

Agriculture curriculum needs of homeschooling parents: A case study

by

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ABSTRACT

The purpose of this study was to explore the gaps, if any, in the curriculum needs of homeschooling parents. It was motivated by the perception that parents homeschooling their children did not have official curriculum for agriculture or agricultural science subjects. The result of this was that the children were not getting the appropriate instruction in these subjects, depriving them of an important set of knowledge, especially since most of them grow up on farms. The research was originally intended to be a national study. However, time and resource constraints limited it to a few states in the Midwest. Therefore, the results reported in the study represent a case study of the situation and not a representation of the national situation.

The study used a structured online survey on the Qualtrics® platform and a snowball sampling technique to collect information on homeschooling families and their agriculture and agricultural science curriculum needs. The response rate was low: 53 parents from mostly Iowa and Missouri (approximately 80% together) responded. Nearly three-quarters of the respondents had bachelor's or advanced degree and about 41% indicated their spouses had at least a bachelor's degree. These homeschooling parents were experienced in developing curriculum with about two-thirds of them having taught for at least five years. Majority of the parents indicated that they were motivated to homeschool their children by their need to spend more time with their children (69%) while almost half of them indicated the negative peer pressure in public schools motivated them.

While more than 64% of respondents to the survey indicated they included agriculture and agricultural science in their education program, less than 17% of them said they had a formal curriculum. When asked if their homeschooled children incorporated farm work formally into their schoolwork, only 17% answered in the affirmative. The conclusion from the agriculture and agricultural science instruction is ad hoc when it is included in homeschooling program of the parents who responded to the survey. When asked if they saw a gap in their agriculture and agricultural science curriculum and whether they needed capacity enhancement, they answered in the negative. It hoped that this result is reflective of this small group of Midwest respondents and not of the broader homeschooling community. The suggestion, therefore, is that the research be expanded to encompass a larger representative sample to ascertain the observations from this case study.

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CHAPTER I: INTRODUCTION

Nearly one-third of the homeschooling population in the United States (U.S.) is from a rural area (Prater 2016), making a large portion of the homeschooling families agricultural. This large proportion of agricultural families involved in homeschooling would suggest that children in these homeschooling environments have a better understanding of agriculture. However, there is the evidence that most homeschooling families do not have an integrated agriculture-centered curriculum. Additionally, parents teaching their children tend to multitask – being mothers, farm managers or supporting their spouses in managing the farm, volunteering in community and church activities, etc. – leaving them often time stressed in preparing their classes, developing assignments and tests, grading and overseeing student projects.

While homeschooling is nothing new, the changing regulatory environment is increasing the expectations from homeschooled children, creating issues for homeschooling parents. Research has shown that providing relevant content is important for learning, suggesting that students need a connection to well-defined and appropriately-structured lessons (Briggs 2014). Having curriculum that is familiar to their cognitive, social, and mental situations allows students to better understand the content.

United States Government data shows that homeschooling has been increasing in the United States since the 1970's. The literature indicates that concerns about public schools' social environment is a major reason. Given that parents have a legal right to provide the education they deem best for their children, it is important that gaps in their ability to provide such education are identified and addressed if homeschooled children

are going to graduate from their home schools with the requisite skills to be successful and competitive against their public-school counterparts. The gaps emanate from parents' access to resources and their capability as teachers in an increasingly complex educational system and knowledge distribution environment. The focus on agriculture is important because of the presumption that living on a farm or being a farmer provides the capability to provide the requisite instruction in agriculture or agricultural science to one's children.

1.1 Research Problem and Research Question

The problem this research seeks to tackle is identifying the extent to which homeschooling parents are using formal curriculum for their agriculture and agricultural science subjects and whether the extent to which they see a gap in their own ability to teach the subject. The research also seeks to identify parents' willingness to pay for training, if they believe they have capacity gaps and pay for instruction material if they deem these necessary to achieve their objectives.

To this end, the research question motivating this project is: To what extent are homeschooling farm families experiencing challenges with their agriculture and agricultural science curriculum? These challenges are framed in two related ways:

1. The lack of curriculum or dissatisfaction with their agricultural and agricultural science curriculum; and
2. Parents' capability to adequately teach their children given the multitude of activities that compete with their time because of their multiple responsibilities.

1.2 Objectives

The project's overall research objective is to determine the extent to which homeschooling parents use formal curriculum for agriculture and agricultural science instruction and evaluate the existence of any gaps in parents' teaching capacity. The specific objectives are as follows:

1. Describe the characteristics of homeschooling parents and the structure of a typical homeschooling family.
2. Estimate the extent to which homeschooling parents use formal agriculture or agricultural science curriculum in their instruction of their children.
3. Assess parents' self-assessed capacity gaps in delivering agriculture and agricultural science content to homeschooled children and their willingness to participate in capacity enhancement programs.
4. Evaluate parents' willingness to pay for agriculture or agricultural science curriculum for use in their homeschooling programs.

1.3 Methods

The principal method used for this research was statistical analysis using STATA 15®. The study used survey data collected using an online survey delivered on the Qualtrics® platform and focusing on parents recruited by means of the snowball technique. The survey will include all 50 states, but will focus on: Iowa, Nebraska, Missouri, Oklahoma, and Texas. Survey participants were self-identified and, hence, non-random. The link to the survey was first distributed to homeschool associations in the

focus states for onward distribution to their members. Additionally, the survey link was posted on two of social networking websites and emailed to acquaintances with connections to the homeschooling community.

1.4 Outline of the Thesis

The next chapter will provide a review of the literature, focusing on the background of homeschooling including: the history, rise of homeschool popularity, curriculum needs, homeschooling laws and regulations, and homeschooling options. Chapter 3 presents the data collection and analytical methods used in this research. Chapter 4 presents the results of the analyses and Chapter 5 provides a summary and conclusions emanating from the study. It also presents what is considered the study's weaknesses and how future research may overcome these weaknesses.

CHAPTER II: LITERATURE

The literature on homeschooling is reviewed in this chapter. It reviews covered the challenges of agriculture in homeschooling programs and parents' capacity to teach children effectively, especially as the children grow into the higher grades and need more availability to complete their requisite programs.

The chapter is organized into six sections. Section 2.1 describes the history of homeschooling and Section 2.2 describes trends and the parent's rationale for homeschooling numbers and enrollment. Section 2.3 describes the demographics focus on age, gender, ethnicity highest college degree obtained by the parents, and the parents income level. Section 2.4 describes provides a discussion on curriculum and patents' use of them. It assesses the regulatory oversights that the Future Farmers of America (FFA) places on homeschoools' agriculture and agricultural science curricula. Section 2.5 presents the general regulations covering education, focusing on the case study regions – Iowa, Nebraska, Missouri, Oklahoma, Kansas, and Texas. The final section, 2.6, describes the alternative homeschooling options available.

2.1 History of Homeschooling

In the colonial period, there was no public education. However, the importance of reading motivated the government to step in and support some level of public education. During the 17th and 18th century, education received at home had two basic purposes: to achieve literacy and learn to be self-sufficient through the acquisition of vocational skills (Jorgenson 2011). Massachusetts was one of the first state to pass laws pertaining to

children's education, they passed a law in 1647 that required education in reading, religion, and trade (Jorgenson 2011). State-mandated education started in 1787, and by 1827, every township with over 500 families was required to provide public education. In 1837, the idea of the common school was established in Massachusetts. This public school was paid for by taxpayers and ran by the state. Almost every state had developed a sort of public-school system by the 1860's (Jorgenson 2011).

As the year passed, public-schools grew as a result of immigration, passing of compulsory school attendance, truancy laws and the elevated costs of homeschooling. The public-school system allowed for an economic of scale and lower cost of resources such as textbooks, computers, laboratories etc. Every state by 1918 had laws regarding truancy, which requires all children 8 to 14 years to attend school (Jorgenson 2011). Due to these laws, many families had to either give up on homeschooling or they had to go "underground." In 1950, Lincoln and Marjorie Levisen were charged and convicted of violating truancy laws in Illinois. They wanted to homeschool their daughter because they believed that "Children should not be educated in competition with other children because it produces a pugnacious character" (Stollar 2015). This case was over turned and the court rules that the Seventh Day Adventist correspondence course did meet the requirements and qualified as private schooling under the Illinois law (Stollar 2015). In 1962, Many parents from the Protestants religion, pulled their children from the public-school system over the court's decision on forcing desegregation and banning of school-officiated religious activities (Stollar 2015).

Up until the 1970's, 87% of 5-17 year old's were enrolled in the public school system (B. D. Ray, A brief history of homeschooling in the United States n.d.)

Homeschooling started to regain popularity in the late 1960's to early 1970's. John Holt was a leading activist in favor of homeschooling. He wrote a book, *How Children Fail*, in 1964, which argued that public-school systems “were an attempt to classify students and segregate the winners and losers of society” (Davis 2011, 30). This book addressed how putting children in a setting where they are focused on getting the right answer for the teacher hinders their education (Stollar 2015). According to Tina Marie Jorgensen “Homeschooling was renewed because of changes in public schooling, and in families during the second half of the twentieth century. Public schools grew larger, less responsive to parents, and less adaptable to individual or local cultural variations.” (Jorgenson 2011, 21).

Homeschooling was redefined in 1967 by the New Jersey Superior Court that states the homeschoolers satisfy the section of the compulsory school attendance directly related to “elsewhere than at a school.” The courts declared that a child can be taught at home and taught by someone who does not have a teaching certificate. Due to this ruling and authorities demanding Amish children attend public school, Iowa passed a law stating “an exemption from compulsory school attendance for members of religious denominations which profess principles of tenets that differ substantially from the objectives, goals, and philosophy of education embodied” (Stollar 2015). In 1972, the U.S. Supreme Court ruled the Wisconsin Vs. Yoder case in favor of Yoder, accepting Amish children do not have to be placed under compulsory education past their 8th grade year (Stollar 2015).

Parents beliefs increased the desire for homeschooling. In the 1970's, there were concerns about how beneficial the public education system was. Parents started to

remove their children from the public-school system and enroll them in either private schools or homeschools. Homeschool numbers continued to rise steadily to where the approximately 10,000 homeschooled children in the 1970's had ballooned to more than 2 million by 2010 (Kararo 2017, 2). The primary motivation was assumed to be parents' beliefs and their values. A Utah court case ruled in favor of a white supremacist father who had opted to homeschool his children due to the public-school teaching about Martin Lothar King Jr. The state ruled that he met the requirements of homeschooling as long as the children received an annual psychological exam and tested twice a year. Court case after court case continued to be won by parents allowing them to exercise their rights over their child's education. (Stollar 2015)

In 1983, the Home School Legal Defense Association (HSLDA) was formed. The HSLDA is an advocate for homeschooling families and provided legal defense for parents at a reasonable price. The HSLDA has defended families against the educational bureaucracy regarding the rights on homeschooled parents (HSLDA 2019). By 1990, membership had grown to over 15,000 families and was represented in all 50 states and by 2003, there were over 70,000 families (Stollar 2015).

The increasing numbers of homeschools engendered the formation of homeschooling groups. Gregg Harris' book, *The Christian Home School*, influenced thousands of families to begin homeschooling. This book also encouraged the formation of State Conferences in numerous states. (Stollar 2015). Homeschooling was recognized as a legal option in all 50 states by 1988 (Stollar 2015).

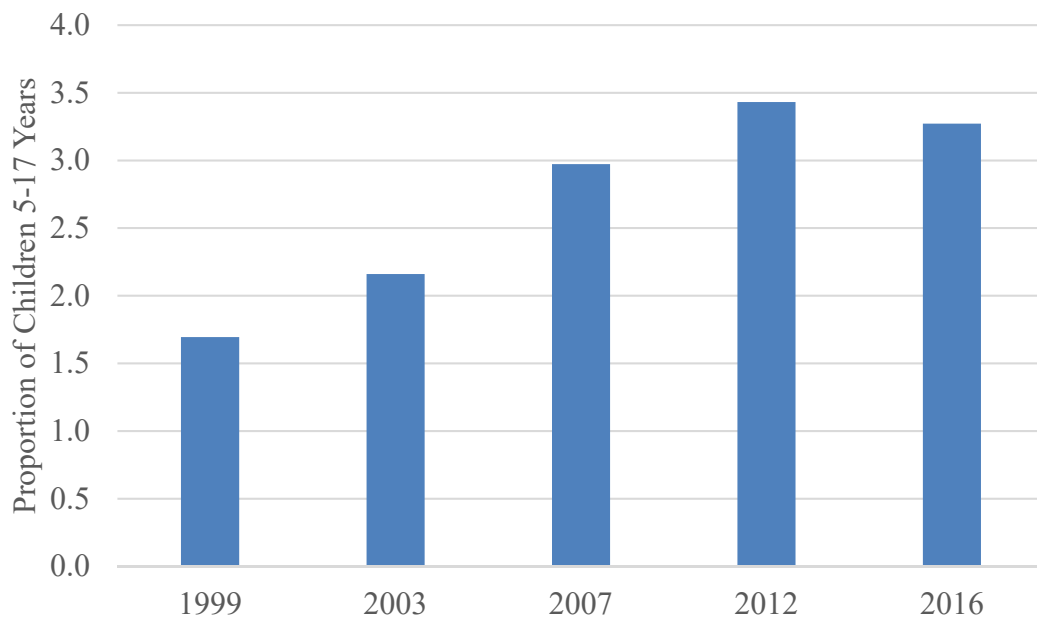
Attitudes continued to turn towards the better for homeschooling. By 2000, over 75% of the colleges changed their admissions so it would favor children that were

homeschool (Sun 2015). In 1995, homeschooling numbers reached between 500,000 and 750,000 and continued to grow (Stollar 2015). A survey sent out in 2001 found that 70% of children that are homeschooled were not homeschooling for religious reasons. By 2013, homeschooling has become an accepted form of education amounting to about \$650 million per annum industry.

2.2 Homeschooling on the rise

Homeschool popularity has been on a steady rise since the 1970's. The proportion of children age between five years and seventeen years with grade equivalent from kindergarten to 12th grade homeschooled increased from 1.7% in 1999 to 3.3% in 2016 (Figure 2.1). The number of homeschooled children also increased from about 850,000 to almost 1.7 million, according to the US Government.

Figure 2.1: Proportion of Children between Kindergarten (5 Years) and 12th Grade (17 Years) Homeschooled in the US (1999-2016)



Source: U.S. Department of Education, National Center for Education Statistics, Parent Survey and Parent and Family Involvement in Education Survey of the National Household Education Surveys Program (Parent-NHES:1999 and PFI-NHES:2003, 2007, 2012, and 2016). February 2018.

The trend has been fueled by parents' concerns about the public-school system and their relative inability to put their children into private schools. It has been argued that homeschooling allows parents to customize their children's education to better suit their needs, to combine education and religious views, and provide them a safe environment due to the exposure to drugs, alcohol, and violence in the public school system (B. D. Ray, Research Facts on Homeschooling January 7, 2019). Nine out of 10 parents choose to home school their children due to concerns of the public school's environment (AIR- American Institutes for Research 2016). In 2013, in the NCES report (National Center for Education Statistics), reported that 91% of parents homeschooled their children due to concerns about the public-school environment. The survey went on to find that 77% wanted to provide moral instruction their child, 77% was dissatisfied with curriculum in public schools (HSLDA 2019). In another survey, 74% of parents homeschool due to dissatisfaction in academic instruction (McQuiggan, Redford and Battle 2016) A 2004 study comparing the SAT and ACT scores of homeschool students, public-school students, and private school students found that homeschool students average scores were higher and comparable, respectively, to both the other types of schooling (B. D. Ray, Research Facts on Homeschooling January 7, 2019). However, Ray observed that homeschooled children typically perform 15 to 30 points higher on the standardized tests than children in the public schools (B. D. Ray, Research Facts on

Homeschooling January 7, 2019). It is worth noting that 64% of families that homeschool take the national or state standardized tests willingly because of their own interest in assessing their children's performance (Bergstrom 2012).

Social integration has been a common concern about homeschooled students over the years. However, recent research has concluded that many homeschooled students, when they become contributing members of society, are actually a positive influence on their communities (Sun 2015). A 1997 study found that homeschooled children participate in 5.2 activities per week (B. Ray, Home Schooling Achievement 2001). Homeschooled students were less likely to have participated in sports compared to public school students, 45.9% versus 56.9% respectively. However, 62.3% of homeschooled students were involved with activities and clubs outside of school, versus 55.5% of public schooled students (Montes 2015). Parents believe that they can tailor their social interactions to suite their child's needs and their personalities and children contribute to their own socialization. Many studies involving homeschooled children's social skills are rated on the Social Skills Rating system (SSRS). The SSRS is "designed to be a broad, multi-rater assessment of socially acceptable learned behaviors that enable a person to interact effectively with others" (Medlin 2013, 287). The scale measures the child's cooperation, assertion, empathy, and self-control. In several studies cited throughout the paper, homeschooling students tested higher on average on the SSRS than their peers in the public-school system. Generally, homeschooled children are "are happy, optimistic, satisfied with their lives, and have a positive attitude about themselves and about being homeschooled" (Medlin 2013, 284).

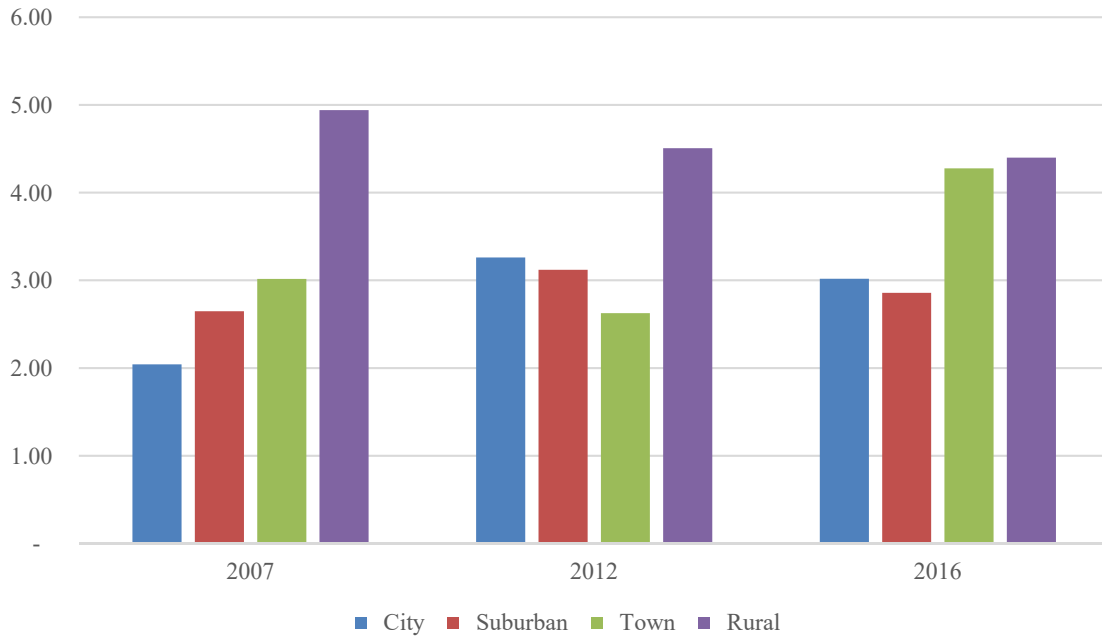
2.3 Homeschooling demographics

The distribution of homeschools and homeschooled children is concentrated in the US. For example, Iowa, Oklahoma, Nebraska, Kansas, Missouri and Texas accounted for about 15.5% of the total number of homeschooled children in the US (Statistics 2018).

The distribution of homeschooled children by sex in 2016 was about 52% female.

The proportion of homeschool children by locale between 2007 and 2016 is presented in Figure 2.2. It shows that the proportion of rural children in homeschools was more than twice the proportion of urban children in homeschools in 2007. However, by 2016, the ratio was down to 1.5, with the proportion of urban children in homeschools increasing even as that proportion for rural children declined. Also, by 2016, homeschool children as a proportion of school age children in urban areas was the same as the proportion of homeschool children as a proportion of school age children in rural areas.

Figure 2.2: Distribution of Homeschooling Children by Locale (2007-2016)



Ethnicity varies in the homeschool demographics. There are approximately 998,000 white children; 132,000 black children; 444,000 Hispanic children; 44,000 Asian/ Pacific Islanders children; and 69,000 other races (Digest of Education Statistics 2017). Of all the homeschooled children, approximately 525,000 are in the grades 9th through 12th grade.

Parents of homeschooled children have different levels of education. In 2016, the majority of parents, 510,000, have a high school diploma or less. 418,000 parents have a vocational or technical degree. Of the 501,000 parents have a bachelor's degree and 260,000 parents have a graduate or professional degree. Most of the families with homeschooled children come from the \$20,000 to \$50,000-dollar income level, approximately 483,000. 435,000 students come from a household income level of \$50,000- \$75,000 (Digest of Education Statistics 2017)

2.4 Curriculum Needs for Homeschooling

According to Ed Glossary, curriculum is defined as “the knowledge and the skills students are expected to learn, which includes the learning standards or learning objectives they are expected to meet; the units and lessons that teachers teach; the assignments and projects given to students; the books, materials, videos, presentations, and readings used in a course; and the tests, assessments, and other methods used to evaluate student learning” (Great Schools Partnership 2015).

Jorgenson (2011) identifies five common types of curricula used by homeschooling parents: (1) text-book based; (2) literature-based; (3) computer-based; (4) video/satellite; and (5) unschooling. Text book-based curricula is similar to the traditional public-school curriculum. Literature-based curricula is based on lessons taught from lectures. A computer-based curriculum is where the students receive instruction through software. This can include; lectures, tests, quizzes, readings, and assignments. Video/ satellite curriculum is where students can watch a teacher give lessons. Unschooling curriculum is more real-world application looking at a more hands on approach to learning. (Jorgenson 2011). These different types of curriculum make it easier for working homeschooling parents to manage their student’s education.

The different forms of curricula have their positives and their negatives. Just like in public schools, not all curriculum suits every child. According to David Dunlap, “What worked one year may not necessarily work the next. Your Family’s needs and interests will always continue to change, and you need to go with the flow. Buy materials that meet your present needs and mold the curriculum to the child’s abilities, not the child to

the curriculum” (Kelley 2019). Textbook-based curriculum is one option for a parent. It provides an endless supply of subjects, it is inexpensive, and it is portable. However, many children are visual learners. With textbooks, children can become bored easily (Soard 2019). Textbook based is the most common the first and second year of homeschooling, and many parents opt to mix textbooks in with other types of curriculum (Kelley 2019).

With Computer- based curriculum, the amount of time for preparation and grading is decreased. Curriculum on the computer are continuously updated and it gives kids breaks from books. Students learning from a computer-based curriculum, get to go at their own rate, a self-study (Clements 2002). However, some believe that children rely on the computer too much, spending too much time on it which can lead to eyestrain. Teaching using a computer takes away some parent’s reasons for homeschooling and decreases parental involvement (Soard 2019). According to Andrea Clements there was more accountability for the materials covered within the curriculum with computer-based education (Clements 2002).

Literature-based curriculum generally requires more input and time from the parent. The parent must be familiar with the books, lectures, etc. that are being used. The parent also must create the assessments and assignments. According to Andrea Clements “The thought behind the method is that children are exposed to literature and are more naturally interested in stories than in textbook style writings” (Clements 2002).

Video/ satellite curriculum brings the lecture to the students through either already videoed lessons or live classes broadcasted out. This allows for the student to

learn from a licensed teacher teaching in front of a class. The parents administer and grade the assessments. Much like the Computer-based curriculum, Video/satellite lectures are self-study for students (Clements 2002).

Unschooling curriculum does not use textbooks or lectures but uses real-life experiences to learn. It is difficult to describe teaching methods with unschooling because the child's learning and everyday activities merge into their education. It is the most controversial type of curriculum (Clements 2002). One of the major negatives surrounding unschooling is overcoming the social pressures (Riley 2013). Parents receive a lot of negative comments about the perceived notion that children that participate in unschooling do not receive an education. Research done by Riley and Gray determined that parents have a difficult time with unschooling because they struggle with their new schooling philosophies and their old philosophies. However, unschooling engages the student and provides more real-life material. Parents also believed "Their children were happier, less stressed, more self-confident, more agreeable, and/or more socially outgoing than they would be if they were in school or being schooled at home." (Riley 2013, 16).

Curriculum in the public-school setting differs from homeschool curriculum. Public school curriculum is based around the standards established by the state. There are 7 different basic types of curriculum that can be found in public schools: recommended, written, taught, supported, assessed, learned, and hidden.

Recommended curriculum is curriculum that is recommended by the scholars and professional organizations (Glatthorn 2000). Generally, this type of curriculum just influences the classroom teacher. This does influence the written curriculum, which is

used in “The curriculum is produced by the state, the school system, the school, and the classroom teacher, specifying what is to be taught.” (Glatthorn 2000, 83) Written curriculum is both content guidelines set-forth by the school district, and the curriculum the classroom teacher has developed to teach the content.

Supported curriculum is where there are instructional materials to help support the curriculum being used in the classroom. This includes textbooks, software, and other multimedia sources (Glatthorn 2019). Taught curriculum is the actual curriculum being taught in class every day. Studies have shown that the curriculum that is written and the curriculum that is actually taught varies. Lessons cannot be set in stone. The teacher has to be flexible with their lesson because things change day to day when dealing with children. The Assessed curriculum is the curriculum that is being tested over. This is not only including the state tests and standardized tests, but it includes the tests the teacher develops to administer to their classes. Tested curriculum has the strongest influence on the curriculum actually being taught in the classroom.

Learned curriculum is the content that is actually being learned by students. According to Glatthorn, there is a significant gap between what the students are taught, and what is actually being obtained by the student. “Several factors account for the gap: the teacher’s failure to make the curriculum meaningful and challenging or to monitor the student learning; and the student’s low level of motivation, cognitive abilities, and short attention spans.” (Glatthorn 2019).

The last of the curriculum types is the hidden curriculum. Hidden curriculum is what a student learns without structured lessons. Students learn about time management,

disciplinary policies, financial management, and accepted cultural standards such as personal space. This is the unintended lessons they learn from their physical environment. The example given by Glatthorn was if a student is required to read for 250 minutes a week and they are required to go to art for 50 minutes, it teaches the students that art is not as important as reading (Glatthorn 2000, 84).

The differences in homeschooling curriculum and public-school curriculum boils down to regulations, ease, and the ability to customize to fit their child's needs. The public-school system is regulated by the government and its curriculum must meet state standards. Because of this, many teachers "teach to the test" instead of for the students learning. Homeschooling students in most states are not required to take standardized tests, but some parents choose to have their child take them to compare their children to public school children.

Parents are free to teach their children how they see fit and choose curriculum that meets their interest. Homeschooled children are also able to slow down or speed up depending on their child's understanding. They can also be taught based on their learning styles. Academically advanced students in the public-school system often are not challenged due to the large classes sizes and limited number of teachers. Those advanced students cannot move ahead at their own speed; they are limited by the rest of the class (DePury 2018).

2.4.1 Homeschooling and FFA

With the increase in homeschooling, the need for a variety of curricula increases. On the Home School Mom's website, they have links taking parents to different

resources for teaching agriculture for topics such as soil resources and food safety (M.A.Kelley and Company, Inc. 2019). This website has activities and games to help parents teach some agricultural content. Websites like National Agriculture in the Classroom have many resources as well, but there is only one fully online accredited Ag coursework program and that is Nelson Academy of Agricultural Sciences Online. They offer Ag Class online to middle school and high school students, along with adult education. They are partnered with North Dakota Center for Distance Education. For a 20-week, elective course for North Dakota Residents it costs an average of \$169 while non-residents cost \$250 (North Dakota Center for Distance Education 2018). They offer many online agriculture classes.

High-school aged homeschooled students cannot be members of the National Future Farmers of America (FFA) association. To be an FFA member, a student has to be enrolled in an agriculture course at school. For public school students that do not have an FFA program at their school, they can join a neighboring school district. (National FFA Organization 2019). Homeschooled student can take ag classes through their local school to be able to participate in FFA. The last several years, there has been a push for the National FFA Association to allow children that are homeschooled to become members.

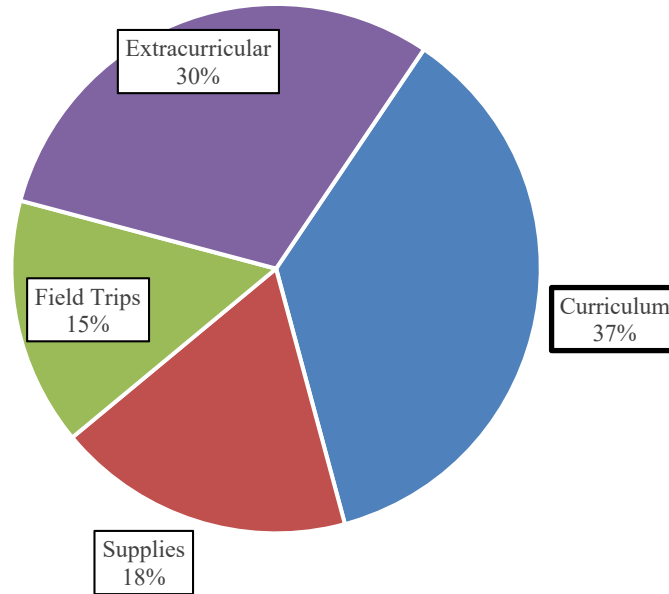
2.4.2 Public School versus Homeschool costs

Public, private and homeschool education requires resources – time and money being only two of the obvious. According to the Census Bureau, on average, taxpayers spend over \$10,615 per student in a public-school setting, and \$0 on children that are homeschooled. The average homeschooling family costs can fall into these categories:

curriculum, supplies and equipment, field trips, and extracurricular activities. The average family spends around \$600 per child for curriculum per year when they are homeschooled (B. D. Ray, Research Facts on Homeschooling January 7, 2019). This would include books, curriculum, etc. The average cost to send supplies with a child to public school is around \$1,000 while homeschooling students' supplies cost average around \$150-300 (Devit 2019).

As stated previously, it is recommended to have extracurricular activities and field trips for the students to participate in for socialization. This would include things like field trips, community sports, music lessons, etc. On average for field trips, a parent would look at spending anywhere from \$100 to \$250 per year on fields trips. Extracurricular activities, the parents may spend around \$100 to \$500 a year. (Devit 2019) Many parents even use their family vacations to continue their child's learning. The approximate total cost of homeschooling a child in the United States can range from \$700 to \$1800 per child per year (Devit 2019).

Figure 2.3 Average cost of homeschooling for parents



2.5 Laws Regulating Homeschooling

Most laws regarding the parents’ rights to homeschooling their children are left to the states. The Home School Legal Defense Association (HSLDA), states “10 states require no notice from homeschooling families, 14 states have “low regulation,” 20 states have “moderate regulations,” and six states have “high regulation”. Some states have compulsory laws, some have requirements for parents, some require notifications from parents, others require record keeping and assessments.

Iowa, Missouri, Oklahoma, and Texas are all states that have a “no notice” law. That is, parents do not have any communication with the public-school system indicating that they are homeschooling their children. Those states are not regulated by the state.

They can choose to participate in yearly state testing to compare how their child's education ranks with public school students. States that have a notice law require parents to submit a form to provide notice that can include, depending on the state, curriculum (Coalition for Responsible Home Education 2019). With some of these states being no notice states, sometimes children may "fall through the cracks" because of lack of information about their progress (Coalition for Responsible Home Education 2019).

Compulsory laws in the United States is when a child is required to be enrolled in an education program, whether it be public, private, or homeschooling. Each state has its own laws governing age and other requirements (USLegal 2016). In Iowa, children aged between six and 16 years are required to be enrolled in an education program. The age range in Texas is six years to 19 years, Missouri is seven to 17 years, Oklahoma is five to 18 years, and Kansas is seven to 18 years (National Center for Education Statistics 2017). Having the compulsory law helped increase school attendance mainly in minority students (National Center for Education Statistics 2017).

2.6 Homeschooling Options

There are four different homeschooling options that a parent may use in the state of Iowa: full time with the support of a certified teacher; full time without the support of a certified teacher; part time homeschool with part-time enrolled in a school district; and attendance at a non-accredited school (Iowa Department of Education 2018). Each program is tailored to suit the parent's needs, but each has different regulations.

Teaching children with independent private instruction, parents need to make sure the right subjects are being taught: math, reading/ language arts, science, and social studies. Parents have to provide information to the schools if requested, regarding who

the primary instructor is, name and location of primary instructor, and the names of students enrolled. They also are allowed access to some public-school programs such as band, choir, family consumer science, and agriculture education (HSLDA 2019).

Homeschooling using private instruction is regulated by ensuring the parents are providing education in a nonpublic school setting and making sure they are following a plan or course of study. Students in a Private Instruction setting also have access to some public-school programs such as driver's education, free testing, and community college classes (HSLDA 2019).

Homeschooling with a supervised teacher requires a little more effort. Parents have to file Form A, which includes name and age of the child, number of days of instructions, textbooks used, child's birthdate, and outline of course study. It also includes the instructor's name and address. Parents must hire a qualified teacher to supervise. The supervising teacher must meet with the student twice every 45 days, one of the two days must be face-to-face. Students are also eligible to partake in public school programs (HSLDA 2019). These practices all require different amount of input and time from the parents. The most beneficial to the child's education and most time efficient for parents is for a program using a supervising teacher.

CHAPTER III: METHODS

The first section of Chapter 3 describes the methods used in the collection of data. The second section of the chapter describes the methods used in analyzing the data.

3.1 Sampling and Data Collection Approach

The data collected using a structured questionnaire distributed to self-identifying respondents recruited via social media and email. The survey got approval from Institutional Review Board (IRB) at Kansas State University prior to distribution. Ideally, we would have needed a list of potential respondents' email addresses for distribution of the questionnaire. Unfortunately, this list was unavailable for this research due to time constraint. To overcome this constraint, the researcher chose to depend on a snowball sampling process. This involved asking friends and relatives, associated colleagues to distribute the survey link to their network of relationships, focusing the network on those with affiliation to homeschooling. The survey link was also posted on Facebook and Twitter for those with these pages to reach out to their followers and friends. The request for participation was clearly focused on parents currently homeschooling or had homeschooled in the past. This approach ensured that respondents were *actually* homeschooling parents or had been.

The questionnaire was organized into four sections. The first section focuses on the demographic characteristics of respondents and the structure of homeschooling families. For example, data were collected on respondents' experience, family income, and number of children homeschooled. The second section explored the factors influencing the decision to homeschool. The literature had suggested families were

motivated to homeschool because of their faith and the secular environment in public schools. It also identified some families motivated by their belief that the public schools system was too liberal while others believed it was too conservative for their children to be in it. This section sought to collect information that allowed the determination of families' characteristics and their motivation for homeschooling.

Homeschooling parents weren't only teachers of their children, but they were their mothers and spouses at the same time. This separated them from public school teachers, who may have similar responsibilities, but performed them at different times during any day. Additionally, homeschooling parents are not required to be registered teachers to be instructors of their children. The third of the survey instrument sought to assess parents' self-assessment of their capabilities as teachers, their challenges and an awareness of any gaps in their skills. It also sought to explore parents' willingness to address these gaps, if they identified any, through capacity building programs. Finally, if they were willing to address the gaps, the third section also sought to collect information on how much they were willing to pay for such capacity enhancement programs.

The final section of the survey instrument focused on parents' use of agriculture and agricultural science curriculum, accessibility to and willingness to use online technologies for instruction and their willingness to pay for customized curricula. The agriculture and agricultural science curriculum was defined to encompass formal and systematic instructional guidelines and content material for each grade level covering the following: Crop and animal production; U.S. and global agriculture; and technologies influencing agricultural production. It also included food production systems, farm management and economics as well as social issues related to agriculture.

3.2 Analytical Methods

The data were analyzed using statistical methods estimating frequencies for categorical variables and central measures and distributions for continuous variables. STATA 15[®] statistical package and Microsoft Excel were used for the analysis. The analyses encompassed estimation of frequency distribution for respondents by their demographics and the count of children by grade level. Central measures of parents' experience as homeschool instructors and their employment situation and incomes were also analyzed.

The role of technology in education has been increasing over the past few decades. The study attempted to assess how homeschooling parents were using internet technologies in the instruction of their children. This consideration provoked the question of how the number of children homeschooled and parents' experience influence the adoption of technology. It was hypothesized that number of children homeschooled increased the likelihood of adopting internet-based instruction resources, and parents' experience has no effect on the use of internet-based instruction resources. Increasing the number of children homeschooled put pressure on the time parents have to not only prepare but also conduct instruction – from content delivery to developing exercises, games, enrichment projects and grading assignments. This time pressure resulting from increasing number of children homeschooled, it is argued, persuade parents to depend on generic lesson plans, content and immersion projects for their children.

A logit regression model was estimated to test this hypothesis of the odds of using internet technology resources ($y = 1$) or not ($y = 0$) with increasing number of children

homeschooled, n (Equation 3.1). Parents' experience is represented by x in the equation, where experience is defined as a binary variable, taking on the value of 0 when experience is greater than zero but less than five years, and the value of 1 when it is five or more years.

$$y \begin{cases} \text{No Internet} = 0 \\ \text{Internet} = 1 \end{cases} = e^{\alpha + \beta_1 n + \beta_2 x}, \quad (3.1)$$

The null (H_0) and alternative (H_1) hypotheses about the odds of internet technology adoption and increasing number of children requires that:

$$\begin{aligned} H_0 : \beta_1 &= 1 \\ H_1 : \beta_1 &> 1 \end{aligned} \quad (3.2)$$

In other words, the hypothesis suggests that increasing the number of children does not increase the odds of adopting internet technology resources, while the alternative hypothesis indicated that the odds are greater with increasing number of children. It is expected that the null hypothesis will be rejected and accept the alternative hypothesis. For experience, the specification of the null (H_0) and alternative (H_1) hypotheses is as follows:

$$\begin{aligned} H_0 : \beta_2 &= 1 \\ H_1 : \beta_2 &> 1 \end{aligned} \quad (3.3)$$

In the experience case, we expect a failure to reject the null hypothesis because of the expectation of the independence between experience and the number of children. That is, changing number of children has no effect on adoption of internet resources once internet technology is adopted. In other words, technology adoption is sticky (Brimley 1999).

CHAPTER IV: DATA ANALYSIS

This chapter presents the results from the survey. It is organized in three sections. Section 4.1 presents the summary statistics about the respondents. Section 4.2 presents the results of the exploration of motivations and interactions of homeschooling parents with the public-school system. Section 4.3 describes the types of curriculum parents use in homeschool program and opportunities for specific agricultural curriculum and technology mediation in instruction to address any gaps. Section 4.3 also explores the willingness to pay for services to address the identified gaps.

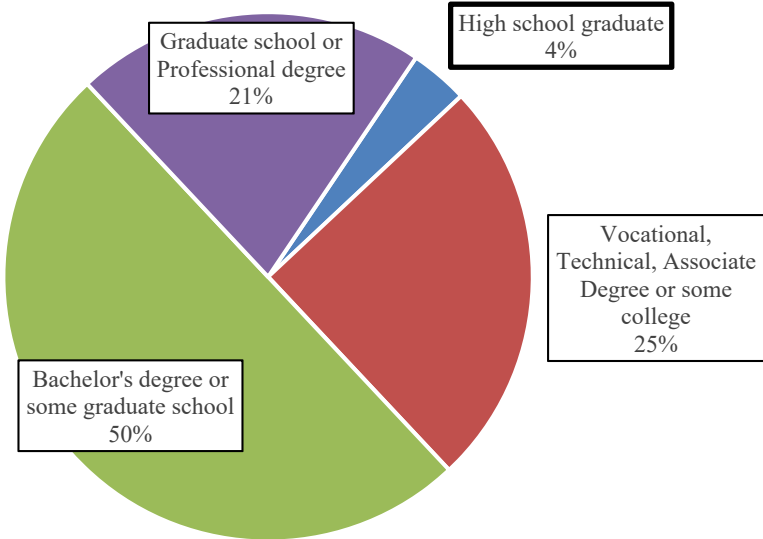
4.1 Summary Statistics about Respondents

The analyses are based on responses from 53 respondents to the online survey described above. Respondents were recruited using a snowball technique. Information for two of the 55 respondents were incomplete and they were, thus, dropped from the analysis. Nearly 57% (30) of the respondents indicated that they are currently homeschooling. Of the remaining 43%, about 27.3% (six) had homeschooled in the past while the remaining 72.7% (16) had never been involved in homeschooling. The main reason those who had homeschooled in the past were currently not was because their children had passed high school age.

Nearly all (96.4%) of homeschooling parents are married or cohabiting. About 87.1% of respondents are women and about 18.5% of them work outside the home. Nearly 72% of them have at least bachelor's degree, with more than 21% indicating that they have a graduate or professional degree (Figure 4.1). Considering only female respondents, 28% of them have vocational training, 52% have bachelors or some graduate school and

20% have a graduate or professional degree. For spouses, about 41% respondents indicated their spouses have bachelor's degree or some graduate education while 37% indicated their spouses have some vocational education. Only 11% of respondents indicated their spouses have either only high school education or graduate or professional degree, respectively. The correlation between the education of respondents and their spouse was estimated at 0.42, and it was statistically significant at the 5% level.

Figure 4.1: Homeschooling Respondent Parents' Education Level (n=28)

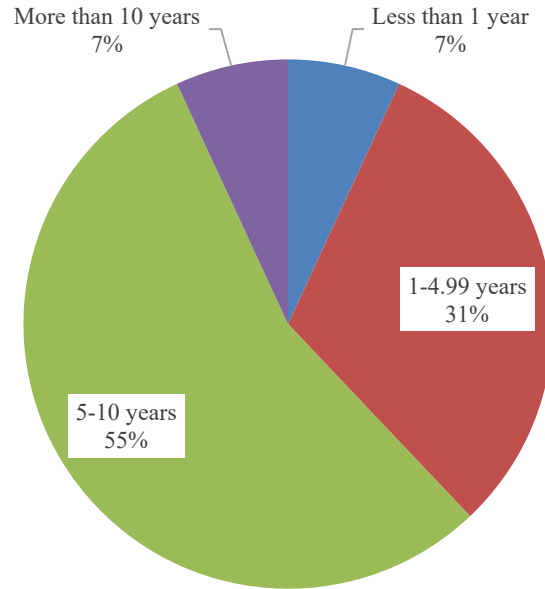


Recall that the researcher depended on their network of contacts as the initial point of distribution of the survey and that meant the snowball effect was limited by the knowledge and contacts of those contacts. The result was although the survey was not limited to any particular state or region, the respondents were concentrated by the concentration of the network connections. As a result of this concentration, two-thirds

(66.7%) of respondents resided in Iowa, 14.8% in Missouri and the remainder was distributed across four states: Illinois; Montana; Oklahoma; and Virginia. This is evidence that the results from this study reflect a case study of homeschooling and homeschools and not a representative of the homeschooling industry in the United States. Future study would draw a more representative sample to facilitate a study that can produce inferential results.

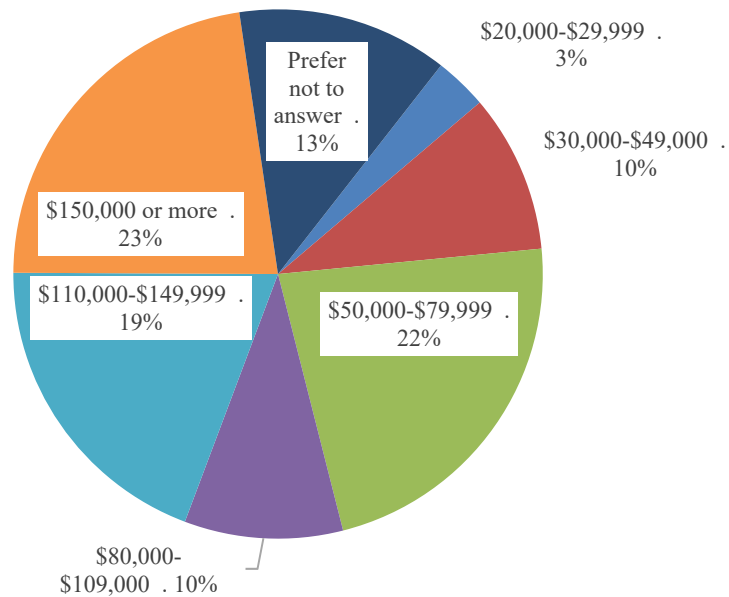
Parents' experience with homeschooling is represented by the number of years they have been involved with homeschooling. The assumption is that number of years of homeschooling increased parents' experience. Parents currently homeschooling are categorized by their experience in Figure 4.2. About 55% of them have between five and 10 years of experience while about 31% had between a year and less than five years' experience. The remaining parents were distributed equally between those with less than a year of experience and those with more than 10 years of experience.

Figure 4.2: Homeschooling Experience of Homeschooling Respondents (n=31)



Redford et al. (2017) report that homeschooling is diffused across all household economic groups. The data supports this position because Figure 4. shows that at least 10% of respondents who are currently homeschooling are from \$30,000 to less than \$50,000 category to \$150,000 or more category. None of the respondents reported annual household income of less than \$20,000 for last year. Figure 4.3 shows that 22% and 23% of households respectively indicated being in the \$50,000 to less than \$80,000 and \$150,000 or more categories, and nearly a fifth indicated being in the \$110,000 to less than \$150,000 category. About 13% of respondents chose not to provide information about their income.

Figure 4.3: Distribution of Respondents by Last Annual Household Income (n=31)

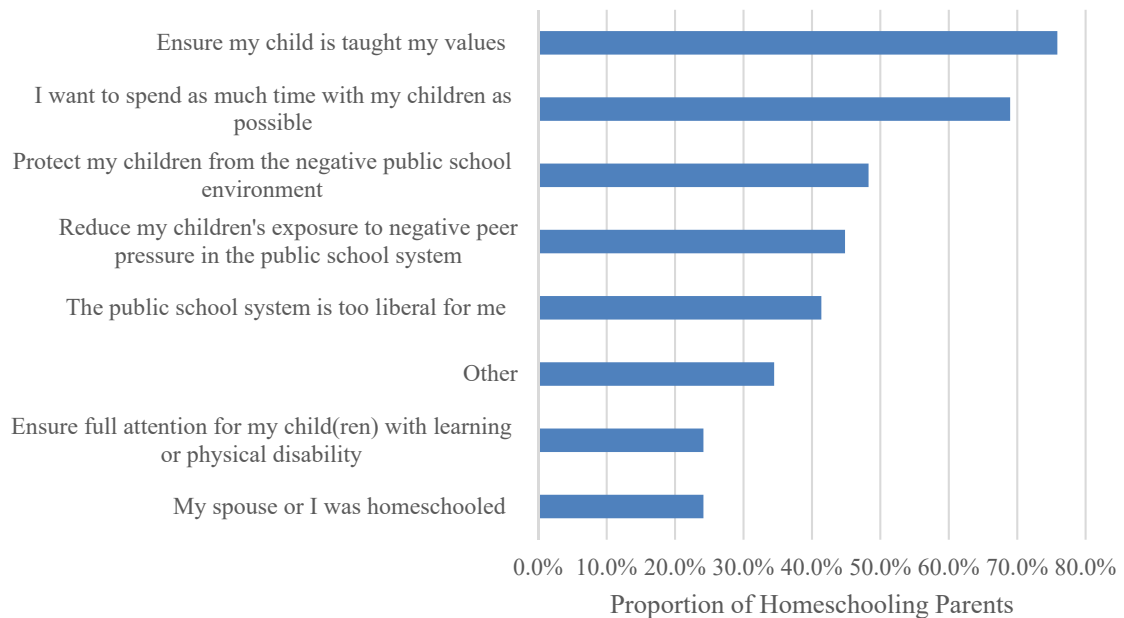


4.2 Motivation for Homeschooling and Homeschooled Children

Respondents were given 10 choices on motivating factors to homeschool. Almost 76% of them selected ensuring their children are taught their values as the dominant reason motivating them homeschooling their children. This was followed by wanting to spend as much time as possible with their children, selected by 69% of respondents. Protecting children from the negative public-school environment and reducing their children's exposure to negative peer pressure in the public-school system were selected by 48% and 45% of respondents, respectively. About 41% of respondents indicated being motivated to homeschool because the public school was too liberal for them, but none indicated they were motivated by the public school being too conservative for them. The foregoing results are summarized in Figure 4.4. That respondent or spouse was

homeschooled and ensuring a child with disability receive the necessary attention was only a motivation for 24% of respondents.

Figure 4.4: Factors Motivating Homeschooling (n=36)



About 35% of respondents selected “Other” motivating factors. These included such statements as:

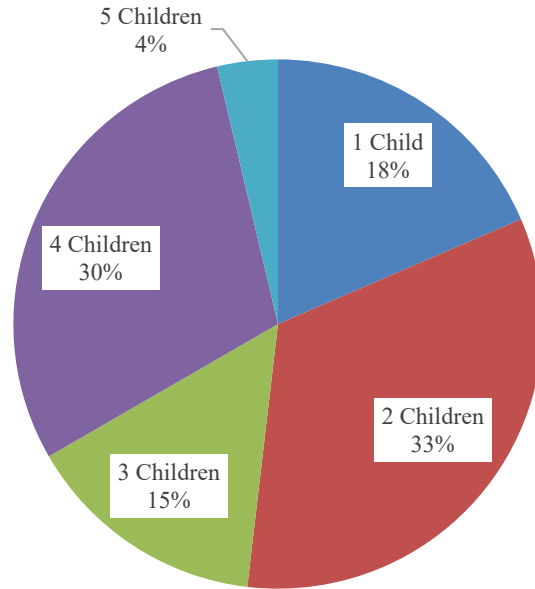
- Too much wasted time at school and in transit to school (given how far family is from nearest school)
- The public-school focus is not on education but on meeting assessments, and that defeats the purpose of educating children.
- Children get the appropriate instruction for their academic progress because they receive one-on-one instruction at home
- Needed the freedom to travel with kids

- Needed a focus on children's ability to play and be out in nature than the early focus on academics that is practiced in the public-school system.

The other responses were reported because they appear in other studies exploring motivation of homeschooling (Redford, Battkle and Bielick 2017).

The average number of children being homeschooled by respondents was estimated at about 2.9, with a standard deviation of 1.4 and a median of three children. This is within the bounds of error of the 2.5 average number of children in United States households (Census Bureau). The distribution of homeschooling parents by the number of children being homeschooled is presented in Figure 4.. It shows that while 18% of respondents had one child being homeschooled, about a third of respondents had two children and about 30% had four children homeschooled. Only 4% of parents indicated homeschooling five children.

Figure 4.5: Distribution of Homeschooling Parents by Number of Children Being Homeschooled (n=30)

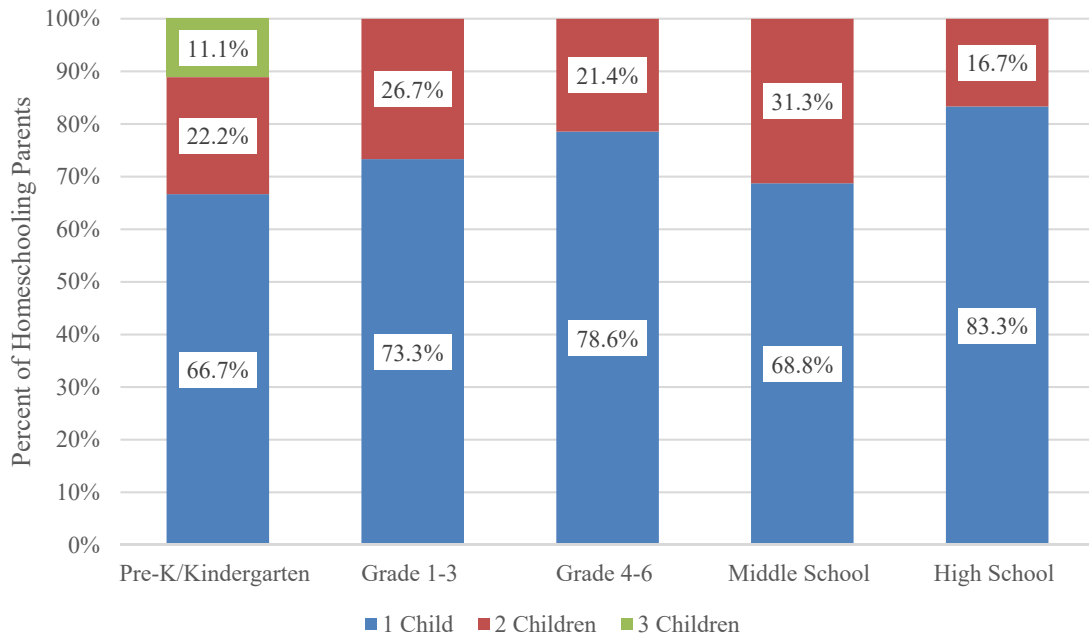


How are these children distributed by grade? This provides an indication of the homeschooled children's age. Of the respondents who are homeschooling parents, 37.9% have children in Pre-K or Kindergarten compared to 55.2% with children in Grade 1 to Grade 3, 48.3% with children in Grade 4th Grade 6, 62.1% with children in middle school and the remaining 48.3% had children in high school. This shows that many families have children in multiple grades, which is to be expected in multi-child household.

The distribution of households by the number of children in each grade is presented in Figure 4.6. The figure shows that nearly 67% of families with a child in Pre-Kindergarten or Kindergarten had only one child in homeschool compared to more than 83% of parents with only one child in high school. One family had three children in Pre-Kindergarten or Kindergarten, and that was the only grade level where more than two

children from a single family was found. It is important to note that because the age range for Pre-Kindergarten or Kindergarten can be wide, this is not surprising.

Figure 4.6: Distribution of Homeschooling Parents by the Number of Children They Have in Each Grade (n=30)

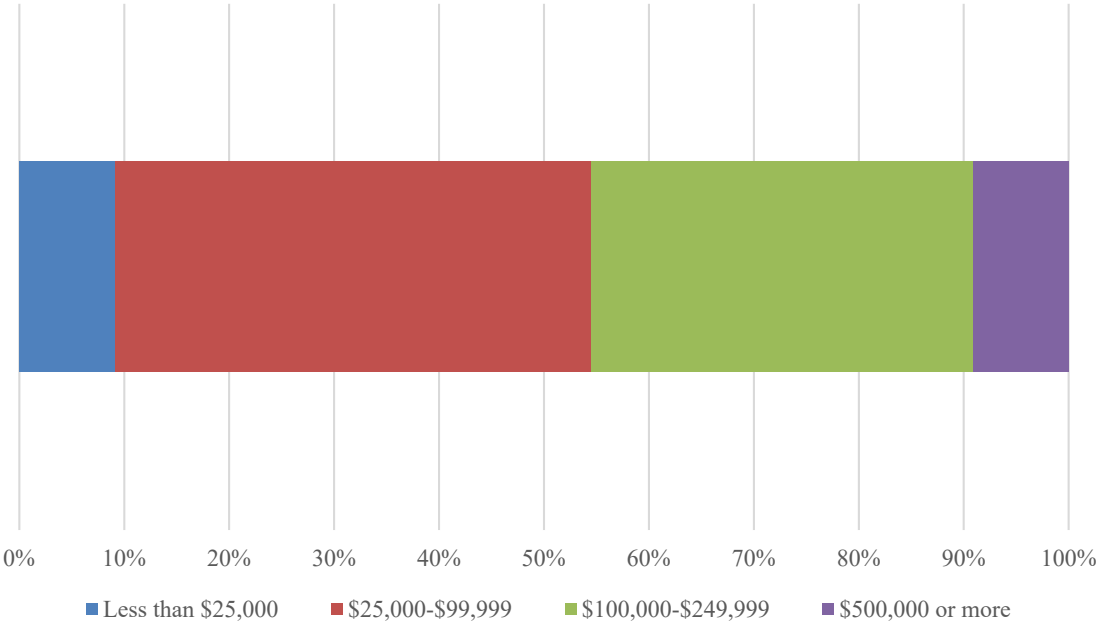


4.3 Agriculture Curriculum in Homeschools

When asked whether they consider their family a farm family, only 39.3% of homeschooling parents indicated in the affirmative and they all lived on a farm or ranch. This is equivalent to 11 of 28 respondents. Farm families are defined as those who make their living producing and selling agricultural commodities and their volume of sales determined the size of their farms. Using U.S. department of Agriculture (USDA) categorizations, the respondents fell into four farm size categories (Figure 4.7). While 9% of these farm families indicated having farms with less than \$25,000 in total sales and another 9% indicating living on farms making \$500,000 or more in sales, 45.5% indicated

their farms make between \$25,000 and less than \$100,000 and 36.4% indicated their farms make between \$100,000 and less than \$250,000.

Figure 4.7: Distribution of Farm Family Respondents by Size of Farm Operations (n=11)



Nearly three-quarters of respondents indicated they have off-farm employment while 60% indicated their spouse has off-farm employment. Respondents and spouses from small farms are more likely to have off-farm employment, but spouses are less likely to have off-farm employment when farm size is \$100,000 or more while respondents' likelihood of having off-farm employment decreases after farm size of between \$25,000 and less than \$100,000. This observation may be due to the majority of respondents to the survey being women and males being the primary income earner in most married families in the U.S. despite the growth in women as breadwinners of their families (Parker and Stepler 2017). Half of those with off-farm employment work full time and a quarter are

self-employed. The remaining quarter work only part-time. None of the respondents indicated they and their spouses working off farm both work full time. That is, respondents working full time off-farm tend to have spouses who are either not working off-farm or only part-time.

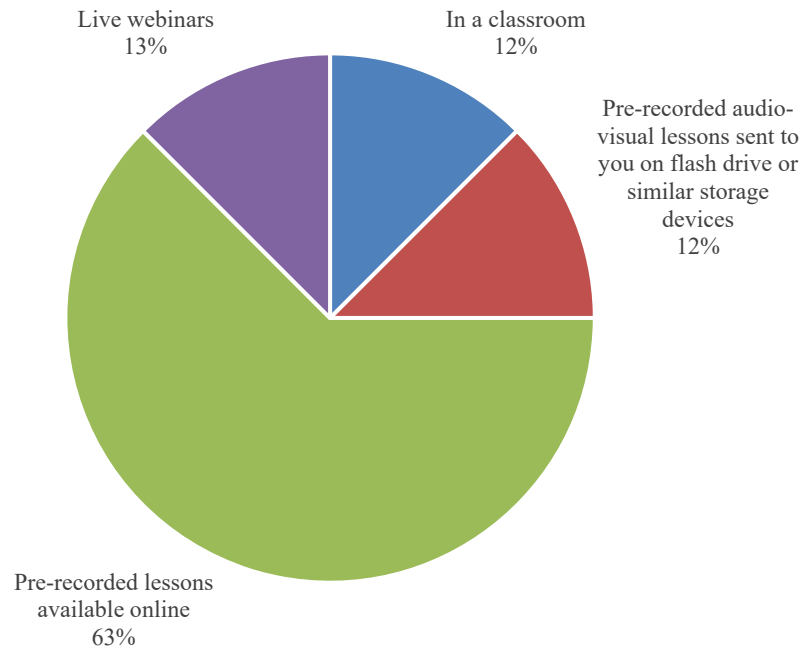
Respondents were asked if they included agriculture or agricultural science in their homeschooling curriculum and if so, did they have structured or formal curriculum for their topics. About 64.3% of them answered in the affirmative, but only 16.7% of those indicated they had a formal curriculum. When asked if their homeschooled children actively participate in on-farm activities as a formal part of their school work, only 16.7% of them answered in the affirmative. Together, the foregoing indicates that agriculture and agricultural science instruction when provided is in an ad hoc manner.

Given the large proportion of respondents who do not incorporate agriculture and agricultural science formally into their children's education, they were asked the likelihood of them incorporating it if they could get formal curriculum. The assumption here was that they were not using formal curriculum because they could not access one. More than 73% of them indicated that they are somewhat or extremely likely to use a curriculum if they could get one. About 20% of them said they were somewhat or extremely unlikely to use an agriculture or agricultural science curriculum even if they had access to it. Those unlikely to use the curriculum have at least bachelor's degree, but those likely to use it were across all education levels.

Overall, respondents feel competent in teaching agriculture and agricultural science. Given that they had no curriculum, this response is not surprising because they

have no way to judge their competence. When asked how competent they felt to teach agriculture or agricultural science using a curriculum, the unanimous response was somewhat or extremely competent to teach. These responses will support a low willingness to pay for capacity enhancement in the teaching of agriculture or agricultural science. When asked the likelihood of taking professional development courses to enhance their ability to teach agriculture curriculum, only 50% indicated they were somewhat or extremely likely to take such a course. For those willing to take a course to improve their teaching capacity, their preferred instruction models are presented in Figure 4.8. While the majority of them wanted online instruction, they indicated a preference for recorded lectures that are asynchronously presented online. This is understandable given that they have full time jobs and would likely want to incorporate their professional development into their schedule on their own terms. Classroom and distribution of material by flash drive or compact discs (CD) were the least preferred modes of instruction. It is important to note that while low, those preferring these modes were not statistically insignificant within the context of the data, i.e., despite the smallness of the data. Therefore, identifying the characteristics of those seeking classroom or material on storage devices may be important to meeting the customized needs of parents.

Figure 4.8: Preferred Instruction Mode for Respondents Willing to Enhance their Teaching Capacity (n=8)

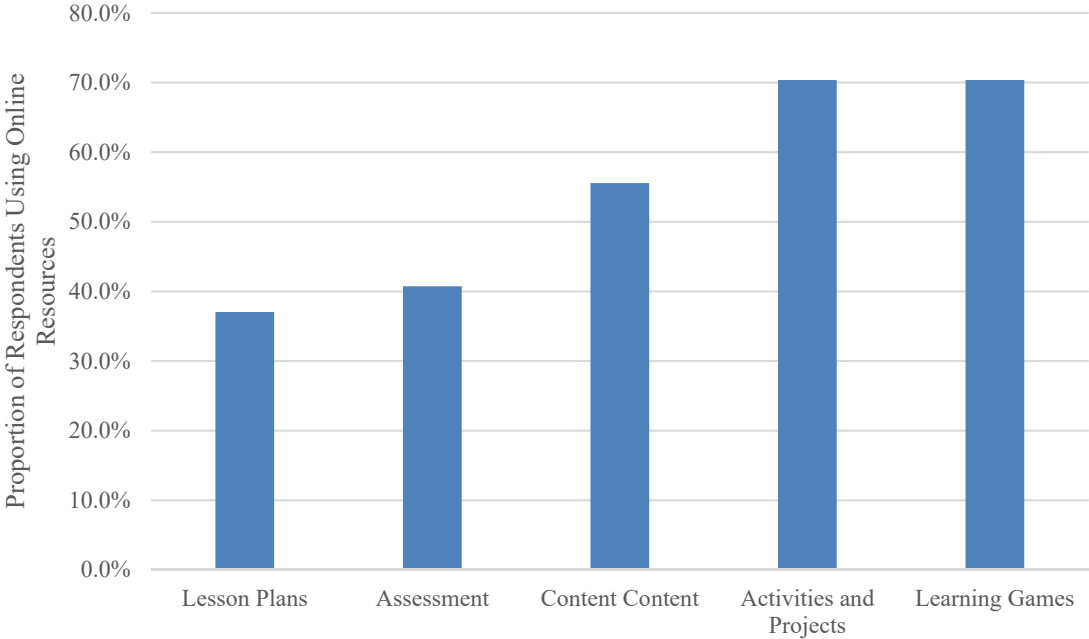


About 92% of respondents use online resources and about 73.3% of them pay or have paid for these resources. Figure 4.9 shows that while about 70.4% of those using online resources use it for learning games and activities and projects, respectively, 37% use it for lesson plans, while 55.56% of them use it to get information about course content. About 41% of them use online resources to receive information and tools for conducting assessment. This would seem to suggest that the value opportunity to serve homeschooling parents is in offering activities and projects and learning games.

The education level of those using online resources was vocational school or above and the likelihood of using online resources increased with education. For example, while 100% of respondents with graduate or professional degrees and 92.9% of those with bachelor's degree or some graduate education used online resources, only 85.7% of those with vocational training used them and none with less than vocational training used them.

This would suggest that targeting more educated people with tools to help them improve their instructional capacity in their homeschooling programs is probably more promising for uptake than those with lower education. It is possible that the more educated parents are, the more aware they become of their limitations as teachers of their children.

Figure 4.9: Proportion of Respondents Using Online Resources for their Homeschooling Program (n=27)



4.4 Number of Children and the Employment of Internet Technology

A logit model exploring the effect of the number of children and parents’ experience as homeschool teachers on the employment of internet was estimated using Stata 15® Professional Edition. The regression was based on data from 27 respondents (observations) and was executed using the bootstrap option for the variance-covariance matrix estimation (VCE) with 26 replications.

The results, showing the odds ratio, are presented in Table 4.1. This model shows that the odds of using online resources increases by nearly 30% with each additional homeschooled child. This coefficient is statistically significant at the 5% level. Thus, we reject the null hypothesis that the odds of adopting internet technology resources are not influenced by the number of children and accept the alternative hypothesis that the odds of adopting internet technology resources are, indeed, influenced positively by the number of children homeschooled. Parent’s experience as a homeschool teacher did not have any effect on whether internet technology was used in the instruction of homeschooled children. This result also supports the hypothesis that experience have no statistical effect on the utilization of internet resources to facilitate homeschool activities.

Table 4.1: Logit Regression Results of Number of Homeschooled Kids and Parents’ Experience on Use of Online Teaching Resources

Independent Variables	Odds Ratio	Bootstrap Std. Err.	z	P>z	Normal-Based	
					[95% Conf. Interval]	
Number of Children Homeschooled	1.300	0.625	2.080	0.038	0.074	2.526
Parent's Experience (Base = Less than 5 Years)	-0.579	0.960	-0.600	0.547	-2.460	1.303
Intercept	0.039	1.274	0.030	0.976	-2.458	2.536

The model's Wald Chi-square of 4.42 is statistically significant at the 10% level and the pseudo-R-square is 0.21, implying that the variability in number of homeschooled children and parents' experience explain about 21% of the variability in parents' use of online resources. The low R-square is typical of cross-sectional data, but in this particular case may be due to the low number of observations resulting from the relatively low response from our snowball sampling technique.

4.5 Willingness to Pay for Capacity Enhancement

Respondents were told to imagine their professional development budget for a year was \$500. When asked how much of this budget they will be willing to allocate to enhance their teaching competence, the majority of them (62.5%) indicated they will spend no more than \$100. Only 12.5% of them indicated they would spend up to \$400 on their professional development. Given that respondents felt they were competent in delivering the requisite education to their children, this result is not surprising. It also indicates that if professional development is going to be enhanced in the homeschooling community represented by the respondents in this study, some prior work needs to be done to reveal gaps in parents' capabilities and competences. The good news is that there is a positive correlation between willingness to pay for enhancing one's competence and their education level. Similarly, the correlation between the willingness to pay and household income is positive. It is important to note, however, that both correlations are not statistically significant within the confines of the data.

CHAPTER V: CONCLUSION

Chapter 5 is broken down into three sections. Section 5.1 summarizes the results of the study. Section 5.2 describes the weaknesses within the study, and suggestions for future work in this area. The last section of Chapter 5 is the conclusion.

5.1 Summary

The research shows that parents are continually looking for better options to provide their children with a superior learning opportunity. Sometimes, they choose to provide homeschooling for their children due to their perspectives about the public-school environment. The dominant motivation for homeschooling was the need to ensure their children were taught the parents' values. This motivation was independent of parents' education or employment situation.

The research was premised on the lack of adequate curricula for agriculture and agricultural science instruction in homeschools. Approximately 64.3% of the parents indicated that their child received some sort of education in agriculture; however, only 16.7% indicated that they used formal education. The results confirmed that parents were not using formal curricula in their agriculture and agricultural science instruction of their children. This means the children did not have any curriculum. Around 16.7% of the surveyed indicated their children received their agriculture education from on- farm work. This means they were being taught lessons while working on the farm. They were using the non-schooling method of teaching. They obtained information from hands on learning of real-world experiences.

This is where a major gap lies between the formal agriculture curriculum versus the non-schooling curriculum. There really is no formal curriculum being used. This could be due to the fact that many of the parents feel they are competent in teaching agriculture and agriculture sciences. Those parents that indicated they do not currently teach agriculture sciences, more than 73%, would be willing to teach that subject if there was curriculum available. Parents with a bachelor's degree or graduates' degree would be less likely be interested in the formal agriculture curriculum, but in this survey parents in this study that indicated they would be willing to use it were from across all education levels. Based on this study, there is area for improvement on the current curriculum offered to parents.

From this study, agriculture curriculum needs to include more activities, projects, and learning games instead of the agriculture-based content. That curriculum would be better marketed using online materials. Around 92% of the respondents from this survey use some sort of online resources. Of those respondents, 73.3% have paid to get resources for their homeschooling program. Most of the content purchased were learning games, activities, and projects. Only 37% purchased lesson plans. Parents with vocational school and above used online resources, and the likelihood of using those online resources increased with the parent's education. It is possible that the more educated a parent is, the more aware they become of their limitations as teachers of their children. Targeting more educated people with tools that improve their instructional capacity in their homeschooling program rather than providing formal curriculum is more promising than targeting those with a lower education.

It can be assumed that parents in this survey are involved with numerous activities, including farm work, careers, and family. Of the respondents, 39.3% specified they lived on a farm or ranch. Forty-five percent indicated their farms make between \$25,000 and less than \$100,000 and 36.4% indicated their farms make between \$100,000 and less than \$250,000. Nearly three-quarters of the respondents indicated they have off-farm employment while 60% indicated their spouses worked off-farm. Of the respondents who worked full time off of the farm, their spouses were either not working off-farm or working part time. With farm sizes indicated in this survey, and a majority of respondents coming from Iowa and farming's main busy seasons are Spring through Fall, it can be assumed parents do not have extra time to spare for curriculum design.

Children are a major time commitment for parents, and the more children a family has the more time is needed to develop curriculum especially when it comes to homeschool curriculum. Parents have to plan curriculum and as stated in the literature section, curriculum does not always fit every child. Parents with a greater number of children are more likely to use online resources. Every child in their homeschooling program increases the likelihood by 3.5. This means larger families are more inclined to use online materials to improve their homeschooling curriculum to meet the needs of all of their children. The parents in this survey averaged 2.9 children per household which indicated they are 10.15 times more likely to use online resources based on their family's size and the given likelihood.

Many of the parents in this survey had several years of experience homeschooling children. Around 55% had between five to ten years. However, 31% indicated they only had between a year and less than five years of experience. The assumption is that the

longer the parent has been homeschooling, the more experience they have. It can be assumed that parents with more experience in teaching and developing their curriculum would be less likely to partake in continuing education.

There was a strong agreement by respondents about their competence and capability in providing the education their children needed. As a result of the assumed competence and high rate of experience, they were not interested in professional development to enhance their instructional capacity. Parents in this study were asked if they would be willing to commit money for professional development. Most of them indicated they would not, and felt they were competent in their teaching. However, there was no real way to measure their competency in this survey. Continuing education is important for not only teachers, but parents as well. The content is constantly changing, and parents and teachers alike need to be able to keep up with it. Offering continuing education for parents would benefit their child's education. The best way to provide the continuing education is to make it affordable and easily accessed online. This is understandable given most have full time jobs and would likely want to incorporate their professional development into their own schedule. Parents do not have the time to sit down and watch lecture after lecture to gain more knowledge. They need it quick, readily available, and affordable. There is a positive correlation between the willingness to pay for enhancing ones' competence and their education level, along with the positive correlation between the willingness to pay and their household income.

5.2 Weaknesses in the study

The study targeted parents with homeschooled children. It used a snowball recruitment approach to recruit respondents for an online survey. Participation rate could have been better to provide a higher confidence to provide broader inferences. Developing an email list to specifically and formally invite participants has been shown to improve participation. Therefore, it is recommended that future research using online surveys should work at developing a list of potential respondents. That invitation illustrates the respondents' importance and often encourages participation.

The time and budget constraints prevented the researcher from providing adequate duration for respondents to participate in the survey. The effect was the concentration of respondents within the researcher's home state. Future work would expand the response window and expand the solicitation to not only reach a larger group of people in more states but reach more diverse groups to help improve the representativeness of the sample and hence the power of the data.

A common response from individuals that wanted to take survey indicated their children were not old enough to homeschool. They would have liked to contribute their opinions to the survey as potential parents. This could have given insight about future markets. Maybe there is an opportunity to develop a study looking at potential homeschooling parents and their expected needs.

The survey could have asked respondents about their specific degree to give better appreciation of the source of parents' confidence in teaching agriculture and agriculture sciences. If they have been trained as agricultural professionals, it could contribute to

their confidence in their capabilities as teachers of agriculture and their less than willing attitude towards addressing any gaps they might have.

5.3 Conclusion

Whether a parent chooses to enroll their child in public-school or homeschool, the ultimate goal is to provide a quality education to their child. Homeschooling parents believe they are achieving this goal based on their motivations, and also getting the chance to spend more time with their children even as they ensure their children grow up with their values.

The history of education shows that it is continuously changing. Educators in the public-school system are required to receive continuing education to keep their teaching license. This ensures the subjects the students are learning are up to date and are accurate. Homeschooling children miss out on this if their parents do not stay up to date with the changing content on the different subjects. Participating parents in this research seemed not to be aware of this need, and felt they were adequately prepared to meet the instructional needs of their children without continuing education. A careful approach to convince them of the dynamics of the subjects their children need to know would be helpful in getting them to consider continuing education for themselves in enhancing their instructional currency and capacity.

The use of formal curriculum for agriculture and agricultural science was found to be low among the respondents of this survey. The study did not ask about the use of curricula in other subjects. Given the number of respondents, no inference is being made about this across the population. However, if the results in this study resemble what

prevails in the population, then it means that homeschooled children are probably not covering all the topics and subjects they need to cover to be well-grounded in their knowledge about agriculture and agricultural science. The homeschool parents associations or organizations may want to embark on an outreach to show their members the importance of using curricula for their programs. The National FFA organization also has a role to play here. It may want to reach out to homeschooling parents, both farm families and non-farm families, to encourage them to improve the structure of their agriculture and agricultural science programs by adopting credible curricula.

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