interview. The topics for discussion, and the language used to ask the questions, however, remained rooted in the interview protocol questions throughout all interviews. Also, although I occasionally deviated from the script, great care was taken to ensure that all of the questions in the protocols were answered throughout each interview.

Table 2, below, illustrates theoretical constructs that act as lenses through which one may view the phenomenon, and supporting literature with which the topic is informed. Also, I list the research questions that I sought to answer through the apprentice interviews, and which interview questions intended to address those research questions. Creswell (2009) recommends beginning with an icebreaker question, and ending with an open-ended question that allows the participant to share more information if they choose, which I did include as the first and last questions, not represented in the below Tables 2 and 3.

**Table 2: Constructs Related to Research Questions and Interview Questions for On-Farm Apprentices**

<b>Construct</b>	<b>Supporting Literature</b>	<b>Research Question</b>	<b>Interview Questions</b>
<b>Situated Learning</b>	Situated learning is social identity formation in context through legitimate peripheral participation (Lave, 1988; 1991)	What kinds of on-farm apprenticeships are available and to whom?	1. Please describe to me how the typical learning experience occurs through your apprenticeship.
<b>Structural Components</b>	Farmers consider skills that are important only able to be learned in context (Kilpatrick, et al, 1999; Parr & Trexler, 2011)  Best practices are put forward by practitioners through guides for farmers hosting apprenticeships (Jones, 1999; Mills-Novoa, 2011; Powell, 2007)	What are the most important educational practices, structures, or institutions that support on-farm apprenticeship learning?	2. What are some of the most important things you learned through your apprenticeship, and how did you learn it?  3. If you could design your own apprenticeship or internship experience, what would it look like?
<b>Novice to Master Identity</b>	Learning occurs in communities of practice through legitimate peripheral participation in a joint enterprise with experts, which allows novices to socially negotiate a new expert	How do farm novices adopt expert identities through on-farm apprenticeships?	4. How did your apprenticeship/internship change the way you see yourself as a farmer?  5. Please tell me a bit about the next steps

	identity (Wenger, 1998)		for you. (Do you think you will start farming? Why or why not?)
<b>Language</b>	Learners must be allowed to be both legitimate and peripheral (Lave, 1991)  Speech mediates learning; farmers actively assist learners in their development (Vygotsky, 1986)	How do expert farmers participate as educators in these on-farm apprenticeships?	6. Tell me about your relationship with the farmer and other apprentices.

The below Table 3 illustrates theoretical constructs with accompanying supporting literature that I sought to address in interviews with farmer educators. Additionally, I list the research questions that I sought to answer through the interviews with farmer educators, and which interview questions are intended to address those research questions. Please see Appendix for Interview Questions and Protocol for Farmer Educators.

**Table 3: *Constructs Related to Research Questions and Interview Questions for Farmer***

*Educators*

<b>Construct</b>	<b>Supporting Literature</b>	<b>Research Question</b>	<b>Interview Questions</b>
<b>Situated Learning</b>	Situated learning is social identity formation in context through legitimate peripheral participation (Lave, 1988; 1991)	What kinds of on-farm apprenticeships are available and to whom?  What are the most important educational practices, structures, or institutions that support on-farm apprenticeship learning?	1. Please describe to me how the typical learning experience occurs for apprentices on your farm.
<b>Novice to Master Identity</b>	Learning occurs in communities of practice through legitimate peripheral participation in a joint enterprise with	How do farm novices adopt expert identities through on-farm apprenticeships?	2. How does their farm experience change the way apprentices seem to see themselves as

	experts, which allows novices to socially negotiate a new expert identity (Wenger, 1998)		farmers? 3. How often do the apprentices get exposure to the larger farming community? 4. Describe the first time you ever identified yourself as a farmer.
<b>Language</b>	Speech mediates learning; farmers actively assist learners in their development (Vygotsky, 1986)	How do expert farmers participate as educators in these on-farm apprenticeships?	5. What is your communication with the apprentices like?

Potential participants for the interview were recruited through a letter and flyer.

Participants were provided with contact information with which to contact the researchers if they were interested in participating in the interview. Flyers were also disseminated at a gathering of Collaborative Regional Alliance for Farmer Training, and Virginia State University’s Small Farmer Conference. Additionally, a question was added to the end of the survey, which asked, “would you be interested in participating in a 60-minute interview about your experiences with apprentices, at a time and place that is convenient for you?” Since many said yes, this also became an important recruitment venue for the interviews.

## **Data Collection**

### *Surveys*

Recruitment materials were disseminated via email to those on the distribution lists to various agricultural organizations, such as ATTRA, CRAFT, and Extension lists. The survey was conducted mainly online utilizing the Virginia Tech Qualtrics platform, but was disseminated in paper format at agricultural events, with a self-addressed stamped envelope. The survey was



open from September 30, 2013, to December 1, 2013. While 55 overall responded to the survey, only 45 responses were validated. Please see Appendix F for Survey Instrument.

### ***Interviews***

Recruitment for interviews occurred primarily through in person recruitment at several agricultural events, and a blank at the end of the survey that allowed those interested to leave their name and number if they wished to be contacted for an interview. Of interviews, five semi-structured interviews were conducted with on-farm apprentices, five were conducted with farmers who have hosted apprentices, and one was conducted with a married couple who were farmers who hosted apprentices and had recently completed an apprenticeship. Interviews ranged from 50 to 84 minutes. This study interviewed participants during the cold season, starting in November, due to logistical concerns that the heavier workload during the growing and harvest season would not be conducive to scheduling an interview. Through purposeful sampling, interviewees were identified through the Collaborative Regional Alliance for Farmer Training (CRAFT), which hosts a monthly gathering of small farmers and their apprentices, and Virginia State University's Small Farm Conference. Each interview took place in a setting mutually agreed upon by participant and researcher, and was audio-recorded. Please see Appendices G and H for Interview Protocols.

### **Data Analysis**

#### ***Quantitative***

Survey results were compiled into Statistical Package for Social Sciences (SPSS) software, and subsequently reported as a descriptive summary of results. Additionally, results were analyzed for statistically significant congruencies that would indicate consensus and commonalities among response rates. Statistical tests were utilized to compare results, including

a one-way ANOVA and paired-sample t-test (2-tailed). Data from Part Three of the survey was compared visually to the larger body of Agricultural Census Data from Virginia farms to describe any noteworthy comparisons and/or contrasts with the larger context of Virginia agriculture. Because sample size was relatively low compared to the Virginia Agricultural Census data, statistical tests were not run to compare for statistically significant differences with the majority of Virginia farms.

### *Qualitative*

Interviews were transcribed into text verbatim, and all identifying characteristics were removed from the resulting Word document. I then performed a content analysis on the transcribed interviews, where the transcripts were reviewed line by line, and codes were assigned to the points in the text where distinct themes emerged. A semi-open coding process was used. Codes, or “key thoughts and concepts” (Hsieh & Shannon, 2005, p. 1279) that are found in the text, were determined through a critical review of the transcripts, with deference to the meanings developed by participants for observed constructs, from the perspective of situated learning, and constructs of CoPs and Vygotsky’s thought and language. I also coded for common structures, practices, and institutions that support on-farm apprenticeship learning, background information about farmers and apprentices, as well as practices engaged in by the farmer educator. Because this study sought to code the transcripts from the theoretical base of situated learning, a semi-directed approach to content analysis will be used (Hsieh & Shannon, 2005). This approach begins with some predetermined codes, which may be modified as review of the text requires. The below Table 4 outlines the main constructs that were used as codes observed through analysis of the transcripts, with supporting literature.

**Table 4: Main Constructs Considered for Coding of Interview Data**

<b>Construct</b>	<b>Operationalization</b>	<b>Supporting Literature</b>
<b>Community of Practice (CoP)</b>	Elements of CoP observed from statements in interviews.	A CoP is a "set of relations among persons, activity, and world, over time and in relation to other tangential and overlapping communities of practice" (Lave and Wenger, 1991, p. 98).
<b>Legitimate Participation afforded to apprentices.</b>	Legitimate participation observed from statements in interviews.	In a master/student or mentor/mentee relationship in a CoP "learners inevitably participate in communities of practitioners and that mastery of knowledge and skill requires newcomers to move towards full participation in the sociocultural practice of the community" (Lave and Wenger, 1991, p. 29).
<b>Peripheral Participation afforded to apprentices on a regular basis.</b>	Peripheral participation observed from statements in interviews.	Apprentices must have access to observe the work of the farmers; Lave (1991) notes that apprentices' learning in a butcher shop was not complete because although they were afforded legitimacy, they were not allowed to have a position peripherally due to logistical problems.
<b>Identity Formation</b>	Negotiation of new forms of participation as described in interviews.	"The social formation of the person, the cultural interpretation of the body, and the creation of the use of markers of membership such as rites of passage and social categories... issues of gender, class, ethnicity, age, and other forms of categorization, association and differentiation in an attempt to understand the person as formed through complex relations of mutual constitution between individuals and groups" (Wenger, 1998, p. 511).
<b>Boundary objects/Brokers</b>	Evidence of people/places/things used as boundary objects or brokers in interviews.	"Boundary objects – artifacts, documents, terms, concepts, and other forms of reification around which communities of practice can organize their interconnections." (Wenger, 1998, p. 105) "brokering – connections provided by people who can introduce elements of one practice into another" (Wenger, 1998, p. 105)
<b>Reification</b>	Evidence of Traditions, Rules, Policies, Institutions in Interviews.	"the process by which social phenomena appear factual in ways that hide their social production and reproduction" (Wenger, 1998, p. 287)
<b>Activity Systems</b>	Observe the most important elements of activity systems for apprentices during their apprenticeship	Gutierrez (2002) defines activity systems are "historically conditioned systems of relations among individuals and their proximal, culturally organized environments" (p. 314) and states that they are better unit of analysis.

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from interviews.

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<b>Inner Speech</b>	Use of language, both inner and outer, used in interviews.	“Language is the most critical tool. Language develops from social speech, to private speech, to covert (inner) speech” (Schunk, 2012, p. 243).
<b>Sociopolitical positioning of on-farm apprenticeships related to agriculture and society.</b>	Demographic, farm income/marketing, educational data from survey. Observations from interviews.	Niewolny and Wilson (2009) argue for greater understanding of power relationships within social cognition theory. Pilgeram (2011) suggests that many sustainable farmers may depend on low-paid apprentices or interns to staff the farms. Host farmers said increased production is a benefit of interns (Carey et al, 2006).

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The codes were assigned to the documents using Atlas.ti software. Following the coding of the transcripts, the codes were analyzed for recurring themes that are common across the interview data, and I analyzed recurring themes for their larger significance, utilizing the lens of theory presented in this text. Data from both the quantitative and qualitative elements were then analyzed together to interpret meaningful results, as the data demanded.

### **Limitations**

This study may involve some sampling bias in both the quantitative and the qualitative segments. The interview may have had some sampling bias, simply because those most enthusiastic to participate in a scholarly research project, may have a more positive inclination towards on-farm apprenticeship learning and be more excited to share opinions on the subject. This sampling bias was noted as a limitation in a similar study that interviewed on-farm apprentices (Barnett, 2012).

Although measures were taken to reduce response bias for the survey, those who responded to the survey may differ somewhat from the non-respondents. The survey also may naturally have sampling bias, because I was only logistically able to send the surveys to those farmers that are online or that attended an agricultural event. Steps were taken to reduce

sampling bias by attempting to identify all venues through which to distribute the survey, but limitations nonetheless exist.

This study was intended to be generalizable to the state of Virginia, but a natural limitation is the low number of participants interviewed and surveyed, due to limits of time and resources. Hence, results of this study must represent only study participants. However, despite limitations, this study still contributes to the overall understanding of on-farm apprenticeship research. As Denzin and Lincoln (2000) suggest, generalizability may be possible through similarity of study conditions. So, although there are limitations, results of this study may contribute helpful ideas to those who wish to study apprenticeship programs in similar conditions, or taking the conditions, as they are outlined in this text as transparently as possible, under advisement

## **Summary**

This concurrent mixed methods descriptive study examines on-farm apprenticeship learning. The methodology is grounded in a historical realist ontological position, framed through a transactional/subjectivist epistemology, with a Deweyan pragmatic research paradigm. This paradigm reminds the reader that, for purposes of this study, no one way of knowing is best, and the researcher's role has been to find the most meaningful words and frame through which to describe the phenomenon of on-farm apprenticeship learning in Virginia. The mixed methods approach included a survey (N=45) of Virginia farmers who advertise on-farm apprenticeship programs, and interviews (N=12) were conducted with apprentices and farmer educators. Participants were recruited through distributing materials to online apprenticeship listings, Extension listserv, and agricultural organizations. Overall, the data analysis phase involved two types of analysis, quantitative statistical analysis and qualitative transcribing, coding, and

compilation. Analysis overall centered around the answering of the research questions using both elements of the study, and the quantitative and qualitative results were married and considered concurrently to arrive at this depiction of on-farm apprenticeship learning in Virginia, presented in Chapter Four.

## **CHAPTER 4: RESULTS**

### **Introduction**

In this study, I sought to answer the overarching research question, “how do on-farm apprenticeships provide learning opportunities for beginning farmers in Virginia?” To this end, I examined on-farm apprenticeship learning in Virginia through a concurrent mixed methods research design, which included a survey (N=45) and interviews (N=12) of farmer educators (n=5), on-farm apprentices (n=5), and farmer educators who had recently been apprentices (n=2).

To briefly summarize, the survey was a three part, 38-question survey (See Appendix F), administered online and in paper format to farmers who have hosted apprentices. The survey’s three parts requested information about (1) the apprentices, (2) the apprenticeship program, and (3) the farm and farmer. The interviews were semi-structured, ranged from 50 to 84 minutes, and were guided by interview protocols (See Appendices G and H). The interviews were face-to-face and audio-recorded. And then transcribed and coded in a semi-open coding process.

The purpose of this section is to provide a synopsis of the findings of the study. Because this study is meant to measure and describe a phenomenon, rather than compare or contrast, care is taken here to present all meaningful results that emerged from the data. The primary purpose of a descriptive study is to describe a phenomenon rather than analyze it comparatively.

### **Mixing of Quantitative and Qualitative Data**

The fundamental attribute of a mixed methods study is that the quantitative and qualitative data be mixed at some stage throughout the research process. As previously discussed in the Chapter Three, this is also the fundamental strength of mixed methods research, as the sum can be greater than the two parts due to the generative potential of the data to be considered together to arrive at meaningful conclusions (Creswell, 2009). Therefore, I will present

quantitative results together with qualitative results throughout this chapter, in order to use both datasets in tandem to derive meaningful results. The data is arranged by the research subquestions 1a through 1d. To remind the reader, this study sought to answer subquestions:

- a. What kinds of on-farm apprenticeships are available and to whom?
- b. What are the most important educational practices, structures, or institutions that support on-farm apprenticeship learning?
- c. How do expert farmers participate as educators in these on-farm apprenticeships?
- d. How do farm novices adopt expert identities through on-farm apprenticeships?

### **Quantitative Component Results Introduction**

Although 55 responded to the survey, the data was scrubbed in order to validate respondents. Respondents were considered validated if they answered at least the first page of survey questions. This means respondents 8, 12, 14, 17, 18, 20, 35, 48, 53, and 55 were withdrawn from the dataset. Also, data on record 15 was scrubbed to exclude extreme outlier data in annual sales and farm acres owned, which was a likely typo or mistake. Thus, the survey had overall 45 valid respondents, and most questions had 40-45 responses.

To summarize respondents of the survey, 87.5 % were the principal operators of the farms hosting the apprenticeship program. The remainder of the respondents, who were asked to fill in a blank to report their farm role, were unanimously all in a management role on the farm. There is a roughly even split between female and male farmers who completed the survey, with slightly more male farmers. 100% of farmers who completed this survey were white. The average age of survey respondents was 46.8 years, but respondents varied greatly between 19-72 years old. Respondents reported they had been operating their current farm for an average of 12



years, but varying widely between 2-37 years. The respondents had an average of 5.3 years working with apprentices.

### **Qualitative Component Results Introduction**

I coded the interview data in Atlas.ti through a semi-open coding process, which included codes to label environmental, structural, and background level topics such as the farmers' and apprentices' youth and education, how the farm relates to the larger world of agriculture, finances, agricultural organizations, etc. I also coded for learning activities that pertained to situated learning, communities of practice, speech, thought, and language. Additionally, I coded for farmers educational activities and attitudes, and how the farm functions to support apprentices through structures, practices, policies, and institutions.

I subsequently grouped the coded data, and created summaries of the themes that emerged from each code. The summaries, though with different codes attached to them, were often alike in theme, for example, themes grouped within the code of financial hardship for the farmer related closely with themes grouped within the code of finances for the apprentice. So, I subsequently grouped those together as well in this section, in order to organize the data into a meaningful platform around emergent themes. So, themes do not translate necessarily directly into the codes I used.

#### **Question 1a: What kinds of on-farm apprenticeships are available and to whom?**

Data illuminates several major patterns that on-farm apprenticeships may follow. Data suggests that apprenticeships take place on farms that are small, diversified in production, and diversified in marketing, utilizing local and direct markets. Farms in this study affiliated themselves with sustainable agriculture, and often expressed difficulties in financial viability. Individuals who undertake apprenticeships are disproportionately white, college educated, and

are not from a farming background, thus have low access to farming and farmland. These findings are detailed in the following subsections.

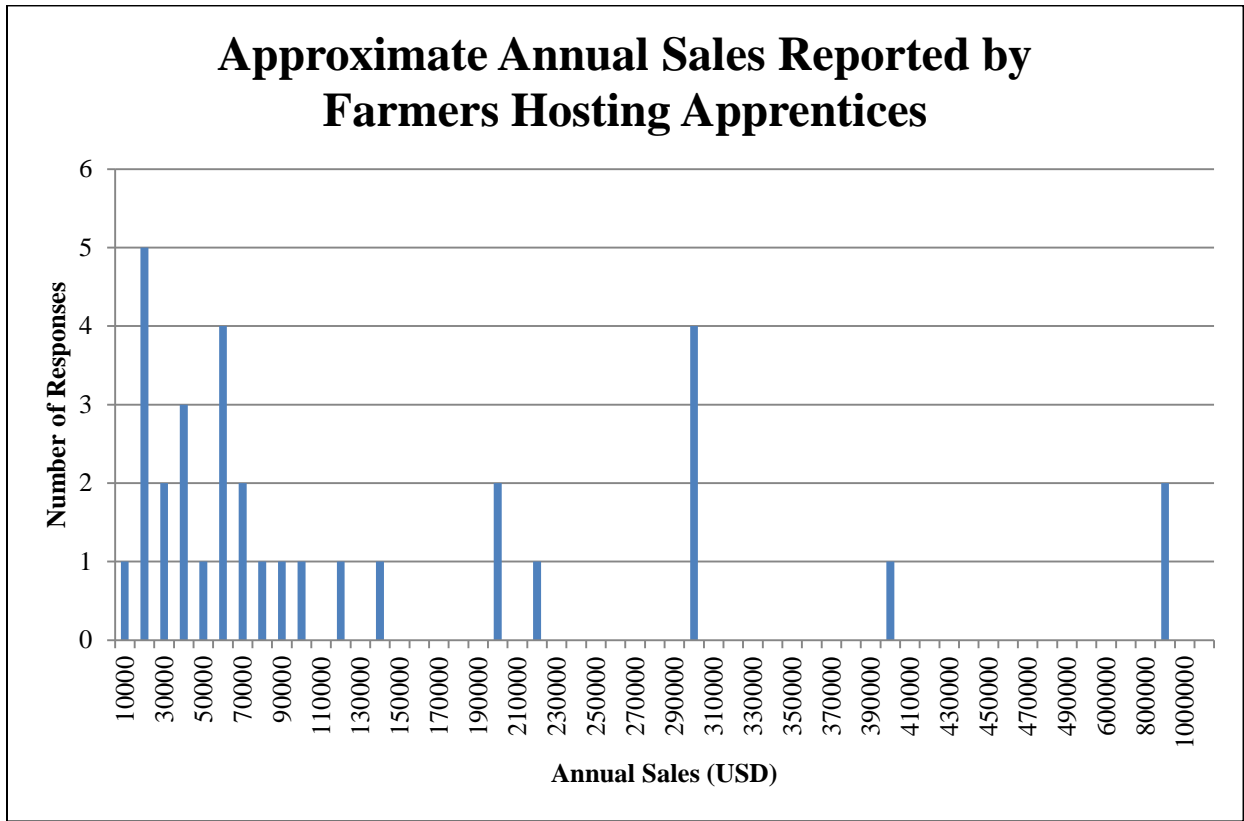
### ***On-Farm Apprenticeship Overview Data***

The data had much to offer towards discovering what kinds of on-farm apprenticeships were available and to whom. Of 45 respondents, 32 used the term 'intern' to refer to learners, whereas only 10 used the term 'apprentice,' several used both terms with different criteria, and several used entirely different terms. The average number of years that survey respondents had apprentices on their farms prior to taking the survey is 5.3 years, with a standard deviation of 4.7. The most common number of years (the mode) respondents had apprentices was three. In response to the question, "how many apprentices total have you had on your farm since you began farming?" (n=44), the most common number of apprentices respondents have had is 5. The total sum of all apprentices reported on all respondents' farms is 817.

### ***Apprenticeships on Small, Diversified, Direct-Marketing Farms***

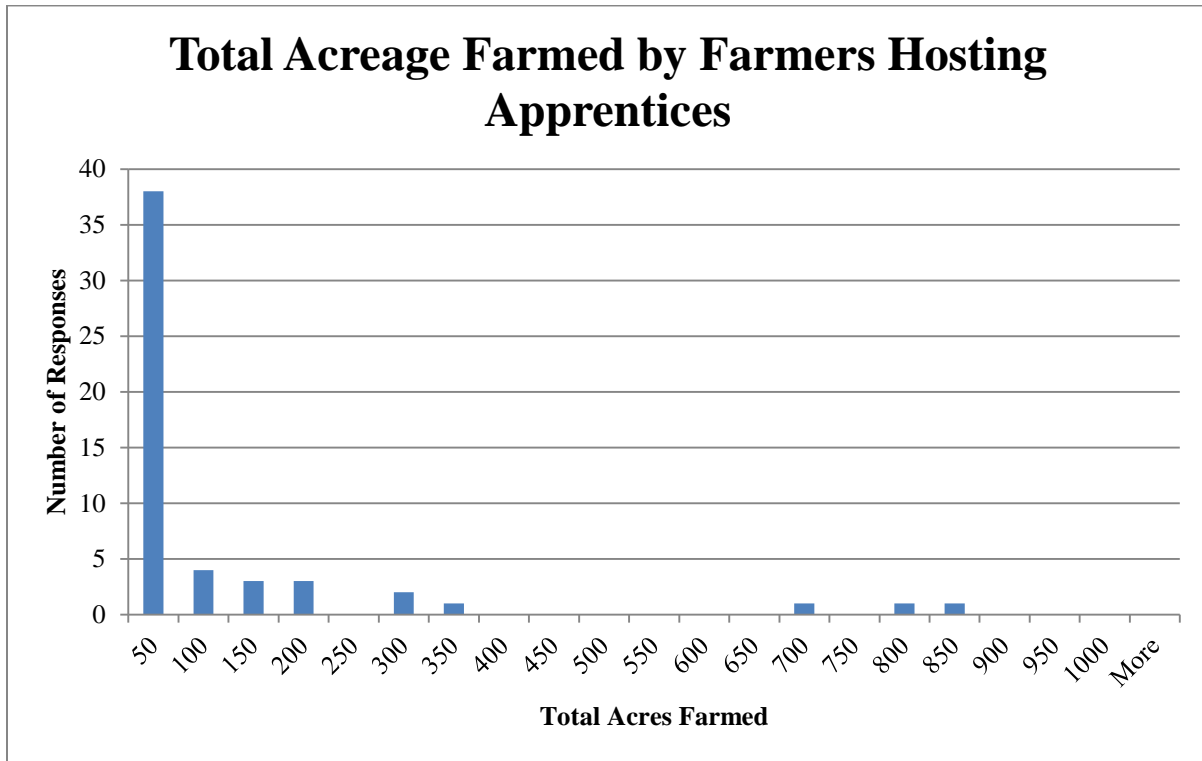
One of the first elements in understanding on-farm apprenticeships is understanding what kinds of farms host apprentices. Overall, respondents hosted apprentices on small, diversified, direct-marketing farms. Most respondents had annual sales less than \$100,000. Average annual sales were \$62,500. Please see Figure 1 for a report on reported annual sales income of survey respondents.

**Figure 1: Approximate Annual Sales as Reported by Farmers Hosting Apprentices**



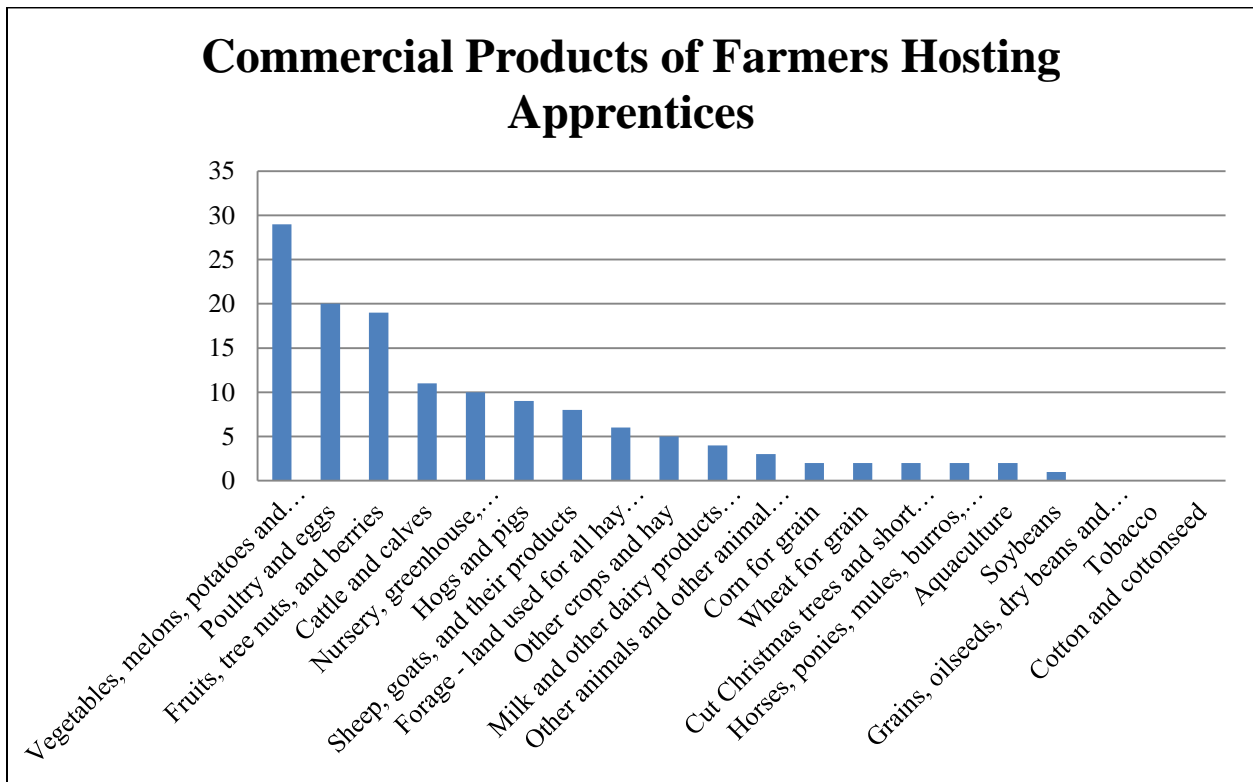
As well as being small in annual sales, survey respondents also had small total acreage they used for farming. The majority of survey respondents were on less than 50 acres of total land farmed (leased and owned). This data is reported in Figure 2. Overall, the data appears to suggest that farms hosting apprentices are small in scale.

**Figure 2: Total Number of Acres Farmed, Leased and Owned, by Host Farmers**



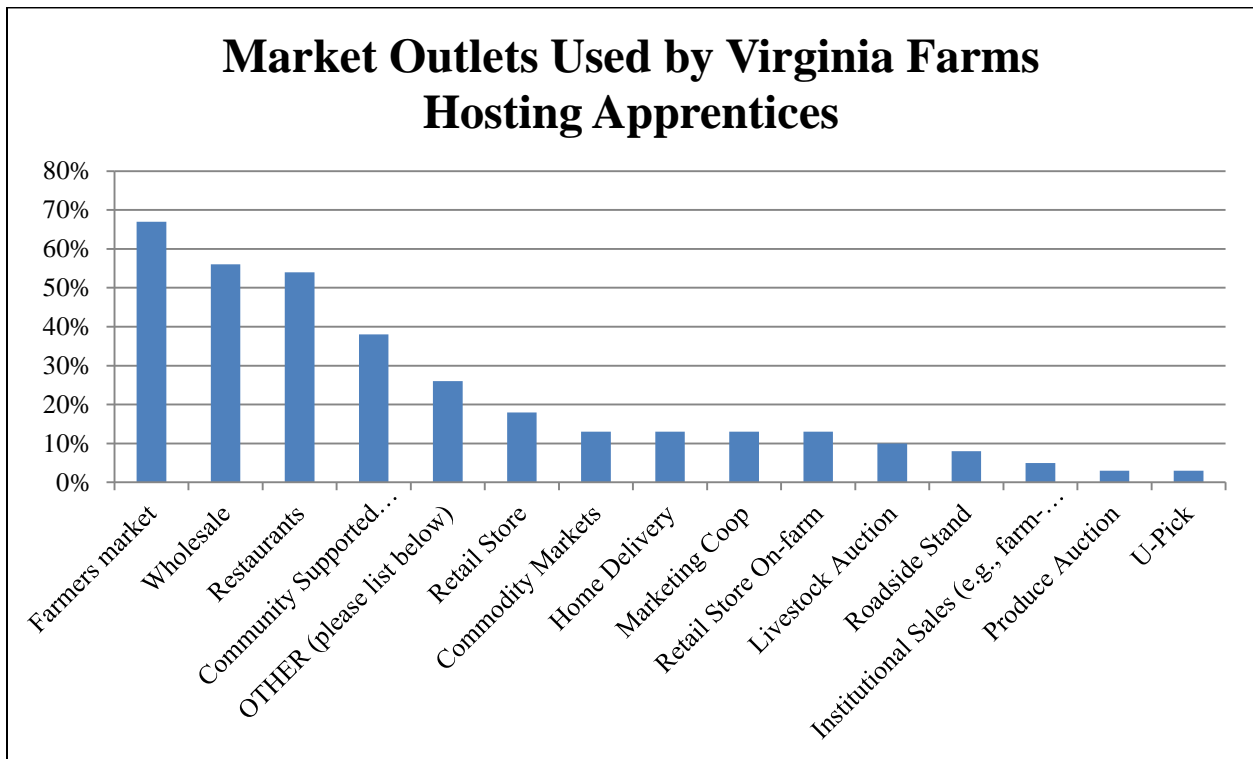
Survey respondents also tended to grow a diverse range of products, with the majority raising vegetables, poultry-based products, and fruits. Respondents sell an average of 3.0 different agricultural products, a statistic that is phenomenal considering that figure groups all vegetables as “one,” and fruits as “one.” This is in comparison to the national average number of products sold on U.S. farms, which is 1.1 (USDA, 2005). Of respondents, 74% raise vegetables, 51% raise poultry and eggs, and 49% raise fruits. It should be noted that very few grow soy, corn, and wheat. The comparison of products of survey respondents is shown in Figure 3.

**Figure 3: Commercial Products of Host Farmers**



Survey respondents also showed a tendency towards a diversified marketing strategy and direct, local marketing of their products. Respondents market through CSAs, wholesale, farmers markets, and restaurants. Respondents reported that they used an average of 2.9 market outlets. The breakdown of market outlets used by survey respondents is shown in Figure 4. It is noteworthy how many sell at farmers markets and through CSA. This means farms have a diversified, and therefore more flexible, marketing profile.

**Figure 4: Market Outlets Used by Host Farms**



Farms in the study showed a range of ownership schemes, with some being individually owned, some family owned, and some operated in partnership with nonfamily members. Also, respondents showed a diverse range of leasing their farmland, owning their farmland, and using a combination of leased and owned farmland. No one business or land ownership model emerged as more dominant for survey respondents.

Taken together, one can see that because these farms are small in size (based on both acreage and sales), diversified in production, and have diverse marketing strategies which include direct, local markets, they fit the description of what Lyson (2004) and others (Carloan, 2012; Doran, 2008) call a “sustainable farm.”

### ***Financial Viability of Host Farms***

Although farmers interviewed identified with sustainable agriculture, and occasionally small-scale agriculture, they also indicated that their farms are not necessarily economically viable. This theme emerged alongside discussions of broad sustainability. As one farmer stated:

*That's the power of small scale really localized sustainable – meaning biological, ecological methods, growing food for people. So possible and so wonderful. The economic viability side of it is up for conversation, but we're really proud of how we've managed it and what we've been able to do.* (Farmer)

### ***Sustainable Agriculture and Alternative Food Movements***

In light of the above data, it should be no surprise, then that interview data corroborates and further illustrates the link between farms hosting apprentices and sustainable agriculture, and alternative food movements and institutions. Farmers interviewed identified their farms with practices in permaculture, organic, and certified natural. Apprentices also discussed themes of organic agriculture and permaculture. One apprentice explained her host farm's orientation to the organic movement:

*We'd get a lot of questions like 'is this organic?' and like the truth is that they weren't they were a part of a cooperative of farmers who made up their own certifications.* (Apprentice)

So here, she is describing that her farm was not organic but was still very serious about biophysical farming methods that were akin to organic certifications. The farm therefore is knowledgeable about organic growing practices.

One farmer, below, discusses her farm's recruitment methods for apprentices, which refers to her growing practices that utilize permaculture techniques:

*There's a website called Permies.com. It's a permaculture website... Um, I post there. I post on localharvest.com. I post on WWOOFers .com, and a lot of it's word of mouth.* (Farmer)

So, in recruiting from the pool of those involved with alternative food movements, she is aware of her farm's attractiveness to apprentices who are also knowledgeable about these alternative food institutions. She therefore aligns her farm with these alternative food institutions. Most farmers interviewed similarly indicated a knowledge of and an involvement with state and national organizations that work on issues of sustainable agriculture, as one farmer when he states:

*You learn about a lot of that when you go to conferences, or like you're in a group, like VABF [Virginia Biological Farming Association] or PASA [Pennsylvania Association for Sustainable Agriculture] or something, you read their newsletters, or you're reading books and certain authors' names come up a lot, then you look them up on the internet, and look up about their farm, you know you learn a lot that way. (Farmer)*

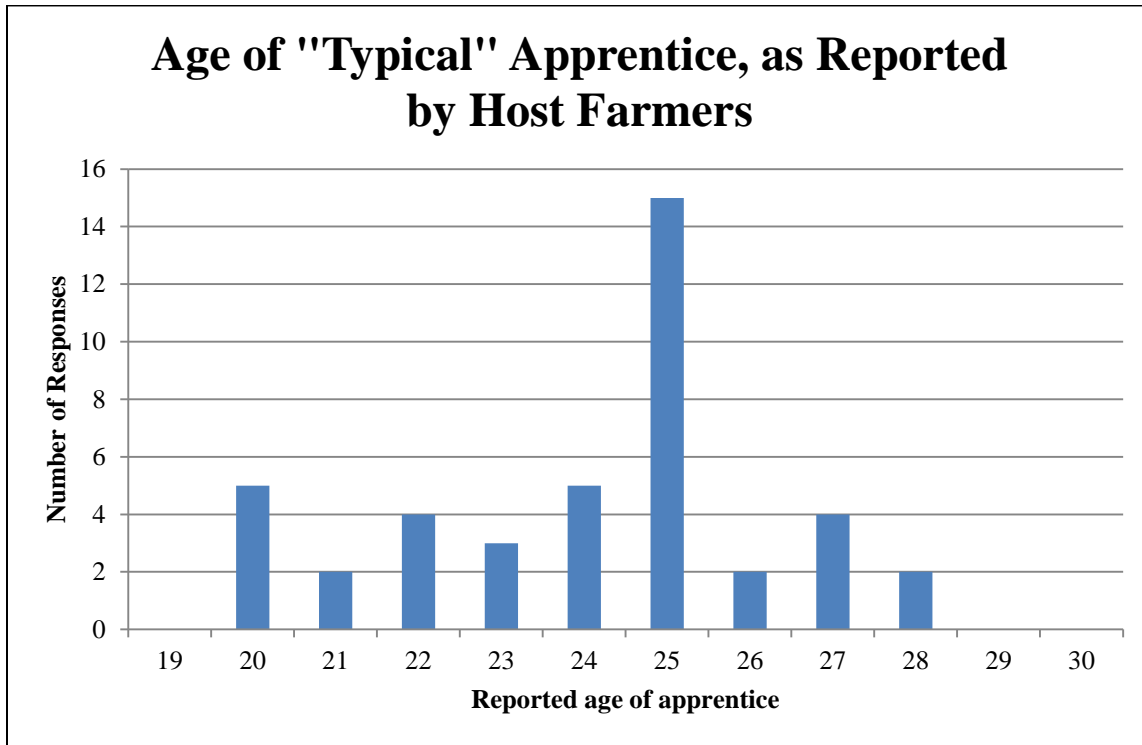
Here, the farmer places value on the knowledge access through agricultural organizations that center around sustainable agriculture. Such agricultural organizations were discussed with familiarity by farmers and apprentices alike during the interviews.

### ***Apprentice Demographics***

The typical on-farm apprentice, as per the respondents, is mean age of 23.9 years (see Figure 1), with a minimum of 20 and a maximum of 28. Low standard deviation (2.3) means this is a strong statistic. Respondents showed some level of consensus over the mean age of apprentices, as Figure 5 demonstrates. Overall, it would seem that the data suggests that apprentices are typically in their early- to mid- twenties.

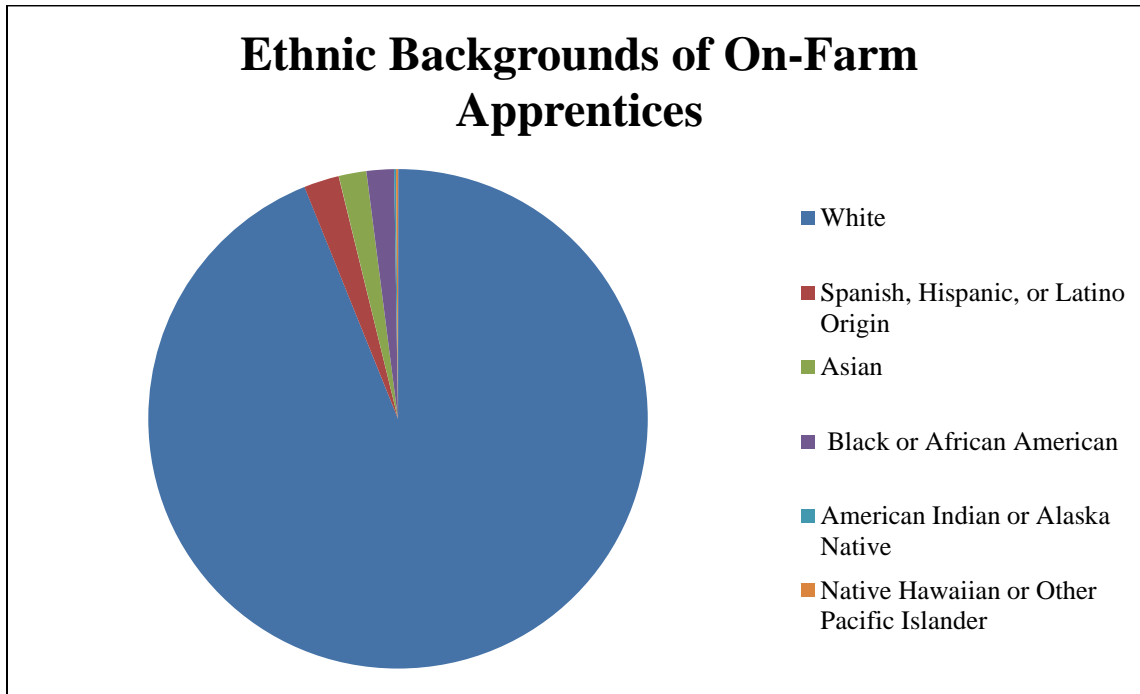


**Figure 5: Reported age of typical apprentice, according to survey respondents**



There was a fairly even split between female and male apprentices on respondents' farms; the data show that 56% are reportedly female, while 44% are male. Results indicate that on-farm apprentices are overwhelmingly White (93.9%), followed by apprentices of Spanish, Hispanic, Latino Origin (2.3%), Black or African American background (1.8%), Asian background (1.8%), and less than 1% of apprentices were of American Indian or Alaskan Native background, or Native Hawaiian or Pacific Islander background. This data suggests that on-farm apprentices are disproportionately White. Figure 6 demonstrates the proportions of ethnic backgrounds of apprentices.

**Figure 6: Ethnic Backgrounds of On-Farm Apprentices, as Reported by Respondents**

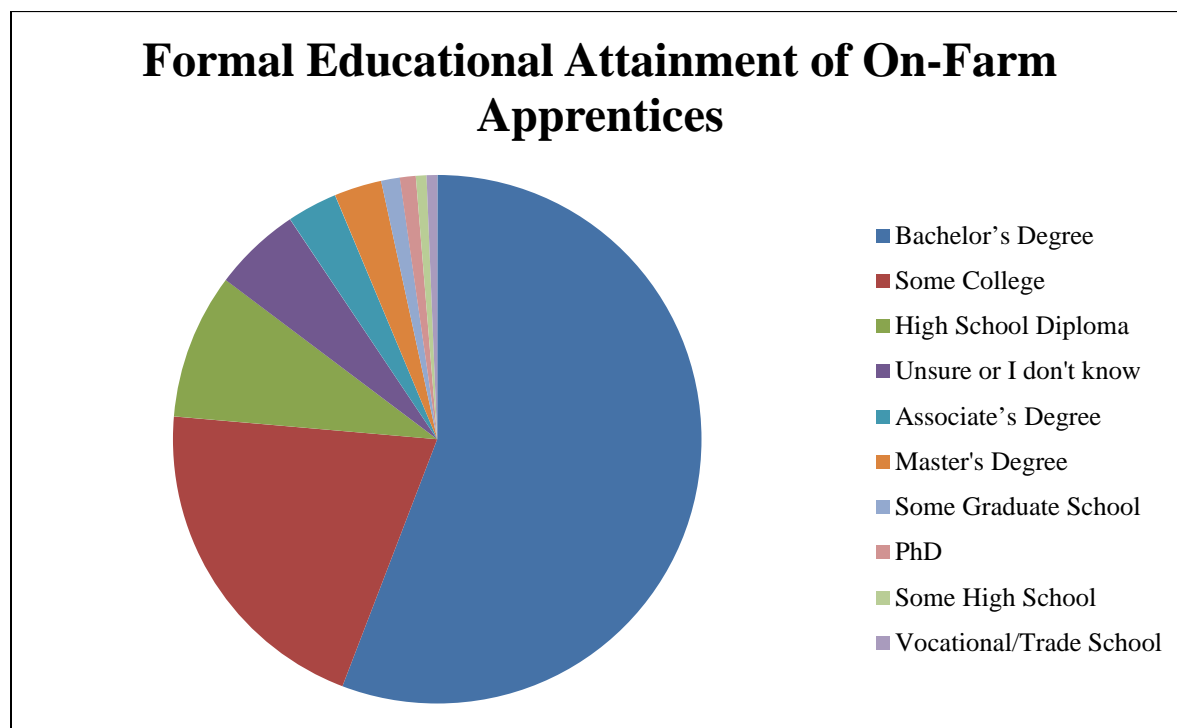


Farmers report that apprentices have typically achieved a high level of formal educational attainment. 84.47% of apprentices have attended institutions of higher education, and 63.9% have earned a college degree from an institution of higher education. Please see Table 5 for a breakdown of highest educational attainment of apprentices as reported by farmers, which is presented pictorially in Figure 7. This data suggests that apprentices are quite often college educated, and most have attended some college.

**Table 5: Highest level of formal education of on-farm apprentices, as reported by host farmers.**

Formal Educational Attainment	Sum	Percentage
Some High School	4	0.65%
High School Diploma	55	8.90%
Vocational/Trade School	4	0.65%
Some College	127	20.55%
Associate's Degree	19	3.07%
Bachelor's Degree	345	55.83%
Some Graduate School	7	1.13%
Master's Degree	18	2.91%
PhD	6	0.97%
Other	0	0.00%
Unsure or I don't know	33	5.34%
<b>TOTAL</b>	<b>618</b>	<b>100%</b>

**Figure 7: Highest Level of Formal Education of On-Farm Apprentices, as reported by host farmers**



### *Apprentice's Non-Agrarian Backgrounds, Low Access to Farmland*

Survey respondents reported that apprentices are typically not from a farming background, and they typically do not have farmland in the family that they may inherit. Because of the very low standard deviation around these responses, there is significant consensus here. Also, respondents reported that apprentices typically had between 0-2 years of farming experience prior to starting the apprenticeship program, with the average experience being 4 months, and the mode (most common) response of 0.0 years of farming. In other words, the data suggests that most apprentices do not have any experience with farming prior to starting the apprenticeship program. Interview data corroborates this conclusion. One farmer states:

*And those are your typical intern, coming from the city, who's looking to just get out. Really fresh ideas, super crunchy granola kind of kids.* (Farmer)

This farmer addresses the fact that most apprentices are not from a farming background, and indeed may not even be from a rural background. A theme that emerged was that apprentices do not have access to agriculture, and the apprenticeship provides a bridge into agriculture for them. The below farmer also associates the bridging into agriculture with the small-scale sustainability movement:

*Then they say Ok, well I need to go work for somebody and learn. I'm sure that there are people like that for sure, But it does seem like many people in the organic, sort of sustainable movement, smaller scale are not from that background, which is one of the reasons they start with the small scale is that they don't have any infrastructure, and they don't have a farm to start with. They don't have tractors and things like that. Starting it small scale is the entry point, it doesn't require much overhead.* (Farmer)

Interestingly, the above farmer not only addresses the fact that apprentices are not from a farming background, but also that they don't have access to a farm, or land, or equipment. He postulates that this is quite possibly the reason that small-scale agriculture is a more attractive

model to many apprentices or would-be beginning farmers, because a small farm is an attainable farming model for those who lack of start-up funds.

**Question 1b: What are the most important educational practices, structures, or institutions that support on-farm apprenticeship learning?**

Overall, I can suggest several important educational practices, structures, and institutions that support on-farm apprenticeships. Farmers in this study did not seek advice from Extension or other agricultural organizations before starting their apprenticeships, and mainly talked to other farmers about the program. They tended to advertise the program online and through word of mouth, and apprentices were paid a small stipend, often less than minimum wage. Additionally, results touch on the embeddedness of on-farm apprenticeships within alternative food movements, and how this might translate to less-than-standard labor practices. In particular, the results suggest that labor practices may be more acceptable to upper- to middle-class apprentices who are motivated by intellectual critical engagement with the food system. These results are discussed in the subsections that follow.

***Farmer Educators Use of Informal Learning Networks***

Both survey and interview data were very helpful in uncovering the most important educational practices, structures, or institutions that support on-farm apprenticeship learning. Before starting their apprenticeship programs, most respondents had not sought advice from a handbook or guide, agricultural organization, or the Extension Service. Approximately two-thirds of respondents did seek advice about their apprenticeship program from another farmer, however, which suggests they rely on informal learning networks. Thus, they may not be using the guides described in Chapter Three of this thesis, for their apprenticeships.

### *Farmer Educators' Advertisement of Apprenticeship*

Respondents tend to advertise their apprenticeship programs most commonly through online venues and word of mouth, and least of all through print media. The most popular online venue was ATTRA, which may be due to dissemination of the survey to all who advertised through ATTRA. The second most common online venue was reportedly “social media (Facebook, blogs, listservs, etc.). Other online advertising venues of note included Good Food Jobs, WWOOF, and the farm’s own website.

### *Apprenticeships as Unstructured Learning Experiences*

Data also suggests that there is a wide range of ways that apprenticeship programs are structured. A paired-sample t-test (2-tailed) reveals a significantly higher agreement among survey respondents to the statements, “I make sure apprentices learn how to do a wide variety of tasks on the farm,” and “I include apprentices in marketing activities (farmers market, roadside stand, etc).” The statistical test revealed that it is not a common practice among respondents to require a written, signed, work agreement with apprentices, to have a probationary or trial period when apprentices first start, to provide incentives for apprentices to stay for the full season, or to have an established orientation process, despite the farm apprenticeship handbooks and guides recommendations to do so. This would indicate that while farmers are giving apprentices a wide variety of experiences on their farms, they do not commonly have formalized structures for the apprenticeship program.

Survey respondents were asked to rank how often they provided certain educational activities to apprentices on a 4-point Likert scale ranging from “often” to “never.” A paired-sample t-test (2-tailed) was used to measure responses that were provided significantly more often than other

responses. The statistical test indicates that survey respondents commonly provide the following as educational activities for apprentices:

**Table 6: *Teaching Strategies Commonly Employed by Farmers as Educators***

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<b>Teaching Strategies Most Commonly Employed to Teach Apprentices</b>
Verbal explanations of new tasks
Hands-on demonstrations for new tasks
Working side-by-side with the apprentices
Explaining the “why” not just the “how” of farming
Discussing their philosophy of farming with apprentices
Personalized feedback to each apprentice after seeing how they perform a new task

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The paired-sample t-test (2-tailed) also revealed that survey respondents provide the following (below) educational activities significantly less often (than the above list):

**Table 7: *Teaching Strategies that were Least Popular with Farmer Educators***

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<b>Least Popular Teaching Strategies Employed to Teach Apprentices</b>
Indoor classroom-style classes on their farm
Written worksheets or other curriculum on farming
Have apprentices journal or do other writing about farming
Scheduled lessons or meetings with other farmers
Have apprentices go with them on errands

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The above list of educational activities typically provided by respondents is conspicuous in its bias against more formalized, school-like, or written activities. The activities typically undertaken are tasks that would allow for social, situated learning to occur, and personalized learning in a one-on-one relationship with the expert farmer. This reinforces the idea that the apprentice is being granted legitimate peripheral participation.

### ***Stipends***

Overall, data suggests that small stipends are typically provided to on-farm apprentices. Survey respondents agreed highly with the statement, “I provide stipends or other monetary

compensation for apprentices.” Interviews revealed the theme, however, that apprentices, while perhaps receiving some compensation, are often paid less than minimum wage. One apprentice discusses how pay was less than minimum wage:

*[Pay was] less than minimum wage, when you add up all the hours. It was a stipend, probably... I think it was like a few hundred dollars a month, or 500 dollars a month.*  
(Apprentice)

Apprentices also discussed stipends in light of appropriate payment for services rendered. In particular, many were not wholly satisfied with the compensation. The below apprentice discussed the low pay received during her apprenticeship, especially since she was aware that she was providing necessary labor for the farm:

*But again, you kind of start to think about it, and it's like, well, I'm not technically an employee, I'm an apprentice. You know, I'm getting paid, like, maybe five bucks a day for this work. How much can you enforce that type of labor restrictions on me, you know? We were apprentices treated like employees. And I think that's true of a lot of farms.*(Apprentice)

### ***Apprenticeships Embedded within Alternative Food Movements***

Data suggests that apprentices and farmers who host apprenticeships see themselves as part of a larger community food systems movement. This emerged as an important body of knowledge and practice that supports and interacts with the on-farm apprenticeship phenomenon. Apprentices invariably showed expert knowledge of community food systems and alternative food institutions, and, in their statements, showed a feeling that they were not just learning farming, but that they felt they were a part of a larger food system, in which they are also intellectually interested. One apprentice puts it simply:

*So that's a little bit about me, a little bit about how I got into this food system world. Beyond that, just my own personal interest with local foods and eating healthy and cooking and connection to food.* (Apprentice)



So, the above apprentice described not only how she got involved in an apprenticeship but how she was a part of an alternative food system. The below apprentice also begins her story about how she became interested in an on-farm apprenticeship through intellectual engagement with alternative food systems. She states:

*So when I went to X University in (town), I began to kind of learn about factory farming and food systems, and of course instantly because a vegetarian, and a food rights activist, and just started really educating ,myself about what was happening in the world, because I had no idea. (Apprentice)*

The apprentices spoke of these issues as an important factor for why they had been motivated to undertake an apprenticeship on a farm. The on-farm apprenticeship is therefore connected to part of a larger critical engagement with analyzing the food system. Specifically, most discussed their apprenticeship in terms of improving the food system to be more sustainable (as sustainability is understood by the apprentices). The below apprentice expresses a connection between farming and “saving the planet” as she says:

*So most people my age are like ‘oh, you work on a farm, that’s awesome.’ I feel like our generation is like totally down with it. They’re like, that’s cool! You’re saving the planet! You’re feeding people! Rock on! (Apprentice)*

Farmers, also, understand that prospective apprentices are intellectually interested in sustainable agriculture, and may seek those who are interested in sustainable agriculture. The below farmer requests that prospective apprentices explain their interest in small-scale and organic agriculture in order to be considered for an apprenticeship:

*We ask for cover letter and resume, um, specifically, detailing experience in and interest with small scale organic agriculture. (Farmer)*

While the below apprentice thinks that was why she was hired as an apprentice:

*I think that’s one of the reasons he hired me, I think just kind of that gentle touch with the plants, and really the appreciation, you know. (Farmer)*

The interview data created an association between intellectual engagement with alternative food systems and on-farm apprenticeships. Also, farmers and apprentices discussed how apprenticeship programs are embedded within alternative food movements because they may produce food system advocates or professionals more than farmers. Only one apprentice that I interviewed was in the process of starting his own farm, and the others were working in other professional roles within alternative food systems. As one farmer explains:

*And all those people [apprentices], they went on to be [food] activists or educators or researchers or just eaters, so in a sense, that's great, but at least with [farm], we got grants to pay people to be there, to pay them like the normal farm wage, and even included health insurance. Um, which is really good. Yeah. And the idea was to support them while they learned, but you know we still struck out more than we hit. (Farmer)*

The above farmer states that many apprentices went on to be engaged intellectually with food system work, but he lamented that more apprentices did not go on to begin farming.

### ***Considerations of Labor Standards***

In general, survey data showed that the average length of the farm stay for the apprentice on the farm was 20 weeks, but this varied widely between just one week and up to one year. Respondents host, on average 2-3 apprentices on their farm at one time. However, some respondents host just one at a time, while others report having 15 at one time. Approximately 4 out of 5 respondents provide some sort of housing for apprentices, and approximately half of farmers provide housing on the farm, in a separate building from their own homes. Approximately 2 out of 5 respondents are sharing kitchen and bathroom facilities with apprentices.

Another theme that emerged was that apprentices may sometimes be subject to substandard housing. This was occasionally related to the association between apprentices and alternative food movements, in that the critical engagement with food system analysis could

create a strong intellectually-driven motivation to do the apprenticeship, even if housing is not up to usual standards. The below apprentice explains unpleasant aspects of living in substandard housing conditions throughout her apprenticeship:

*I think it's an issue with apprentices, is the housing, and it's something that I've noticed in other friends that have had apprenticeships, who have done farm apprenticeships, is housing can be pretty sub-par. You know? At the end of the day, the farmer gets to go home. The apprentice usually has minimal. We were sharing a trailer and a tent. And you know, it was a tiny trailer. And the couple lived in it when they first bought the farm. So it had already been used. There were mold issues in there, there were mice. (Apprentice)*

The way this relates to the alternative food system is further elaborated through another apprentice who discussed substandard housing. The below apprentice suggests that because apprentices are driven by intellectually-driven values, they may be more likely to idealize their situation, which makes them less likely to issue complaints. The below apprentice explains:

*I think if somebody had brought it [substandard housing] up, they would have, but, we were all kind of like, radical hippies, and it didn't seem to matter. It made me a little uncomfortable. I was a little self-conscious. (Apprentice)*

The interaction between this intellectually driven, critical engagement with the food system and the substandard housing conditions may be partially intimated by another apprentice:

*It's a very simple, very frugal lifestyle. And in some ways I think it is good for Americans to experience that. (Apprentice)*

So, the critical engagement with the food system could quite possibly also be linked to the same critical engagement with lifestyle consumption patterns of “Americans.” This would make sense, considering overlaps in discourse between sustainable agriculture and the environmental movement (see Carolan, 2012; Lyson, 2004). If true, this would partially explain why apprentices are accepting substandard housing conditions, considering their values-based motivations for engaging in agriculture.

Also, an important theme to emerge from the interviews, corroborated by survey data (see ‘farmer educators’ motivations for wanting to farm,’ also in this chapter), is that farmers view apprentices as a source of necessary labor. However, they view the educational experience as in-kind payment. The below farmer illustrates this point succinctly:

*And so make no bones about it, they’re here to operate the farm. But they’re hopefully going to get a world class education on how we do our farm. (Farmer)*

Another farmer agrees with this assessment:

*Um, but our goal really is to make it an educational experience, in that they’re going to work hard here, um, you know, at not a lot of pay. (Farmer)*

Also, class issues emerged as an interesting theme throughout the interviews, as they pertain to on-farm apprenticeships. Apprentices discussed how in the living arrangements of on-farm apprenticeships may only be desirable to middle- or upper-class individuals. This may be because the experiences are only accessible to those who can afford to receive low pay for the duration of the apprenticeship. As one apprentice nicely (if not succinctly) explains:

*If you think of somebody who might have come from a low income or single parent family, they want to be a farmer, but they might be trying to go to school, so they’re paying off their own student loans, which means they probably need to work a job that pays them. And so I think the reality is, yes, somebody from that [low income] background could do it, but in their minds, is that a sacrifice that they’re able to make? I’m not sure that many would say yes...you actually end up losing a lot of money as an apprentice, if you don’t have – you know it’s also to me, a class issue, right? The people who can afford to take the financial risk of doing apprenticeships, are people who have either done a great job at saving money, or have had the support of their families while they’re in school or while they’re in the apprenticeship. And so that makes apprenticeships only accessible, usually, to people who come from well-off backgrounds. (Apprentice)*

The above apprentice brings up a real challenge for on-farm apprenticeships, in that they may be affordable only to middle- to upper-class individuals. According to the apprentice, this inaccessibility is due to the low pay of an apprenticeship within the context of specific

arrangements of an apprenticeship. This challenge can be a barrier to start farming, and is important in understanding on-farm apprenticeships.

**Question 1c. How do expert farmers participate as educators in these on-farm apprenticeships?**

This data suggests that most farmers who host apprentices have attended college. Over half of survey respondents have had agricultural training through working on a farm, and have had adult education experiences (workshops, community programs, etc.). A two-thirds majority of survey respondents did not grow up on a farm. Farmer educators were motivated to host apprentices by a need for labor, and enjoyment. Farmer educators in this study taught through demonstration, verbal explanation, and working side by side, and often provide long term mentoring for some apprentices after they complete their apprenticeship. While most are unstructured situated learning, a few noteworthy exceptions do provide some structured lessons.

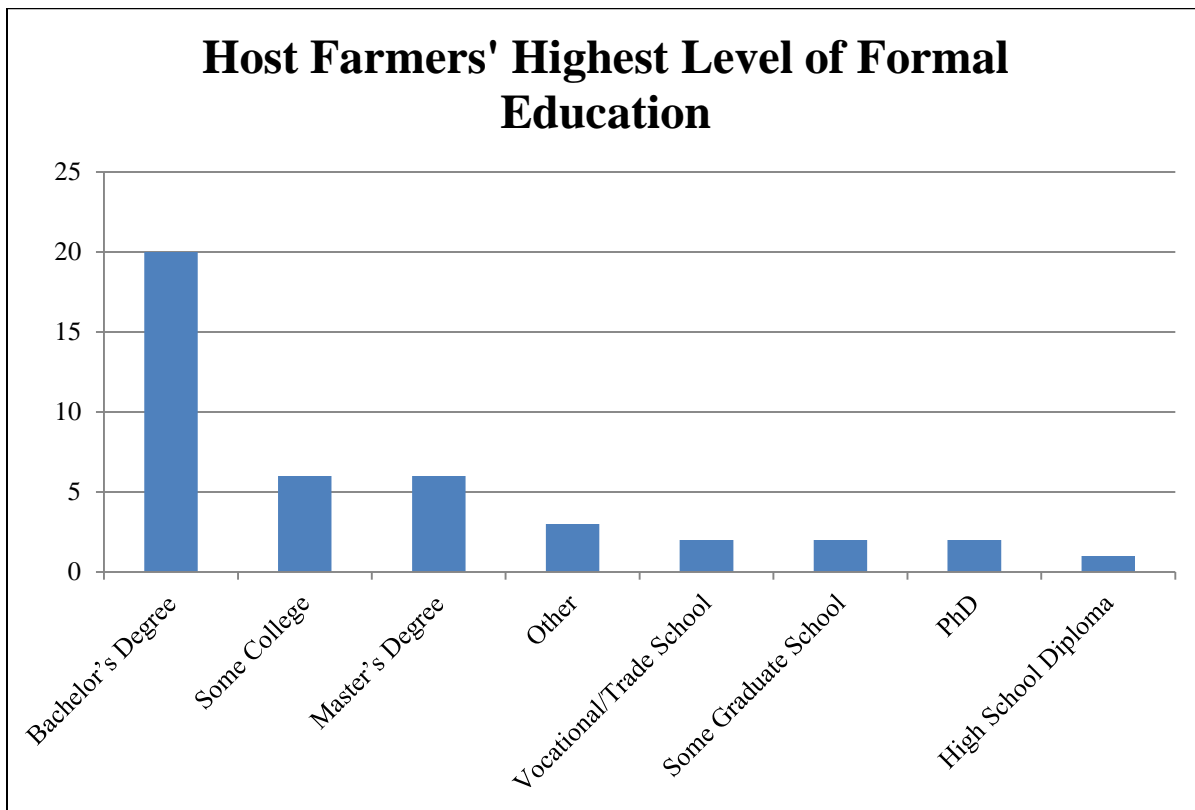
***Farmer Educators' Demographics***

Before learning how farmers participate as educators, it is helpful to get a snapshot of the educational background of farmer educators themselves. Of respondents, 92% have attended some institution of higher education, while 77% have earned degrees. Also, 19% have earned advanced degrees from institutions of higher education. Table 6 demonstrates the highest level of formal educational attainment by farmers, while Figure 8 provides a visual summary of these findings.

**Table 8: Host Farmers' Highest Level of Formal Education**

<b>What is your highest level of formal education completed?</b>	<b>Sum</b>	<b>Percentage</b>
Some High School	0	0%
High School Diploma	1	2%
Some College	6	14%
Associate's Degree	0	0%
Vocational/Trade School	2	5%
Bachelor's Degree	20	48%
Some Graduate School	2	5%
Master's Degree	6	14%
PhD	2	5%
OTHER	3	7%
<b>TOTAL</b>	<b>42</b>	<b>100%</b>

**Figure 8: Host Farmers' Highest Level of Formal Education**



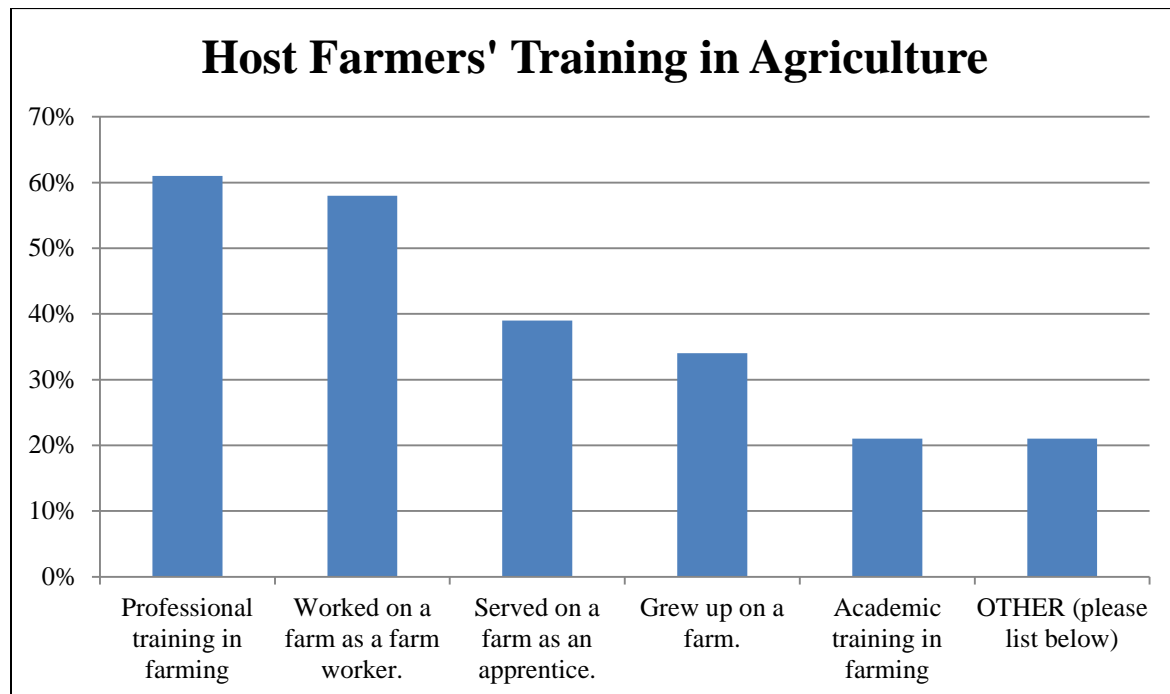
Respondents have had previous training in agriculture through professional training (workshops, community programs, etc.) and through working on a farm as a farm worker. Also,

66% have received professional training in agriculture, while 39% once served on a farm as an apprentice, and 66% did not grow up on a farm. Table 7 details these results about farmer training in agriculture.

**Table 9: Farmers' Training/Background in Farming**

<b>Farmers training in agriculture</b>	<b>Sum</b>	<b>Percentage</b>
Grew up on a farm.	13	34%
Served on a farm as an apprentice.	15	39%
Worked on a farm as a farm worker.	22	58%
Had some academic training in farming (in high school, college, etc.).	8	21%
Had some professional training in farming (workshops, community programs, etc.).	23	61%
<b>OTHER</b>	<b>8</b>	<b>21%</b>
<b>TOTAL</b>	<b>38</b>	

**Figure 9: Host Farmers' Training in Agriculture**



Farmers who host apprentices are often not from a farming background, and may not often be from the location where their farm is located. Four out of five farmers that I interviewed had not grown up on a farm, and most had all got their knowledge of agriculture through various forms of experiential learning. The below farmer talks about how his farming community, which he describes elsewhere as the more sustainable farming community, and how they are not from an agricultural background:

*We're talking about like, people who went to school, and then maybe lived in the city for a year or something, and then somehow got hooked on farming, but like our – like, we're not from the area where we end up farming. And then, so, in a sense, we're not, tapped into that community.*(Farmer)

By considering the words of the above farmer, we see that he reveals that he identifies with others who also did not grow up on a farm. Three of those interviewed had completed farming apprenticeships themselves. The below farmer describes how the apprenticeship experience was his only farming experience prior to starting his own farm:

*I started as a volunteer, actually. For three years at (local organic farm) in (town), and after that, I became an intern for two years. So in a sense, our system is almost identical to the route I took. Volunteer for a number of hours, and then took an internship... and that's the only experience I have.* (Farmer)

So the above farmer suggests that his farm's apprenticeship program is similar to the one he undertook when he was younger. The success stories of the farmers I interviewed, who had been apprentices once themselves, also highlights the potential of apprenticeship programs in successfully bridging entry into farming for those not from a farming background. Overall, data suggests that farmers who host apprentices are most often younger, white, well-educated, often not from a farming background, and have learned farming through work and other means of adult education.



### *Farmer Educators' Motivations for Hosting Apprentices*

Survey respondents were asked to rank their motivations for hosting apprentices off a list of common motivations, which was based on the National Family Farm Coalition's mentoring toolkit (Mills-Novoa, 2011). Respondents indicated that their biggest motivation by far for hosting apprentices on their farm is that they need labor for their farm. Beyond that, they also want to help train the next generation of farmers, to share the farming lifestyle with others, and they enjoy teaching. These results suggest that apprentices are filling a need for labor on farms. The labor component also emerged as a theme in the interviews. The idea that apprentices were needed to serve as the labor force for the farm was repeated by every farmer and apprentice I interviewed. While apprenticeships are presented theoretically as a win-win situation for both farmer and apprentice (because the apprentice receives education in return for work), themes that emerged from the interviews painted a more complicated picture. For example, the below farmer addresses how the farmer may not actually want to an apprentice but feels that labor cannot be obtained in other ways, and that the arrangement may not always be positive for the apprentice, either:

*And I think a lot of farmers do really want to work independently, but they know they need the labor, they know an apprentice is low cost, you know, when you're talking about dollars, but it doesn't always work out. Like maybe they're not really good at communicating, or teaching, you know, or like I said, the living situation is just very bad for the intern, or the intern thinks it will be much more romantic than the actual grunt work is going to be, you know? (Farmer)*

At the same time, another theme that emerged from the interviews was that farmer educators would rather have apprentices than farm workers, because they are more interested in farming. Farmers may do so because want engaged thinkers to work with. As one farmer states:

*We want critical thinkers working here with us, and to be engaged with the work, thinking about it critically, and how to make it better, not just 'OK, you told me to do something, I'm going to work hard to remember that and do it.' (Farmer)*

The below farmer agrees with this sentiment, and goes on to explain the enjoyment experienced in teaching apprentices rather than simply supervising:

*And I guess personality-wise, too, we enjoy being part of a team that is all interested in learning together and making something better, rather than being bosses of hired hands. So those were all the reasons we thought about using apprentices from the get-go, from our earliest planning, however many years ago that was, and we like that interaction, we like that relationship between engaged learners. (Farmer)*

So the data would suggest that farmers are motivated primarily by needing labor for the farm, and secondarily, by wanting to have helpers that are interested in farming.

### ***Farmer Educators Demonstrate, Verbally Explain, Work Side by Side***

In keeping with the unstructured learning experiences that apprentices are receiving, farmers in this study demonstrated new material, verbally explained farming, and often worked side by side with apprentices. An interview theme also emerged that elaborate on how farmers work side by side with apprentices. The below apprentice describes:

*She [the farmer] would do it and just sort of just delegate tasks to us, and sort of work side by side with us, and we would just sort of learn as we were watching her and working with her. (Apprentice)*

Many farmers and apprentices interviewed described how farmers use a combination of verbal explanation and demonstration to teach new tasks to apprentices. One apprentice describes a typical learning experience alongside a farmer, below. She states:

*I know I have probably asked them the same questions like 15 times, and then every time they're like, oh yeah, let me go out and show you. Until you feel totally comfortable, they're willing to teach you, or re-teach you, or show you a different way to do things. ... Or 'hey come look at this right here. This is what it's supposed to look like, that's not what it's supposed to look like.' (Apprentice)*

So the above apprentice has experienced social learning alongside the farmer. The farmer has explained and demonstrated new skills, and then is willing to continue the teaching,

providing feedback, and prolonged social interaction to the apprentice. Another apprentice (below) describes a similar experience involving both verbal and demonstration of skills:

*One of them would literally grab the seedlings that they were going to be working with, and literally show us, and talk about the technique associated with it, and then we would have our own set and we'd be working on it, and they would give us feedback as we were going. So like, 'plant that deeper, or shallower, or be really gentle with the roots, or make sure you're compacting the soil a little bit.' So they would work really closely with us on each task until they felt like we understood it. (Apprentice)*

So the above apprentice has described how the farmer would work closely with the apprentice to provide one-on-one feedback, via verbal communication and demonstration, during the acquisition of new skills. This describes a mentor-mentee relationship in which social learning is occurring, and demonstrates that farmers were guiding apprentices through a Vygotskyan zone of proximal development. Through this assisted development, farmers and apprentices alike valued open communication is key, and questions were welcomed. One apprentice explains her feelings that her farmer educators were openly communicating:

*They're very, like, they go with the flow of things, they understand that mistakes happen, and they understand that they make mistakes, and I feel like as long as we all keep open communication, which is something that's important to all of us, to all parties, then everyone's fine, you know? (Apprentice)*

Another apprentice (below) explains how questions were welcomed, in a situation where communication is open and important:

*The questions were welcomed, like, they didn't have a set curriculum or anything like that. (Apprentice)*

So farmers were participating as educators through assisted development, openly communicating, demonstrating, and providing feedback, in which the apprentice was guided through a zone of proximal development. This teaching process is also evident in another theme that emerged through the interviews – that farmers would explain the “why,” rather than just the

“how” of farming. Farmers talked about how they tried to explain to apprentices the decision-making process behind their farm tasks, as the farmer below:

*And then within that day, and I should add that decision-making was made transparent, so we would explain why we were doing something that day or why we were changing what we were doing that day, given situations. Um, when it came time to, ‘what are we doing?’ so it came time to train them, we’d give them some context. A lot of times we would go out of our way to do that. (Farmer)*

So the above farmer would make sure to give his apprentices context for the daily tasks.

The fact that farmers explained the “why” of farming tasks to apprentices shows that farmers placed value on the learning of apprentices, rather than just giving them enough information to finish the task at hand.

### ***“Formal” Learning Structures in Apprenticeships***

Additionally, interviews also showed that some farmers indeed did provide some structured lessons, although the bulk of the learning occurred as situated learning in unstructured settings. One apprentice described how they had one class per week, which included other experiential learning such as farm tours, in which apprentices learned about a topic of interest to agriculture. She states:

*So kind of the program of the apprenticeship was that you work as a farmhand. You get paid a small stipend. Every week on a certain afternoon, we’d end early and have a class, or we’d go to another farm and do a tour. And so the classes were oriented to farming and permaculture, and even some herbalism. (Apprentice)*

So this apprenticeship did offer a structured lesson in a topic pertaining to farming once a week. Another of the farmers had designed an apprenticeship program that was conspicuously more structured than the others. The farmer, who had been a graduate of a more structured apprenticeship program, was crafting a curriculum that will follow a logical progression. He outlines the beginning of his proposed program, below:

*[The first quarter] we cover the basics of why, we emphasize more on policies, responsibilities, work ethic and that kind of thing, rather than me going over 'hey this is what happens every day when we take care of the animals.' The second quarter really goes into the fundamentals of why we do what we do, you know what are the reasons for, every day, down to the plant level. Basically mastering how we do it. (Farmer)*

So although most apprenticeship programs do not have a structured curriculum and rely on more assisted development within the mentor-mentee relationship for learning, a few are more formalized in their approach to learning farming.

Also, farmers often discussed how apprentices must build up over time before they will be able to perform more difficult tasks. In this way, farmers are deliberately crafting a pattern, a logical progression to give apprentices more independence and responsibility as they learn. This is a way that farmers indicated they are guiding apprentices through the zone of proximal development, as in Vygotsky's (1986) assisted development, in a mentor-mentee relationship. As one farmer describes:

*We try to make sure we work alongside of someone at first, with a new task, and then leave to give them their own space to do it, and then return and check in, um, see if they're still doing it the way it needs to be done, or if they have any other additional questions, or ideas, suggestions, et cetera. You know? (Farmer)*

### ***Long-Term Mentoring***

Lastly, farmers may participate as educators by serving as more long-term mentors to apprentices. Over half of survey respondents talk to and see former apprentices. Low standard deviation means that there is some convergence around the fact that farmers talk to and see former apprentices. This would mean that the situated learning in an apprenticeships could occur past the duration of the farm stay, and lead to a true mentor-mentee relationship.

**Question 1d: How do farm novices adopt expert identities through on-farm apprenticeships?**

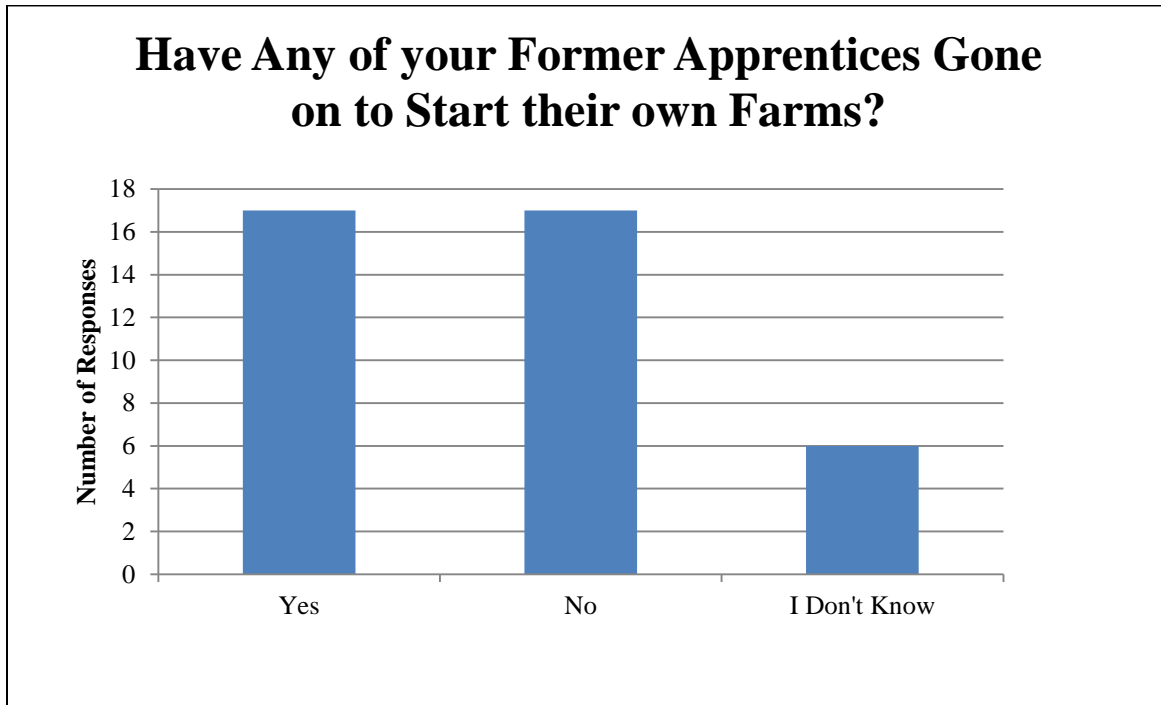
Results from this study, as outlined in the below subsections, suggest that apprentices do occasionally adopt expert identities. There is evidence that some do go on to start their own farms, and produce some of the same products as their former host farmers. They may create expert identities through the situatedness of the apprenticeship, which includes a sensory, corporal element, and simply doing the work, when the stakes are real. Also, emotional exchange between farmer and apprentice emerged as an important way apprentices give meaning to their learning.

***Apprentices' Rate of Entering and Continuing Farming***

Of great interest is how novice farmers adopt expert identities through their apprenticeship experience, and if this will help them build identities as expert farmers. Survey respondents were fairly lukewarm, and had little consensus, around the statement “Through their apprenticeship, most come to see themselves as farmers.” So does Lavian legitimate peripheral participation cause an identity shift through participation in a CoP with an expert farmer?

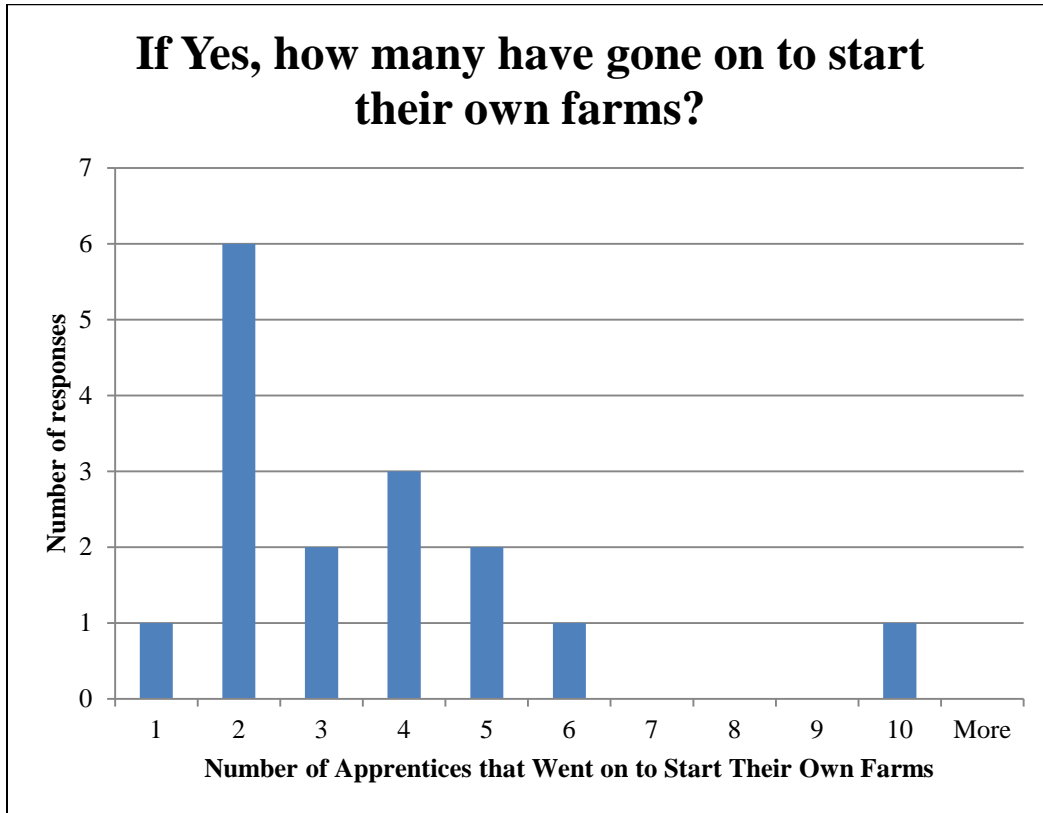
Survey data shows that a proportion of apprentices on respondents' farms have gone on to start their own farms after their apprenticeships. Of survey respondents, 43% reported that they knew of apprentices who had gone on to start their own farms. Figure 10 demonstrates the proportion of farmers who knew of apprentices who had gone on to start their own farms.

**Figure 10: Farmer Educators' Reported Rate on Apprentices Starting Farms**



A total of 57 apprentices represented in this study reportedly went on to start their own farms. The average number of apprentices to continue from each farm was 1.4 from all farms, and 3.6 from farms that reported that they knew of apprentices who had gone on to start their own farms. Please see Figure 11 for a visual display of this data.

**Figure 11: Number of Apprentices that Went on to Start Own Farm, from Respondents that answered “Yes,” Some Have Gone on to Started Their Own Farms**



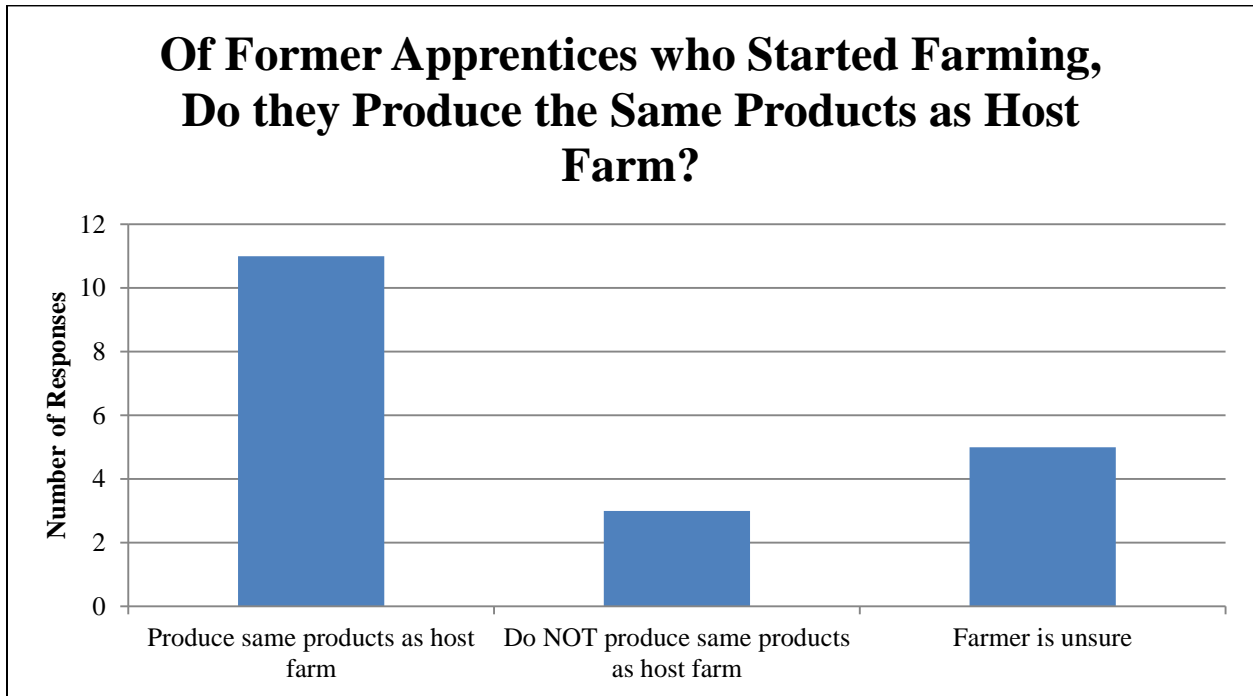
So, from this data, an aggregated (rough) estimation can be derived, to tentatively suggest that approximately 7% of apprentices reported upon in this survey have gone on to start their own farms after the apprenticeship. Thus, this data intimates that a select few do go on to start their own farms. This provides a small hint at the fact that some apprentices may adopt expert identities in order to start their own farm, although more research is clearly needed to arrive at a good estimation of how many, how often.

Of those surveyed, it is also interesting that the farmers who knew of apprentices that had gone on to start their own farms also said that more often than not, apprentices who had started their own farms raised the same products as the host farm. This data suggests that situated learning allowed the apprentices to develop identities that included raising these products. Please



see Figure 12 for a display of how many apprentices reportedly raise the same products as their former host farmers.

**Figure 12: *Proportion of Former Apprentices Who Started Farming who Produce Same Products as Host Farm***



So, this data would suggest that apprentices occasionally do go on to start their own farms. Of those that start their own farms, many raise some of the same products as their host farm, which could suggest that they also have diversified production schemes. Interestingly, this data also suggests that although a significant portion (43%) of farms answer “no,” when asked if any apprentices have gone on to start their own farms, when averaging out all farms participating in this study, the rate of producing apprentices is 1.4 per survey respondent. This data point suggests that the population of farmers who host apprentices is overall replacing themselves within the farmer population. Overall, this data suggests that some apprentices indeed form expert identities sufficient to start farming operations of their own.

### ***The Value of Situated Learning on the Farm***

Of those farmers and apprentices interviewed, many discussed the value of situated learning in farming. There emerged an understanding that farming is best learned in situ, on the farm. The apprentice, below, discusses the value of situated learning in farming:

*I think that's the most necessary part of the experience, of learning. Because farming is not something you can read a book about and then go do. You really need to see it. At least that's how I feel about it. (Apprentice)*

That the above apprentice states that farming “is not something you can read a book about and then go do” seems to say that farming, specifically, requires situated learning, more than other topics one could learn. The below apprentice agrees, and adds that there is a sensory, corporal element to learning agriculture that is important. She states:

*That's what I loved about the farm apprenticeship, is like, what better way to learn to farm, than to farm? It gets ingrained in your muscles. You learn the plants basics, you learn the sowing rate, you learn what are weeds, what aren't. You learn it in your body, I mean you learn something like that, and it's kind of hard to unlearn it. (Apprentice)*

The above apprentice is stating that through the visceral, physical sensations that are felt in situated learning, the knowledge will be retained more effectively, as she states, “it's kind of hard to unlearn it.” The sensory elements are part of the context of the learning experience. Spoken of these terms by interviewees, it is obvious that the context is not wholly separated from the learner. Both are acting upon one another and co-constructing reality.

Another theme that emerged in the interviews is the nuances of knowledge that can be gained in situated learning. For the below farmer, the situatedness of the experience also makes it more effective in ways that seem to be hard to put into rational words, as he discusses his apprenticeship he underwent when he was younger. The above farmer is expressing that there are nuances of knowledge in farming that can be learned through the apprenticeship experience. He

describes farming as having a “unique flavor” that takes a while to “build,” in his below statement:

*It [the apprenticeship] gave me a really strong taste of what it takes to be successful, in really any business, but farming has its own unique flavor of business, and especially for my generation, raised on video games and pop tarts, we really don't have a lot of appreciation for what it takes to build something successfully.*(Farmer)

Also, in light of the survey data's suggestion that most apprentices have attended college, it makes sense that apprentices were aware of and in appreciation of the differences between classroom learning and their apprenticeship learning experience. A common theme that emerged from the apprentices interviewed was negative impressions of the formality of their school education, and satisfaction with the situated learning that occurred naturally through their apprenticeship. As one apprentice states:

*You know when I was in college I was getting frustrated because it was all academics, and nothing hands on. And now over the years, I've realized that I am such a tactile experiential learner, and that's what I loved about the farm apprenticeship.* (Apprentice)

The apprentice here compares her experience as an apprentice to her formal schooling, and preferred the situated learning that took place on the farm. Another apprentice also preferred the situated learning approach. She states:

*I was out there and I dug a thirty foot trench for her [the farmer]... on the second day, and that was more satisfying than my entire last semester in undergrad! And so it was part of affirmation of just, you know, you need to do some hands-on stuff if you're going to be really happy.* (Apprentice)

This data demonstrates that the apprentices and farmers themselves acknowledge that the situated learning that occurs during their apprenticeship was more satisfying than school-based learning. Indeed, some felt an emotional and sensory connection to the farm, which created

learning. Indeed, many interviewed expressed their belief that farming was best learned in context, by farming.

### ***When the Stakes are Real***

Importantly, apprentices come to identify as a farmer due to performing activities as a farmer in a real context. Many who were interviewed described how identity as farmer comes not from knowing things, but from doing the job of the farmer, and it happens gradually. One apprentice describes her identification as a farmer:

*I felt like I, especially when I was doing the urban farming, I was like, I'm an urban farmer. You know, I'm doing this, I'm – I've got my planting calendar, I'm handing out tasks, I'm making sure everything is grown well, overseeing it all. I felt like every much a farmer. (Apprentice)*

So for the above apprentice, the work of doing the job of the farmer made her feel like a farmer. It was precisely in doing the job, as an expert farmer would, that made her identify herself as a farmer. The below farmer describes how her apprentice seemed to experience an identity shift during her apprenticeship. In the below statement, it seems to be, again, the activity of doing the job of a farmer, in a social context, that creates the identification as a farmer:

*It's been wonderful to see her identify herself as a farmer. She's like, 'I am now a farmer. I am living this life.' ... it's been neat to see her make that transformation. ... she goes to public places or talks with people, and it started when she was waiting tables, you know, people are eating food and she's like 'I am a farmer. I grow food, and now you're eating it.' (Farmer)*

Another interesting theme to emerge from the interviews is that the learning of farming happens when the stakes are real and potential consequences are felt. Apprentices realized that whether or not they do the job correctly has real consequences. This gives them motivation to learn, and thus imbues their new knowledge with meaning. As one apprentice puts it:

*There are stakes. This is their livelihood. So you know you're not just in a academic setting where you're like, oh, this whole row of something dies, it's just that I'll get a B. I*

*don't know how that works. But you know, it's like, if this whole row of stuff dies, that's like, hundreds of dollars of produce that we're not bringing in and so it's like, it gives you that extra momentum for you say 'I'm going to care for these!' (Apprentice)*

So the data suggest that a big part of the situated learning that occurs in an apprenticeship is due to the reality of the situation in which the work is done. Learning in this way cannot be devoid of real life effects. The distinction here is that effects and consequences are natural and follow logically from actions of apprentices, creating raw, natural motivation and authentic meanings around the material to be learned.

### ***Emotional Exchange and Learning***

The above apprentice also shows also a sense of empathy with the farmers, when she acknowledges that she is moved by the fact that their livelihoods depend on the farm products. This also touches on Vygotsky's idea of intersubjectivity, which also emerged as an important theme in apprenticeship learning and identity formation. Intersubjectivity aids in identity formation as apprentices more accurately perceive how the farmer does farming by being an astute observer of the unspoken as well as spoken. In short, the apprentices learn from emotional reactions of others, without having to be told. One farmer recalls a powerful apprenticeship experience he had when he was younger, as he once failed to harvest enough carrots due to the frozen ground:

*I walked back from the fields, with a bucket, and they were like, 'where are the carrots?' and I was like, it was frozen and I couldn't do it, just sort of explained, and. I could see how pissed he was, And it wasn't that he yelled at me or anything, but that he was really upset... and part of it to me, was like, what I did mattered, and the way I did it, and whether or not it worked, and how much time I spent. I learned a lot just by watching people's reactions, by watching people's reactions, who, this was their livelihood. (Farmer)*

The above farmer is describing how motivated he was, and how much he learned from the experience, not because of anything that was explicitly verbalized, or deliberately

demonstrated, but through astutely perceiving the emotions of the farmer. This is a vital piece to understanding how learning occurs in on-farm apprenticeships. The mentor-mentee relationship is powerful not only because of information about farming, but because within the emotional landscape of both mentor and mentee, a deep well can be accessed that allows knowledge to sink deeper and stick stronger than other abstract, objectified, intellectually-based forms of learning.

Apprentices experience identity shifts not only through emotional experiences with other people, but also with the experiences within the physical place of the farm itself. Through the interviews, apprentices expressed how they felt a transcendental connection, often expressed as happiness, or joy, to the farm place.

*Just what it feels like to wake up every morning with the sun, and then put all of your energy into something outside and something living and growing, and I guess knowing it's possible. Um, that both of these people had livelihoods, um, they were outside, doing what they wanted, and made it, and somehow, worked it all together. (Apprentice)*

The data suggests that the situated learning that is occurring on farms in apprenticeships creates a space for emotional content. This means that apprentices are able to make meaning of the material that they are learning not just through logic, but through emotional exchange as well. Within this space, raw, natural meanings are created about the material being learned.

## **Summary of Results**

Results depict a snapshot, if still a bit blurry in parts, of on-farm apprenticeships in Virginia. Taking both quantitative and qualitative data together, the data suggest that situated learning is indeed occurring and supported by practices in on-farm apprenticeships. Apprentices are able to develop expert identities through on-farm apprenticeships due to the way in which their learning experiences unfold, and some do occasionally go on to start farming.

Data suggests that apprenticeships take place on farms that are small, diversified in production, and diversified in marketing, utilizing local and direct markets. Farms in this study affiliated themselves with sustainable agriculture, and often expressed difficulties in financial viability. Individuals who undertake apprenticeships are disproportionately white, college educated, and are not from a farming background, thus have low access to farming and farmland.

Farmers in this study did not seek advice from Extension or other agricultural organizations before starting their apprenticeships, and mainly talked to other farmers about the program. They tended to advertise the program online and through word of mouth, and apprentices were paid a small stipend, often less than minimum wage. Additionally, results touch on the embeddedness of on-farm apprenticeships within alternative food movements, and how this might translate to less-than-standard labor practices. In particular, the results suggest that labor practices may be more acceptable to upper- to middle-class apprentices who are motivated by intellectual critical engagement with the food system.

This data suggests that most farmers who host apprentices have attended college. Over half of survey respondents have had agricultural training through working on a farm, and have had adult education experiences (workshops, community programs, etc.). A two-thirds majority of survey respondents did not grow up on a farm. Farmer educators were motivated to host apprentices by a need for labor, and enjoyment. Farmer educators in this study taught through demonstration, verbal explanation, and working side by side, and often provide long term mentoring for some apprentices after they complete their apprenticeship. While most are unstructured situated learning, a few noteworthy exceptions do provide some structured lessons.

Apprentices do occasionally adopt expert identities. First, there is evidence that some do go on to start their own farms, and produce some of the same products as their former host

farmers. Apprentices and farmers alike indeed view situated learning as a satisfying and effective means through which to learn the more nuanced aspects of farming, and stress finer elements of the situatedness of the apprenticeship experience. They may create expert identities through the situatedness of the apprenticeship, which includes a sensory, corporal element, and simply doing the work, when the stakes are real. Also, emotional attachment to the farm place, and the emotional exchange between farmer and apprentice, emerged as an important way apprentices give meaning to their learning.

Apprenticeship programs are embedded within alternative food movements. Apprentices are an important labor force for the farm, but are often paid less than minimum wage. Farmers see the education as in-kind payment, but recognize that apprentices are needed to provide the labor for the farm. Apprentices may go on to be professionals working on alternative food systems more often than farmers. This association with alternative food systems means a more values-driven motivation to get involved in agriculture, which could possibly explain why apprentices in this study accepted substandard housing conditions and low pay. To further complicate the picture, apprenticeships may only be accessible to those who can afford to spend an indentured duration receiving less than minimum wage. Because apprenticeship may only be accessible to some, this leaves questions of class barriers to entry in sustainable agriculture.

Taken all together, results from this study hint at the state of apprenticeships in Virginia. Participants in this study report that apprenticeship programs are allowing apprentices to develop farmer identities. In all, situated learning is occurring in on-farm apprenticeships.



## CHAPTER 5: DISCUSSION AND CONCLUSIONS

### Introduction

This has been a mixed methods study to describe on-farm apprenticeship learning in Virginia. Because beginning farmers have been on the decline for several decades (Ahearn, 2013), this study can have impacts in the analysis of a potentially effective means through which to prepare beginning farmers. The theoretical framework I use in this study is situated learning as defined by Lave (1988; 1991), including constructs of CoPs (Wenger, 1998), and Vygotsky's (1986) thought and language.

Conclusions about on-farm apprenticeship learning are derived from mixed analysis of both quantitative and qualitative components of this study. The quantitative component consisted of a 38-question survey of Virginia farmers (N=45) who have hosted apprentices on their farms. The qualitative component consisted of interviews (N=12) of farmer educators and on-farm apprentices, which were transcribed, coded, and compiled. The quantitative and qualitative strands were mixed in the analysis phase to arrive at meaningful results.

The purpose of this chapter is to provide a discussion of the most meaningful results, recommendations for practice, and recommendations for future research. This chapter will also address limitations to the research. Finally, this section will conclude this thesis. To remind the reader, this thesis has sought to answer the following questions:

1. How do on-farm apprenticeships provide learning opportunities for beginning farmers in Virginia?
  - a. What kinds of on-farm apprenticeships are available and to whom?
  - b. What are the most important educational practices, structures, or institutions that support on-farm apprenticeship learning?

- c. How do expert farmers participate as educators in these on-farm apprenticeships?
- d. How do farm novices adopt expert identities through on-farm apprenticeships?

## **Discussion of Results**

Three interesting results emerged from this study, which merit further discussion. First, apprenticeships are sites for powerful situated learning, and on-farm apprenticeships indeed guide learners to create expert identities as farmers through the situated learning occurring in their apprenticeship learning experience. Second, the apprentices and farmers are embedded within a social movement which Allen (2004) and others (Guthman, 2008; Hinrichs, 2003; Sbicca, 2013) call the alternative food movement (AFM), in which values-based critical engagement with improving the food system is a large factor in on-farm apprenticeship learning. Third, the critical engagement in on-farm apprenticeships is a factor in the social reproduction that is occurring through these experiences. I discuss this in the below subsections.

### ***On-Farm Apprenticeships as Situated Learning***

Results from this study suggest that the structures, policies, and practices, and institutions of on-farm apprenticeships generate situated learning opportunities. Farmers led unstructured learning experiences, and mentor-mentee relationships were established in which emotional content enabled meaning co-creation. Also, apprentices and farmers alike expressed that farming is best learned when situated in context, and they expressed satisfaction, appreciation, and even joy that was derived by learning farming *in situ*.

Constructs of situated learning are helpful in describing how these educational practices can be effective in training beginning farmers through apprenticeship learning. I would like to point out that it was not lost on the apprentices and farmers in this study, who almost all expressed a value on the situatedness of the learning experience, and many expressed in various

ways that it was the “best” way to learn farming. The apprenticeship is clearly learning in context, on the farm, while the apprentice is situated within the farm fabric, contending with and manipulating physical elements and negotiating socially with people daily. The involvement as an official “apprentice,” with a title, a job to do, and often room and board provided, affords the novice learner a legitimacy, leading to their involvement with farm activities, jointly with the farmer expert, as a legitimate peripheral participant (see Lave, 1991). These circumstances were indeed affirmed by the participants in the study to be taking place in on-farm apprenticeships.

Interviewees reported that the situatedness of on-farm apprenticeships is important in making this a satisfying and effective learning experience. In particular, elements of context allowed the newcomers to learn the more nuanced aspects of farming, which are often highly visceral and sensory in nature. This includes attachment to place, expressed by those interviewed, where apprentices are in a free exchange with the many facets, tangible and intangible, describable and ineffable, of the farm, and they build knowledge based on these many facets. Apprentices came to see themselves as farmers through doing the work of the farmer. They attached meaning to their farming activities because they are socially engaged with other people (the expert farmers). In this situation, it is easy to make meaning of the activities because of the embeddedness of the learner within the activities, thus a more detailed and ingrained understanding of the subject of farming is constructed.

Additionally, apprentices expressed ways in which their identity is changing to be closer to an expert farmer through social negotiation with that context, in particular, learning from the expert farmer. Interview data confirms that apprentices are socially negotiating their identities as farmers during their apprenticeship. They are working side by side with expert farmers in a format that has granted them legitimate peripheral participation. Because they show that they are

identifying as farmers through the work of farming, they are negotiating their identity shift through a joint mutual enterprise. When viewed from a CoP perspective, the apprentice learner will view the farmer educator as the expert and move towards becoming an expert herself. If the unique community in which each of these farms dwell is a community of practice (CoP), then apprentices are negotiating how to become the expert farmer at the center of this community of practice (Lave & Wenger, 1991). So, situated learning is happening as knowledge is constructed within the farm makeup. Interview data suggests that they indeed negotiate their identities while on the farm, and many do approach nearer to the center of this CoP through their apprenticeship experience.

Farmer educators in this study led primarily unstructured learning experiences. The apprentices and farmers reported that much of the ways farmers participate as educators is through verbal explanation and demonstration. Although structured lessons were occasionally performed by a noteworthy few, most of the teaching in the apprenticeships was accomplished through farmer educators and apprentices working side by side. Additionally, farmer educators kept in touch with some apprentices after the apprenticeship program had officially concluded. These factors mean that there was room for a rapport and relationship to develop between the farmer educator and the apprentice, and for the establishment of the authentic mentor-mentee relationship that apprenticeship learning promises.

Relatedly, part of the reason expert identities are formed, according to interviewees, is that the stakes are real in apprenticeships, which may be felt emotionally. It was recognized by apprentices interviewed that farmers depend on the income from the work of apprenticeships. One reason this works is that apprentices are sensitive to the emotional signals they receive from farmer educators. As Vygotsky (1986) terms it, apprentices and farmers are “intersubjective,”

meaning they, as humans, are sympathetic and cognizant of the emotions of others, however tacit, subtle, and nuanced. Vygotsky's concept of intersubjectivity is helpful in explaining how the apprentices know the minds of others, including farmers. Because humans are innately able, as social mammals, to know the thought and feelings of others, we put this ability to work in learning. Apprentices are astute observers of farmers' emotions, which becomes a part of co-creating knowledge together with farmer, farm, environment, and everything else within the context.

In turn, farmers respond socially to the apprentices, as well. This study suggests that farmer educators provide feedback to individualize learners in a one-on-one relationship, and help apprentice learners bridge a zone of proximal development. So, this dynamic also leads to farmers showing signs of assisted development. The farmers are cognizant of what the apprentices are comfortable with (already have mastery of), so they give apprentices easier tasks, leading to more difficult tasks as the learning pace allows. Thus, farmer educators employ strategies described in Vygotsky's zone of proximal development.

Interestingly, the backgrounds of farmers who host apprentices and the backgrounds of the apprentices themselves were similar. In this study, 66% of farmer survey respondents did not grow up on a farm, which was corroborated by interview data. This data echoes recent reports that many who are entering farming are not from a farming background (Meuleners, 2013). This study suggests that the vast majority of on-farm apprentices, likewise, are also not from a farming background. Apprentices, who have no background in farming and little access to farming, can gain access through the apprenticeships. Thus, by hosting apprentices, these farmers have created a space where apprentices can be mentored by a farmer who is an accessible role model to those with non-agrarian backgrounds. This makes it more likely that the apprentice will

be able to find a way to socially negotiate their way from novice into an expert farmer identity through seeing farmer mentors who have themselves accomplished the same feat. Of survey respondents, 43% reportedly had at least one apprentice to go on to start their own farm. Because 39% of farmer educators who answered the survey had previously served on the farm as an apprentice, the survey data suggests that apprenticeships may at least assist in preparing a proportion of beginning farmers to enter farming as a profession. The fact that farmers in this study were often former apprentices shows that apprentices, with non-agrarian backgrounds, do, at least occasionally, adopt expert identities to the point where they may effectively begin farming as a full-fledged farmer.

The results of this study suggest that apprentices occasionally do develop expert farmer identities through their apprenticeship experience, leading them to future agricultural pursuits. Due to the unstructured nature of most of the learning, and the social interaction between farmer and apprentice, the on-farm apprenticeships created a space where situated learning occurred. Accordingly, apprentices and farmers alike expressed that learning in the context of farming is the best way to learn farming, and they expressed satisfaction and appreciation of it. They also expressed that emotional content within place and the mentor-mentee relationship was vital to the learning. More than that, farmers and apprentices alike described that they, through situated learning, had developed identities as expert farmers.

### *Alternative Agri-Food Movements/Institutions*

Results indicate that apprenticeships are best understood as embedded within a social movement which Allen (2004) and others (Guthman, 2008; Hinrichs, 2003; Sbicca, 2013) call alternative agri-food movements (AFMs), populated by alternative agri-food institutions (AFIs). Constructs of AFMs and AFIs often overlap and are related to the discourse on sustainable

agriculture (Allen, 2004; Lyson, 2004). Data suggests that apprentices and the farmers who host apprentices see themselves as embedded within alternative food systems. Accordingly, the theories and practices embodied within AFMs and sustainable agriculture play a large role in the on-farm apprenticeship phenomenon.

First of all, survey results suggest that farms in the study that host apprentices are typically small-scale, diversified in production, and have diverse, direct marketing strategies. Consumers who have a value on locally and sustainably produced food are connecting to farmers through farmers markets and CSAs (Kloppenburger, Hendrickson, & Stevenson, 1996), and farmers in these studies commonly marketed through farmers markets and CSAs. Interview data showed that farmer educators and apprentices align with biophysical practices and social discourses around organic, permaculture, and certified natural agriculture. Participants were knowledgeable of AFIs that promote issues of sustainable agriculture. These farms fit the description of what some view as a sustainable farm (Doran, 2008; Lyson, 2004; MacRae, et al., 2009).

In this study, most on-farm apprentices were college educated, and most were white. Farmers who host apprentices were also college educated and white. This demographic data is seems to paint a similar picture to Allen's (2008), who finds that those typically involved in AFMs, are disproportionately middle- to upper-income, and Slocum (2007), who reports that those typically involved in alternative food institutions are disproportionately white. Allen (2008) and Guthman (2004) point out the persistent inequity of consumers of sustainable agricultural products having disproportionately more wealth and better health status than other groups. In AFIs, color blindness and whiteness as normative create non-inclusive environments

for people of color (Guthman, 2008). Hinrichs (2003) argues that local food systems can often be a force for minimizing the visibility of diversity in a population. She writes:

“defensive food system localization tends to stress the homogeneity and coherence of ‘local,’ in patriotic opposition to heterogenous and destabilizing outside forces, perhaps a global ‘other.’ Predicated on such pat assumptions about the community or heritage being preserved and promoted, localization becomes elitist and reactionary, appealing to narrow nativist sentiments” (p. 37).

If on-farm apprenticeships are indeed embedded within larger AFMs, then a shift to be more inclusive of other ethnicities and classes would be difficult without a change to the entire AFM. However, viewed another way, if there were a way to effectively make on-farm apprenticeships more inclusive, on-farm apprenticeships could serve as an important gateway to include more diverse audiences in the alternative food systems. If on-farm apprenticeships are indeed sites of powerful situated learning that can reduce barriers to entry for sustainable agriculture, then by changing this point of entry, one shifts the food system in that direction. Finally though, in light of arguments from Allen (2004), it would require more than a crafty entry point to change AFMs to be more diverse. Slocum (2007) discusses the possibility of anti-racism training for practitioners within AFIs. Public sociology that is professional, critical, and political can work towards better understanding of these elements of the social movement at land grant universities (Tanaka & Mooney, 2010). So, improving AFMs could improve on-farm apprenticeships, and vice versa.

One finding from this study shows that apprentices are typically not from a farming background, have little farming experience, and they typically do not have farmland in the family that they may inherit. Interestingly, this situation may make them more attracted to the small, diversified, direct marketing farm model. Perhaps newcomers to agriculture are more oriented towards the sustainability discourse before considering farming. But perhaps also, as the



interview data suggests, the farming model that includes small-scale farming, diversified vegetable and fruit crops, and direct marketing through farmers markets and CSAs, would simply seem a more attainable goal to those without access to land, equipment, and infrastructure. This would mean that beginning farmers who are from a non-agrarian background would be more attracted to this farming model due to structural components rather than intellectual engagement with idealism. This finding leaves an intriguing question about how on-farm apprenticeships and new entrants into agriculture relate to AFMs, and whether it is not partially out of necessity.

Because apprentices are not typically from a farming background, they are not automatically embedded within a CoP of a rural farming community. The on-farm apprenticeship does not guarantee them entry into a rural farming community, since farmers who host apprentices, the interview data suggests, are not often embedded in a rural farming community CoP.

### ***Social Reproduction in Apprenticeships***

Given on-farm apprenticeships' association with practices and theories of alternative food systems and sustainable agriculture, what "realities" that are being socially reproduced in the apprenticeships? Because on-farm apprenticeships are most common on small, diversified, flexibly marketing farms, this can reproduce this type of farmer. This is hinted at by survey data, which suggest that many of the former apprentices that go on to start their own farms raise the same products as their host farm. Apprenticeships, primarily, allow novices to negotiate socially to form an expert identity akin to the expert farmer (Wenger, 1998). With this, there is much else that may be unintentionally reproduced in the apprenticeship model. In order to best understand how on-farm apprenticeships can benefit agriculture overall, I examine several other elements that could be unintentionally reproduced within on-farm apprenticeships.

This study suggests that on-farm apprenticeships may present unfair working conditions for apprentices. In this way the study agrees with others, as Barnett (2012) and Hamilton (2011) point out that on-farm apprenticeships often provide no pay, or a stipend that is far less than minimum wage. They also note that on-farm apprenticeships may typically have low standards for poor housing, and do not provide health insurance, and often the farm does not have workers compensation insurance. Barnett notes that the low pay means that apprentices typically cannot afford to buy land after the low pay of their apprenticeships, which is significant in light of the fact that this study showed that apprentices are typically not from a farming background and therefore do not have access to family farmland.

This finding makes sense in light of on-farm apprenticeships as embedded within AFMs. AFMs have historically given labor issues much less consideration than issues of physical ecological sustainability (Shreck, Getz, & Feenstra, 2006), which Guthman (2003) suggests is due to the moral sensibilities of the middle- to upper-class consumers of sustainable agricultural products. Shreck, Getz, and Feenstra (2006) found that organic farmers, however they feel about farmworker treatment, reported that providing “fair and healthy working conditions for farmworkers... [was] simply not economically viable given the realities of the market” (p. 445). Farmers within alternative food institutions may not be able to afford to pay workers better (Guthman, Morris & Allen, 2006). A conflict has been noted between farmer financial security and food security, with farmer financial security privileged over the latter (Guthman, Morris & Allen, 2006). Guthman (2003), in her historical analysis of the popularization of organic salad mix, notes that middle- to upper-class consumer values and preferences were privileged over farm laborers, to the point where organic growers lobbied to keep legal tools that required long hours of stoop labor. However, the international organic community has been moving towards

inclusion of social sustainability standards for treatment of laborers within organic certifications (Shreck, Getz & Feenstra, 2006). ATTRA (2014b) recommends best practices of giving farm workers traditional benefits such as healthcare, housing, flexible scheduling and overtime pay.

Ideological motivation plays a large role in AFMs. Guthman (2003) calls these “garden variety organic farmers,” which she goes on to state are: “independent and ideologically motivated” (p. 48). Niewolny and Lillard (2010) also report that many beginning farmers are ideologically motivated. Sbicca (2012) notes that participants in AFMs are motivated by issues of justice and fairness. For Sbicca, AFMs are a compendium of myriad concerns that center around “anti-oppression ideology premised on notions of social justice and autonomy” (p. 464). As members of AFMs, it should then be no surprise that on-farm apprentices (and the farmers that host them) may be ideologically motivated. Results from this study suggest that on-farm apprentices indeed have an approach to farming based on critical intellectual engagement with the food system. Apprentices may therefore accept substandard housing conditions and low pay, possibly due to their values-based motivations and approach to farming.

Apprentices in this study reported substandard housing. Most respondents provide some sort of housing for apprentices, and approximately 2 out of 5 respondents are sharing kitchen and bathroom facilities with apprentices. While housing is provided, exact type of housing provided was not addressed in the survey. However, interview data suggested that housing is substandard. Farmers see apprentices as an important labor force for the farm, but they are often paid less than minimum wage, and sometimes paid no monetary compensation. Farmers see the education as in-kind payment, but there are logical conflicts here. Since this study shows that few farmers provide structured approaches to their educational philosophies, apprentices’ daily activities include mainly farm work.

Maxey (2006) and Pilgeram (2011) note the struggle of sustainable farmers to maintain a livelihood, and both find that on-farm apprentices were employed as a means of obtaining labor for cheap or free. If apprentices reproduce conditions of context through situated learning, they may learn that cheap or free labor is the way to provide labor on a farm, which could reproduce poor working conditions for future generations of apprentices. Former apprentices, now farmers, could reproduce this way of farming, which could be less than truly financially stable, or socially just.

To further complicate the picture, apprenticeships may only be accessible to those who can afford to spend an indentured duration receiving less than minimum wage, creating questions of class barriers. As the data suggests, the fact that apprentices are not well paid and must accept poor working conditions may mean that there is bias within those who elect to do on-farm apprenticeships. If one can afford no health insurance and can afford to do without good pay for a time, they may have support from elsewhere, like parents, or money in savings, etc. This might mean that on-farm apprenticeships, if they continue to have low pay and no traditional benefits (health insurance and overtime pay), will tend to draw a middle- or upper-class population.

Guthman (2004) argues that we must “take seriously the sort of politics and policies required to enable organic agriculture to be what it is imagined” (p. 313). Although she is referring specifically to organic, in a broad sense, this applies to AFMs and sustainable agriculture. For Shreck, Getz & Feenstra, “it is imperative to move beyond the deafening silences within the sustainable agriculture and organic communities in regard to the distinctly different structural positions and power asymmetries” (p. 448). Thus, these issues are important in improving AFMs and sustainable agriculture.

## **Recommendations for Practice**

Considering the rise of on-farm apprenticeships, and the data presented here, agricultural education has opportunities to address training of beginning farmers informed by situated learning. These opportunities center around importance of the mentor-mentee relationship for learning farming, recognize non-farming futures of apprentices, analyze fair treatment of apprentices, and consider greater inclusivity. This study has illuminated several recommendations that agricultural educators may consider.

### ***Develop Best Practices for On-Farm Apprenticeships***

Farmer educators, in establishing their apprenticeship programs, did not consult a handbook or guide but instead talked to other farmers about hosting apprentices. They recruited the apprentices online or through word of mouth. Mainly, it seems as though farmer educators do not engage with any agricultural service provider or organization to assist them in arranging their apprenticeships. This has implications in that farmer educators may therefore be unaware of the advice of handbooks and guides on on-farm apprenticeships. Future involvement of the land grant system may be possible through development of best management practices guide for on-farm apprenticeships. This would undoubtedly involve outreach to potential host farmers. Also, involvement of host farmers who are leading successful on-farm apprenticeship programs is key towards authoring a helpful, functional guide that will be used by farmer educators.

### ***Teach Farming as Situated Learning***

Create more situated, mentor-mentee learning experiences for those entering agriculture. Although farmers in this study did not consult Extension on their apprenticeship program, their situated-learning-style educational orientation towards explanation, demonstration, and working side by side are nevertheless consistent with the longstanding pedagogical traditions of Extension

(Rasmussen, 1989). The similar approaches makes apprenticeships more of a potential future beginning farmer training strategy that may be taken into consideration by Extension and land grant universities. The situatedness of the experience is important, and the relationship with a role model that is accessible to the mentee. It is important that the experience allow for intersubjectivity to occur.

### ***Consider a Two-Pronged Approach***

One recommendation to improve on-farm apprenticeships is to consider screening of on-farm apprentices specifically to determine if they are interested in farming in the future, or simply food system professional work. Create on-farm apprentice-like experiences that are custom tailored and attractive for future food systems workers. Then, practitioners might have resources targeted towards the apprentices who want to learn farming to enter farming as a profession, and ensure a good recruitment approach for programs. If the apprentices are undergoing an apprenticeship where the local-food-sustainability-oriented CoP is their primary CoP, recognize that fact and create a bifurcated path for those who truly desire to learn farming to become beginning farmers, and those who desire to become professionals in the local-food-sustainability-oriented CoP. Again, there are fewer and fewer beginning farmers every year, and this situation must be addressed. So, smart targeting of programs towards likely beginning farmers will help reduce barriers to entry for these farmers.

### ***Offer Fair Labor Standards in Apprenticeships***

Find ways to offer fair pay and benefits for apprentices. Analyze policy instruments to incentivize fair treatment. This could require revisiting the myriad factors that make it difficult for farms that host apprentices to outcompete larger farms. By offering fair labor standards, on-

farm apprenticeships will likely attract a more diverse population to participate, and widen an entry point to sustainable agriculture.

### ***Implement Inclusive Practices***

Continually revisit how AFIs can become more inclusive of other ethnicities and social classes. Consider anti-racism training. Indeed, apprenticeships, understood as negotiating an expert identity in AFI participation (rather than expert identities being restricted to farming), could present an entry point for those considering greater participation in AFIs.

### **Recommendations for Future Research**

Because this is a descriptive study, it was intended to probe into the phenomenon of on-farm apprenticeship learning, and therefore it uncovered many areas that may need further exploration. This section highlights several of the most important questions that I can recommend for further research in this area.

First, I recommend future research to determine factors that makes a host farm and/or farmer educator more or less effective at enabling beginning farmers to start farming, and to continue farming until they have stable enterprises. What behaviors are most common on these farms? Can they improve by implementing changes? If practices employed by successful on-farm apprenticeship programs can be determined, then best practices might also be developed. Although this could involve a more long-term study to track success of apprenticeships, it is crucial to see how successful these programs are, in order to put forward effective, science-based programs that will reduce barriers for beginning farmers.

Second, a larger study would help strengthen the results. A national dissemination of the survey I developed for this study would broaden the scope of the research. I recommend a larger study to interview farmer and apprentice pairs. By interviewing the apprentices and the farmer

educators who hosted them, one might have a better picture of the mentor-mentee relationship, and thus determine how learning occurs from both perspectives.

Third, the system-wide factors that enable AFMs to be non-inclusive should be better scrutinized. Because this study suggests that on-farm apprenticeships are embedded in AFMs, can apprenticeship program possibly be a more all-inclusive point of entry to AFMs? One could evaluate if apprenticeships, through Slocum's (2007) recommendations including anti-racist training, could improve AFMs in this way. Research must continue to analyze if there are structural barriers that create barriers to participation based on race and class.

Finally, future research could determine how AFMs are creating social conditions that do not allow farmers to provide fair treatment for workers, especially on small farms. A question emerged from this study as to how on-farm apprenticeship learning relates to the low pay and substandard housing accepted by apprentices. Is this related to the disproportionately white, college educated demographic seen in participants in this study? Also, how much do farmers, by hosting on-farm apprentices who are driven by critical, intellectually-driven motivations, depend on the cheap labor provided by apprentices? Is this model of farming, including the strategy of apprenticeships to meet labor needs, being reproduced on former apprentices' farms? Can sustainable agriculture depend indefinitely on this stream of young apprentices from alternative food movements to provide needed labor for farms? These systems-level questions are areas much in need of further analysis. A theoretical approach may be employed that views the situated learning in on-farm apprenticeships with a lens of social movement theory, with the unit of analysis being the entire activity system, and quite possibly utilizing actor network theory.



## **Limitations of the Study**

This study was not without its limitations. While I made efforts to recruit all farmer educators and on-farm apprentices to participate in the study, there was a possibility that many did not receive the recruitment materials, because they are uninvolved with the agricultural organizations, or Extension groups, through which I recruited. In particular, I am left questioning if urban and peri-urban farmers had received the recruitment letters, as the data suggests a bias towards rurality. If urban and peri-urban farms had been more recruited, possibly the demographics would have been different, especially if other ethnic groups would have been better represented. Also, there may have been inherent selection bias, as some farmer educators and on-farm apprentices did not participate because they are not frequent internet users, or they simply did not see value in participating in academic research. Additionally, this study addressed Virginia only, and may therefore not represent other areas. Lastly, the small sample size of both the survey (N=45) and the interviews (N=12) means that this study represents only the participants in the study.

## **Conclusion**

This study sought to describe on-farm apprenticeship learning in Virginia through a mixed methods design. Apprenticeship education programs are being offered on Virginia farms that are mainly unstructured, where farmer educators teach verbally, through demonstration, and working side by side, interacting socially and emotionally. Overall, apprentices are developing expert farmer identities through a situated learning approach that hinges on the sociocultural learning inherent in joint enterprises within a mentor-mentee relationship. This study illuminated the value of situated learning to learn farming. This study also showed the value of intersubjective emotional, and place-based context for learning farming.

This study suggests that apprenticeships are happening on small-scale, diversified, direct-marketing farms in Virginia. The farms, farmers, and apprentices are best understood as within larger alternative food movements (AFMs). This finding is consistent with demographics of the study, which suggests that apprentices and the farmer that teach them are disproportionately white, college educated, and most are not from a non-agrarian background. Apprentices have little access to farming and farmland, but apprenticeships provide them an access point. While some apprentices do go on to start their own farms, many apprentices may have different social locus that positions them more as future food system professionals, rather than farmers. This study also finds that on-farm apprenticeships are often not practicing fair labor practices, which may deter those of less advantaged backgrounds. This situation may create socially unjust situations that are reproduced through the situated learning process as former apprentices start similar farm models. These conditions have been noted in the larger AFMs.

In sum, the apprenticeship learning in Virginia shows great promise to train beginning farmers. In the future, agricultural educators should consider this model for beginning farmer adult education programs. However, future research is needed that will illuminate issues of social injustice that may be unintentionally reproduced within the powerful situated learning that occurs in an on-farm apprenticeship. By answering these difficult questions, on-farm apprenticeships can fulfill their promise to be not only an effective way to train beginning farmers, but also a sustainable, socially just way to train beginning farmers, as well.

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## APPENDIX A: IRB Approval Letter



Office of Research Compliance  
Institutional Review Board  
North End Center, Suite 4120, Virginia Tech  
300 Turner Street NW  
Blacksburg, Virginia 24061  
540/231-4606 Fax 540/231-0959  
email [irb@vt.edu](mailto:irb@vt.edu)  
website <http://www.irb.vt.edu>

### MEMORANDUM

**DATE:** November 20, 2013  
**TO:** Kim Niewolny, Lorien Eleanora Macauley  
**FROM:** Virginia Tech Institutional Review Board (FWA00000572, expires April 25, 2018)  
**PROTOCOL TITLE:** A Mixed Methods Study of On-farm Apprenticeship Learning in Virginia  
**IRB NUMBER:** 13-643

Effective November 20, 2013, the Virginia Tech Institutional Review Board (IRB) Chair, David M Moore, approved the Amendment request for the above-mentioned research protocol.

This approval provides permission to begin the human subject activities outlined in the IRB-approved protocol and supporting documents.

Plans to deviate from the approved protocol and/or supporting documents must be submitted to the IRB as an amendment request and approved by the IRB prior to the implementation of any changes, regardless of how minor, except where necessary to eliminate apparent immediate hazards to the subjects. Report within 5 business days to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

All investigators (listed above) are required to comply with the researcher requirements outlined at:

<http://www.irb.vt.edu/pages/responsibilities.htm>

(Please review responsibilities before the commencement of your research.)

### PROTOCOL INFORMATION:

Approved As: Expedited, under 45 CFR 46.110 category(ies) 6,7  
Protocol Approval Date: September 25, 2013  
Protocol Expiration Date: September 24, 2014  
Continuing Review Due Date\*: September 10, 2014

\*Date a Continuing Review application is due to the IRB office if human subject activities covered under this protocol, including data analysis, are to continue beyond the Protocol Expiration Date.

### FEDERALLY FUNDED RESEARCH REQUIREMENTS:

Per federal regulations, 45 CFR 46.103(f), the IRB is required to compare all federally funded grant proposals/work statements to the IRB protocol(s) which cover the human research activities included in the proposal / work statement before funds are released. Note that this requirement does not apply to Exempt and Interim IRB protocols, or grants for which VT is not the primary awardee.

The table on the following page indicates whether grant proposals are related to this IRB protocol, and which of the listed proposals, if any, have been compared to this IRB protocol, if required.

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*An equal opportunity, affirmative action institution*

## APPENDIX B: Recruitment Letter for Survey

Dear Sir or Madam,

My name is Lorien MacAuley, and I am a Master's Student in the department of Agriculture and Extension Education at Virginia Tech. I'm contacting you to invite you to participate in the On-farm Apprenticeship Research Project (O-FARP), which is a research project looking at how apprenticeships or internships are currently being structured, common practices and how learning occurs in apprenticeship/internship programs, and the types of farms that host apprentices and interns. As someone familiar with on-farm apprenticeship learning, you know how and why farming is best learned on the job. I would like to invite you to please fill out the attached survey, to share how learning on the job works on your farm. As a farmer who has worked with apprentice learners, currently or in the past, you will help Virginia Tech researchers complete the puzzle of how learning on the farm works.

An apprentice learner can be anyone who learns on the job – the exact job title of “apprentice” may not be used. The important part is when the farmer takes an interest in the learning of his or her workers, apprentices, or interns, and they learn how to farm, from the farmer, on the farm. That's apprentice-style learning, and that's what O-FARP is all about!

You were selected for this invitation based on your affiliation with [AGRICULTURAL ORGANIZATION]. This survey is being conducted as a Virginia Tech academic research project, as a Master's thesis study in the department of Agricultural and Extension Education, and will hopefully result in a published report. Your participation in O-FARP is in no way required or compulsory. Your identity will remain anonymous in all resulting documents, published materials, and findings from the study. There are no known risks to participating in this study, and the benefits of participating include informing how agricultural service providers might best serve and support on-farm apprenticeships.

Please fill out the questionnaire [and return it, using the stamped, self-addressed envelope] or [by clicking on the below link].

If you would like to learn more about O-FARP, please e-mail me at [lorien@vt.edu](mailto:lorien@vt.edu), or, feel free to call me anytime, at (703) 789-7748.

If you have complaints, suggestions, or questions about your rights as a research volunteer, contact the staff of Virginia Tech's Institutional Review Board, at 540-231-4991.

Thank you very much, in advance, for your involvement in O-FARP!

Sincerely,

Lorien MacAuley  
Master's Student  
Agricultural and Extension Education  
Virginia Tech  
228 Litton Reaves Hall (0343)  
Blacksburg, VA 24061  
(703) 789-7748

## APPENDIX C: Recruitment Letter for Interview

Dear Sir or Madam,

My name is Lorien MacAuley, and I am a Master's Student in the department of Agriculture and Extension Education at Virginia Tech. I'm contacting you to invite you to participate in the On-farm Apprenticeship Research Project (O-FARP), which is a research project looking at how apprenticeships or internships are currently being structured, common practices and how learning occurs in apprenticeship/internship programs, and the types of farms that host apprentices and interns. As someone familiar with on-farm apprenticeship learning, you know how and why farming is best learned on the job. I would like to invite you to participate in a 60-minute, audio-recorded interview to share how learning on the job has worked on your farm. I am interviewing both the apprentice learners, and the farmers who have worked with apprentice-style learning.

An apprentice learner can be anyone who learns on the job – the exact job title of “apprentice” may not be used. The important part is when the farmer takes an interest in the learning of his or her workers, apprentices, or interns, and they learn how to farm, on the farm. That's apprentice-style learning, and that's what O-FARP is all about!

You were selected for this invitation based on your affiliation with [AGRICULTURAL ORGANIZATION]. This survey is being conducted as a Virginia Tech academic research project, as a Master's thesis study in the department of Agricultural and Extension Education, and will hopefully result in a published report. Your participation in O-FARP is in no way required or compulsory. Your identity will remain anonymous in all resulting documents, published materials, and findings from the study. There are no known risks to participating in this study, and the benefits of participating include informing how agricultural service providers might best serve and support on-farm apprenticeships.

If you are interested in being interviewed for O-FARP, please e-mail me at [lorien@vt.edu](mailto:lorien@vt.edu) and include your name and phone number in the text of the e-mail. I will then contact you to schedule a time and place for the interview that is most convenient for you. Or, feel free to call me anytime, at (703) 789-7748.

If you have complaints, suggestions, or questions about your rights as a research volunteer, contact the staff of Virginia Tech's Institutional Review Board, at 540-231-4991.

Thank you very much, in advance, for your involvement in O-FARP!

Sincerely,

Lorien MacAuley  
Master's Student  
Agricultural and Extension Education  
Virginia Tech  
Litton Reaves Hall (0343)  
Blacksburg, VA 24061  
(703) 789-7748

## APPENDIX D: Recruitment Letter to Service Providers

Dear [SERVICE PROVIDER],

My name is Lorien MacAuley, and I am a Master's Student of Agriculture and Extension Education at Virginia Tech. Because of your involvement in [SERVICE PROVIDER], I'm contacting you to ask for your help in recruiting participants for my thesis research, which examines structures and common practices in apprenticeships, how learning occurs in apprenticeship programs, and the types of farms that host apprentices. For the study, we are looking for farmers who teach apprentices, and on-farm apprentices, to fill out a questionnaire (online or mailed), and/or be interviewed, about their experiences with on-farm apprenticeships. Please see recruitment materials, attached.

For the purposes of this research, an on-farm apprentice:

- May be referred to as apprentice, intern, or on-farm student,
- Is over 18 years of age,
- Works on the farm for a specified length of time,
- Can be paid or unpaid, and
- There is an expressed agreement that the farmer teaches them how to farm.

If you know of farmers or on-farm apprentices who might be interested in participating in the survey and/or interview, or would like to learn more about the study, please e-mail me at [lorien@vt.edu](mailto:lorien@vt.edu), or call me anytime, at (703) 789-7748. Together, we will work out the best way to get in contact with the farmer or apprentice.

Participation in this study is in no way required or compulsory. Participant's identity will remain anonymous in all resulting documents, published materials, and findings from the study. There are no known risks to participating in this study. Benefits of participating include informing how agricultural service providers might best serve and support on-farm apprenticeships. If you have questions or suggestions about participants' rights as a research volunteer, you may contact the staff of Virginia Tech's Institutional Review Board, at 540-231-4991.

Thank you very much, in advance, for your help recruiting participants for the On-Farm Apprenticeship Research Project!

Sincerely,

Lorien MacAuley  
Master's Student  
Agricultural and Extension Education  
Virginia Tech  
Litton Reaves Hall (0343)  
Blacksburg, VA 24061  
(703) 789-7748



## **APPENDIX E: Consent Form for Interviewees**

### **VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY Informed Consent for Participants in Research Projects Involving Human Subjects**

**Title of Project:** A Mixed Methods Study of On-farm Apprenticeship Learning in Virginia

**Investigator(s):** Dr. Kim Niewolny    [niewolny@vt.edu](mailto:niewolny@vt.edu)    540-231-6836

Lorien MacAuley    [lorien@vt.edu](mailto:lorien@vt.edu)    703-789-7748

#### **I. Purpose of this Research Project**

The purpose of this study is to learn about on-farm apprenticeship learning by exploring the lived experiences of individuals involved with on-farm apprenticeship learning, and describing and situating these experiences within a larger survey of on-farm apprenticeship programs in Virginia.

#### **II. Procedures**

This interview will take place at a place and time that is convenient to you, mutually agreed upon ahead of time by yourself and the researcher. This interview will last approximately 60 minutes and will be audio-recorded. The researcher will ask you questions about your experiences with on-farm apprenticeship learning. If you agree, you may be contacted by phone, approximately one to three months following the interview, in order to provide additional clarification on comments made during your interview.

#### **III. Risks**

This study has been reviewed and approved by the Virginia Tech Institutional Review Board. Participation in this interview is entirely anonymous, and all identifying information will be removed from any resulting documents. This research involves minimal risk to the participants.

#### **IV. Benefits**

There are no known benefits to participants. The data gathered in this study will be synthesized into one or more reports, or articles for publication in academic journals, or for presentation at professional conferences. This study may improve educational opportunities for new and beginning farmers, in the long term. No promise or guarantee of benefits has been made to encourage you to participate.

## V. Extent of Anonymity and Confidentiality

Your identity, and that of any individuals whom you mention, will be kept confidential at all times and will be known only to the research team. No sensitive personal information will be solicited in the interview.

The interviews will be audio recorded and later transcribed by researchers, under the supervision of the principal researcher (Dr. Kim Niewolny). When transcribing the interviews, codes or pseudonyms (i.e., false names) will be used for your name and any other individuals you mention, as well as other identifying characteristics like farm name, road name, etc. These codes/pseudonyms will also be used in preparing all written reports of the research. Any details in the interview recordings that could identify you, or anyone you mention, will also be altered during the transcription process. After the transcribing is complete, the audio recordings will be destroyed. The transcriptions will be stored on a password-protected computer indefinitely. At no time will the researchers release identifiable results of the study to anyone other than individuals working on the project without your written consent.

It is possible the Institutional Review Board (IRB) at Virginia Tech will view this study's collected data for auditing purposes. The IRB is responsible for overseeing the protection of human subjects who are involved in research.

## VI. Compensation

There is no compensation for participation in this study.

## VII. Subject's Consent

I have read the Consent Form and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent:

\_\_\_\_\_ Date \_\_\_\_\_  
Subject signature

\_\_\_\_\_  
Subject printed name

Do you agree to be contacted by phone, approximately one to three months following the interview, in order to provide additional clarification on comments made during your interview?  
*(check one)*

\_\_\_\_\_ Yes

\_\_\_\_\_ No

## **VIII. Freedom to Withdraw**

It is important for you to know that you are free to withdraw from this study at any time without penalty. You are free not to answer any questions that you choose or respond to what is being asked of you without penalty.

Please note that there may be circumstances under which the investigator may determine that a subject should not continue as a subject.

Should you withdraw or otherwise discontinue participation, you will be compensated for the portion of the project completed in accordance with the Compensation section of this document.

## **IX. Questions or Concerns**

Should you have any questions about this study, you may contact one of the research investigators whose contact information is included at the beginning of this document.

Should you have any questions or concerns about the study's conduct or your rights as a research subject, or need to report a research-related injury or event, you may contact the VT IRB Chair, Dr. David M. Moore at [moored@vt.edu](mailto:moored@vt.edu) or (540) 231-4991.

## APPENDIX F: Survey Instrument

### The On-Farm Apprenticeship Research Project Survey

**Who should take this survey?**

**Please fill out and return this survey if you are one of the primary owners or managers of a farm that has an on-farm apprenticeship or internship program, or a farm that has hosted apprentices and/or interns.**

**For purposes of this survey, an on-farm apprentice is someone who:**

- **May be referred to as an apprentice, intern, or on-farm student,**
- **Over 18 years of age,**
- **Works on the farm for a specified length of time,**
- **Can be paid or unpaid, and**
- **There is an expressed agreement that you would teach them how to farm.**

***Thank you very much*** for your time and attention to this survey about on-farm apprenticeship and internship programs in Virginia. This is an academic research project through the Department of Agricultural and Extension Education at Virginia Tech.

***Your answers are very important*** in determining how apprenticeships are currently being structured, common practices and how learning occurs in apprenticeship programs, and the types of farms that host apprentices. In the long run, your answers can help inform how Agricultural Extension might best serve and support these programs to advance agriculture in Virginia.

You will be asked questions relating to the apprentices, any practices, policies and procedures that support apprentices and interns, educational strategies, and information about you and your farm. Your participation in this survey is completely voluntary, and you are under no obligation to answer any question, for any reason. Your survey is completely anonymous, and no identifying characteristics will be used in any way for this survey.

## Part 1: Apprentice Information

First, please answer the below questions about the apprentices on your farm.

1. What word do you use to describe your apprentices (for example: intern, apprentice, wage employee with educational component, etc.)? \_\_\_\_\_
2. How many years have you had apprentices on your farm? \_\_\_\_\_
3. How old is the typical apprentice? \_\_\_\_\_ (years)
4. How many apprentices TOTAL have you had on your farm since you began farming? \_\_\_\_\_
5. Of the apprentices you've had, please write how many were:  
\_\_\_\_\_ female  
\_\_\_\_\_ male
6. Of the apprentices you've had, please write how many were:  
\_\_\_\_\_ American Indian or Alaska Native  
\_\_\_\_\_ Asian  
\_\_\_\_\_ Black or African American  
\_\_\_\_\_ Native Hawaiian or Other Pacific Islander  
\_\_\_\_\_ Spanish, Hispanic, or Latino Origin  
\_\_\_\_\_ White
7. Of the apprentices you've had, please write how many had the below education level:  
\_\_\_\_\_ Some High School  
\_\_\_\_\_ High School Diploma  
\_\_\_\_\_ Some College  
\_\_\_\_\_ Associate's Degree  
\_\_\_\_\_ Bachelor's Degree  
\_\_\_\_\_ Vocational/Trade School  
\_\_\_\_\_ Some Graduate School  
\_\_\_\_\_ Master's Degree  
\_\_\_\_\_ PhD  
\_\_\_\_\_ Other \_\_\_\_\_  
\_\_\_\_\_ Unsure or I don't know
8. How many years of farming experience does your typical apprentice have before they start at your farm?  
\_\_\_\_\_ (years)
9. How many apprentices do you usually have on the farm at the same time? \_\_\_\_\_

**Part 2: Apprenticeship Program Details**

Next, please provide some information pertaining to the apprenticeship program on your farm.

10. Apprentices stay with the farm for (on average) how many weeks? \_\_\_\_\_

11. Please rate your **motivations for wanting apprentices** on your farm, on a scale of “very important” to “not important.”

<b>Check the box:</b>	Very Important	Somewhat Important	Somewhat Not Important	Not Important
I need labor for my farm.				
I like working with others.				
I enjoy teaching.				
I want to help create educated consumers.				
I had a good learning experience and want to provide the same opportunity to others.				
I want to share the farming lifestyle with others.				
I want to help train the next generation of farmers.				
I like the energy of having “new blood” on my farm.				
I want to spend time with others who enjoy farming.				
<b>Other motivations (please list):</b>				

SOURCE: "The On-Farm Mentor's Guide: Practical Approaches to Teaching on the Farm," by Miranda Smith, published by New England Small Farm Institute.

12. If you have used any outlet for advertising your apprenticeship program, which did you use?

*(check one)*

- \_\_\_ ATTRA website
- \_\_\_ OTHER website (please list below)
- \_\_\_ Social media (Facebook, blogs, listserv, etc.)
- \_\_\_ Ad in newspaper or magazine
- \_\_\_ Flyers or brochures
- \_\_\_ Word of mouth
- \_\_\_ OTHER (please list below)

If you used “OTHER” outlets for advertising, please list: \_\_\_\_\_

- 13.** Have you consulted a handbook or guide for information to help you with your apprenticeship program? (*check one*)  
\_\_\_yes \_\_\_no  
IF YES, which handbook or guide did you use? \_\_\_\_\_
- 14.** Have you sought advice or guidance from an agricultural organization to help you with your apprenticeship program? (*check one*)  
\_\_\_yes \_\_\_no  
IF YES, please list which one(s): \_\_\_\_\_
- 15.** Have you sought advice or guidance from another farmer to help you with your apprenticeship program? (*check one*)  
\_\_\_yes \_\_\_no  
IF YES, what was your relation (ex: friend, relative, etc.)? \_\_\_\_\_
- 16.** Have you sought advice or guidance from the Extension Service to help you with your apprenticeship program? (*check one*)  
\_\_\_yes \_\_\_no  
IF YES, what was your relation (ex: friend, relative, etc.)? \_\_\_\_\_
- 17.** If you had any OTHER sources of advice or guidance that you sought to help you with your apprenticeship program, please list here:  
\_\_\_\_\_

18. Next, please let us know about what kinds of **practices, policies and procedures** you have on your farm to support your apprenticeship program.

Please rate **how much you agree** with the following statements, on a scale of “strongly agree” to “strongly disagree.”

<b>Check the box:</b>	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
I have an established application process, which includes a written application.				
I require all prospective apprentices to visit the farm for an interview.				
I require a written, signed, work agreement with apprentices.				
I provide stipends or other monetary compensation for apprentices.				
I have an established orientation process.				
I have a probationary or trial period when apprentices first start, to make sure they are a good fit for the position.				
I provide incentives (monetary or in-kind) for apprentices to stay for the full season.				
I have regularly scheduled meetings with apprentices to discuss the farm work.				
I include apprentices in marketing activities (farmers market, roadside stand, etc.).				
I make sure apprentices learn how to do a wide variety of tasks on the farm.				
I have regularly scheduled check-ins to receive feedback from apprentices.				

19. What kind of housing do you provide to apprentices? (*check one*)

- I do not provide housing.
- On the farm in my home.
- On the farm in a separate building from my home.
- We have an arrangement to provide housing off the farm.
- Other: \_\_\_\_\_

20. Do you share kitchen facilities with apprentices? (*check one*) yes no

21. Do you share bathroom facilities with apprentices? (*check one*) yes no



22. Next, please let us know what kind of **teaching strategies** you employ on your farm to teach apprentices.

**How often** do you provide the following to your apprentices? Please rate on a scale of “very often” to “never.”

<b>Check the box:</b>	Often	Sometimes	Rarely	Never
Verbal explanations of new tasks				
Hands-on demonstrations for new tasks				
On-farm special workshops				
Tours of your farm				
Tours of other farms				
Farmer-led discussions about farming				
Discussion time for apprentices just to talk with each other about farming				
Scheduled lessons or meetings with other farmers				
Written worksheets or other curriculum on farming				
Have apprentices journal or do other writing about farming				
Have apprentices go with you on errands				
Use of your farming books or other literature				
Use of the internet to research farming topics				
Indoor classroom-style classes on your farm				
Work side-by-side with the apprentices				
Personalized feedback to each apprentice after seeing how they perform a new task				
Discuss my philosophy of farming with apprentices				
Explaining the “why” not just the “how” of farming				
Shared meals or social events with apprentices				
Bring apprentices to other farming classes or workshops				

23. Next, please inform us of the **attributes and performance** of apprentices on your farm.

Please rate **how much you agree** with the following statements, on a scale of “strongly agree” to “strongly disagree.”

<b>Check the box:</b>	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
Apprentices are accustomed to hard physical labor before they start.				
Apprentices have a realistic picture of the realities of farming before they start.				
Apprentices are accustomed to life on the farm before they start.				
Apprentices are from a farming background.				
Apprentices have farmland in the family that they may inherit.				
Most apprentices live on the farm for the duration of their apprenticeship.				
Most apprentices are certain that they want to start their own farm.				
Apprentices develop their own philosophy of farming during their apprenticeship.				
As a result of the apprenticeship, apprentices become comfortable in their role as farmer.				
As a result of the apprenticeship, most come to see themselves as farmers.				
I am overall satisfied with the work of apprentices on the farm.				

24. Next, please inform us **policies, practices and procedures** you may use **after** an apprenticeship has finished.

Please rate **how much you agree** with the following statements, on a scale of “strongly agree” to “strongly disagree.”

<b>Check the box:</b>	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
My farm follows up with apprentices after they finish their apprenticeships.				
I give apprentices farming advice after they complete their program.				
I talk to and see former apprentices.				

25. Have any of your apprentices gone on to start their own farms? (*check one*)

yes no I don't know

a. If YES, how many apprentices have gone on to start their own farms? \_\_\_\_\_

b. If YES, is their farm located in Virginia? (*check one*) yes no I don't know

c. If YES, do they produce some or all of the same agricultural products as you do? (*check one*)

yes no I don't know

### Part 3: Farm/Farmer Background

Finally, please answer the following background questions about you and your farm.

26. Are you the principle operator of this farm? (*check one*) \_\_\_yes \_\_\_no

If NO, what is your role?\_\_\_\_\_

27. I am: \_\_\_ female \_\_\_male (*check one*)

28. Please check the category that best describes you (*check one*):

- \_\_\_ American Indian or Alaska Native
- \_\_\_ Asian
- \_\_\_ Black or African American
- \_\_\_ Native Hawaiian or Other Pacific Islander
- \_\_\_ Spanish, Hispanic, or Latino Origin
- \_\_\_ White

29. In what year did you begin to operate or manage any part of this farm? \_\_\_\_\_

30. What is your age at the time of this survey?\_\_\_\_\_

31. How many years have you been farming?\_\_\_\_\_

32. I have had the following training in agriculture (*check all that apply*):

- \_\_\_ Grew up on a farm.
- \_\_\_ Served on a farm as an apprentice.
- \_\_\_ Worked on a farm as a farm worker.
- \_\_\_ Had some academic training in farming (in high school, college, etc.)
- \_\_\_ Had some professional training in farming (workshops, community programs, etc.)
- \_\_\_ Other\_\_\_\_\_

a. What is your highest level of formal education completed? (*check one*)

- \_\_\_ Some High School
- \_\_\_ High School Diploma
- \_\_\_ Some College
- \_\_\_ Associate's Degree
- \_\_\_ Vocational/Trade School
- \_\_\_ Bachelor's Degree
- \_\_\_ Some Graduate School
- \_\_\_ Master's Degree
- \_\_\_ PhD
- \_\_\_ Other\_\_\_\_\_

**33. What were your farm's approximate annual sales this past season? \$\_\_\_\_\_**

**34. What market outlets do you use? (check all that apply)**

- Commodity Markets
- Community Supported Agriculture (CSA)
- Home Delivery
- Wholesale
- Farmers Market
- Marketing Coop
- U-Pick
- Restaurants
- Institutional Sales (e.g., farm-to-school, farm-to-hospital, farm-to-prison)
- Roadside Stand
- Retail Store
- Retail Store On-farm
- Produce Auction
- Livestock Auction
- Other\_\_\_\_\_

**35. What do you produce commercially on your farm? (check all that apply)**

- Soybeans
- Corn for grain
- Wheat for grain
- Grains, oilseeds, dry beans, and dry peas
- Tobacco
- Cotton and cottonseed
- Vegetables, melons, potatoes and sweet potatoes
- Fruits, tree nuts, and berries
- Nursery, greenhouse, floriculture, and sod
- Cut Christmas trees and short rotation woody crops
- Other crops and hay
- Poultry and eggs
- Cattle and calves
- Milk and other dairy products from cows
- Hogs and pigs
- Sheep, goats, and their products
- Horses, ponies, mules, burros, and donkeys
- Aquaculture
- Forage - land used for all hay and haylage, grass silage, and green
- Other animals and other animal products\_\_\_\_\_

**36. My farm is:** *(check all that apply)*

- Individually-operated
- Family-operated
- Operated in a business partnership with non-family members

**37. County and State in which your farm is located (COUNTY, STATE)**

\_\_\_\_\_

**38. How many acres of farm land do you LEASE? \_\_\_\_\_ OWN? \_\_\_\_\_**

**39. Would you be interested in participating in a 60-minute interview about your experiences with apprentices, at a time and place that is convenient for you?**

Checking “yes” does NOT obligate you to participate in an interview. (*check one*)

yes no

**IF YES, you may leave your contact information, below. By sharing your contact information, you are agreeing to be contacted by a Virginia Tech researcher, who will invite you to schedule an interview at a time and place that is convenient for you. Your survey responses will remain anonymous.**

**Name** \_\_\_\_\_

**Phone Number** \_\_\_\_\_

**Email Address** \_\_\_\_\_

**40. Please write below any comments or anything else you wish to share about on-farm apprenticeships:**

**Please return this survey to: Lorien MacAuley, Agricultural and Extension Education, 228 Litton Reaves, Virginia Tech, Blacksburg, VA 24061.**

*Thank you very much for your time!*

*If you would like to learn more about the On-Farm Apprenticeship Research Project, please contact Lorien MacAuley at 703-789-7748, or [lorien@vt.edu](mailto:lorien@vt.edu).*

This is academic research towards a Master’s Thesis through Virginia Tech. If you have complaints, suggestions, or questions about your rights as a research volunteer, please contact the staff of Virginia Tech’s Institutional Review Board, at 540-231-4991. For all other inquiries, please contact Lorien MacAuley at 703-789-7748, or [lorien@vt.edu](mailto:lorien@vt.edu).

## **APPENDIX G: Interview Protocol for Farmer Educators**

### **On-Farm Apprenticeship Learning Research Project Interview Protocol and Questions for Farmer Educators**

#### **Share consent form.**

#### **Read aloud the following:**

“I am Lorien MacAuley, and thank you very much for your participation in my master’s thesis research to explore and describe on-farm apprenticeship learning in Virginia. This interview will be audio recorded to ensure accuracy, and I will take a few notes to keep pace with the interview. There are no right or wrong answers. In all written documents that result from this interview, a pseudonym, or fake name, will be used, and identifying characteristics will be removed, to ensure your anonymity. This interview is completely voluntary. You are under no obligation to answer any question, and are free to leave at any time.”

#### **Interview body questions:**

1. Please tell me a little about yourself and your background. (Where are you from? How long have you been on the farm?)
2. Describe the first time you ever identified yourself as a farmer.
3. Please describe to me how the typical learning experience occurs for apprentices on your farm.
4. What is your communication with the apprentices like?
5. How often do the apprentices get exposure to the larger farming community?
6. How does their farm experience change the way apprentices seem to see themselves as farmers?

#### **Conclusion**

1. Is there anything else you would like to share that you haven’t already?
2. Who else should I visit to learn more about my questions?

***Thank you very much for your time!***



## **APPENDIX H: Interview Protocol for On-Farm Apprentices**

### **On-Farm Apprenticeship Learning Research Project Interview Protocol and Questions for On-farm Apprentices**

#### **Share consent form.**

#### **Read aloud the following:**

“I am Lorien MacAuley, and thank you very much for your participation in my master’s thesis research to explore and describe on-farm apprenticeship learning in Virginia. This interview will be audio recorded to ensure accuracy, and I will take a few notes to keep pace with the interview. There are no right or wrong answers. In all written documents that result from this interview, a pseudonym, or fake name, will be used, and identifying characteristics will be removed, to ensure your anonymity. This interview is completely voluntary. You are under no obligation to answer any question, and are free to leave at any time.”

#### **Interview body questions:**

1. Please tell me a little about yourself and your background. (Where are you from? How long have you been on the farm?)
2. Please describe to me how the typical learning experience occurs through your apprenticeship.
3. What are some of the most important things you learned through your apprenticeship, and how did you learn these?
4. How did your apprenticeship/internship change the way you see yourself as a farmer?
5. Tell me about your relationship with the farmer and other apprentices.
6. If you could design your own apprenticeship or internship experience, what would it look like?
7. Please tell me a bit about the next steps for you. (Do you think you will start farming? Why or why not?)

#### **Conclusion**

8. Is there anything else you would like to share that you haven’t already?
9. Who else should I visit to learn more about my questions?