Skills gap analysis of farmer-owned cooperative directors and its connection to the agricultural landscape

by

Jody S. Herchenbach

B.S., University of Nebraska – Lincoln, 2013
MAB, Kansas State University, 2019

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Agricultural Economics
College of Agriculture

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2022

Abstract

Agricultural cooperatives are larger and more complex than ever before. Due to this growth, farmer directors need to up-skill to maximize farmer member benefits. Director education is generally considered a successful strategy for improving financial and strategic performance, yet little research has examined the skills farmer cooperative directors need.

This research identified skills necessary for farmer cooperative directors to ensure financial and operational success. A two-part approach is taken to address the research objective. The first step follows a qualitative data collection approach using personal interviews and focus groups. Results were consistent across farmer directors and cooperative general managers in Kansas and suggest that successful directors must possess the following skills and behaviors: financial/business, governance, board leadership, industry knowledge and strategic planning.

The second step follows a quantitative data collection approach. A survey was designed to identify the farmer cooperative director skill gap, using a Likert scale design, and what skills are most important, using best/worst scaling. We found that directors seem to evaluate themselves at a higher skill level than CEOs/GMs evaluate directors. Most of the skill gaps suggest training opportunities for new directors. The largest skill gaps were found in Cooperative Governance and Policy and Cooperative Finance. Time Management was found as being the least important skill for directors to possess. Asking Critical Questions, Strategic Planning, and Understanding Current Economic and

Industry Conditions were consistently in the top three skills with Cooperative Finance and Communication occasionally entering into the top three. Using a Skills Priority Matrix, we found that the same top skills are of highest priority and should, therefore, be the foremost skills training programs are designed to improve moving forward.

Skills gap analysis of farmer-owned cooperative directors and its connection to the agricultural landscape

by

Jody S. Herchenbach

B.S., University of Nebraska – Lincoln, 2013
MAB, Kansas State University, 2019

A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Agricultural Economics
College of Agriculture

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2022

Approved by:

Major Professor
Dr. Brian C. Briggeman

Copyright

Abstract

Agricultural cooperatives are larger and more complex than ever before. Due to this growth, farmer directors need to up-skill to maximize farmer member benefits. Director education is generally considered a successful strategy for improving financial and strategic performance, yet little research has examined the skills farmer cooperative directors need.

This research identified skills necessary for farmer cooperative directors to ensure financial and operational success. A two-part approach is taken to address the research objective. The first step follows a qualitative data collection approach using personal interviews and focus groups. Results were consistent across farmer directors and cooperative general managers in Kansas and suggest that successful directors must possess the following skills and behaviors: financial/business, governance, board leadership, industry knowledge and strategic planning.

The second step follows a quantitative data collection approach. A survey was designed to identify the farmer cooperative director skill gap, using a Likert scale design, and what skills are most important, using best/worst scaling. We found that directors seem to evaluate themselves at a higher skill level than CEOs/GMs evaluate directors. Most of the skill gaps suggest training opportunities for new directors. The largest skill gaps were found in Cooperative Governance and Policy and Cooperative Finance. Time Management was found as being the least important skill for directors to possess. Asking Critical Questions, Strategic Planning, and Understanding Current Economic and

Industry Conditions were consistently in the top three skills with Cooperative Finance and Communication occasionally entering into the top three. Using a Skills Priority Matrix, we found that the same top skills are of highest priority and should, therefore, be the foremost skills training programs are designed to improve moving forward.

Table of Contents

List of Figures

List of Tables

Acknowledgements

The author wishes to thank the entire Department of Agricultural Economics staff and faculty at Kansas State University. She learned much more than she ever could have imagined from this graduate program and pushed herself beyond her limits. The relationships she formed with staff, faculty, and fellow classmates have helped create a very positive and vibrant learning environment while completing this degree. She is also extremely thankful for her entire dissertation committee: Dr. Brian Briggeman, Dr. Aleksan Shanoyan, Dr. Jason Bergtold, and Dr. Sarah Low. She has gained so much knowledge from these individuals throughout the dissertation research project. Their insight collectively has been invaluable.

The author would also like to thank the cooperative community in Kansas and the surrounding states. She was able to expand her knowledge on cooperatives by asking questions and partaking in various cooperative events with fellow colleagues and experts. They all have renewed the spark for cooperatives the author first discovered years ago.

Lastly, the author would like to thank her husband, Jeff, and her family for their support throughout the time she dedicated to receiving the doctorate degree. These individuals include Bruce and Jean (the author's parents), Jessica and Jamie (the author's sisters), Jeff's family, and author's extended family. Knowing they would always be there at her best times and her worst times while juggling life, work, and school has meant so much to her.

Dedication

This dissertation is dedicated to all non-traditional graduate students. May you find your life's passion as you embark on your own educational journeys. It's OK to not fit the stereotypical graduate student mold.

Chapter 1 - Introduction

Boards of directors are vital to the success of any firm. All boards of directors are charged with setting long-run strategic goals that benefit customers and owners of the firm. Directors also hire and work with the CEO or general manager to accomplish these goals. Most of the academic research relating to boards focuses on their connection to firm financial performance and associated metrics. To improve firm financial performance, directors must have certain skills. Some research has been done in this space but mainly from observing necessary skills for directors of corporate or non-profit boards. Cooperatives operate differently with a specific audience and mission in mind. Scant research has been done to identify the skills needed by agriculture cooperative directors or board members. Additionally, the economy and business structures of cooperatives have changed rapidly over the past few decades, likely changing the director role and the skills needed to be successful.

The purpose of this dissertation is to ascertain the necessary skills for today's farmer cooperative director to successfully lead their cooperative. The objectives are:

1. To identify what skills are necessary to be an engaged and knowledgeable farmer cooperative director.
2. To detect potential skill gaps between new farmer cooperative directors and current directors utilizing the list of necessary skills.
3. To recognize and suggest potential training opportunities for farmer cooperative directors, focused on the necessary skills to close skill gaps between new and

experienced directors so they can become engaged and knowledgeable at the beginning of and throughout their tenure as a director.

Our research questions include:

1. What skills are needed in order to be an engaged and knowledgeable farmer-owned cooperative director?
2. Do farmer directors of local cooperatives exhibit an adequate or proficient level of expertise of identified skills that a farmer director should have? If not, what skills gaps exist?
3. What skills are the most important for directors to possess?

1.1 Cooperative Background and Landscape

Cooperatives exist to generate profits and operate efficiently, but not necessarily to maximize profits like most other corporations. More specifically, farmer cooperatives exist to maximize member benefits (Puusa & Saastamoinen, 2021). A cooperative is owned and democratically controlled by the people who use its services. Member-owner benefits are distributed back to them on the basis of their use of the cooperative.

The nature of cooperatives goes back to the mid-1700s in the United States. Various types of cooperatives began to pop up in the United States and in Britain throughout the 1800s. They were formed during this time to alleviate economic stress and dire social conditions. For example, in Britain, industrialization and struggles with Napoleon brought about depressed economic and social conditions. Cooperatives were formed to

deal with such pressures. Cooperatives also sprang up to sell food and clothing to those unhappy with other merchants (Frederick, 2012).

Hogeland (2006) notes that in the mid-1900s, cooperatives were not seen as profit seeking businesses. Instead, they were seen as a way to protect farmers from unfair prices and as a risk management tool for farmers. In a way, cooperatives served as a community staple for collective bargaining. Farmers could pool their grain together to be marketed collectively or to be made into livestock feed as a way to increase their bargaining power. Several producers acting together toward a common goal is stronger and more prominent than one producer trying to negotiate for better prices and services. Cooperatives served as the one place for farmers to conduct their business locally. Additionally, as Nourse (1945) famously pointed out, cooperatives were the "competitive yardstick" that kept other firms from exploiting farmers. In other words, if non-cooperative firms wanted a farmer's business, they had to drop prices and offer similar services to be competitive in the marketplace. Cooperatives were not out to displace other businesses, but to create competition in the marketplace.

In the late 1900s, agricultural production and marketing began to change because of vertical integration and other industrialization movements. Cooperatives became "value-added" businesses that were "market driven" (Hogeland, 2006), instead of "competitive yardsticks" or collective bargaining vehicles. Cooperatives were now competing with several other like-minded businesses who had similar target markets. Cooperatives were

not just marketing grain anymore – they could provide farmers with additional products and services based on the demands of the market.

According to Frederick (2012), there are a few characteristics that distinguish a cooperative from another form of business: open membership, one member one vote, membership education, political and religious neutrality, no unusual risk assumption, limitation on the number of shares owned, limited interest on stock, goods sold at competitive retail prices, and the redistribution of profits back to the membership, according to business conducted. Cooperatives do not just have to be agriculture focused; cooperatives exist to serve various industries, such as insurance, finance and banking, grocery stores, electricity, and housing.

Cooperatives provide various benefits for their members, as explained by Candemir, Duvaleix, and Latruffe (2021). Belonging to a cooperative increases the members' economic stability and could potentially increase their farm income. Cooperatives help farmers manage market risks by way of economies of scale, the solidarity nature of cooperatives, and the sharing of fixed costs. Sometimes, cooperatives can even encourage farmers to adopt new practices and technologies by helping make the investments more feasible and by providing access to inputs, expert advice, and other services. Cooperatives may be able to provide access to larger high-quality markets, which could then mean higher prices and more reliable contracts for farmers. The cooperative provides farmers an additional market in which to sell their products so that they are not only selling to investor-owned firms.

Cooperatives also benefit the surrounding landscape. Cooperatives can help generate jobs and salaries for the local community. Additionally, they pay taxes that could help finance schools, hospitals, and other community resources (Frederick, 2012). Cooperatives provide added community income, stronger communities by bringing patrons into communities to do business and stimulating home ownership, and goods and services to farmers and nonfarmers (Mather, 1990). Furthermore, cooperatives provide competitive services, prices, and markets; serve as educators; and act as agents of social change (Chapman, et al., 1986).

1.2 Director Roles and Responsibilities

In Chapman's book (1986), he discusses the duties and responsibilities of directors. These include establishing the mission and objectives of the cooperative, creating policies, selecting the general manager, approving and monitoring the financial structure and budgets, identifying future plans for growth, and maintaining communication with members. Directors need to represent the members, participate effectively in board meetings, help select and guide the general manager, engage in financial planning and policy making, conduct strategic planning, and maintain relations with the community. There are five functions of the board of directors:

1. Supreme decision center function – making the final decisions;
2. Advisory function – advise the general manager and members;
3. Trustee function – safeguard the cooperative's assets;
4. Perpetuating function – ensure the cooperative has long-term viability; and

5. Symbolic function – board is seen and acts as leaders of the organization.

Similar statements can be found in other works done by the USDA Rural Business Cooperative Service: (Baarda, 2003) and (Wadsworth, Kirkman, Rapp, Ingalsbe, & Duffey, 2015).

Furthermore, within the works done by Baarda (2003) and Wadsworth, et al. (2015), some director qualities and abilities are suggested. Cooperative principles should be familiar to each director. These principles include:

1. The User-Owner Principle – the people who own and finance the cooperative are those who use the cooperative
2. The User-Control Principle – the people who control the cooperative are those who use the cooperative
3. The User-Benefits Principle – the sole purpose of the cooperative is to provide and distribute benefits to its users on the basis of their use.

Directors are expected to act in good faith, apply their best judgments for the benefit of the cooperative, and remain loyal to the cooperative. They should be able to clearly express their views, communicate well, and be good listeners. They must be able to work with other directors, cooperative management, and members. Directors need to know and understand what questions to ask in regards to financials and business matters, character and principles, the governance structure, policy and legal aspects, member relations and education, operations and management, and strategic planning (Wadsworth J. J., 2018).

Given the long list of duties, responsibilities, and qualities of cooperative directors, training and continuing education is important. Both positives and negatives of the business and surrounding market and agricultural landscape emphasize the importance of continued cooperative education. Such education programs should include topics such as the cooperative's character, governance, finances, policies, structure, operations, strategic efforts, and market position (Wadsworth J. , 2004). Additionally, Park, et al. (2019) suggests that director training not only includes educating directors on their roles and responsibilities, but that it also includes education on personal, board, and organizational development. Finally, Cobia (1989) advocates for directors being exposed to many viewpoints and educators, which allows the directors to potentially develop a broad and unbiased perspective. One such way to do so is through the training process.

Furthermore, it has been shown that firm productivity is linked to having individuals who are willing and able to learn new skills according to the demands of their position (Reiter-Palmon, Young, Strange, Manning, & James, 2006). Orientation training for new directors and continued training are both positively related to cooperative financial performance (Franken & Cook, 2017). Furthermore, director and management education are key for successful strategy implementation and evaluation (Boland, Hogeland, & McKee, 2011). It has been found that the skills provided by being a community leader or involved in agricultural production are less likely to adequately prepare those individuals to be engaged and knowledgeable cooperative directors (Bond, 2009).

1.3 Overview of Methods and Results

In order to identify necessary skills for a director to be engaged and knowledgeable and to develop training on those skills that are most important, a two-part approach is taken. The first step follows a qualitative data collection approach. A personal interview questionnaire was designed that asks open-ended questions about director skills. A set of focus groups and personal interviews were conducted with current farmer directors as well as current farmer cooperative CEOs and general managers in Kansas. The qualitative piece provides insights into what skills are needed to be an engaged and knowledgeable farmer director.

We found that not only are skills needed to be an engaged and knowledgeable director but behaviors are important as well. The responses were consistent among the different types of participants (i.e. CEOs, directors, and stakeholders). There is some overlap with our results and the results from other studies that focused more on director skills needed for larger corporation boards (Adams, et al. 2018; Asahak, et al. 2018; Leblanc 2020). The eleven skills identified through the qualitative approach can be seen in Table 1.1 below.

Table 1.1 Eleven Farmer Cooperative Director Skills

Skill Code	Skill
1	Cooperative Finance
2	Cooperative Governance and Policy
3	Communication
4	Time Management
5	Understand Current Economic and Industry Conditions
6	Asking Critical and Constructive Questions
7	Strategic Planning

8	Networking
9	Listening
10	Teamwork
11	Leadership

The second part follows a quantitative approach utilizing the eleven skills listed above. A survey was sent out to farmer directors and agricultural cooperative CEOs across the Midwest in early 2022. The survey contained three sections: a demographic section, a skills assessment, and best/worst scaling exercise. The skills assessment allowed us to identify potential skill gaps faced by new directors using the eleven skills between new farmer directors and current directors. The best/worst approach allowed us to identify the most important skills out of the list of eleven considered in Table 1.1.

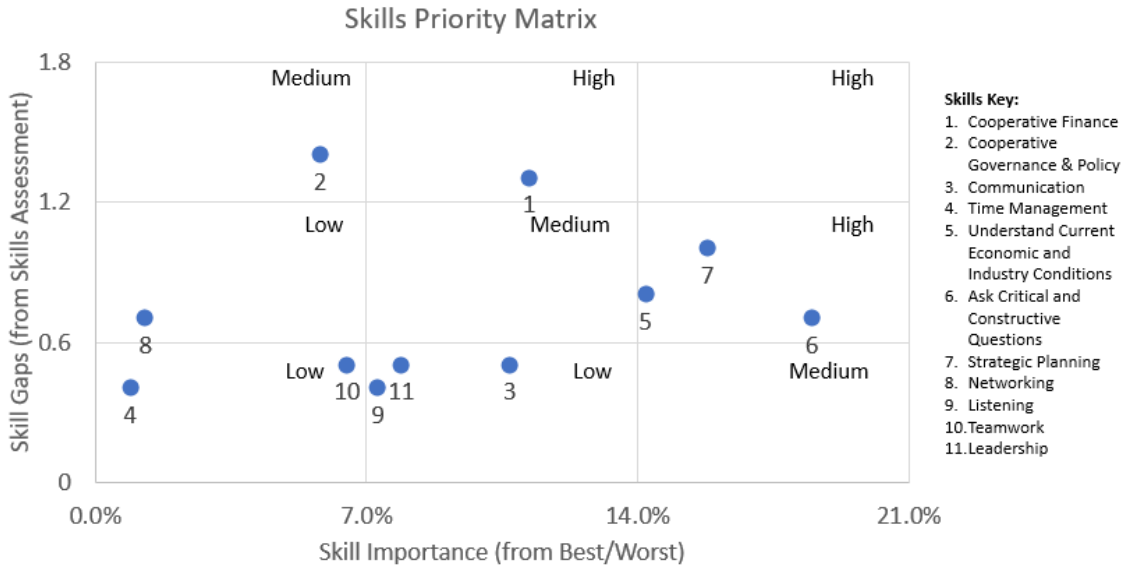
Using descriptive statistics and discrete choice methods to analyze the results, we found that directors seem to evaluate themselves at a higher skill level than CEOs/GMs evaluate directors. Most of the skill gaps evidenced provide suggestions of potential training opportunities for new directors. Of interest is Strategic Planning, which suggested a significant possible training opportunity for both new and current directors. The largest skill gaps were found for Cooperative Governance and Policy and Cooperative Finance. The demographics of the respondent and the cooperative they represent weren't as important in affecting the skill level ratings as was thought to be expected.

Time Management was found as being the least important skill for directors to possess. Asking Critical Questions, Strategic Planning, and Understanding Current Economic and

Industry Conditions were consistently in the top three skills with Cooperative Finance and Communication occasionally entering into the top three.

Using a Skills Priority Matrix (Figure 1.1), we found that Cooperative Finance, Understanding Current Economic and Industry Conditions, Strategic Planning, and Asking Critical and Constructive Questions are the highest priority skills identified amongst survey respondents.

Figure 1.1 Skills Priority Matrix



The outcomes of this research can easily be translated into training needs since engaged and knowledgeable directors contribute to board effectiveness and therefore, improvements in organizational performance. It has been shown that firm productivity is linked to having individuals who are willing and able to learn new skills according to the demands of their position (Reiter-Palmon, Young, Strange, Manning, & James, 2006).

Orientation training for new directors and continued training are both positively related to cooperative financial performance (Franken & Cook, 2017).

1.4 Dissertation Outline

The following chapters are organized as follows: Chapter 2 highlights the background, methods, and results from the qualitative approach. Chapter 3 focuses on the background, theory, methods, and results from the quantitative approach. Finally, Chapter 4 concludes the project and mentions next steps, limitations, and future research.

Chapter 2 - A Qualitative Assessment of Farmer Director Skills in Agricultural Cooperatives

2.1 Introduction

A board of directors is a key decision-making group for non-profit organizations, corporations, and even farmer cooperatives. Some of the board's roles include monitoring and controlling management, creating policies, and formulating strategy. Brown (2005) analyzed how effective non-profit boards improve organizational performance and found that higher performing organizations reported having high-performing boards. Payne, Benson, and Finegold (2009) found that board effectiveness is significantly related to corporate financial performance. Minichilli, et al. (2012) found that board processes help explain board task performance and board task performance differs between boards based on their operational contexts. Kouaib, et al. (2020) found that a diversified board increases management's ability to make quality decisions and implement competitive strategies. They also found that increasing the amount of independent directors on a board increases the focus on social and environmental aspects. Erhardt, Werbel, and Shrader (2003) found that board diversity was positively associated with return on investment and return on assets.

Given boards of directors are associated with company success, the existing and necessary skills of the board should be considered. Research has been conducted on director skills needed to maintain successful business operations. Much of this research is focused around non-profits and corporations. Adams, et al. (2018) studied skills needed

for directors of larger corporations. They identified skills contributed to overall financial performance, such as directors having commonalities in skill sets. Asahak, et al. (2018) comprised a list of eleven factors that contribute to high board performance in Australian organizations. These include aspects such as effective internal communication and teamwork, effective leadership by the chair, effective self-assessment of board functioning, clarity of board member roles and responsibilities, and oversight of strategic direction. Finally, Payne, Benson, and Finegold (2009) identified five attributes of high-performing teams that promote board effectiveness: incentives, opportunity/time, information, knowledge, and power.

Most of the director skills research has focused on non-profits and corporations; however, few studies have focused on cooperatives. Cooperatives exist to generate profits and operate efficiently but not necessarily to maximize profits like most other corporations. More specifically, farmer cooperatives exist to maximize member benefits (Puusa & Saastamoinen, 2021). This might suggest necessary cooperative director skills could differ from non-profit and corporate boards, given the variance in vision and mission statements, for example.

The objective of this research is to identify what skills are needed and what skills are most important to being an engaged and knowledgeable farmer cooperative director. To do so, we follow a qualitative data collection approach. Following the Delphi method, an interview questionnaire was designed that asks open-ended questions about director skills. This questionnaire was then used with a set of focus groups and personal

interviews with current farmer directors as well as current farmer cooperative CEOs and general managers in Kansas.

Results from the collected data suggest that particular skills and behaviors are needed to be an engaged and knowledgeable director. The skills and behaviors mentioned fit into five main categories: financial/business, governance, board leadership, industry knowledge, and strategic planning. Also, the responses were consistent among the different types of participants (i.e. CEOs, directors, and stakeholders). There is some overlap with our results and the results from other studies that focused more on director skills needed for larger corporation boards (Adams, et al. 2018; Asahak, et al. 2018; Leblanc 2020). Combining the results from this study with the literature, eleven key skills can be identified for farmer cooperative directors to be engaged and knowledgeable: cooperative finance, cooperative governance and policy, communication, time management, understanding of current economic and industry conditions, being able to ask critical and constructive questions, strategic planning, networking, listening, teamwork, and leadership.

The results shown here can easily translate into training needs since engaged and knowledgeable directors contribute to board effectiveness and therefore, can improve organizational performance. Simply having an agricultural producer on the board isn't enough. It has been found that the skills provided by being a community leader or involved in agricultural production are less likely to adequately prepare those individuals to be engaged and knowledgeable cooperative directors (Bond, 2009). Furthermore, it has

been shown that firm productivity is linked to having individuals who are willing and able to learn new skills according to the demands of their position (Reiter-Palmon, Young, Strange, Manning, & James, 2006). Orientation training for new directors and continued training are both positively related to cooperative financial performance (Franken & Cook, 2017). Finally, director and management education are key for successful strategy implementation and evaluation (Boland, Hogeland, & McKee, 2011).

2.2 Changing Agricultural Cooperative Landscape

Over the past century, technological advancements, industrialization, and globalization has changed the agricultural landscape; and, as a result, the cooperative landscape has changed as well. Today, there are fewer farmers and the size of farms has increased (USDA National Agricultural Statistics Service, 2021). Total farm input use has remained constant while total agricultural output has drastically increased, being driven by increased efficiencies and total factor productivity (USDA Economic Research Service, 2022). In addition to farmer needs changing because of the changing farm demographics, innovation and globalization have led to the consolidation of agribusinesses, food manufacturing, and food retailers (Dunn, Crooks, Frederick, Kennedy, & Wadsworth, 2002).

These aspects plus many more have led to agricultural cooperative consolidations and business volume growth. In 1979, there were 6,445 farmer cooperatives. This number decreased to 2,186 in 2014 (Eversull, 2014). The amount of agricultural cooperatives decreased again to 1,779 in 2019 (USDA Rural Development, 2021). Some of this

decline is attributed to cooperatives going out of business entirely. However, most of the decline is due to consolidations, mergers, or acquisitions. Despite the decline in physical numbers of cooperatives, gross business volume has increased. In 2010, gross business volume was $171.803 billion versus $203.047 billion in 2019, an 18.2% increase. Additionally, assets have grown 54.3% over the same time period from $64.890 billion in 2010 to $100.121 billion in 2019 (USDA Rural Development, 2021).

Given the significant change among agricultural cooperatives in the United States, the skills necessary to lead these organizations has likely changed too. Cooperatives are more complex, are larger in size, cover more territory, and handle much more business volume than ever before. But, before we can explore the skills necessary for a director to be engaged and knowledgeable today, an understanding of the literature related to identification of director skills is needed.

2.3 Cooperative Director Skills Literature

Some director skills and board performance research has been conducted in the cooperative space. Bond (2009) found the cooperative board of directors affects the overall financial performance of the cooperative. Therefore, the make-up of a board and the director skills are important for ensuring a high performing cooperative. Biggs (1978) argues that cooperative directors are responsible for making policy decisions and ensuring the cooperative reaches its goals and objectives, while the general manager is responsible for assigning tasks to employees and guiding the day-to-day activities. Chapman, et al. (1986) noted that board members are representative of the cooperative's

members so they need to be familiar with the cooperative principles, act in good faith, act only in the interest of the cooperative and its members, understand the purpose and goals of the cooperative, listen to input from the members, and communicate the activities of the co-op to the members. Hakelius (2018) compared investor-owned firm boards with farmer cooperative boards in Sweden and identified four main tasks for boards: distributing responsibility, monitoring and controlling management, strategy, and policy formulation. Additionally, they found that educated directors were related to cooperative success.

Some research identified a specific set of skills. Cobia (1989) identified skills and characteristics cooperative directors need: business judgment, being respectful and trustworthy, being active in the cooperative, being hard working, having the energy and time to commit, the ability to work on a team, having integrity, being honest, being loyal to the cooperative and its principles, and willing to learn. Baarda (2003), Reynolds (2004), and Wadsworth, et al. (2015) identified similar responsibilities, skills, and characteristics. Hine, Fulton, and Pritchett (2005) found there was a need to build skills in communication, trust, teambuilding, financial analysis, and decision making when studying agricultural cooperative managers and directors in Colorado and Indiana. Park, et al. (2019) found that most boards of directors are made up of farmers having similar skills and experiences. Therefore, those boards may have missing skills since cooperative members choose directors from a similar member pool.

Leblanc (2020) compiled a list of competencies and behaviors that all directors should possess whether they serve on corporate boards, non-profit boards, or cooperative boards. He also created a solid framework for internal evaluations of individual boards as well as the board as a whole. Leblanc found that there are three elements that contribute to an effective director: competency, independence, and behavior.

A competency is defined as "a collection of skills, knowledge, experience, education, and training that can be assessed, and that contributes to the effectiveness of the director." (Leblanc, 2020, p. 11) Competencies can be enhanced through training and development, have the potential of being lost by lack of effort and maintenance, and are not the same as experiences. Leblanc's list of competencies includes: enterprise leadership, governance/board, industry/sector, strategic/value creation/growth, and financial.

A behavior is defined as "the way in which directors act and conduct themselves, particularly in regard to fellow directors and management. [These] include a collection of qualities, characteristics, traits, and attributes that can be assessed and that contribute to director effectiveness." (Leblanc, 2020, p. 20) Leblanc identifies ten behaviors. Independent judgement is needed by the director to maintain impartiality and to refrain from engaging in management activities. Having integrity requires the director to be trustworthy, honest, and dependable. One's commitment to do the right thing for the good of the organization is referred to as organizational loyalty. A director must also commit their time to be available, attentive, and responsive. The capacity to challenge includes critically and constructively asking questions and challenging assumptions. Directors

need to be willing to take action with difficult situations and have the ability to follow through on those actions. Problem-solving skills, communication skills, and teamwork skills are important as well. Directors must be engaged, have the ability to build rapport, and have mutual respect and trust with others. Finally, influence skills are key. Directors should be able to persuasively reason and effectively model their ideas.

2.4 Data Collection and Design

The data were gathered via two primary methods: focus groups and personal interviews. Focus groups were mainly used for idea generation. We had a handful of unique questions we wanted to pose to farmer-owned cooperative experts to get initial feedback on the research idea to aid us in laying out the road map for conducting the full research study. One limitation of focus groups is the potential presence of group think. The intimidation factor for some individuals may limit their confidence to speak up and participate in group discussion.

Personal interviews are one way to combat some of the limitations of focus groups. Conducting interviews allowed us to push further and expand past the original short list of probing questions. We utilized open-ended questions in an unstructured interview setting to gather qualitative information. Our goal was to understand the individual's opinions in regards to the questions and research topic. One limitation of this form of interview, however, is respondents may choose to answer questions in a way that is socially desirable. Interviewees may also limit the details they share in order to protect themselves even though confidentiality agreements have been signed. Utilizing both

focus groups and interviews allowed us to capitalize on the benefits of the two methods while minimizing the risks associated with each.

An adaptation of the Delphi method was followed when collecting data. This is a technique used to find convergence of opinions when gathering knowledge from topic area experts. The method includes gathering responses from various individuals or groups at different times and combining the responses to create a single statement (Sackman, 1975). For example, Ramsey and Edwards (2011) used the Delphi method to identify the role of the Supervised Agricultural Experience in providing students with technical skills needed to enter the agriculture workforce. The researchers asked panelists to identify entry-level technical skills that should be learned through the Experience. Next, the researchers asked panelists about their level of agreement of each of the entry-level skills recorded in the first round. The agreement rating step was repeated once more before compiling final results.

In the present research, a short list of questions was posed to a group of cooperative leaders in Kansas. This was the initial round of the Delphi method of a small focus group of 10 cooperative leaders. Three questions were posed to this group where they answered in an open discussion format. Questions included: What skills do directors need in order to be engaged and knowledgeable? What qualities or behaviors do you feel co-op boards should look for in potential directors? What do directors struggle the most to understand about serving on a farmer cooperative's board of directors?

The second round included 16 focus groups of 2-6 cooperative leaders each. The majority of these participants represented Kansas cooperatives with a few representing cooperatives from surrounding states. Each focus group was asked the same three questions as the first round of focus groups plus one additional question: What do you think directors need to know about the rural economy?

Next, the question list was further expanded and posed to a new focus group. The list of questions was altered again and expanded to be used in the personal interview stage of data collection. The personal interview questionnaire was beta tested with an inexperienced director and with a more seasoned director, each representing a different cooperative in the Midwest. These beta tests allowed us to create the final personal interview questionnaire to be used for the official qualitative data collection.

Finally, personal interviews were conducted with 13 cooperative CEOs and directors from Kansas cooperatives throughout late 2021. These were completed via phone and Zoom calls, with most being audio recorded. Approval from the Institutional Review Board at Kansas State University was granted and informed consent forms were obtained by each participant. The interview questionnaires can be reviewed in Appendix A and Appendix B. Two separate questionnaires were used – one for cooperative CEOs and another for cooperative directors.

2.5 Results and Discussion

2.5.1 Demographic Data

Cooperative leaders from Kansas participated in the data collection process. Respondents connected to a Kansas cooperative are categorized based on the number of grain elevator locations they manage. Managing more locations is one way to account for business complexity across respondents. There are 13 total cooperatives in Kansas that represent the 0-1 grain elevator locations category; 19 total cooperatives that represent the 2-5 grain elevator locations category; 15 total cooperatives that represent the 6-11 grain elevator locations category; and 15 total cooperatives that represent the 12 or more grain elevator locations category. These categories allow us to account for the differing sizes of cooperatives and how that may affect the respondents' answers. Another option when capturing complexity of the responses and the types of cooperatives the respondents represent includes the cooperative's most recent total annual sales. A summary of the demographics can be seen in Table 2.1 below.

Table 2.1 Qualitative Data Demographics

	Focus Groups	Personal Interviews	Total	Percent of Total Responses
Total Individuals	55	13	68	
Male	44	13	57	83.8%
Female	11	0	11	16.2%
Number of Groups	17	N/A	17	
Cooperative Position				
Director	11	6	17	25.0%
CEO/GM	15	7	22	32.4%
Other[i]	29	0	29	42.6%
Number of Grain Elevator Locations [ii, iii]				
0-1 Locations	1	3	4	8.0%

2-5 Locations	5	4	9	18.0%
6-11 Locations	8	1	9	18.0%
12+ Locations	17	4	21	42.0%
Out of State	6	1	7	14.0%
Total Annual Sales (2020) [ii]				
Less than $15 Million	1	0	1	2.0%
$15-$150 Million	15	9	24	48.0%
$150-$500 Million	12	3	15	30.0%
More than $500 Million	9	1	10	20.0%

Notes:

i. "Other" includes those in Human Resources, financial managers, other department managers, CoBank representatives, etc.

ii. Some in the "Other" cooperative position category represent agricultural cooperatives. Therefore, those representing agricultural cooperatives are included in the totals for the Number of Grain Elevator Locations as well as the Total Annual Sales. Percent of Total Responses for those categories is out of 50 instead of 68.

iii. There are 61 total cooperatives in Kansas with grain storage locations. Therefore, our sample represents 4/61=6.6% of cooperatives with 0-1 grain storage locations, 9/61=14.8% of cooperatives with 2-5 grain storage locations and 6-11 grain storage locations, and 21/61=34.4% of cooperatives with 12 or more grain storage locations.

A total of 68 individuals comprise the qualitative data with the majority being male. There were a total of 17 focus groups and 13 personal interviews. There is a fairly even split between directors and CEOs/GMs: 25% versus 32.4%, respectively. The remaining individuals participating were other cooperative leaders from banking, insurance, and other service providers to cooperatives. The majority of the participants represent Kansas cooperatives with a small amount, 7 total, representing cooperatives from surrounding states. The majority of the individuals participating represented the larger cooperatives: 21 (or 42%) coming from the 12 or more grain elevator locations category. However, referring to the other form of complexity observed, 24 (or 48%) of the respondents represent cooperatives falling in the $15-$150 million in total annual sales category.

2.5.2 Qualitative Results – Focus Groups and Personal Interviews

Results from the survey questionnaire are placed into five categories: enterprise/board leadership, governance, industry, strategic/value creation, and financial. These represent the overall competency categories deemed necessary by the respondents. They are also consistent with the literature. Enterprise/board leadership refers to being a leader both inside and outside the board room (i.e. communication, advocacy, and reputation). Governance includes understanding the system of rules, practices, and processes for governing a cooperative. This could include compliance, risk management, compensation, and internal controls. The industry category refers to knowing what is happening within the agricultural industry at multiple levels, such as local, regional, and global. Strategic/value creation includes being able to have strategic discussions, evaluate strategies, and make strategic decisions that create value for the membership. Finally, financial refers to being able to know and understand financial statements, financial decisions, accounting and tax methods, and implications of board decisions on the cooperative's financial position.

The first question posed to focus groups and personal interviewees was "What skills do directors need in order to be engaged and knowledgeable?" The key themes arising from this question include financial and business skills, communication skills, the ability to separate the board responsibilities from the farmer profession, understanding current economic conditions, and being open-minded. Financial and business skills is one of the most important skills needed by directors as 25 of the 30 respondents answered the question in this way. The full results can be seen in Table 2.2 below.

Table 2.2 Responses to: What skills do directors need in order to be engaged and knowledgeable?

	Focus Groups (n=17)	Personal Interviews (n=13)	Total (n=30)
Financial and Business Skills	**13**	**12**	**25**
Governance Skills			
Understanding how co-ops work	3	4	7
Board Leadership Skills			
Communication Skills	12	4	16
Separate board and farmer hat	6	8	14
Loyalty	5	1	6
Networking Skills	5	1	6
Boardsmanship Skills	4	2	6
Confidentiality	4	1	5
Time Commitment	4	0	4
Technology Skills	4	0	4
Conflict Resolution Skills	3	1	4
Thinking for collective good	0	1	1
Industry Knowledge			
Understand current economic condition	9	1	10
Strategic Planning Skills			
Open-minded	6	7	13
Willing to Learn and Ask Questions	5	5	10
Think Futuristically, Strategic Planning	7	3	10
Progressive	1	2	3

The second question posed to focus groups and interviewees was “What qualities or behaviors do you feel co-op boards should look for in potential directors?” The key themes arising from this question include patronizing the co-op, loyalty, separating the board responsibilities from the farmer profession, understanding duties and responsibilities, critical thinking and strategic thinking skills, being open-minded, and willing to learn. The most popular response was patronizing the cooperative with 19 of the 30 responses. The next most common responses being a critical thinker and open-

minded, both receiving 14 of the 30 responses. The full results can be seen in Table 2.3 below.

Table 2.3 Responses to: What qualities or behaviors do you feel co-op boards should look for in potential directors?

	Focus Groups (n=17)	Personal Interviews (n=13)	Total (n=30)
Financial Skills, Business Skills	**5**	**5**	**10**
Governance Skills			
Diversity and Inclusion	5	5	10
Board Leadership Skills			
Patronize the Co-op, Loyal	12	7	19
Separate board hat and farmer hat understand duties and responsibilities	7	4	11
Networking Skills	5	3	8
Communication Skills	4	4	8
Seen as a Community Leader	7	0	7
Honest	5	2	7
Time Commitment	3	3	6
Soft Skills	4	2	6
Listening Skills	3	1	4
Confidentiality	4	0	4
Willing to Ask Questions	2	2	4
Credibility	4	0	4
Conflict Resolution Skills	3	0	3
Be actively engaged and have a vested interest	0	2	2
Technology Skills	1	0	1
Basic understanding of Parliamentary Law	0	1	1
No personal agenda	0	1	1
Strategic Planning Skills			
Critical Thinker, Strategic Thinking	11	3	14
Open-minded	11	3	14
Willing to Learn	10	1	11
Outgoing, Positive	5	1	6
Even-temper	0	1	1

The third question posed to focus groups and personal interviewees was “What do directors struggle the most to understand about serving on a farmer cooperative board of directors?” The key themes arising from this question include understanding cooperative finances, understanding how the cooperative operates, transitioning from having a

personal agenda to being able to think for the collective good, understanding why decisions are made, understanding that there is a two-way street between the general manager and the board, and understanding the complexities of the entire supply chain. The most common response was cooperative finances, receiving 13 of the 23 responses. How the cooperative operates and transitioning from a personal agenda to thinking for the collective good were close behind, each receiving 11 of the 23 responses. The full results can be seen in Table 2.4 below.

Table 2.4 Responses to: What do directors struggle the most to understand about serving on a farmer cooperative board of directors?

	Focus Groups (n=16)	Personal Interviews (n=7)	Total (n=23)
Financial Skills			
Co-op finances	8	5	13
Making money isn't bad	4	0	4
Governance Skills			
How the co-op operates	8	3	11
Why decisions are being made	8	2	10
Two-way street between board and GM	8	0	8
Can't micromanage	5	2	7
Board Leadership Skills			
Transition from personal agenda to thinking for the collective good	9	2	11
Takes time to learn the director responsibilities	7	3	10
Time commitment	6	1	7
Board doesn't have HR responsibilities	4	2	6
Confidentiality	5	0	5
Board leadership	2	0	2
Can't make everyone happy	1	0	1
Ability to use technology	1	0	1
Industry Knowledge			
Understand complexities of the entire supply chain – see the big picture	7	1	8
Cost of labor	6	0	6
Strategic Planning Skills			
How to progress the co-op without becoming irrelevant	5	0	5
Strategic planning	5	0	5

Notes:

i. One focus group didn't answer this question; therefore, focus groups are only out of 16 total.
ii. This question was only asked of CEOs in the Personal Interviews; therefore, this is only out of 7 total.

The fourth question posed to focus groups and personal interviewees was "What do you think directors need to know about the rural economy?" The key themes arising from this question include rural economy trends, local markets, what is happening globally, and workforce issues. The answers receiving the most responses were workforce issues with 13 of 25 responses and rural economy trends, local markets, and what is going on globally, each receiving 12 of the 25 responses. It was interesting to hear from one of the focus groups that rural economy topics as a whole are not necessary to know for directors to be engaged. The full results can be seen in Table 2.5 below.

Table 2.5 Responses to: What do you think directors need to know about the rural economy?

	Focus Groups (n=12)	Personal Interviews (n=13)	Total (n=25)
Industry Knowledge			
Rural Economy Trends	3	9	12
Local Markets	2	10	12
What is going on globally	3	9	12
Relationships between Co-op and Other Local Businesses	2	5	7
Farm Consolidation and Transitions	2	3	5
Other Farming Cooperative Trends	0	4	4
Trends in Ag Financing	1	0	1
Workforce			
Workforce Issues	6	7	13
Off-Farm Employment	2	2	4
Job Competition	1	3	4
Skill Gaps in Workforce	3	0	3
Housing and Daycare Struggles	1	0	1
Legal and Policy			
Infrastructure	2	6	8
Legislative Issues	1	5	6
Not necessary to know	**1**	**0**	**1**

Notes:
i. Five focus groups didn't answer this question; therefore, focus groups are only out of 12 total.

2.5.3 Qualitative Results – Personal Interviews Only

There were a variety of additional questions only asked of the personal interview participants, four of which will be presented here with the full questionnaires available in Appendix A and Appendix B. The first question of interest is “Think about a director you admire. Why do you admire them as a director? Are there certain qualities that director possessed?” The key themes arising from the responses include asking quality questions, having the ability to read the boardroom, being passionate about the director role, challenging ideas when appropriate, being outspoken, and being knowledgeable of what is happening in the community, county, state, and beyond. The most common answer was being passionate about their director role, receiving 9 of the 13 responses. Following close behind was asking quality questions, challenging ideas when appropriate, and putting in extra time to understand the director role, each receiving 6 of the 13 responses.

One aspect to highlight here is the part about admiring those directors that spoke up and challenged ideas. Several respondents made an additional comment stating that even if there were directors that challenged the status quo in discussions and votes, it was still imperative that the directors left the board room with a united front. One respondent provided the insight, “The directors are the most important people because they’re the checks and balances. They make sure the ebb and flows are working right and keep the manager accountable. Having a high functioning board that is engaged is the key to fully utilizing the co-op system.” The full results can be seen in Table 2.6 below.

Table 2.6 Responses to: Think about a director you admire. Why do you admire them as a director? Are there certain qualities that director possesses?

	Personal Interviews (n=13)
Financial Skills	
Run a successful farming operation themselves	2
Board Leadership Skills	
Passionate about their director role	9
Asked quality questions	6
Challenged ideas when appropriate	6
Put in extra time to fully understand co-op and director role	6
Outspoken	5
Ability to read the boardroom	4
No personal agendas, think on behalf of the collective good of the co-op and community	4
Good listener	3
Ability to self-assess	2
Ability to step away from patron gossip	2
Intelligent	2
Helped foster good communication	1
Industry Knowledge	
Knowledgeable of what is going on in community, county, state, and beyond	3
Strategic Planning Skills	
Good level of decisiveness	3
Open-minded	2
Willing to learn	2
Futuristically driven	1

The next question is "What skills, behaviors, etc. do you feel are missing from incoming farmer directors?" The key themes arising from the responses include understanding the role of the cooperative and understanding the impact the cooperative has on the whole community such as farmers, employees, schools, and other businesses. There were not as many diverse responses to this question. The majority of the responses were understanding the role of the cooperative, receiving 6 of the 13 responses. Understanding the impact of the cooperative on the community received 5 of the 13 responses while having soft skills and understanding the director's role each received 4 of the 13 responses. The full results can be seen in Table 2.7 below.

Table 2.7 Responses to: What skills, behaviors, etc. do you feel are missing from incoming farmer directors?

	Personal Interviews (n=13)
Financial Skills	
How the co-op financials work	3
Governance Skills	
Understanding the role of the cooperative	6
Understanding the co-op bylaws	2
Board Leadership Skills	
Understanding the director's role	4
Soft skills	4
Confidence to speak their mind	2
Understanding the potential for a conflict of interest	1
Industry Knowledge	
Understanding the impact the cooperative has on the whole community – farmers, employees, schools, other businesses	5
Strategic Planning Skills	
Seeing the big picture	3

The question of "What do you see as a potential barrier to bringing on new directors?" included key responses of time commitment, not wanting to get wrapped up in the controversies of the co-op, not seeing the value of the co-op or of being a director, and thinking the director role would be too much of a hassle. The variety of responses were low with this question. However, the highest answer of time commitment received 9 of the 13 responses. The next highest responses were not seeing the value of being a director and not wanting to get wrapped up in cooperative controversies, receiving 5 of 13 and 4 of 13 responses, respectively. The full results can be seen in Table 2.8 below.

Table 2.8 Responses to: What do you see as a potential barrier to bringing on new directors?

	Personal Interviews (n=13)
Time commitment	9
Don't see the value of the co-op or of being a director	5

Don't want to get wrapped up in the controversies of the co-op	4
People think being a director is too much of a hassle	3
Lack of strong membership to choose from	2
Don't feel qualified to be a director	1
Feel like it's a lifetime commitment and don't want to give that	1
No term limits – don't want to run against someone who is doing a good job already	1

The last question we would like to highlight is "With your current knowledge of being a director, when you were new to the board, what do you wish you knew?" This question was only asked of directors that participated in the personal interview (only 6 total). The highest recorded response was a financial understanding of financial statements receiving 4 of the 6 responses. All other responses received only 1 of the 6 total possible. Some of those include understanding how patronage works, how the cooperative works, the director's role, the relationship between the directors and the CEO/GM, and how the cooperative is intertwined with businesses along the supply chain. The full results can be seen in Table 2.9 below.

Table 2.9 Responses to: With your current knowledge of being a director, when you were new to the board, what do you wish you knew?

	Personal Interviews (n=6)
Financial Skills	
Financial understanding	4
How patronage works	1
Governance Skills	
How the co-op works	1
Operating year of the co-op	1
Crash course of where the co-op was and where it was trying to go over the past 5 years	1
Board Leadership Skills	
The director's role (i.e. no HR responsibilities)	1
Better understand the relationship between director and GM	1
It's good to ask questions – there's no dumb question	1
Industry Knowledge	
How the co-op is intertwined with other businesses and the whole supply chain	1

Note: This question was only asked of directors in the personal interviews (only 6 total).

2.5.4 Additional Candid Responses

Since all questions were open-ended, a few quotes can be drawn from the personal interviews that contribute candidly to the results. Several of the interviews highlighted training and education as important pieces to director development. One respondent mentioned, “Training should be required for both new and continuing directors. The [general manager] needs to encourage attendance and maybe go to the trainings with the directors.”

One respondent mentioned that managers can’t necessarily expect an agricultural producer to be a professional board member. However, those board members still need guidance to do their job and this guidance can and should come from the manager. Not only do the CEOs need to make sure their directors and leaders are tactfully educated, but the directors themselves need to be engaged and willing to learn their role and responsibilities. There needs to be a culture of the board where learning and continuing education is important. One interviewee mentioned that educating the entire membership base is important. If the membership is well educated on cooperative systems and happenings, those members will have a good base knowledge when and if they enter the director role later on.

One of the interviews highlighted the benefit to farmers when they serve as directors. This individual mentioned that the farmers learn what truly makes the co-op “tick.” They

learn how the co-op works, how money is spent, and how decisions are made. Those farmers then move from being a passive customer to being more of an active or involved customer. The director experience gives them a much bigger picture of agriculture and they can take what they learned at the co-op level back to their own operations.

2.6 Conclusions and Limitations

We found that not only are skills needed to be an engaged and knowledgeable director, but behaviors are important as well. The responses were consistent among the different types of participants (i.e. CEOs, directors, and stakeholders). The skills and behaviors mentioned fit nicely into five main categories: financial/business, governance, board leadership, industry knowledge, and strategic planning. Combining the results from this study with the literature, eleven key skills can be identified for farmer cooperative directors to be engaged and knowledgeable: cooperative finance, cooperative governance and policy, communication, time management, understand current economic and industry conditions, ask critical and constructive questions, strategic planning, networking, listening, teamwork, and leadership.

In turn, engaged and knowledgeable directors contribute to board effectiveness and therefore, can improve organizational performance. This could easily translate into training needs. For example, respondents from our study say that engaged and knowledgeable directors need financial and business skills, communication skills, and the ability to separate their board and farmer hat. Directors wish they had more financial understanding when they were new to the board. Finally, personal interview respondents

said that new directors were missing an understanding of the role of the cooperative as well as an understanding of the impact the cooperative has on the whole community. Perhaps these aspects are most important when creating training programs for directors.

Additionally, updating and continually offering training opportunities is important. It has been shown that firm productivity is linked to having individuals who are willing and able to learn new skills according to the demands of their position (Reiter-Palmon, Young, Strange, Manning, & James, 2006). Orientation training for new directors and continued training are both positively related to cooperative financial performance (Franken & Cook, 2017). Furthermore, director and management education are key for successful strategy implementation and evaluation (Boland, Hogeland, & McKee, 2011).

One limitation of this approach is that the actual skill level of the directors in relation to the list of skills needed is unknown. Identifying the gap between beginning farmer directors and more seasoned directors as well as identifying the gap of where farmer directors should be in order to be an engaged and knowledgeable director would be beneficial. That insight would allow the training programs to be directed toward what skills need more focus, especially since time and resources are always limiting.

Knowing the importance of each of the above skills would be beneficial as well. We know the frequency of each response from qualitative data collection. However, our study is lacking the identification of which skills are more important than others and the skill level each director possesses of the necessary skills. For example, training program

educators would find value in knowing that financial skills are more important and have a larger skill gap level than communication skills among farmer directors. This can be accomplished by incorporating a quantitative approach to the research study.

Other limitations of the qualitative approach include the geographic area covered in the data collection process. It would be interesting to expand this research into other states or even countries to see if the same skills list can be created. More diverse respondents may change the results as well. For example, the majority of our respondents were male and there was not an even representation of the varying sizes of agricultural cooperatives that operate in Kansas. Expanding this research to include various sizes and even types of cooperatives (i.e. agriculture, service, electric, grocery, etc.) would provide interesting results. Furthermore, our approach could be conducted internationally to identify director skill needs. Given our results and the provided survey questionnaires, we feel international cooperative researchers have a good start to continuing this very important work of identifying the skills necessary for a cooperative director to be engaged and knowledgeable.

Chapter 3 - A Skills Gap Analysis of Farmer Directors at Midwest Agricultural Cooperatives

3.1 Introduction

Boards of directors are vital to firm performance and are an integral part to the decision-making processes for any business. Several studies have been conducted that observe corporate or nonprofit board characteristics and skills and their connection to firm performance. Brown (2005) found that strategic contributions from the board of directors have a higher effect on organizations that already have better financial performance. Payne, et al. (2009) studied the attributes of high-performing teams that they believe will promote board effectiveness, therefore affecting corporate financial performance. These attributes include knowledge, information, power, incentives, and opportunity/time.

Cooperatives also use boards of directors to make key business decisions and to act on behalf of their stakeholders. However, cooperatives are not for-profit corporations nor are they non-profit organizations. Some may argue that they fit somewhere in-between. Much of the research on boards of directors have been focused, though, on for-profit corporations and non-profits. Older materials and training resources do exist that focus on cooperative director skills, but such research is very limited. Bond (2009) found the cooperative board of directors, such as board size, affects the overall financial performance of the cooperative. A working paper by Burress and Cook (2010) surveyed board chairs of producer-owned cooperatives and found that a balance between veterans

and rookie (or new) directors may lead to higher performance as well as increasing transparency and inclusiveness between boards and CEOs.

Given boards of directors are key components to company performance, the necessary skills for ensuring directors are engaged and knowledgeable is important to identify and assess. The purpose of this research is to identify potential skill gaps among new and current directors as well as to identify which skills are indeed the most important for directors to maintain. This research is an extension of the work done by Herchenbach, et al. (2022) that identified eleven key skills and behaviors for farmer cooperative directors to possess: cooperative finance, cooperative governance and policy, communication, time management, understand current economic and industry conditions, ask critical and constructive questions, strategic planning, networking, listening, teamwork, and leadership.

A survey was conducted with farmer directors and current CEOs and general managers of agricultural cooperatives in the Midwest in January 2022 and included three components: a demographics section, a skills assessment section, and a best/worst scaling section. The data was analyzed using descriptive statistics and discrete choice methods.

We found that the largest skill gaps exist for Cooperative Governance and Policy and Cooperative Finance. However, the most important skills were found to be Asking Critical and Constructive Questions, Strategic Planning, Understanding Current Economic and Industry Conditions, Communication, and Cooperative Finance.

Therefore, the skills of highest priority are Cooperative Finance, Understanding Current Economic and Industry Conditions, Strategic Planning, and Asking Critical and Constructive Questions. These results are important for educators and cooperative managers when creating training opportunities for new and current directors as well as looking for directors to fill empty board seats.

3.2 Director Skills Literature

Most of the research around boards of directors focuses on corporations and non-profit organizations. One finding from Minichilli, et al.'s (2012) work is that the different contexts in which boards operate may affect board task performance. Adams, et al. (2018) identify skills, attributes, qualifications, and experiences that directors of larger corporations need in order to have higher firm performance. Some of the skill categories are understanding the firm's business and industry, having a higher academic degree, understanding compensation and benefits, understanding finance and accounting, leadership, marketing, strategic planning, and sustainability. Similarly, Asahak, et al. (2018) comprised a list of eleven factors that contribute to high board performance in Australian organizations. These include aspects such as effective internal communication and teamwork, effective leadership by the chair, effective self-assessment of board functioning, clarity of board member roles and responsibilities, and oversight of strategic direction.

Some work has researched cooperative boards of directors, most of which is potentially outdated. Chapman and various other authors put together a handbook for cooperative

directors (1986). In this work, they identify that board members are representative of the cooperative's members. Therefore, they need to be familiar with the cooperative principles, act in good faith, act only in the interest of the cooperative and its members, understand the purpose and goals of the cooperative, listen to input from members, and communicate the activities of the cooperative to the members. Cobia pushed further in his book on agricultural cooperatives (1989) to say that the skills and characteristics of directors should include business judgment, being respectful and trustworthy, being active in the cooperative, being hard working, having the energy and time to commit, ability to work on a team, have integrity, be honest, be loyal to the cooperative and its principles, and willingness to learn.

More recent work includes Hakelius (2018) who compared investor-owned firm boards with farmer cooperative boards in Sweden. They identified four main tasks for boards: distributing responsibility, monitoring and controlling management, strategy, and policy formulation. Park, et al. (2019) found that most boards of directors are made up of farmers having similar skills and experiences. Therefore, those boards may have missing skills since cooperative members choose directors from their member pools. A study conducted in Colorado and Indiana in the summer of 2000 with agricultural cooperatives by Hine, et al. (2005) uncovered the needs of cooperative managers and directors. The researchers found that there was a need to build skills in communication, trust, teambuilding, financial analysis, and decision making. Furthermore, they believed that directors must have management skills, governance skills, strategic thinking, and finance skills in order for the cooperative to remain competitive.

These studies' results lead to further questions: Does the local farmer director pool have these skills already? Or, to what extent do they possess these skills? Answering these questions would help ensure director training programs are focused on teaching and developing the most relevant skills to farmer directors. A skill gap analysis would be beneficial to help answer such questions.

Of most relevance is the work done by the rural development and cooperatives branch of the United States Department of Agriculture in the early 2000s. Much of the work done by this service created training materials and informational booklets to support formation and development of cooperatives. Some of its later work started to pinpoint the skills needed by cooperative directors, such as the work done by Wadsworth and Reynolds (2004). They write that the key traits of effective leaders include having enthusiasm, listening skills, the ability to think before speaking, the ability to analyze information and create logical conclusions, the ability to know when to be more flexible, the ability to complete tasks, the ability to take responsibility, the ability to motivate others to think critically, adequate knowledge about cooperatives and businesses, and the willingness to learn and commit time to becoming more educated about the director role.

Wadsworth, et al. (2015) reiterates these points by stating that attributes of a good director include establishing two-way communication with the manager, the ability to get along with others, patronizing the cooperative, the ability to actively participate in making decisions, the ability to exercise good judgment, and the willingness to ask

questions. The research methods of these two articles were not stated. Therefore, perhaps our study provides a more rigorous research approach in identifying director skills.

Even though cooperatives have a very rich history, the cooperative landscape continues to evolve. We also know that agricultural cooperatives are a function of its members: farmers and ranchers. Today, there are fewer farmers and the size of farms has increased. There are roughly one third the amount of farms today compared to 100 years ago and those farms are roughly twice the size (in acres) today (USDA National Agricultural Statistics Service, 2021). Total agricultural output has greatly increased, being driven by increased efficiencies and total factor productivity, while total farm input use over time has remained fairly flat (USDA Economic Research Service, 2022).

Changing farm demographics have sparked innovation and globalization, which, in turn, have influenced consolidations of agribusinesses, food manufacturing, and food retailers (Dunn, Crooks, Frederick, Kennedy, & Wadsworth, 2002). Agricultural cooperatives have not been immune to such consolidations and amendments in business structure. The number of agricultural cooperatives have declined over the past 50 years while business volume has grown (USDA Rural Development, 2021). These significant changes in the micro- and macro-environment point towards necessary skills of farmer cooperative directors potentially differing than what was believed to be needed in the past.

3.3 Conceptual Framework

The world and business landscape are continuously changing, thereby affecting the skill levels and types of skills needed. Reiter-Palmon, et al. (2006) explains how an analysis of tasks and knowledge, skills, and abilities can help create occupationally-specific skills. Once a list has been compiled, training programs can be designed around those specific skills. Franken and Cook (2017) found that orientation training and continued training for directors is positively related with cooperative financial performance. To increase strategy implementation and evaluation, Boland, Hogeland, and McKee (2011) note that education for directors and management is important. Continued board training is associated with co-ops that will have a higher chance of growth, longevity, and member satisfaction (Bruynis, Goldsmith, Hahn, & Taylor, 2000). As a result, training programs for new directors, current directors, and managers could be created utilizing the results of this study.

McKenney and Handley (2020) propose using the design science research method (DSRM) to conduct skills gap analyses. DSRM is highly utilized in engineering and information systems research. It is based on natural science, behavioral science, and design science research methods. Design science can be defined as "the scientific study and creation of artefacts as they are developed and used by people with the goal of solving practical problems of general interest (Johannesson & Perjons, 2014, p. 7)."

As discussed in Johanneson and Perjons' book (2014), the main ingredient of design science is creating artifacts, which can be any human-made object that addresses solving

a practical problem. This practical problem is a gap that exists between what is observed versus what is desired. There are five main activities that are part of the method framework for design science research. These are summarized in Table 3.1.

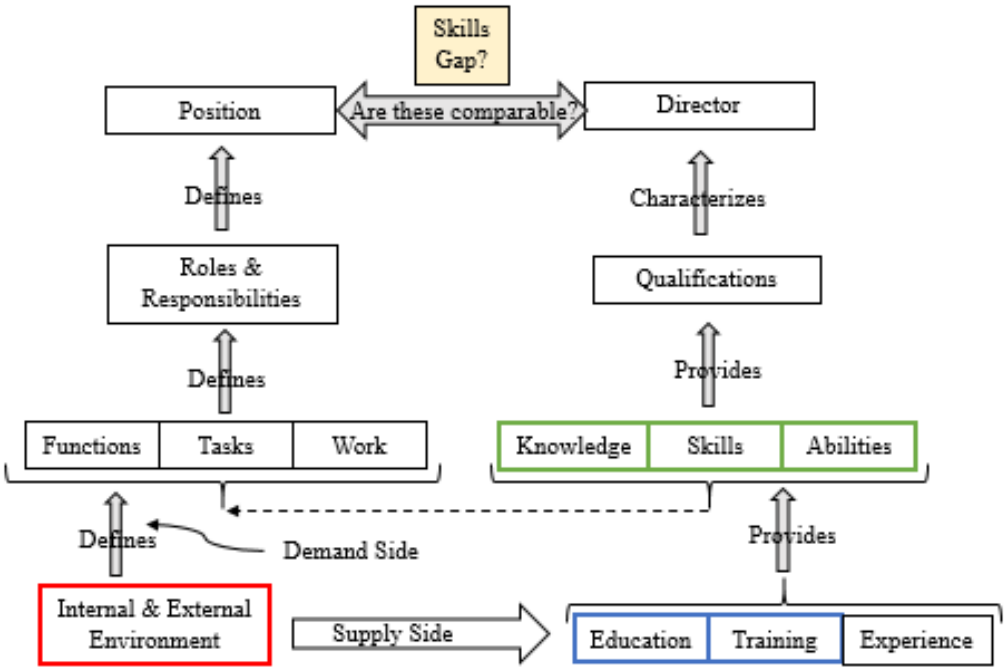
Table 3.1 Activities in Design Science Research

Activity	Description
Explicate Problem	Investigation and analyzing a practical problem.
Define Requirements	Outlining a solution to the explicated problem.
Design and Develop	Creating an artefact that addresses the explicated problem and fulfils the define requirements.
Demonstrate	Proving the feasibility of the artefact.
Evaluate	Evaluating how well the artefact fulfils the requirements and to what extent it can solve the practical problem.

Source: (Johannesson & Perjons, 2014)

Our model, seen in Figure 3.1 below, brings empirical science - where researchers describe, explain, and predict - together with design science - where researchers create artefacts for improving practices (Johannesson & Perjons, 2014).

Figure 3.1 Farmer Director Skills Gap Conceptual Model



Source: Adapted from (McKenney & Handley, 2020).

This model depicts the potential skills gap between farmer directors and the cooperative director position (explicating the problem). We see that the cooperative director position itself is defined by roles and responsibilities (defining requirements). The roles and responsibilities are defined by functions, tasks, and work. These aspects are in turn defined by the internal and external environment as well as being connected to knowledge, skills, and abilities (KSA's). The director themselves is characterized by their qualifications, which are defined by the individual's knowledge, skills, and abilities. Education, training, and experience provides that knowledge, skill, and ability.

A skills gap is present if the position itself is not comparable to what the potential farmer director brings to the table (i.e. demand is not met with what is supplied). One of the main issues, though, as mentioned by McKenney and Handley (2020), is defining the

position requirements and needed skills so that a gap can be potentially identified. We can use our research to identify the KSA's needed, as noted by the green boxes in Figure 3.1. By evaluating current farmer directors based on the identified KSA's, we can then measure a potential gap. This gap will shed light on what education, training, and experiences (artefacts) can be created to help teach the needed KSA's to prepare directors for the position of cooperative director. The education, training, and experiences piece focuses on human and social capital development. Human capital is the accumulation of knowledge throughout one's life and includes knowledge, skills, and experiences. It is a function of education and economic activity (Kaufman & Geroy, 2007). The educational efforts can build up potential directors' qualifications to be an engaged and knowledgeable director. Then, the gap between the director position and the potential farmer director becomes much smaller.

Reiter-Palmon, et al. (2006) highlight this chain as well. KSA's and information of tasks required help define the occupationally-specific skills needed for a job. Occupationally-specific skills can then be used to select personnel and to create training and evaluation programs. Additionally, they can be used to identify performance gaps.

Identifying KSA's to evaluate gaps in education and training is not a new concept. Jones, et al. (2018) conducted interviews to help identify KSA's and then conducted surveys to understand the level of importance of each as it relates to cyber-defense professionals. The survey work helped define the needed training and education in order to help professionals reach desired levels of KSA's. Others have completed similar work in

various disciplines: Cetin, et al. (2016) in the hospitality industry; Erickson, et al. (2018) in precision agriculture; Jang (2016) in STEM careers; Cegielski, et al. (2016) in business analytics; and Williams, et al. (2020) in public librarians.

3.3.1 Internal and External Environment

We know that the director position itself has changed over the years given the history of cooperatives. Therefore, as our model suggests, the internal and external environment has changed and in turn, influences what is needed for the director position. (See the red box in Figure 3.1.) As the position itself changes, the KSA's needed will change in order to keep the gap between the position itself and the potential farmer director small. The internal and external environment affects both the demand and supply side of the potential director skills gap.

The roles and responsibilities of the farmer director is defined by both the internal and external environment of the cooperative. Huhtala, et al. (2020) found that in Finnish agricultural cooperatives, the cooperative and its board's needs, the local environment and economy, market drivers, policies, the director market available in the community, and the cooperative governance structure all influence director selection. We would argue this is also true of farmer-owned cooperatives in the United States. To confirm, an industry and organizational analysis approach is used to identify external and internal factors relevant to the roles and responsibilities of farmer directors.

3.3.1.1 External Factor Analysis

The external factors affecting the farmer director position can be uncovered using a STEEP analysis. This framework allows us to categorize factors into five areas: Sociocultural, Technological, Economic, Environmental, and Political/Legal. Sociocultural forces are those that create the values, norms, and customs of a society, such as demographic trends, lifestyle changes, career expectations, population growth, health care, and education levels. Technological forces are the technology advances and innovations that change the way problems are solved. Economic forces are those that regulate the markets and economy, such as GDP trends, interest rates, the money supply, inflation rates, unemployment, income levels, and the financial system as a whole. Environmental forces are those that affect the natural environment around us, including physical resources, wildlife, and climate. Political/legal forces are those that allocate power and define laws and regulations (Hunger & Wheelen, 2011).

3.3.1.1.1 Sociocultural Forces

Globalization is a major force that has changed several industries over the past few decades and it continues to reshape industries. As more people travel and settle in different spots compared to their ancestors, the make-up of our communities around the world changes. This causes the needs of those communities to change (Reiter-Palmon, Young, Strange, Manning, & James, 2006).

Farms and farmers have different characteristics including size, make-up, and age. This creates information gaps among farmer cooperative members, which can then trickle down into board make-up as well as each member wanting and needing different goods

and services from the same cooperative (Candemir, Duvaleix, & Latruffe, 2021). The heterogeneity in cooperative membership threatens the culture, vision, and values of the cooperative. Therefore, collective action is no longer mutually beneficial in some cases (Saitone & Sexton, 2017).

Consumer preferences continuously change, thereby affecting the food produced in the agriculture sector as well as how it is produced. Modern agriculture is asked to provide a variety of products that differ in quality, variety, size, color, ingredients, and production practices. This affects how cooperatives are run and the types of grain they can accept and process. It also affects the types of products the cooperative can sell to the farmers as inputs such as seed, fertilizer, and feed. Consumers are increasingly becoming aware and concerned about the environment. These pollution and environmental concerns affect how cooperatives and agricultural producers operate. The types of products and processes used are closely watched and scrutinized (Saitone & Sexton, 2017).

The United States population has grown, on average, over the past 40 years, with the majority of that growth seen in urban areas. Surprisingly, the poverty rate has remained the same at roughly 12%. Education levels are on the rise for both rural and urban areas leading to a higher-educated population (Economic Research Service, 2022).

3.3.1.1.2 Technological Forces

Advancements in science have led cooperatives to rethink the services they provide and what their members actually need. There may be an increased role of producers. Perhaps

the cooperative will serve its members by way of financial and management analysis, agronomy and crop scouting, crop production experts, marketing, and mechanics (Wadsworth J. , 2011).

Over the last couple of decades, production agriculture itself has become more capital intensive. Decisions across the supply chain are becoming more interdependent and risks are arising around food health and safety. Additionally, information tends to bring control and power. Such things have led to an increase in vertical coordination and integration (Merrett & Walzer, 2001). Cooperatives have then been faced with identifying where they exactly fit into the vertical coordination of the production supply chain.

The expansion of broadband access in rural areas across America will affect cooperatives and the types of goods and services they can provide (Halverson, 2020). Other advancements have led to new products such as the creation of biodiesel and ethanol or even electric vehicles, solar power, and wind energy.

3.3.1.1.3 Economic Forces

The decreasing number of farms, increasing costs, industrialization of agriculture, increasing competition, and decreasing profits are all contributors to the changing cooperative landscape (Hine, Fulton, & Pritchett, 2005). The number of farms has decreased by roughly 200 over the past decade while the average size of the farm has slightly increased over that same time period (Economic Research Service, 2022). The net value of producing corn in the U.S., for example, has been negative the past seven

years and looks to continue for the next couple of years (Economic Research Service, 2021). Additionally, the threat of vertical integration in other parts of the agricultural supply chain and in competing agribusinesses affects the current model of cooperatives (Saitone & Sexton, 2017).

The make-up of farm household income changes each year. In 2019, on average, farm households received roughly 80% of total income from off-farm income (Giri, Subedi, Todd, Litkowski, & Whitt, 2021). Land prices fluctuate yearly along with commodity prices and lease agreements. It seems as if once farmers can capitalize on lower interest rates, inflation rises causing interest rates to rise once again (Key, Burns, & Lyons, 2019). All such factors affect how farmers evaluate input costs and grain marketing decisions.

The general economy affects agriculture as well. Unemployment in the United States has increased from 3.7% in 2019 to 8.1% in 2020. Rural areas went from 4.0% to 7.0% over that same time period while urban areas saw an increase in unemployment from 3.6% to 8.2% (Economic Research Service, 2022). Unemployment has settled slightly to around 4.2% in late 2021. Inflation is well above 4% while GDP growth is around 6% (Cavey, et al., 2021).

The growth of other countries and markets around the world will impact the role cooperatives serve, especially as it relates to their close agribusiness competitors. China,

for example, is one of the fastest growing countries in the world and accounts for almost one third of the world's growth (Kowalski, 2020).

3.3.1.1.4 Environmental Forces

Drought conditions that have plagued parts of the United States in recent years affects the food supply and types of crops and produce grown in such regions. As different crops are planted, this places a different expectation on cooperatives to serve those members. Climate change has brought about initiatives to reduce carbon emissions. Policy considerations come into play both on the level of the larger government as well as within individual companies (Cavey, et al., 2021).

3.3.1.1.5 Political/Legal Forces

Policies, such as unemployment benefits and healthcare, put in place to support and protect employees affects the workforce available for cooperatives and other businesses. The availability of reliable help affects the breadth of services a cooperative can provide. Monetary policy and interest rate levels impact farmers, which in turn, impacts local cooperatives. Additionally, the individuals put in place at the US government level to run the Department of Agriculture and to create the ever-changing Farm Bill have trickle-down effects on the local farming community (Ehmke, 2020).

The COVID-19 pandemic affected various policies, such as what businesses were deemed essential as well as policies for shipping various materials between countries.

Travel restrictions limited tourism and household lifestyles, including how and where families and individuals chose to consume their meals (Dobis, et al., 2021).

Trade policies come into play as well. With agricultural output growing faster than domestic demand, overseas markets are needed to bring profits and price stability to producers. Agricultural exports have grown in the U.S. by roughly $100 billion over the past quarter century. The largest increase over that time period was exports to the European Union, North America, South Asia, and Central America. U.S. agricultural imports have also increased by more than $100 billion over the past 25 years (Economic Research Service, 2022). The flow of exports and imports relies on trade barriers, such as trade agreements, tariffs, and quotas.

On a more local scale, policies are being put into place that restrict the types of products farmers are allowed to use to produce crops and livestock. When these policies are implemented, cooperatives have to modify the product offerings they provide for their members (Saitone & Sexton, 2017). Strategic planning becomes a key factor for cooperatives when navigating such policies.

3.3.1.2 Internal Factor Analysis

Resources are the assets of an organization, including both tangible and intangible assets. Capabilities are the abilities of the organization to utilize its resources. These consist of how the organization uses its resources to turn inputs into outputs and can be separated in

various categories such as marketing capabilities, manufacturing capabilities, and human resource capabilities (Hunger & Wheelen, 2011).

One of the main resources of any given cooperative is its human capital. This includes both its members and management team (i.e. general manager, employees, and board of directors). Without these individuals, the cooperative does not thrive. The members choose the directors and the directors choose the general manager, who then chooses the employees. However, membership has declined from 2010 to 2019 by 15% in U.S. cooperatives. More specifically, membership has decreased by 8% in Marketing cooperatives and 19% in Farm Supply cooperatives (USDA Rural Development, 2021).

Fulton and Giannakas (2006) mention that members may lose interest in cooperatives sometimes based on who is running the cooperative. This not only causes decreased membership, but it also may lead to current members not wanting to become directors. Members face two problems in generating leadership that will enhance their well-being. One is adverse selection or the concern of choosing the correct type of leader. The other is moral hazard or if the leader that is chosen is acting in the proper manner. Perhaps some of these aspects can be trained or taught so that the two problems mentioned can be mitigated after the individual is selected to board membership instead of only being addressed before board elections take place. This may help current membership be more comfortable running for a board seat and/or electing an individual with a higher level of confidence.

As Park, et al. (2019) mentions, Situational Leadership Theory is important when evaluating and selecting the management team. This theory suggests that a leader's behavior is connected to the characteristics of the team in which they belong. Therefore, different situations may require different styles of leadership as well as different abilities and skills in order to be successful. Pushing further, as Choi, et al. (2014) states, the board of directors is assumed to monitor and control management, which is tied to agency theory. The board of directors is the decision-making group, which consists of directors. Process theory, which suggests that the performance of the board of directors and the organization is different depending on characteristics of the decision-making process, then comes into play. As a result, the skills and characteristics that directors come in with affect the decision-making processes as well as how the entire board operates.

Human capital is one of the only resources that each cooperative has in common. People cannot be separated from their knowledge and skills. Therefore, investing in education and training is an investment in growing human capital (Inwood, 2017). This gives rise to the importance of training and educating the human capital within a cooperative, as seen by the blue boxes in Figure 3.1. As Haskell (2003) points out, education is important for cooperative directors, employees, youth, members, and the public. "Education is the lifeblood of a cooperative (Wadsworth J. , 2004, p. 26)." According to Park, et al. (2019), 1) Board members are elected from among the members and therefore, may have limited experience to agricultural production only; 2) Board members are experts at managing their own operations; 3) Members of the cooperative expect equal treatment; and 4)

Board members may not have had many opportunities to hone their interpersonal skills. Additionally, since directors are chosen from the farmer memberships, the diversity of thought being brought to the table may be limited. A study done among Swedish cooperatives found that educated directors alone were related to cooperative success. High-performing cooperatives spent significant time educating both new and sitting directors (Hakelius, 2018).

The capability of cooperatives to offer education and training isn't quite up to par with how important such actions are to cooperative success. More specifically, tracking down the resources that provide education and training materials can be a challenge. Cooperative educational resources have been reduced across typical access points: national co-op associations, universities, and federal programs. A lack of financial and human resources may be leading to issues in educational efforts as well. It's important for educational resources to change with the times, including materials presented, how educational resources are accessed, and who leads trainings (Haskell, 2003).

The capabilities of cooperatives to offer a variety of goods and services to its members are exceeding the typical experiential skills that most directors possess. For example, the way cooperatives contribute to farm sustainability is different today than it may have been a decade ago. This gives rise to the importance of proper education and training for directors. This includes continuing education as well (Candemir, Duvaleix, & Latruffe, 2021).

Another resource for cooperatives is its collection of assets, liabilities and equity. From 2010 to 2019, the marketing volume of cooperatives has increased by 21%. In addition, farm supply volume is up 11%, assets values have increased 54%, liabilities have risen 39%, and equity levels are up 77% (USDA Rural Development, 2021). Farmer and rural utility cooperatives have access to unique capital funding opportunities through CoBank, who has a loan volume of more than $42 billion (Frederick, 2012).

The way that cooperatives are governed and set up could act as a resource or a potential threat. For example, traditional cooperatives operate under the idea of one member, one vote and open membership. New Generation Cooperatives (NGC's) are built based on closed memberships. They focus on a single commodity and processing of that commodity. They utilize delivery rights and try to maximize profits from downstream in the supply chain. This differs from traditional cooperatives since traditional cooperatives exist to serve the wide variety of members which may include working with several types of commodities and providing a multitude of services, such as fuel, fertilizer, grain storage and marketing, feed solutions, etc. (Merrett & Walzer, 2001). On the contrary, the open membership model with one vote per member can be an asset. This gives all members a voice, allows for a variety of membership, and a wider pool to draw from for director positions.

Another challenge that cooperatives face based on their structure is the free-rider problem and the horizon problem. The first suggests that little incentive exists for members to actually invest in the cooperative since benefits come from the use of the co-op.

Therefore, members may only invest as much as they need to in order to be considered a patron of the co-op. The horizon problem suggests that members may get stuck only focusing on the short-term rather than the long-term life of the co-op since benefits are only received from the co-op when members use the co-op. In order to see returns this year, the member needs to patronize the co-op this year. Furthermore, tying back into the idea that cooperatives are governed by the members who serve as directors, perhaps those members end up acting out of self-interest while on the board rather that considering the interests of the greater good (Cook, 1995).

3.4 Survey Design

There are a variety of approaches to conduct a skills gap analysis. Mason, et al. (2016) utilized job postings to identify skills to assess if a skills gap was present between graduating students and open positions. Christo-Baker, Sindone, and Roper (2017) studied skills and their correlation to unemployment rates, open positions and job postings, and hiring rates using skills that were identified by The Society for Human Resource Management. Easterly, et al. (2017) analyzed the gap between employers and potential employees (students) going through bachelor's degree programs utilizing Human Capital Theory as a theoretical framework and a survey to identify skills needed by graduates. Abbasi, Ali, and Bibi (2018) used a survey method as well to look at fresh college business graduates and a potential skill gap to enter into the banking industry. The survey included two separate 5-point Likert scale questions – one to assess expected

skills and one to assess possessed skills. A total of 12 soft skills were assessed using means of expected versus means of possessed skills to see if there was indeed a skill gap.

From the collected qualitative data and literature review conducted by Herchenbach, et al. (2022), a survey was created and distributed to CEOs/GMs and directors of farmer cooperatives in the Midwest. This research represents the quantitative approach to identify the farmer cooperative director skill gap and what skills are most important. Approval from the Institutional Review Board at Kansas State University was granted and informed consent forms for each participant were collected.

In late January 2022, the survey was sent out to CEOs/GMs and directors of farmer cooperatives in South Dakota, Nebraska, Kansas, Oklahoma, Texas, Iowa, Missouri, Minnesota, Wisconsin, and Illinois. A participation incentive of $50 in cash for the first 400 participants was offered. An estimated 1,900 emails were sent out. Achieving a response rate of 9.7% was made possible by working with state cooperative councils and CoBank, the primary lender to farmer cooperatives.

The first section of the survey, the demographics section, focused on gathering information about the individual including gender, director/CEO, average hours of training attended each year, type of cooperative, number of years as CEO, number of grain storage locations for the cooperative, annual sales of the cooperative, and other attributes. The second section focuses on a skills assessment that addresses the potential skill gap. It contains two parts: one asking the respondent to evaluate a new director with

regards to the skill level corresponding to each of the eleven skills studied in Herchenbach, et al. (2022) and another part asking the respondent to evaluate a current director in regards to the skill level corresponding to the same set of eleven skills, each done on a 5-point Likert scale. Finally, the third section contains the best/worst scaling model to identify the most important and least important skills for farmer cooperative directors to possess in order to be engaged and knowledgeable. Each participant chooses the most important and least important skill for directors to possess out of a list of five skills. This approach is then repeated eleven times with the skill pairings varying based on a discrete choice experiment algorithm.

Eleven skills, as found by Herchenbach, et al. (2022) were used in section two and three of the online survey: cooperative finance, cooperative governance and policy, communication, time management, understanding current economic and industry conditions, asking critical and constructive questions, strategic planning, networking, listening, teamwork, and leadership. A short explanation of what is included in each section of the survey follows. The full survey is provided in Appendix C.

3.4.1 First Section – Demographic Questions

The demographic questions were asked not only for gathering background information on the participants, but also to gather information that can be used as control variables in the data analysis. The survey included general questions asking participants to identify their gender, state in which they reside, age, highest level of education, primary occupation, number of years working in that occupation, total acres rented and owned on their

farming operation, number of years they have served as a director on their farmer cooperative board, officer positions held while on the board, educational opportunities attended, and the number of hours of director education training attended each year. One of the main questions in this demographic section is asking the participant if they are a director or a CEO/GM in their farmer cooperative. This answer then poses specific questions pertaining to that particular role throughout the rest of the survey.

A smaller section within the demographics portion asks questions related to the cooperative in which they serve as director, CEO, or GM. These questions include classifying the primary source of sales for their cooperative, identifying the sales range that best reflects their cooperative's most recent total annual sales, and selecting how many total grain storage locations their farmer cooperative owns.

One question that we failed to ask directors is which skills were highlighted during the trainings they have attended. This is a limitation to the data we did collect. By failing to gather data in regards to the skills they have attended training for, we are not able to see if training was effective in increasing the director's skill level for the list of skills we tested. However, we did ask every director the average number of training hours they complete annually.

3.4.2 Second Section – Skills Assessment

In this section, the participants are asked to complete a director skill assessment. The list of skills and the Likert scale does not change between director and CEO/GM survey

participants. However, the way in which the question is approached does change. For directors, they are asked to complete the skill assessment in regards to their skill level when they were new to the board and then complete it again in regards to their current skill level for the 11 skills presented.

For CEO/GM survey participants, they are asked to complete the skill assessment based on the average director for their farmer cooperative board. Therefore, the first skills assessment they are asked to complete is in regards to the skill level of the average new director to their board and the second skills assessment is in regards to the current skill level of the average director. Comparing the assessment results between current and new allows us to identify a potential skill gap for the 11 skills found through literature, focus groups, and interviews. An example of a skills assessment question can be seen in Figure 3.2 below.

Figure 3.2 Example Skills Assessment Online Survey Question for Directors

For this next section, please complete a director skill assessment by reading the skill presented and then clicking the button that best reflects your skill level. For this first assessment, please think about your skill level **before** you were a director on a farmer cooperative board.

For skill level definitions, please utilize the following scale in your assessment:
1 = None = possess no knowledge, understanding, or application of the skill
2 = Basic = possess limited knowledge, understanding, or application of the skill
3 = Intermediate = possess an adequate understanding and application of the skill
4 = Skilled = possess significant understanding and application of the skill
5 = Expert = possess extensive understanding and is regarded as a skill expert

	Your Skill Level Before You Were A Director				
	1 = None	2 = Basic	3 = Intermediate	4 = Skilled	5 = Expert
Cooperative Finance	○	○	○	○	○
Cooperative Governance and Policy	○	○	○	○	○
Communication	○	○	○	○	○
Time Management	○	○	○	○	○
Understand Current Economic and Industry Conditions	○	○	○	○	○
Ask Critical and Constructive Questions	○	○	○	○	○
Strategic Planning	○	○	○	○	○
Networking	○	○	○	○	○
Listening	○	○	○	○	○
Teamwork	○	○	○	○	○
Leadership	○	○	○	○	○

One limitation of the Skills Assessment design is how the questions are phrased for directors versus CEOs. Directors are asked to evaluate themselves when completing the skills assessment while CEOs are asked to evaluate the average director. These require different frames of mind and are therefore not analogous.

3.4.3 Third Section – Best/Worst Scaling

The final section of the survey is best/worst scaling, which asks participants to select the "best" or "most" preferred option and the "worst" or "least" preferred option out of a set of alternatives. This technique has mainly been used in the marketing sphere to identify consumer preferences. As of late, it has expanded into the areas of economic planning, ethics, food packaging, health care, policy, transportation, travel, etc.

Best/worst scaling first appeared in Finn and Louviere's (1992) work on food safety. They asked participants to identify which food safety issue was of most concern and which was of least concern out of several paired issues. Best/worst scaling is considered to be one type or form of conjoint analysis. Conjoint analysis is "any decompositional method that estimates the structure of a consumer's preferences (i.e., estimates preference parameters such as part-worths, importance weights, ideal points), given his or her overall evaluations of a set of alternatives that are pre-specified in terms of levels of different attributes." (Green & Srinivasan, 1978, p. 104) For further explanations of theory, methods, and validity of conjoint analysis, see Louviere and Woodworth (1983), Louviere (Analyzing Decision Making, 1988), Louviere (1988), Green and Srinivasan (1990), Louviere and Timmermans (1990), and Batsell and Louviere (1991).

Alternatives to best/worst scaling is using a Likert scale approach or a ranking approach. With Likert scale approaches, however, the participant is not forced to choose a "top" priority out of the choices presented. Likert scales also pose the challenge of maintaining constant interpretations of the scale used across participants. With the ranking alternative,

the participant would be asked to rank all attributes shown together. In our study, that would require them to rank the skills from 1 (most important skill) to 11 (least important skill). Being presented 11 skills at one time to rank all 11 could be overwhelming and cumbersome for the participant. One could argue that the 11 skills could be broken down into small subgroups to then be ranked, for example, from 1 to 4. Once this approach is taken, though, best/worst scaling becomes a similar and simpler option.

We use best/worst scaling to help identify which skills are the most and least important for farmer cooperative directors to possess in order to be engaged and knowledgeable. As mentioned previously, through literature review, focus groups, and interviews, we compiled a list of 11 skills to incorporate into the skills assessment and best/worst scaling approach in the survey. Therefore, we have a list of J objects, where J=11 and j=1, 2, …, 11.

Following Louviere, Flynn, and Marley (2015), we need to choose an experimental design to help determine which objects were put into choice sets together in order to construct the best/worst scaling survey questions. Paired comparisons could be used where each object is paired with every other object. Therefore, for J objects, there are $J(J\text{-}1)/2$ pairs. In our case, that would give us 55 pairs, or 55 survey questions where each of the 11 skills are compared to each other separately. This would likely contribute to survey fatigue and likely an early exit from the survey.

Another option is to use an orthogonal design based on 2^J factorials. In our case, we would have $2^{11} = 2{,}048$ choice sets with each set containing a different number and combination of the eleven objects. However, unequal choice sets pose the issue of the respondent receiving unintentional signals from the researchers such as the respondents needing to choose differently in sets with different sizes. Lusk and Briggeman (2009) utilize the unbalanced method when studying food values but they also admit the limitations of the method.

A solution to both of these options is to use a balanced incomplete block design (BIBD). This is where each of the *J* objects is assigned to various choice sets that are fixed in size, *k*. Each of the choice sets is called a "block." A BIBD is a table with *b* choice sets with *k* objects. Each object will occur *r* times and co-occurs with other objects *m* times. The two calculations below must be integers:

$$\frac{\boldsymbol{b*k}}{\boldsymbol{J}} \tag{1}$$

$$\frac{\boldsymbol{b*k}}{\boldsymbol{J}} * \frac{(\boldsymbol{k-1})}{(\boldsymbol{J-1})} \tag{2}$$

Equation (1) tells us how many times each object appears across all questions. Equation (2) tells us how many times a pair shows up in the same choice set. Using SAS or other statistical software, you can find the optimal points for the given equations. All of the optimal designs for various *J* can be seen in Table 3.4 below.

Table 3.2 Balanced Incomplete Block Designs for Selected *J* Objects

J	***k***	***r***	***b***	***m***
7	2	6	21	1

	3	3	7	1
	4	4	7	2
	6	6	7	5
8	2	7	28	1
	4	7	14	3
	7	7	8	6
9	2	8	36	1
	4	8	18	3
	5	10	18	5
	6	8	12	5
	8	8	9	7
10	2	9	45	1
	3	9	30	2
	4	6	15	2
	5	9	18	4
	6	9	15	5
	9	9	10	8
11	2	10	55	1
	5	5	11	2
	6	6	11	3
	10	10	11	9
13	3	6	26	1
	4	4	13	1
	9	9	13	6

Source: (Cochran & Cox, 1950, pp. 469-470)

With J=11 objects, we have four potential designs. The first design includes $k=2$ objects in each choice set, $r=10$ times the object occurs in the design, $b=55$ blocks or choice sets, and $m=1$ time each object is paired with another object. In our case, this would mean our 11 skills are paired with other skills of the list only one time, appear a total of 10 times in the experiment, and survey participants would be faced with 55 total questions showing 2 skills in each question. This design would make the best/worst approach very straightforward; each participant would choose one skill of the two presented as the best option and the other skill, by default, would fill the worst option. However, answering 55 questions is seen as too long and will increase survey fatigue.

An alternative would be to look at the remaining three options given our 11 total objects or skills (J=11). We chose the second option where the 11 skills appear a total of 5 times (r=5) throughout the experiment and are paired with other skills in the list a total of 2 times ($m=2$). This means the survey participant answers 11 total questions ($b=11$) with 5 skills presented in each question ($k=5$). Option 2 and 3 are rather similar. The main difference is that the participant has to compare 6 skills in each of the 11 questions in option 3 versus comparing 5 skills in each of the 11 questions in option 2.

Additionally, using SAS, we can see what the treatment D-efficiency score is for either option. The treatment D-efficiency is one way to measure the goodness or efficiency of the experimental design. It is based on the geometric mean of the eigenvalues. Alternatively, we could observe the A-efficiency score, which is based on the arithmetic mean of the eigenvalues. The D-efficiency is easier for SAS to optimize and is invariant if one uses different coding schemes. Therefore, we observe the D-efficiency for both potential designs to then compare the relative goodness of each design.

For option 2 where 5 skills are presented in each choice set, the treatment D-Efficiency score is 87.85. The treatment D-Efficiency score does increase with option 3 to 91.60 where 6 skills are presented in each choice set. However, option 3 is not selected because comparing 6 skills instead of 5 over 11 total questions could become cumbersome and difficult for the survey taker to track 6 skills. The treatment D-Efficiency improvement in option 3 is small as well. Therefore, to minimize survey fatigue and limit the number of

skills to choose between the two options, we chose option 2 using 5 skills in each choice set.

It is also important to note that even though we are choosing a design with a relatively lower D-efficiency compared to another design, our design is still optimally efficient since it is balanced and orthogonal. Given that the efficiency scale runs from 0 to 100, our design of choice with a D-efficiency of 87.85 still represents a potentially highly efficient design. For further information on efficiency scores, see Kuhfeld (2010).

Perhaps the most ideal option for a survey taker would be to have 3 or 4 skills presented in each question and answer less than 10 questions. This allows for easier understanding of the presented survey question and minimizes survey fatigue. However, in order to find such a combination, we would have to decrease the total number of skills (J) down to 7. Among the options when J=7, we find one where 3 skills are presented in each question and the survey participant is asked 7 total questions. We found it rather difficult to consider decreasing our skills list from 11 down to 7. Therefore, this was not a feasible option for this particular research. As you can see, increasing the number of skills does not aid in reaching an optional survey design as it relates to decreasing participant fatigue or increasing survey question understanding.

As mentioned, we have 11 choice sets, each containing 5 skills or objects. The table shows which objects appear in each choice set. Each skill appears a total of 5 times throughout the 11 choice sets and is paired with any other skill only two times. The skills

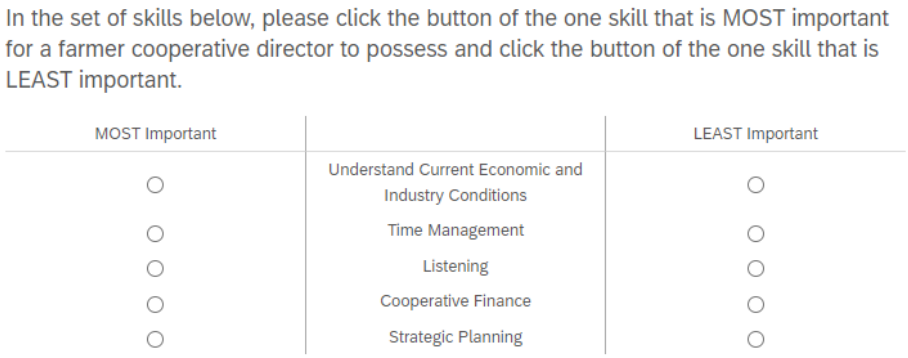
appearing in each choice set are randomly moved within the set so the order of the skills presented in each choice set is not the same for each respondent. The chosen experimental design using SAS can be seen below in Table 3.3. An example of how one of the 11 questions appears in the survey can be seen in Figure 3.3.

Table 3.3 Balanced Incomplete Block Design (BIBD) for 11 Farmer Cooperative Director Skills

Choice Set (*b*)	Objects in Each Set				
1	Understand Current Economic and Industry Conditions	Time Management	Listening	Cooperative Finance	Strategic Planning
2	Leadership	Understand Current Economic and Industry Conditions	Teamwork	Communication	Time Management
3	Networking	Teamwork	Time Management	Ask Critical and Constructive Questions	Listening
4	Leadership	Cooperative Governance and Policy	Teamwork	Understand Current Economic and Industry Conditions	Listening
5	Communication	Strategic Planning	Cooperative Governance and Policy	Listening	Ask Critical and Constructive Questions
6	Ask Critical and Constructive Questions	Cooperative Governance and Policy	Cooperative Finance	Time Management	Leadership
7	Leadership	Strategic Planning	Understand Current Economic and Industry Conditions	Ask Critical and Constructive Questions	Networking
8	Cooperative Finance	Listening	Networking	Leadership	Communication

9	Teamwork	Networking	Time Management	Strategic Planning	Cooperative Governance and Policy
10	Cooperative Governance and Policy	Cooperative Finance	Understand Current Economic and Industry Conditions	Networking	Communication
11	Ask Critical and Constructive Questions	Cooperative Finance	Teamwork	Communication	Strategic Planning

Figure 3.3 Best/Worst Scaling Survey Question Example



3.5 Measures and Instrumentation

3.5.1 Skills Assessment

The type of cooperative representative participating in the survey determined which version of the skills assessment they answered. If the participant was a cooperative director, they were asked to evaluate themselves before they became a director and then again as a current director. If the participant was a cooperative CEO or general manager, they were asked to evaluate the average new director to their board and then evaluate the average current director on their board. Both the directors and the CEOs were presented

the same eleven skills in the skills assessment section. The Likert scale was the same for both as well.

To analyze the results, we computed the average score given for each skill based on the type of respondent, director or CEO. By comparing the "before" score and the "current" score, we could identify a potential gap between new and current directors.

Another approach utilizes ordered logit models. The dependent variable is ordinal with the levels having a natural ordering based on the Likert scale values being 1 to 5. However, the distances between adjacent levels are unknown since each respondent has a different measure or definition of the measurement that exists between a '1' and a '2,' for example.

Our ordered logit model utilized the current skill level for each of the eleven skills as the dependent variable. We then utilize various characteristics of the respondents as the independent variables in order to observe the potential effects those characteristics have on the respondent's choice when choosing a value on the Likert scale. These characteristics are denoted as $X_i = x_{i1}, x_{i2}, \dots, x_{iK}$, for all individuals i. Therefore, a random utility function can be modeled, shown as $U_{is} = X_i + e_{is}$, where e_{is} is a random error component. Assuming the random error component is Extreme Value Type I, mean zero, and IID, we use Maximum Likelihood methods to estimate the coefficients for vector, X_i (Greene, 2012).

A total of 33 ordered logit models were estimated, one for each skill both for directors and CEOs. Each group of respondents were asked the same questions in addition to a couple of questions that only pertained to their cooperative position. For example, directors were asked how many years they have served as a director. This particular answer could affect how that director evaluated themselves in the skills assessment portion of the survey. Therefore, that characteristic was included when running ordered logit models on the director data.

3.5.2 Best/Worst Scaling

Data analysis using best/worst scaling collection techniques includes a variety of options. One of the easiest ways to summarize the best/worst responses is to simply count the choices for each of the objects, or create a log-interval scale of importance. The researcher can count the number of times the skill was selected as "most" or "least" important. If selected as "most" important, the skill is given a value of 1 while the skill selected as "least" important is given a value of '-1'. The skills in each choice set that are not selected as either "most" or "least" important are given a value of 0. Each skill appears five times throughout the eleven questions. Therefore, when computing the average, the score range is '-5' to '+5'.

A similar approach can be completed using a conditional logistic regression model, such as multinomial logit (MNL). See Marley and Louviere (2005) for a more formal explanation of the properties of the best/worst models. More specifically, using our random utility theory, we can compute the maximum difference. When answering the

best/worst questions in the survey, the participants are simultaneously choosing the skills on the extreme ends of the most important and least important scale. Therefore, the difference between the most important and least important skills is a maximum difference.

Basic demand and consumer theory provide a background to this method. A consumer is presented two different consumption options, x and y for example. The consumer can identify which one of the two they prefer over the other based on which may bring them the most utility. The theory suggests that people are rational and will make choices in order to maximize their utility subject to a budget constraint. Furthermore, random utility theory plays a part. Random utility theory is a model from the researcher's perspective, observing choices by individuals. When the person is faced with the options several times and in several combinations in best/worst scaling, we can utilize their choice frequencies to better understand how much they value those particular options, according to a scale of importance.

In our case, the respondent *i* will choose skill *j* that maximizes the importance of the skill on an importance scale. Assume that s_j is the scale parameter on the importance scale for respondent *i*, and the latent unobserved level of importance for respondent *i* is represented as $M_{ij} = s_j + e_{ij}$, where e_{ij} is a random error component. The probability that the respondent chooses skill *j* as the most important skill of the choice set with *J* skills and chooses skill *k* as the least important skill of the choice set, is the probability that the difference in M_{ij} and M_{ik} is greater than all other *J*(*J*-1)-1 possible differences in

the choice set. If the e_{ij} random error component is IID type 1 random variates and with the IIA property, the following conditional logit form exists:

$$\boldsymbol{P(j\ is\ chosen\ most\ important\ and\ k\ is\ chosen\ least\ important)} = \frac{\exp(s_j M_{ji})}{\sum \exp(s_j M_{ki})} \quad (3)$$

Using equation (3) above and maximizing the log-likelihood function, the variables s_j can be estimated. Here, s_j represents the specific location of the skill *j* on the importance scale. This location is dependent on skill *j* being selected over all other skills. The estimate of s_j shows the importance of skill *j* relative to another skill that was used as the "base" and set to zero.

We can then calculate "importance shares." These will show the percentage of respondents who would choose the skill in question as most important:

$$\boldsymbol{Importance\ Share} = \frac{\exp(\widehat{s_j})}{\sum_{k=1}^{j} \exp(\widehat{s_k})} \quad (4)$$

Additionally, the ratios of the "importance share" will show us how many times more important skill *j* is compared to another skill *k*. The shares must add up to equal one across all eleven skills.

A limitation of this model is it assumes all individuals in the sample assign the same level of importance on each skill *j*. To explore the impact of individual characteristics and their potential effect on defining the levels of importance, additional conditional logit models were estimated for these characteristics.

3.6 Results and Discussion

3.6.1 Demographic Data

Table 3.4 below shows the demographics for the entire sample of directors and CEOs.

Table 3.4 Sample Demographics

Category	Total	Percent of Total Responses
Total Responses	174	
Cooperative Position		
Director	109	62.6%
CEO/GM	65	37.4%
Gender		
Male	168	96.6%
Female	4	2.3%
Didn't Respond	2	1.1%
Age (All Responses)		
30-40	37	21.3%
41-50	44	25.3%
51-60	41	23.6%
61-70	48	27.6%
71-80	4	2.3%
Education (All Responses)		
High School/GED	18	10.3%
Some College	53	30.5%
4-Year College	84	48.3%
Graduate Degree	18	10.3%

A total of 174 respondents completed the survey, with 109 reporting as directors and 65 reporting as CEOs/GMs. The large majority were male and have received a bachelor's degree or higher. The age groups are fairly evenly represented, ranging from age 30 to

age 80. One limitation is the small sample size as a whole and the small sample of female participants.

As seen in Table 3.5, which shows specific demographics for directors, a total of 109 directors responded to the survey.

Table 3.5 Director Demographics

Category	Total	Percent of Total Responses
Total Director Responses	109	
Age (Directors)		
30-40	25	22.9%
41-50	25	22.9%
51-60	23	21.1%
61-70	32	29.4%
71-80	4	3.7%
Education (Directors)		
High School/GED	13	11.9%
Some College	43	39.4%
4-Year College	43	39.4%
Graduate Degree	9	8.3%
Director Occupation		
Farmer and/or Rancher	104	95.4%
Non-farm Employment	4	3.7%
Non-farm Self-Employment	1	0.9%
Years in Occupation (Director)		
<10 years	7	6.4%
10-19 years	23	21.1%
20-29 years	21	19.3%
30 years and over	58	53.2%
Years as Director		
<10 years	51	46.8%
10-19 years	33	30.3%
20-29 years	17	15.6%
30 years and over	7	6.4%

Average	12.3	
Number of Director Training Hours per Year		
Less than 5 hours	19	18.4%
5-20 hours	55	53.4%
20-40 hours	24	23.3%
More than 40 hours	5	4.9%
Directors Serving on other BODs	79	72.5%

*Note: Only 103 directors responded to the training hours per year question.

An even distribution among the director age groups was observed. The vast majority are farmers and/or ranchers with about half serving in that occupation for more than 30 years. Just under half of the director respondents have been a director for less than 10 years. The majority of directors reported attending 5-20 hours of training each year. Almost 75% of directors reported serving on another board of directors during their lifetime outside of their cooperative board.

Table 3.6 shows the demographics for the CEO/GM respondents.

Table 3.6 CEO/GM Demographics

Category	Total	Percent of Total Responses
Total CEO/GM Responses	65	
Age (CEOs/GMs)		
30-40	12	18.5%
41-50	19	29.2%
51-60	18	27.7%
61-70	16	24.6%
71-80	0	0%
Education (CEOs/GMs)		
High School/GED	5	7.7%
Some College	10	15.4%
4-Year College	41	63.1%

Graduate Degree	9	13.8%
Years in Occupation (CEO/GM)		
<10 years	38	58.5%
10-19 years	9	13.8%
20-29 years	9	13.8%
30 years and over	9	13.8%
Average	12.0	

A total of 65 CEOs/GMs responded to the survey. Once again, an even distribution among the age groups is observed, except for the 71-80 age group which received zero respondents. The majority received at least a bachelor's degree and have served less than 10 years in their CEO/GM role.

Participating cooperative demographics can be seen in Table 3.7.

Table 3.7 Participating Cooperative Demographics

Category	Total	Percent of Total Responses	2019 U.S. Agricultural Cooperatives Statistics[ii]
Total Responses[i]	173		
Cooperative Classification			
Primarily Grain/Oilseed (more than 2/3 of sales)	63	36.4%	68.0%[iii]
Primarily Farm Supply (more than 2/3 of sales)	23	13.3%	31.7%[iv]
Mix Between Grain/Oilseed and Farm Supply	81	46.8%	25.3%[v]
Other	6	3.5%	5.0%
Cooperative Sales			
Less than $15 Million	12	6.9%	50.7%
$15-$150 Million	75	43.4%	36.6%[vi]
$150-$500 Million	37	21.4%	9.4%[vii]

More than $500 Million	49	28.3%	3.3%
Number of Grain Storage Locations			
0-1 total grain storage locations	24	13.9%	
2-5 total grain storage locations	43	24.9%	
6-11 total grain storage locations	32	18.5%	
More than 12 total grain storage locations	74	42.8%	

Notes:

i. One respondent did not answer these questions.
ii. Source: (USDA Rural Development, 2021)
iii. This figure is attributed to Agricultural Marketing Cooperatives as defined by the USDA.
iv. This figure is attributed to Agricultural Supply Cooperatives as defined by the USDA.
v. This figure is attributed to a mix between Agricultural Marketing and Supply Cooperatives as defined by the USDA.
vi. This figure encompasses cooperatives with $15-$200 million in sales.
vii. This figure encompasses cooperatives with $200-$500 million in sales.

The majority of the cooperatives represented in the sample are classified as a mix between grain/oilseed and farm supply. Just under half of the cooperatives surveyed fall into the $15-$150 million annual sales category with about a quarter having more than $500 million in annual sales. Finally, just under half of the cooperatives surveyed have more than 12 grain storage locations.

Comparing the sample to the United States agricultural cooperative statistics, we can only make a general statement that our sample is indicative of the country's agricultural cooperatives. Recall, our sample focuses on cooperatives based on the Midwest. The USDA statistics of agricultural cooperatives are not broken down by region. The types of cooperatives seen in the Midwest are likely different or are of different proportion than the country as a whole. This can be argued for both the cooperative classification percentages and the sales category percentages. Additionally, it is likely that the USDA has a more comprehensive survey than the one we conducted. Our sample, though, may

be indicative of where the cooperative landscape is going given cooperative construction (i.e. there is an increased number of larger cooperatives today than a couple of years ago).

3.6.2 Skills Assessment

The results from both director respondents and CEO/GM respondents can be aggregated to allow us to look at the overall skill level of new directors versus the overall skill level of current (or more seasoned) directors. Utilizing the 5-point Likert scales, we can identify the average skill level for each of the 11 skills presented, which is reported in Table 3.8.

Table 3.8 Average Scores for Skills Assessment

Skill	Before (n=174)	Current (n=174)	Skill Gap
Cooperative Finance	2.0	3.3	1.3*
Cooperative Governance & Policy	2.0	3.4	1.4*
Communication	2.9	3.4	0.5*
Time Management	3.0	3.4	0.4*
Understand Current Economic & Industry Conditions	2.8	3.6	0.8*
Ask Critical & Constructive Questions	2.9	3.6	0.7*
Strategic Planning	2.4	3.4	1.0*
Networking	2.7	3.4	0.7*
Listening	3.3	3.7	0.4*
Teamwork	3.1	3.6	0.5*
Leadership	2.9	3.4	0.5*

Note: Statistical significance is determined by using the Wilcoxon Rank-Sum Test. All Skill Gaps are significant at the 5% level as denoted by a *.

Each skill shows a positive gap, meaning directors increased their skill level for all skills from when they were new to the board of directors. The largest skill gaps are seen for

Cooperative Governance and Policy and Cooperative Finance. The small skill gaps are seen for Time Management and Listening.

Table 3.9 segments the averages into director responses and CEO/GM responses.

Table 3.9 Average Scores for Skills Assessment by Directors and CEO/GM

Skill	Directors – Before (n=109)	Directors – Current (n=109)	Skill Gap	CEO/GM – Before (n=65)	CEO/GM – Current (n=65)	Skill Gap
Cooperative Finance	2.0	3.5	1.5*	2.0	3.0	1.0*
Cooperative Governance & Policy	2.0	3.5	1.5*	2.0	3.1	1.1*
Communication	3.0	3.6	0.6*	2.7	3.1	0.4*
Time Management	3.1	3.6	0.5*	2.9	3.0	0.1*
Understand Current Economic & Industry Conditions	2.7	3.7	1.0*	2.9	3.3	0.4*
Ask Critical & Constructive Questions	2.9	3.7	0.8*	2.8	3.4	0.6*
Strategic Planning	2.6	3.7	1.1*	2.1	2.9	0.8*
Networking	2.6	3.4	0.8*	2.9	3.2	0.3*
Listening	3.3	3.8	0.5*	3.3	3.6	0.3*
Teamwork	3.1	3.7	0.6*	3.0	3.5	0.5*
Leadership	3.0	3.6	0.6*	2.7	3.1	0.4*

Note: Statistical significance is determined by using the Wilcoxon Rank-Sum Test. All Skill Gaps are significant at the 5% level as denoted by a *.

All skills show an increase from “Before” to “Current” for both Director respondents and CEO/GM respondents. It is interesting to see and it warrants further research to see why none of the skills have an average rating above 4 or the ‘skilled’ level. This result might suggest that training is still needed for some directors across all of the skills in order to

reach a ‘skilled’ level.

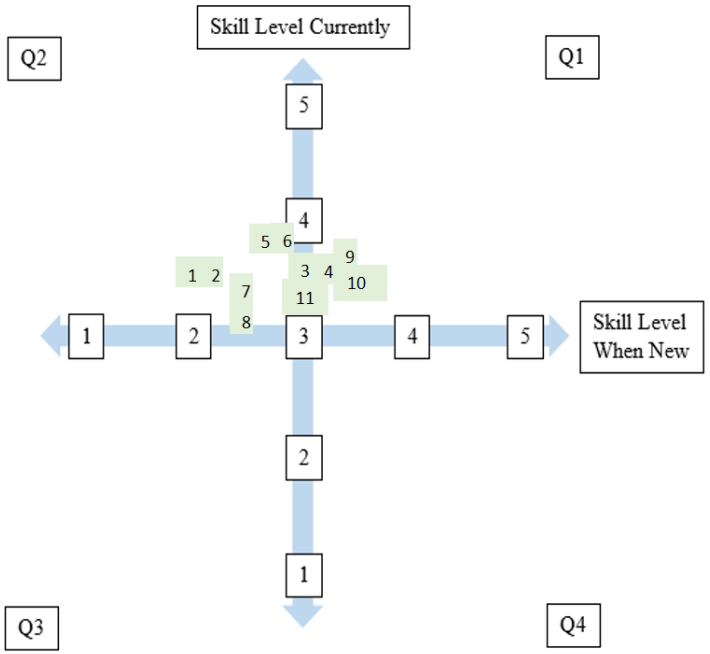
Of particular interest is Strategic Planning. Directors believed they had much more improvement in this skill area from when they were new to the board, reporting a skill gap of 1.1. CEOs believe the improvement of new directors wasn’t quite as high, reporting a skill gap of 0.8. Additionally, on average, CEOs do not believe their directors have reached a score of 3, the ‘intermediate’ level. This could be attributed to the fact that directors and CEOs define Strategic Planning and the role directors play in strategic planning differently.

Looking at the Skill Gap columns, Directors show that there is a gap of 1.0 in Understanding Current Economic and Industry Conditions while CEOs/GMs say that skill gap is 0.4. This seems to be a slight discrepancy between the two groups. However, the “before” and “current” averages for the two groups are not entirely different from each other. The main inconsistency is seen in the “current” average for each group with directors claiming a higher “current” skill level than CEO/GM respondents. Directors and CEOs/GMs agree that Cooperative Governance and Policy and Cooperative Finance have the largest skill gaps while Time Management has one of the smallest skill gaps.

To help illustrate how this skills gap analysis connects with director training opportunities, a skills assessment graph is presented. As shown in Figure 3.4, the vertical axis of the graph represents the current director skill level while the horizontal axis represents the new director skill level.

Each quadrant within the graph is then defined in regards to detecting when additional training might be needed. Quadrant 1 characterizes a director that came on the board very skilled and still has a high skill level for the particular skill. This represents the ideal quadrant. Quadrant 2 characterizes a director that came on the board without the skill in question but now has the skill as a current director. This represents potential training opportunities for new directors. Quadrant 3 characterizes a director that came on the board without the skill in question and still does not have the skill as a current director. This represents training areas that are needed for new directors and potentially current directors. Quadrant 4 characterizes a director that came on the board very skilled in the skill in question but now does not feel confident in their current skill level as a current director. This represents potential training opportunities for current directors. Figure 3.4 below shows the director averages for each skill on one graph and the CEO/GM averages for each skill on another graph.

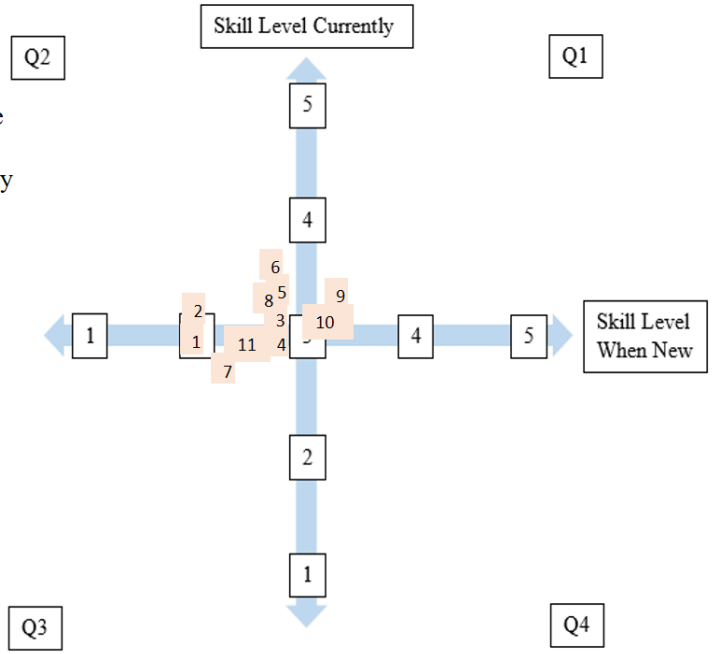
Figure 3.4 Skills Assessment Averages in Skills Assessment Graph



Director Average

Skills Key:

1. Cooperative Finance
2. Cooperative Governance & Policy
3. Communication
4. Time Management
5. Understand Current Economic and Industry Conditions
6. Ask Critical and Constructive Questions
7. Strategic Planning
8. Networking
9. Listening
10. Teamwork
11. Leadership



CEO/GM Average

Q1 – director was and is still currently very skilled (ideal)
Q2 – director lacked this skill when new but has since acquired the skill (potential training for new directors)
Q3 – director lacked this skill when new and is still lacking the skill (potential training for new and current directors)
Q4 – director came in very skilled but has since lost their skill level (potential training for current directors)

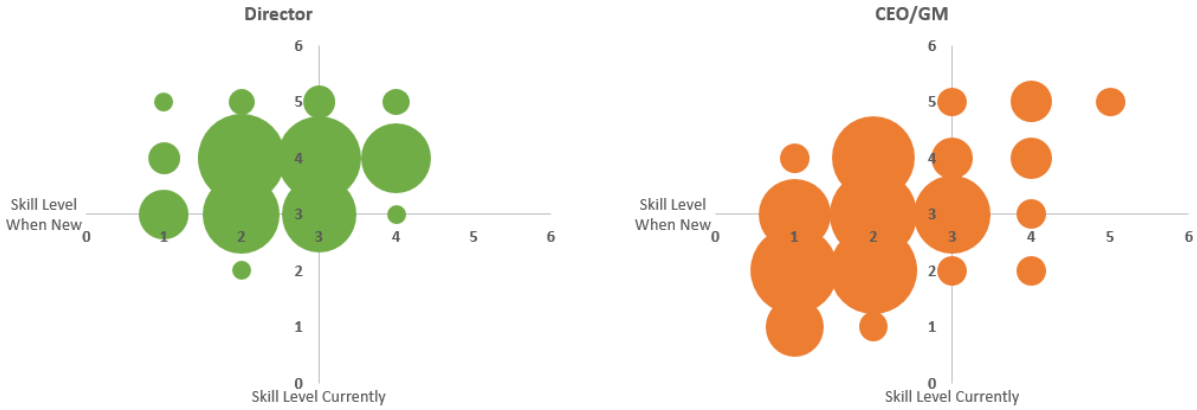
Looking at Figure 3.4, none of the skills as evaluated by directors and CEOs/GMs are in quadrant 4. Therefore, none of the skill levels are in a place where training is needed for current directors only. Most of the skills are found in quadrant 2, which suggests training is needed for those skills for new directors. Some skills end up on the border between quadrants 2 and 3. Only one is clearly in quadrant 3, Strategic Planning, according to CEOs/GMs. This may be a good training opportunity for both new and current directors.

However, as seen by the reported averages previously by both respondent groups, a potential disagreement exists with the definition of Strategic Planning. Directors don't feel as if they need training in this skill as a current, more experienced director, while CEOs believe that ongoing training in strategic planning is important regardless of how long the director has been on the board. Therefore, more work needs to be done to identify exactly what needs to be the focus of the training when it comes to preparing directors for their strategic planning roles.

A couple of skills ended up in quadrant 1 – Communication, Time Management, Listening, Teamwork, and Leadership. This suggests that these skills are at expected levels. However, the placement of each is not necessarily agreed upon between directors and CEOs/GMs. For example, directors would place Time Management in quadrant 1 while CEOs/GMs would place Time Management in quadrant 2. CEOs/GMs place Communication in quadrant 1, while directors place it in quadrant 2. In general, though, CEOs/GMs rated directors lower than directors rated themselves for each of the skills.

Strategic Planning is one skill that raises questions based on its placement on the director graph versus the CEO/GM graph in Figure 3.4. We can plot the frequencies of responses for Strategic Planning to see the difference between director responses and CEO/GM responses, shown in Figure 3.5 below.

Figure 3.5 Response Frequencies for Strategic Planning



Frequency plots, such as the one above, are extensions of the Skills Assessment Graph in Figure 3.4. Such plots can be created for each of the skills. However, only Strategic Planning is shown here given its disputed placement in the Skills Assessment Graph above. In Figure 3.5, we can see that the majority of directors placed themselves in Quadrant 2 while the majority of CEOs placed directors in Quadrant 3. This depicts that directors believe they gained knowledge of Strategic Planning during their tenure as a director. CEOs believe that current directors still need training in order to gain knowledge of Strategic Planning.

As mentioned previously, in most cases, directors tend to rate their skill levels higher than CEOs/GMs. One of the easiest skills to plot and see this difference is Strategic Planning. Directors mainly place themselves in quadrant 2, suggesting that training is needed for new directors in this skill. CEOs/GMs place directors in quadrant 3, indicating Strategic Planning is a training opportunity for both new and current directors.

To this point, only the average skill ratings have been analyzed for the entire sample, directors, and CEOs/GMs. However, additional amounts of heterogeneity within the responses could exist. More specifically, do the demographic characteristics of the respondents affect how the respondent completed the skills assessment section of the survey? To investigate this potential heterogeneity, ordered logit models are estimated. The current skill level for each skill served as the outcome measure or dependent variable. These levels are ordinal with the levels having a natural ordering, from 1 to 5. Current skill level is used because the distances between adjacent levels are subjective and not necessarily comparable. Each respondent has a different measure between a 1 and a 2, for example. Table 3.10 below shows the results of the first ordered logit model using all responses for both directors and CEOs/GMs.

Table 3.10 Ordered Logit Results – Skills Assessment Using Current Skill Level

Coefficient	Cooperative Finance	Cooperative Governance	Communication	Time Management	Economic Conditions	Ask Questions	Strategic Planning	Networking	Listening	Teamwork	Leadership
Director=1	1.0109***	0.8225**	1.4578***	1.0372***	1.2542***	0.7939**	1.7531***	0.0580	0.3540	0.4884	1.2812***
Age	0.0376***	0.0198	0.0428***	0.0146	0.0236*	0.0516***	0.00632	0.0267**	0.268*	0.0170	0.0411***
Education Level											
Some College	0.1552	-0.9176*	-0.1839	0.5590	-0.3207	0.0402	-0.3669	0.1286	-0.2224	-0.6668	-0.3287
4-year College	0.4968	-0.5301	0.1842	-0.2760	0.1518	0.2715	-0.2541	0.0621	-0.3909	-0.3629	-0.2016
Graduate Degree	0.3246	-0.3075	0.6603	0.1559	1.2934*	1.1324*	-0.6286	1.1375*	-0.2224	0.9063	0.4413
Co-op Classification											
Grain	-1.2562	-1.5630*	-0.5490	-0.2017	0.6336	-0.4172	0.1786	-0.0332	0.6109	0.3712	-0.1415
Farm Supply	-1.3789	-0.6671	-0.7476	0.3571	0.6804	0.5547	0.6898	-0.8813	1.0645	0.5535	-0.0346
Mix	-1.3880	-1.6609*	-0.6059	0.1150	0.4662	-0.0656	0.0651	-0.3055	0.5817	-0.2656	-0.1507
Sales Category											
$15-$150 MM	0.6853	0.9144	0.2002	-0.1942	0.1391	0.0244	0.7940	-0.4833	0.6017	0.7143	0.6955
$150-$500 MM	0.7099	1.0472	0.3326	0.3372	0.4623	-0.0235	0.4165	0.0146	-0.0922	0.8042	0.1642
>$500 MM	1.0393	1.8605**	-0.2345	-0.3632	0.6502	-0.2414	1.2015*	0.4427	0.4307	1.2335*	0.5244
Number of Grain Storage Locations											
2-5	0.8830*	0.6819	-0.1541	1.4643***	0.3295	0.9176*	1.2402**	0.5558	1.1663**	0.5379	0.0670
6-11	0.4213	1.0135*	0.5846	1.3310**	0.1134	1.1960*	1.3428**	0.3977	1.0113*	0.2332	0.4788
12+	0.6863	0.5427	0.6264	1.2821**	0.2737	1.3845**	1.2189**	0.3027	1.4497**	0.5829	0.6198
Fit Statistics											
Somers' D	0.376	0.403	0.441	0.357	0.389	0.424	0.427	0.324	0.306	0.349	0.421
Kendall's Tau-a	0.245	0.255	0.275	0.235	0.241	0.263	0.289	0.215	0.173	0.210	0.271
n	173	172	172	173	173	173	173	172	173	173	172
AIC	418.14	395.50	384.73	411.55	392.90	383.55	425.42	432.74	360.55	388.88	389.30
Likelihood Ratio P-Value	0.0065***	0.0039***	0.0009***	0.0007***	0.0077***	0.0021***	<0.0001***	0.0680*	0.0925*	0.0693*	0.0016***
Percent Concordant	68.4%	69.9%	71.8%	67.6%	69.2%	70.9%	71.1%	65.8%	64.9%	67.2%	70.8%
Log Likelihood Function Value	-191.07	-179.75	-174.36	-187.77	-178.45	-174.77	-194.71	-198.37	-163.28	-177.44	-177.65

*P-Value<0.1, **P-Value<0.05, ***P-Value<0.01

Dependent variable has 5 levels: 1 = No Skill Level, 2 = Basic, 3 = Intermediate, 4 = Skilled, 5 = Expert

It is important to note that the actual value of the coefficient is not directly interpretable. One would have to look at the marginal effects in order to directly interpret the value of the coefficient. What is directly observable here is the sign and significance of each coefficient. The Director dummy variable is positive and significant, which indicates directors, on average, rated their current skill level higher than a CEO/GM current skill level assessment. Additionally, age is significant for almost all skills. As age increases, a higher level of skill competence is assigned. The other variable that shows significance is the number of grain storage locations. As the number of grain storage locations increases in relation to the Time Management skill, for example, the competency level assigned decreases. It is interesting to see that there is not a general trend of significance in the education level, cooperative classification, and sales categories.

The AIC (Akaike Information Criterion), likelihood ratio P-value, percent concordant, and log likelihood function value can be used to analyze the goodness of fit for the model. The AIC estimates quality of the model relative to other models. Typically, a lower value is better. The likelihood ratio P-value shows the significance level of the likelihood ratio used, all of which are significant in the above model. The percent concordant is a percentage that a model's outcome will be true. In our case above, this value ranges from 65%-72%. Finally, the higher the log likelihood function value, the better a model fits the dataset. This ranges from negative infinity to positive infinity and is useful when comparing two or more models (SAS Institute Inc., 2022).

The Somers' D calculation tells us the strength and direction of relation between pairs of variables and will range from -1, or all pairs disagree, to a +1, or all pairs agree. Across the skills, it seems as if they're all around 0.4. Therefore, almost all pairs agree, meaning we might expect several of the independent variables to not be statistically significant. Kendall's Tau-a is similar to Somers' D but also takes into account the difference between the number of possible paired observations and the number of paired observations with different responses (SAS Institute Inc., 2022).

Given the classification of being a director versus a CEO/GM is significant, separate ordered logit models were estimated – one to observe the heterogeneity in director responses and one to observe the heterogeneity in CEO/GM responses. Table 3.11 reports the full results of the director ordered logit model.

Table 3.11 Ordered Logit Results – Directors Skills Assessment Using Current Skill Level

Coefficient	Cooperative Finance	Cooperative Governance	Comm.	Time Mngt	Economic Conditions	Ask Questions	Strategic Planning	Networking	Listening	Teamwork	Leadership
Age	0.0229	0.0147	0.0353	-0.0055	0.0278	0.0569**	-0.0074	0.0029	0.0165	0.0017	0.0238
Yrs as Dir.	0.0597*	0.0440	0.0137	0.0110	0.0129	0.0172	0.0112	0.0643**	-0.0047	0.0235	0.0251
Average Yearly Hours of Director Training											
5-20	0.0277	-0.4212	0.6922	1.1719*	0.6871	0.6380	0.8136	0.9325*	1.1670*	2.1026***	1.0646*
20-40	0.5840	0.4834	2.1690***	1.4172**	1.5651**	0.7649	1.8517***	1.4005**	0.7984	2.9105***	1.6309**
>40	1.2918	2.1260*	1.7464*	1.4955	1.9456*	1.6111*	2.1860*	2.6066**	1.7324	1.6867*	1.9857*
Education Level											
Some College	-0.5060	-1.2282*	-1.4225*	-0.2447	-0.4599	-0.4379	-0.7778	-0.3129	-0.9762	-0.7566	-0.6020
4-year College	0.8515	0.0295	-0.2785	-1.0878*	0.6350	0.1236	0.1952	0.2002	-1.0121	-0.4355	0.2070
Graduate Degree	-0.3043	-0.9761	0.1635	-0.3713	1.8489*	0.3390	0.9102	0.5337	-1.2008	1.3400	0.4762
Co-op Classification											
Grain	-2.4832	-4.3200**	-3.1291	0.1355	0.1010	-2.3198	-0.0570	-2.9123*	-0.8545	-2.7963*	-1.4227
Farm Supply	-2.2941	-3.3214*	-3.0321	1.1405	0.1178	-1.3772	0.3445	-4.2314**	-0.3453	-3.0409*	-1.2978
Mix	-2.8710*	-4.2571**	-3.0561	0.1767	-0.1505	-2.1132	0.0084	-2.8123*	-0.7705	-2.9806*	-0.9723
Sales Category											
$15-$150 MM	1.9663*	2.0504*	1.6075*	1.6543*	0.9486	2.6127**	0.9859	-0.3905	0.0453	0.9480	1.9678*
$150-$500 MM	2.9308**	2.7306**	2.0895*	2.4701**	1.4946	2.6680**	0.5635	-0.1117	-0.0351	0.5968	1.3912
>$500 MM	2.8858**	3.3679***	1.3372	2.0779*	1.7457	2.3006*	1.6885	0.3010	-0.0409	1.0403	1.3245
Number of Grain Storage Locations											
2-5	-1.1746	-0.5682	-1.3540	-0.1794	-1.0656	-0.2169	-2.2810**	0.3987	1.1971	0.0906	-0.3309
6-11	-1.8016*	-0.3315	-0.9983	-1.3103	-1.9795*	-0.3185	-2.4269**	0.3951	-0.0300	-1.4429	-0.3588
12+	-1.4828	-0.8273	-0.7068	-1.3330	-1.3531	0.1010	-2.2701**	0.5568	1.1058	-0.3086	0.2963
Fit Statistics											
Somers' D	0.514	0.552	0.596	0.417	0.499	0.480	0.452	0.518	0.398	0.591	0.454
Kendall's Tau-a	0.317	0.323	0.330	0.241	0.283	0.278	0.255	0.329	0.196	0.319	0.268
n	102	101	102	102	102	102	102	102	102	102	102
AIC	225.94	206.47	198.20	228.75	209.03	219.09	204.96	233.55	201.99	203.61	230.57
Likelihood Ratio P-Value	0.0115**	0.0091***	0.0082***	0.3525	0.0637*	0.0468*	0.1011*	0.0140**	0.7063	0.0066***	0.1637
Percent Concordant	75.6%	77.4%	79.6%	70.6%	74.8%	73.9%	72.5%	75.7%	69.4%	79.3%	72.3%
Log Likelihood Function Value	-92.97	-83.24	-79.10	-94.37	-84.52	-89.54	-82.48	-96.77	-80.99	-81.81	-95.28

*P-Value<0.1, **P-Value<0.05, ***P-Value<0.01
Dependent variable has 5 levels: 1 = No Skill Level, 2 = Basic, 3 = Intermediate, 4 = Skilled, 5 = Expert

Looking at the director ordered logit model results, it is interesting to see that age is only significant for Asking Critical and Constructive Questions. As one gets older, perhaps they become wiser and better understand the overarching structure of the world and general businesses. Therefore, asking critical and constructive questions may become easier for the older director.

The number of years as a director was significant for Cooperative Finance and Networking. As one works on the board team, their cooperative finance understanding and networking skills likely increases. Perhaps the experience of being a director gives them the opportunity to fine-tune these skills.

The average yearly hours of director training were significant for different skills at varying levels. Having more than 40 years, on average, of training per year significantly increased the skill level in Cooperative Governance and Asking Critical and Constructive Questions. As the average yearly hours of training increased, the skill levels for Time Management, Understanding Current Economic and Industry Conditions, Strategic Planning, Networking, and Leadership also increased. Surprisingly, the opposite can be said about Communication and Teamwork skills.

If the respondent has obtained a graduate degree, their skill level for Understanding Current Economic and Industry Conditions has increased. Graduate school classes have likely taught the individual how to assess economic conditions. It's interesting to see that if the respondent had at least a 4-year college degree, their time management skill level

has likely decreased. It is assumed that college life and experiences helps teach time management skills.

Cooperative classification is significant for Cooperative Governance, Networking, and Teamwork. Primarily farm supply cooperatives rate themselves higher than other types of cooperatives in Cooperative Governance. Perhaps this is because farm supply cooperatives are simpler to govern and manage than primarily grain cooperatives which may be more complex. On the other hand, primarily grain cooperatives rate themselves higher than other types of cooperatives in Networking and Teamwork. Perhaps this is because grain cooperatives manage several grain storage locations, requiring a higher level of communication and transparency.

As the annual sales of the cooperative increases, the skill level in Cooperative Finance and Cooperative Governance also increases. This can be explained from the fact that larger cooperatives likely have more in-depth discussions about financial statements and governance processes. It appears that as the annual sales of the cooperative increases, the skill level in Communication, Time Management, and Asking Critical and Constructive Questions increases, but only to an extent. Once the cooperative enters into the largest sales category, the skill level for those three skills decreases. Perhaps this is because the size of the cooperative becomes too large and the size becomes detrimental to the communication and teamwork channels within the board.

Directors coming from cooperatives with 6-11 grain storage locations significantly rate themselves lower than other cooperatives in Cooperative Finance and Understanding Current Economic and Industry Conditions. For Strategic Planning, directors from 0-1 grain location cooperatives significantly rate themselves higher than larger cooperatives. Perhaps this is because they have a smaller footprint that is easier to manage when considering their future outlook.

As shown in Table 3.12, the CEOs/GMs ordered logit results are similar to the previously discussed director results.

Table 3.12 Ordered Logit Results – CEO/GM Skills Assessment Using Current Skill Level

Coefficient	Cooperative Finance	Cooperative Governance	Comm.	Time Mmgt	Economic Conditions	Ask Questions	Strategic Planning	Networking	Listening	Teamwork	Leadership
Age	0.0168	-0.0458	-0.0083	0.0038	-0.0250	0.0394	-0.0311	0.0060	0.0251	-0.0121	0.0252
Yrs as GM	0.0155	0.0530*	0.0708**	0.0784**	0.0476	0.0089	0.0485	0.0266	00582*	0.0207	0.0551*
Education Level											
Some College	0.5465	-0.6647	1.4863	0.7004	0.0505	0.3959	-0.6020	1.4505	1.1005	-1.0540	0.7534
4-year College	-1.3199	-1.3596	0.7298	0.2946	-0.5801	0.3925	-1.8151*	0.7332	0.8659	-0.6703	-0.4178
Graduate Degree	-0.4294	0.1368	1.3955	1.1393	0.4390	1.8012	-0.2754	2.2646*	1.7606	0.4827	0.8602
Co-op Classification											
Grain	-0.3145	-0.1923	0.5178	0.4637	0.8905	0.9127	1.3366	1.2536	1.1758	1.7305	-0.3437
Farm Supply	-1.4603	0.8174	-0.1056	0.8026	0.7895	2.3670*	2.0341*	0.5803	1.6762	2.1587*	-0.2743
Mix	-0.8668	-1.1301	-0.2184	1.2369	0.5747	1.1238	0.4565	0.4633	1.0677	0.5053	-0.7352
Sales Category											
$15-$150 MM	-0.3585	0.0112	-0.2496	-1.2510*	-0.2920	-1.0941	0.8912	-0.6312	1.0359	0.6893	0.0160
$150-$500 MM	-1.9163*	-0.6704	-0.5634	-0.8069	-0.3911	-1.2241	-0.0067	-0.2945	-0.6762	0.5710	-1.3625
>$500 MM	-0.0392	1.3115	-1.2909	-2.1960**	-0.0138	-1.5745	1.0349	0.0691	1.5939	1.3460	0.2263
Number of Grain Storage Locations											
2-5	2.3069***	1.8792***	0.6593	2.7655***	0.9836	2.1012***	3.0624***	0.8568	1.1874*	1.3128*	0.2632
6-11	2.0166**	2.2852***	1.2310	2.0671**	1.1412	2.1800**	3.1926***	0.4771	1.5830*	1.2720*	1.2414
12+	2.5796***	2.3909***	1.5958*	2.5999***	1.1490	2.4506***	3.6895***	0.3086	2.0448**	1.6325*	1.4112*
Fit Statistics											
Somers' D	0.521	0.460	0.483	0.547	0.362	0.505	0.520	0.406	0.564	0.404	0.495
Kendall's Tau-a	0.361	0.317	0.328	0.388	0.244	0.340	0.386	0.292	0.363	0.277	0.336
n	65	65	64	65	65	65	65	64	65	65	65
AIC	176.75	180.83	172.62	172.38	185.07	169.41	187.90	195.39	156.31	179.16	163.18
Likelihood Ratio P-Value	0.0223**	0.0862*	0.1357	0.0052***	0.7530	0.1435	0.0030***	0.3879	0.0289**	0.3925	0.1243
Percent Concordant	75.9%	72.6%	73.8%	77.3%	67.5%	75.2%	76.0%	70.1%	78.2%	69.9%	74.6%
Log Likelihood Function Value	-70.37	-72.42	-68.31	-68.19	-74.53	-67.71	-75.95	-79.69	-61.16	-72.58	-64.59

*P-Value<0.1, **P-Value<0.05, ***P-Value<0.01

Dependent variable has 5 levels: 1 = No Skill Level, 2 = Basic, 3 = Intermediate, 4 = Skilled, 5 = Expert

The age of the CEO is not statistically significant for any of the skills. Perhaps this suggests that regardless of the CEO's age, they evaluate their board of directors similarly. The number of years as a CEO/GM was significant, however, for Cooperative Governance, Communication, Time Management, Listening, and Leadership. As the number of years of experience increases for the CEO, the skill level rating of their average current director also increases for the listed skills.

A CEO with at least a graduate degree will rate their average current director's skill level for Networking higher than other CEO's with different educational levels. CEO's with a 4-year college degree will rate their average current director lower in Strategic Planning than all other CEOs. Perhaps this is because a CEO with a college degree has a better understanding of what it takes to properly conduct a strategic plan and can therefore more accurately rate their average current director's skill level in this area.

Primarily farm supply cooperatives rate their average current director higher in Asking Critical Questions, Strategic Planning, and Teamwork than other cooperatives. This is different from the director results explained above. CEOs of farm supply cooperatives may believe that their target market customers are very unique and diverse which requires their cooperative to better understand the inter-workings of the cooperative and better plan for the future.

Cooperatives in the $150-$500 million in total annual sales category rate their average current director lower in skill level for Cooperative Finance than all other cooperatives.

Since these cooperatives are some of the largest cooperatives, they may see understanding cooperative finance as a very important skill to possess. Therefore, they may be more pessimistic of the current skill level in their directors. As the cooperative's total annual sales increases, the skill level assigned in Time Management to the average current director by the CEO decreases. Time management skills may be lacking from directors as the cooperative becomes larger and more complex.

Finally, the number of grain storage locations does affect the skill level assigned for several skills. As the number of grain storage locations increases, the skill level assigned also increases for Cooperative Finance, Cooperative Governance, Communication, Time Management, Asking Critical and Constructive Questions, Strategic Planning, Listening, Teamwork, and Leadership. The more complex the cooperative, the more value the CEO sees in the director obtaining these skills. Therefore, the skill level assigned to the average current director may be higher than other sizes of cooperatives given the nature and requirements of the larger cooperatives.

3.6.3 Best/Worst Scaling

The best/worst scaling portion of the survey allows for a determination of which skills are most important for a farmer director to be engaged and knowledgeable. In the Best/Worst portion of the survey, the participant is asked to choose the most important skill and the least important skill out of a list of five total skills. If the skill was picked as the most important in that set of five skills, the skill was given a value of '1'. If the skill was

picked as the least important in that set of five skills, the skill was given a value of '-1'. All other skills in that set of five skills were given a '0'.

Each skill appeared a total of five times in the 11 questions. Adding the skills total based on its given value (a '0', '-1', or '1') and diving by the total number of respondents, gives us the average score for the skill. Possible scores range from a '-5' to '5'. A '-5' indicates the skill was picked as the least important skill each time it appeared in the 11 choice sets. A '5' indicates the skill was picked as the most important skill each time it appeared in the 11 choice sets.

Table 3.13 reports the average scores for director respondents, CEO/GM respondents, and all respondents combined.

Table 3.13 Average Scores for Best/Worst

Skill	Directors	CEOs/GMs	Combined
Cooperative Finance	0.92	0.55	0.81
Cooperative Governance & Policy	-0.36	-0.14	-0.29
Communication	0.82	0.42	0.60
Time Management	-3.43	-3.62	-3.65
Understand Current Economic & Industry Conditions	1.45	1.45	1.52
Ask Critical & Constructive Questions	1.78	1.57	1.73
Strategic Planning	1.51	3.72	1.58
Networking	-2.52	-2.75	-2.72
Listening	0.23	-0.08	0.09
Teamwork	0.10	-0.09	0.00
Leadership	0.09	0.89	0.33

Directors and CEOs agree that Time Management is least important with an average score of -3.43 and -3.62, respectively. There is a slight disagreement between the two

groups in what is the most important skill. Directors felt that Ask Critical and Construction Questions with an average score of 1.78 was most important, while CEOs/GMs chose Strategic Planning as the most important skill with an average score of 3.72. The top three most important skills for both groups are Strategic Planning, Ask Critical and Constructive Questions, and Understand Current Economic and Industry Conditions. It is interesting to see that Listening and Teamwork have positive average scores for Directors and negative average scores for CEOs/GMs. Perhaps this means that the random groupings of the five skills per choice set might play a role. Or, perhaps directors simply believe that Listening and Teamwork are more important than other skills in the list of 11, while CEOs/GMs do not.

A conditional logit was used on the Best/Worst survey results as well. Recall, this model allows us predict the probability of two skills being the most and least important. We are then able to compute the skill's importance share relative to the other 11 skills (see equation 4). Table 3.14 below shows the importance shares for each skill using results from all respondents.

Table 3.14 Conditional Logit Results and Importance Shares

Skill	Importance Share
Ask Critical & Constructive Questions	18.50%
Strategic Planning	15.78%
Understanding Current Economic & Industry Conditions	14.22%
Cooperative Finance	11.20%
Communication	10.68%
Leadership	7.85%
Listening	7.26%
Teamwork	6.50%
Cooperative Governance & Policy	5.78%

Networking	1.33%
Time Management	0.92%

N = 161
Number of observations (n) = 1,771
Number of cases = 35,420
Number of iterations = 5
All are P-value<0.01

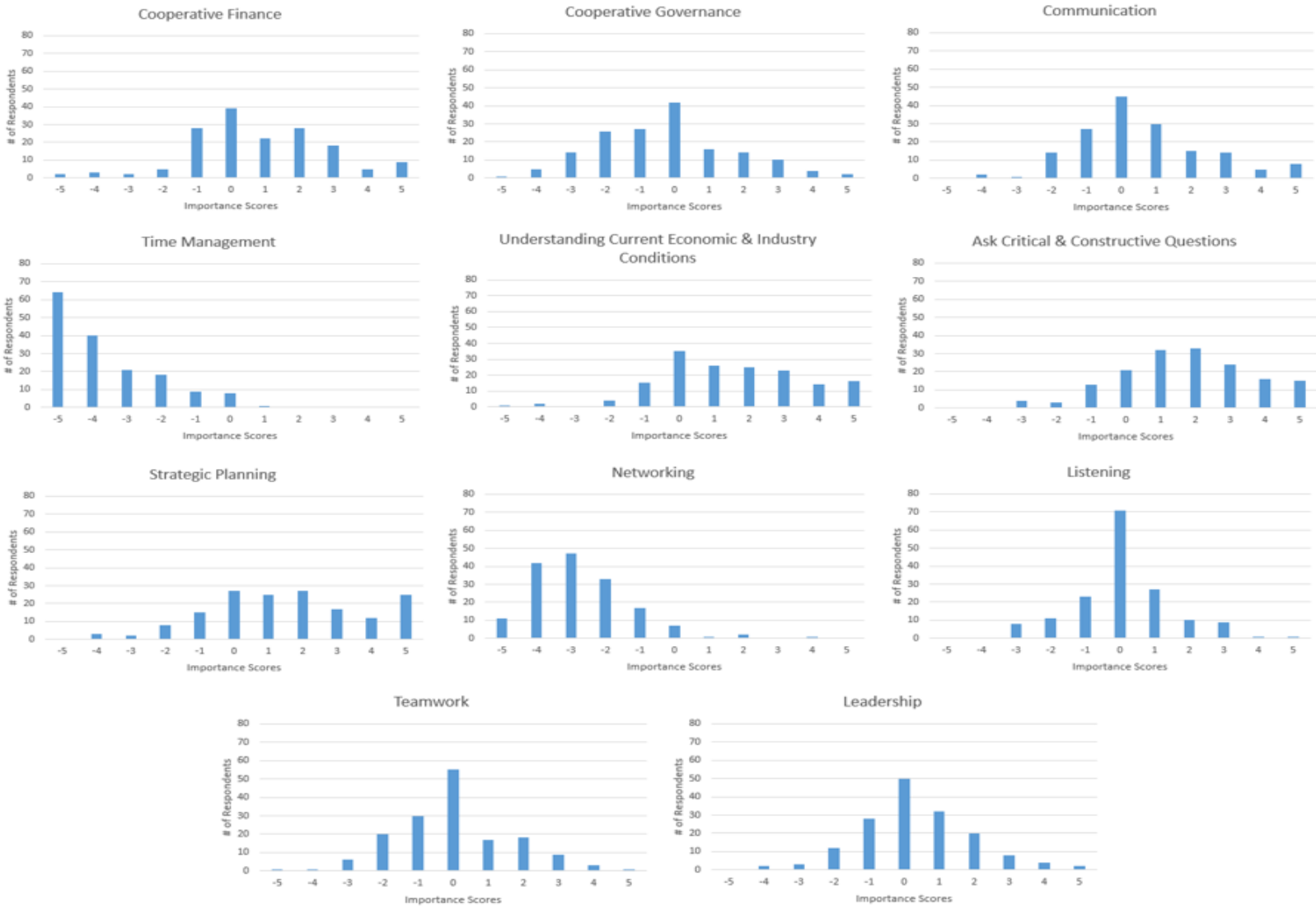
The values in the above table are listed as percentages for easier viewing. Asking Critical and Constructive Questions is of highest importance while Time Management is of lowest importance relative to the other skills. The top five skills listed are chunked together looking at their importance shares while there is a noticeable break in importance share percentage between the top five skills and the lower six skills. In the personal interviews and focus groups portion of the research study, the researchers heard Time Management come up quite often in discussions as being an important skill. However, Asking Critical and Constructive questions is shown here as being roughly twenty times more important.

We can also compare this list to current trainings being conducted for new and current directors in the region. For example, Cooperative Finance is a common skill taught in director training programs across the U.S. According to the results above, Cooperative Finance is still seen as an important skill for directors to possess. However, it is fourth most important and Asking Critical and Constructive Questions is roughly 1.5 times more important that Cooperative Finance. Perhaps this means that the current director training is doing a great job of preparing directors for their role in understanding and managing cooperative finances. However, other skills need to be added to the training classes to help make directors well-rounded in their skill set.

One of the more challenging conclusions from this study is around Asking Critical and Constructive Questions. It is interesting to see this skill at the top of the list. How can we teach and train directors to ask critical and constructive questions? Is this something that would require a minimum level of education? What base knowledge do they need in order for them to know what kinds of questions to ask? Perhaps this is an area of further research to really help fine-tune potential training opportunities in this skill area.

Figure 3.6 shows the histograms reporting the frequency of each skill being always selected as least important (-5) to always being selected as most important (5) across respondents.

Figure 3.6 Skill Importance Share Frequencies



As shown above, the skills skewed to the left are the least important while those skewed to the right are the most important. It is easy to see that Time Management was chosen as the least important skill by about half of the respondents each time it appeared in the 11 choice sets. Strategic Planning has the highest amount of respondents selecting it as the most important skill each time it appeared in the 11 choice sets. Therefore, the conditional logit results indicated it was one of the most important skills overall.

The skills that have a high amount of respondents not selecting it as the most important or least important skill in the choice set questions have more of a bell shape to their frequency graph. These skills include Cooperative Governance, Communication, Listening, Teamwork, and Leadership. Therefore, these skills appear in the middle portion of the importance shares table above. Some of the respondents selected them as least or most important but the majority didn't choose the skill for either designation.

Since some of the demographics were significant in affecting the skill level scores, those same demographics were highlighted in seeing how they affect the best/worst importance shares. To see these effects, conditional logit models were ran using separate demographics. First, we observed the effects of being a director versus being a CEO/GM, seen in Table 3.15 below.

Table 3.15 Director vs CEO/GM Rankings and Importance Shares

Skill	All Respondents	CEOs	Directors
Ask Critical & Constructive Questions	1 (18.5%)	2 (17.0%)	1 (19.5%)

Strategic Planning	2 (15.8%)	1 (17.1%)	2 (14.8%)
Understanding Current Economic & Industry Conditions	3 (14.2%)	3 (14.4%)	3 (14.1%)
Cooperative Finance	4 (11.2%)	6 (9.5%)	4 (12.4%)
Communication	5 (10.7%)	5 (9.6%)	5 (11.4%)
Leadership	6 (7.9%)	4 (10.7%)	8 (6.3%)
Listening	7 (7.3%)	7 (6.7%)	6 (7.6%)
Teamwork	8 (6.5%)	9 (6.2%)	7 (6.6%)
Cooperative Governance & Policy	9 (5.8%)	8 (6.5%)	9 (5.3%)
Networking	10 (1.3%)	10 (1.4%)	10 (1.3%)
Time Management	11 (0.9%)	11 (1.0%)	11 (0.9%)
Number of Observations (n)	1,771	693	1,078

All are P-value<0.05
Importance Shares listed in parentheses

We found that the importance shares were roughly the same when running regressions by respondent's position. The order of which shares were most important did vary, though. The top three skills were the same between both groups: Ask Critical and Constructive Questions, Strategic Planning, and Understanding Current Economic and Industry Conditions.

The number of grain storage locations greatly affected some of the importance share results, which are seen in Table 3.16.

Table 3.16 Grain Storage Location Categories Rankings and Importance Shares

Skill	All Respondents	<12 Grain Storage Locations	12+ Grain Storage Locations
Ask Critical & Constructive Questions	1 (18.5%)	2 (16.1%)	1 (22.2%)
Strategic Planning	2 (15.8%)	3 (14.9%)	2 (17.0%)
Understanding Current Economic & Industry Conditions	3 (14.2%)	1 (16.3%)	3 (11.5%)
Cooperative Finance	4 (11.2%)	4 (11.6%)	5 (10.6%)
Communication	5 (10.7%)	5 (10.2%)	4 (11.2%)
Leadership	6 (7.9%)	6 (7.7%)	6 (8.0%)
Listening	7 (7.3%)	7 (7.4%)	7 (6.9%)
Teamwork	8 (6.5%)	9 (6.6%)	8 (6.2%)
Cooperative Governance & Policy	9 (5.8%)	8 (6.6%)	9 (4.6%)
Networking	10 (1.3%)	10 (1.5%)	10 (1.1%)
Time Management	11 (0.9%)	11 (1.0%)	11 (0.8%)
Number of Observations (n)	1,771	1,023	748

All are P-value<0.05
Importance Shares listed in parentheses

The order of importance didn't change too much between the number of grain storage locations. The top 3 skills remained at Ask Critical and Constructive Questions, Strategic Planning, and Understanding Current Economic and Industry Conditions.

The largest difference in important shares existed among the top 3 skills between cooperatives with less than 12 grain storage locations and cooperatives with 12 or more grain storage locations. For example, all respondents showed an importance share of 18.5% for Asking Critical and Constructive Questions. However, cooperatives with less than 12 grain storage locations had an importance share of 16.1% for that same skill while cooperatives with 12 or more grain storage locations gave an importance share of 22.2%. This indicates that cooperatives with more grain storage locations tended to place more importance on a director's ability to ask critical and constructive questions than those cooperatives with less than 12 grain storage locations. The same can be said for Strategic Planning. However, cooperatives with less than 12 grain storage locations had a higher importance share for Understanding Current Economic and Industry Conditions than cooperatives with 12 or more grain storage locations. These values suggest that the complexity of the cooperative matters with how important certain skills are over other skills.

Another form of cooperative complexity that can be observed is annual sales categories as seen in Table 3.17.

Table 3.17 Total Annual Sales Categories Rankings and Importance Shares

Skill	All Respondents	<$15 MM Sales	$15-$150 MM Sales	$150-$500 MM Sales	>$500 MM Sales
Ask Critical & Constructive Questions	1 (18.5%)	2 (15.6%)	2 (15.9%)	1 (21.5%)	1 (21.1%)
Strategic Planning	2 (15.8%)	5 (9.9%)	1 (18.1%)	3 (13.3%)	2 (15.7%)

Understanding Current Economic & Industry Conditions	3 (14.2%)	1 (19.5%)	3 (15.5%)	2 (14.5%)	5 (10.6%)
Cooperative Finance	4 (11.2%)	4 (12.5%)	4 (10.4%)	4 (11.7%)	4 (11.8%)
Communication	5 (10.7%)	3 (13.4%)	6 (8.8%)	5 (10.7%)	3 (12.9%)
Leadership	6 (7.9%)	8 (5.6%)	5 (9.2%)	7 (6.7%)	7 (7.4%)
Listening	7 (7.3%)	6 (9.6%)	9 (6.3%)	6 (7.8%)	6 (7.7%)
Teamwork	8 (6.5%)	9 (5.0%)	7 (6.8%)	8 (6.3%)	8 (6.2%)
Cooperative Governance & Policy	9 (5.8%)	7 (7.1%)	8 (6.6%)	9 (5.3%)	9 (4.7%)
Networking	10 (1.3%)	10 (1.1%)*	10 (1.3%)*	10 (1.5%)	10 (1.2%)
Time Management	11 (0.9%)	11 (0.7%)	11 (1.1%)	11 (0.8%)	11 (0.7%)
Number of Observations (n)	1,771	132	748	385	495

All are P-value<0.01, *Not statistically significant
Importance Shares listed in parentheses

We looked at the importance shares of four sales categories: less than $15 million in sales, $15-$150 million, $150-$500 million, and more than $500 million in sales. The largest difference in importance shares between each sales category can be seen for Ask Critical and Constructive Questions, Strategic Planning, Understanding Current Economic and Industry Conditions, Communication, and Leadership. The two larger sales categories placed Ask Critical and Constructive Questions at the top of the importance shares list with a value of roughly five percentage points higher than the two lower sales categories.

Cooperatives with annual sales of $15-$150 million placed Strategic Planning at the top of the importance shares list while cooperatives with less than $15 million in annual sales placed Understanding Current Economic and Industry Conditions at the top of the list. Perhaps this is due to the larger cooperatives being more susceptible to market conditions. Cooperatives with lower annual sales placed more value in Cooperative Finance, Communication, and Listening than other cooperatives.

Just isolating directors, we can look at the effects of age, number of annual training hours, and number of years as a director on skill importance shares. Starting with age affects, shown in Table 3.18, most skills have fairly similar importance shares across age groups.

Table 3.18 Director Age Group Categories Rankings and Importance Shares

Skill	Directors	Age 30-40	Age 41-50	Age 51-60	Age 61+
Ask Critical & Constructive Questions	1 (19.5%)	1 (23.6%)	1 (17.8%)	2 (17.8%)	1 (18.9%)
Strategic Planning	2 (14.8%)	2 (20.8%)	5 (10.0%)	1 (18.6%)	3 (13.1%)
Understanding Current Economic & Industry Conditions	3 (14.1%)	3 (11.9%)	3 (15.7%)	4 (14.5%)	2 (13.7%)
Cooperative Finance	4 (12.4%)	5 (9.9%)	2 (15.9%)	3 (15.5%)	6 (9.8%)
Communication	5 (11.4%)	4 (10.0%)	4 (12.7%)	5 (9.6%)	4 (11.9%)
Leadership	8 (6.3%)	6 (5.9%)	7 (7.0%)	8 (4.9%)	8 (6.4%)
Listening	6 (7.6%)	7 (5.6%)	8 (5.9%)	6 (6.9%)	5 (10.8%)

Teamwork	7 (6.6%)	8 (5.5%)	9 (5.1%)	7 (6.6%)	7 (8.2%)
Cooperative Governance & Policy	9 (5.3%)	9 (4.2%)	6 (8.5%)	9 (4.3%)	9 (4.5%)
Networking	10 (1.3%)	11 (1.3%)*	10 (0.8%)*	10 (0.8%)*	10 (1.8%)
Time Management	11 (0.9%)	10 (1.3%)	11 (0.6%)	11 (0.6%)	11 (0.8%)
Number of Observations (n)	1,078	231	264	231	352

All are P-value<0.01, *Not statistically significant
Importance Shares listed in parentheses

The largest difference is seen with Strategic Planning where directors in the 30-40 age group assigned an importance share that is roughly three percentage points higher, on average, than any other age group. Perhaps this is because they see strategic planning as a way to look towards the future and how they want their cooperative to be used in the future while older directors are more focused on the current use of the cooperative.

The results from training hours categories can be seen in Table 3.19 below.

Table 3.19 Director Training Hours Categories Rankings and Importance Shares

Skill	**Directors**	**<5 Hours**	**5-20 Hours**	**20+ Hours**
Ask Critical & Constructive Questions	1 (19.5%)	1 (24.7%)	1 (19.0%)	2 (16.7%)
Strategic Planning	2 (14.8%)	2 (14.5%)	4 (11.4%)	1 (22.1%)
Understanding Current Economic & Industry Conditions	3 (14.1%)	4 (12.6%)	3 (14.1%)	4 (12.8%)
Cooperative Finance	4 (12.4%)	3 (13.4%)	2 (14.2%)	5 (9.2%)

Communication	5 (11.4%)	5 (9.1%)	5 (10.7%)	3 (15.2%)
Leadership	8 (6.3%)	9 (3.9%)	6 (7.4%)	8 (5.8%)
Listening	6 (7.6%)	6 (8.2%)	7 (7.2%)	6 (7.4%)
Teamwork	7 (6.6%)	8 (5.7%)	8 (7.1%)	7 (6.0%)
Cooperative Governance & Policy	9 (5.3%)	7 (5.9%)	9 (6.1%)	9 (3.7%)
Networking	10 (1.3%)	10 (1.0%)**	10 (1.6%)*	10 (0.7%)*
Time Management	11 (0.9%)	11 (1.0%)	11 (1.1%)	11 (0.3%)
Number of Observations (n)	1,078	198	583	264

All are P-value<0.01, *P-value<0.05, **Not statistically significant
Importance Shares listed in parentheses

When looking at the annual training hours attended, those directors with less than five annual training hours highly valued Asking Critical and Constructive Questions while those with more than 20 training hours highly valued Strategic Planning and Communication. This could be because of current training opportunities for directors. As they attend more and various trainings, they gain skills in asking critical and constructive questions but still feel like they lack skills in strategic planning and communication. Perhaps these should be additional focus areas for future training programs. Those directors that attend several trainings per year have gained key skills according to our list of skills but still feel further training or skills development is needed in other areas.

The final Director analysis looks at the effects of the number of years as a director on the skill importance shares, seen in Table 3.20.

Table 3.20 Director Years of Experience Categories Rankings and Importance Shares

Skill	Directors	<10 Years	10-19 Years	20+ Years
Ask Critical & Constructive Questions	1 (19.5%)	1 (18.9%)	1 (18.8%)	1 (20.8%)
Strategic Planning	2 (14.8%)	2 (17.2%)	2 (17.6%)	5 (8.7%)
Understanding Current Economic & Industry Conditions	3 (14.1%)	4 (12.5%)	3 (14.0%)	2 (18.2%)
Cooperative Finance	4 (12.4%)	3 (13.0%)	5 (9.7%)	3 (14.6%)
Communication	5 (11.4%)	5 (11.2%)	4 (13.3%)	4 (8.8%)
Leadership	8 (6.3%)	7 (6.6%)	8 (4.6%)	7 (7.1%)
Listening	6 (7.6%)	6 (7.0%)	6 (8.4%)	6 (7.5%)
Teamwork	7 (6.6%)	8 (6.0%)	7 (6.8%)	8 (6.7%)
Cooperative Governance & Policy	9 (5.3%)	9 (5.4%)	9 (4.4%)	9 (6.1%)
Networking	10 (1.3%)	10 (1.1%)*	10 (1.6%)	10 (1.1%)
Time Management	11 (0.9%)	11 (1.1%)	11 (0.8%)	11 (0.4%)
Number of Observations (n)	1,078	506	319	242

All are P-value<0.01, *Not statistically significant
Importance Shares listed in parentheses

The categories include directors with less than 10 years of experience, those with 10-19 years, and those with 20 or more years of director experience. Across the three categories, the most important share is Asking Critical and Constructive Questions. There is a large gap in importance shares between directors with less than 20 years of

experience and those with 20 or more years with Strategic Planning. Another gap can be seen in Cooperative Finance where it is fairly important for directors with less than 10 years of experience and for directors with 20 or more years of experience. The importance share drops slightly when looking at directors with 10-19 years of experience.

CEOs/GMs importance shares are now analyzed. Conditional logit models are estimated to look at the effects of age and years of experience in the CEO/GM role on the Best/Worst survey responses. We start with age group categories in Table 3.21.

Table 3.21 CEO/GM Age Group Categories Rankings and Importance Shares

Skill	CEO/GM	Age 30-40	Age 41-50	Age 51-60	Age 61+
Ask Critical & Constructive Questions	2 (17.0%)	1 (20.9%)	1 (17.4%)	3 (13.3%)	1 (17.0%)
Strategic Planning	1 (17.1%)	2 (18.8%)	3 (14.9%)	1 (27.6%)	5 (10.3%)
Understanding Current Economic & Industry Conditions	3 (14.4%)	4 (12.4%)	2 (15.5%)	2 (14.7%)	3 (13.5%)
Cooperative Finance	6 (9.5%)	5 (9.0%)	5 (9.0%)	7 (6.2%)	2 (13.9%)
Communication	5 (9.6%)	3 (13.7%)	8 (6.1%)	5 (8.5%)	4 (11.5%)
Leadership	4 (10.7%)	6 (7.7%)	4 (14.5%)	4 (11.7%)	7 (8.0%)
Listening	7 (6.7%)	7 (6.2%)	6 (7.6%)	8 (5.1%)	9 (6.8%)
Teamwork	9 (6.2%)	9 (3.3%)	9 (5.8%)	6 (7.3%)	8 (7.6%)
Cooperative Governance & Policy	8 (6.5%)	8 (5.7%)	7 (6.5%)	9 (4.7%)	6 (8.2%)

Networking	10 (1.4%)	11 (0.9%)*	10 (1.5%)*	10 (0.6%)*	10 (2.5%)
Time Management	11 (1.0%)	10 (1.4%)	11 (1.2%)	11 (0.5%)	11 (0.7%)
Number of Observations (n)	693	132	187	198	176

All are P-value<0.01, *Not statistically significant
Importance Shares listed in parentheses

Similar to directors, we see some differences across age groups for CEOs/GMs. Ask Critical and Constructive Questions, Strategic Planning, Communication, and Leadership show the biggest changes. For example, the highest importance share associated with Ask Critical and Constructive Questions is 20.9% for those age 30-40. Those in the 41-50 age group assign a 17.4%, those age 51-60 assign a 13.3% and those age 61 and up assign a 17.0%. This could be simply because different age groups value different skills based on their stage of life. However, there could be other underlying reasons that go beyond the scope of this study.

The largest differences between categories can also be seen when looking at the effects of different CEO/GM years of experience on the Best/Worst responses as seen in Table 3.22.

Table 3.22 CEO/GM Years of Experience Categories Rankings and Importance Shares

Skill	**CEOs/GMs**	**<10 Years**	**10-19 Years**	**20-29 Years**	**30+ Years**
Ask Critical & Constructive Questions	2 (17.0%)	2 (17.5%)	2 (16.5%)	1 (15.7%)	1 (15.4%)

Strategic Planning	1 (17.1%)	1 (23.2%)	6 (8.9%)	2 (15.6%)	6 (8.4%)
Understanding Current Economic & Industry Conditions	3 (14.4%)	3 (12.8%)	1 (21.4%)	3 (14.9%)	4 (13.2%)
Cooperative Finance	6 (9.5%)	5 (8.8%)	3 (12.5%)	8 (5.4%)	3 (14.6%)
Communication	5 (9.6%)	6 (8.2%)	7 (7.6%)	5 (11.5%)	2 (14.7%)
Leadership	4 (10.7%)	4 (9.7%)	4 (9.6%)	4 (14.2%)	5 (11.2%)
Listening	7 (6.7%)	8 (6.0%)	5 (9.3%)	6 (8.0%)	9 (5.0%)
Teamwork	9 (6.2%)	9 (5.6%)	9 (5.5%)	7 (6.5%)	7 (7.6%)
Cooperative Governance & Policy	8 (6.5%)	7 (6.3%)	8 (5.9%)	9 (5.4%)	8 (7.6%)
Networking	10 (1.4%)	10 (1.1%)**	10 (1.8%)**	10 (1.5%)**	10 (1.7%)*
Time Management	11 (1.0%)	11 (0.9%)	11 (1.0%)	11 (1.1%)	11 (0.7%)
Number of Observations (n)	693	407	88	99	99

All are P-value<0.01, *P-value<0.05, **Not statistically significant
Importance Shares listed in parentheses

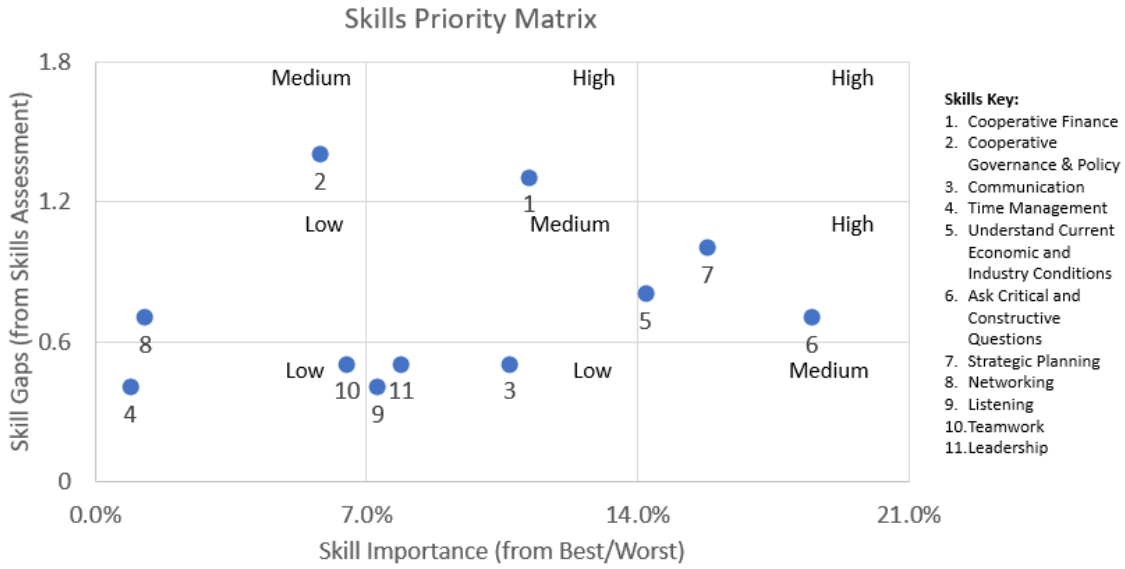
In this case, only three skills show significant changes: Strategic Planning, Understanding Current Economic and Industry Conditions, and Cooperative Finance. This could be attributed to the small sample sizes for the latter three experience categories. Further research could be done utilizing individuals in these categories to better understand if the results can be generalized.

Regardless of categories and segmentations used, the top three skills generally remain the same: Ask Critical and Constructive Questions, Strategic Planning, and Understanding

Current Economic and Industry Conditions. Occasionally, Communication and Cooperative Finance enter into the top three skills.

Utilizing the average results from the Skills Assessment for all respondents, a skills gap can be calculated by taking the Average Current score for each skill minus the Average Before score for each skill. The importance shares for all respondents are used from the Best/Worst results. Combining these two calculations, a skills priority matrix is created similar to Hunger and Wheelen (2011, p. 36). As seen in Figure 3.7 below, the skills can be categorized as highest priority, medium priority, and lowest priority for training purposes. It is important to note that the matrix is created based on the scale being created by the entire sample. Therefore, the placement of each skill is relative to the results of the other skills.

Figure 3.7 Skills Priority Matrix

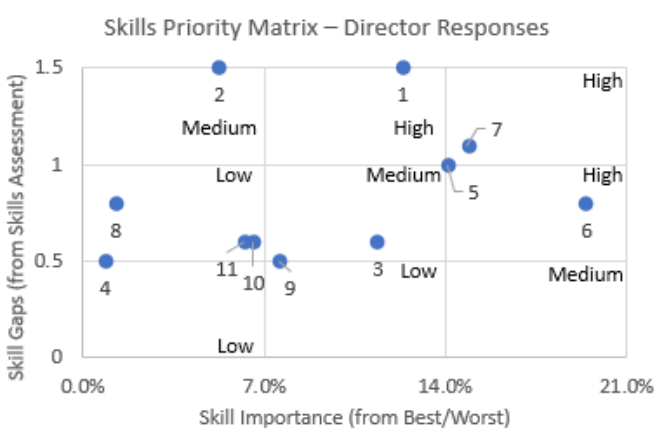


The ‘Low’ grid boxes include skills that had a relatively low skill gap and a relatively low skill importance share. The ‘Medium’ grid boxes include skills that had a high skill gap and low skill importance share, a low skill gap and high skill importance share, or a relatively medium skill gap and a relatively medium skill importance share. Finally, the ‘High’ grid boxes include skills that a relatively high skill gap and a relatively high skill importance share.

The skills of lowest training importance are those in the ‘Low’ grid boxes. These skills include Networking, Time Management, Teamwork, Listening, Leadership, and Communication. The skills of medium training importance are those in the ‘Medium’ grid boxes. This only includes Cooperative Governance and Policy. Finally, the skills of highest training importance are those in the ‘High’ grid boxes. These skills include Cooperative Finance, Understand Current Economic and Industry Conditions, Strategic Planning, and Ask Critical and Constructive Questions.

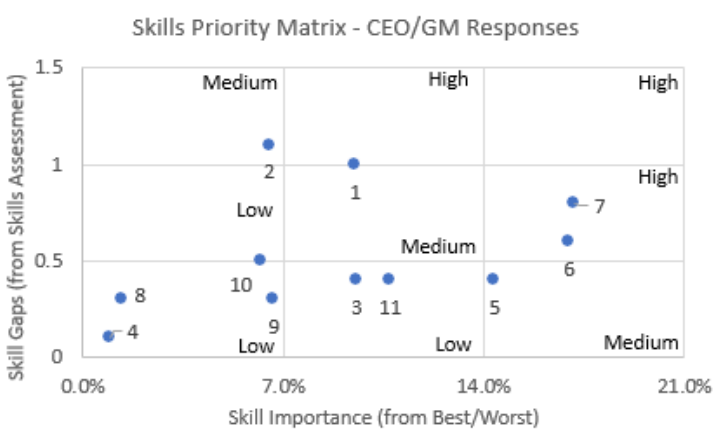
Comparing director responses with CEO/GM responses in Figure 3.8, we see that the two groups differ on skill priorities.

Figure 3.8 Skills Priority Matrix – Director and CEO/GM Responses



Skills Key:

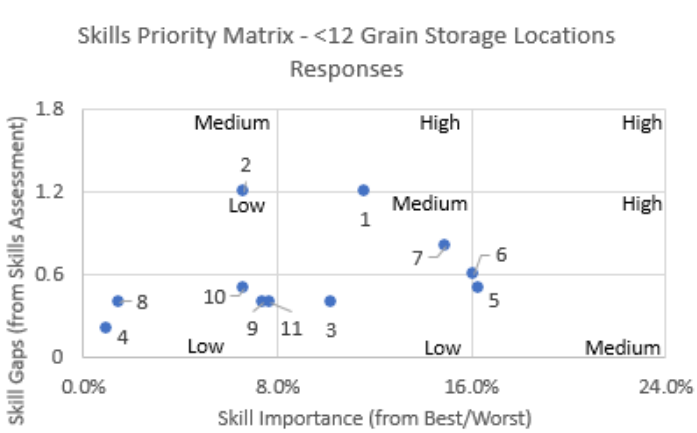
1. Cooperative Finance
2. Cooperative Governance & Policy
3. Communication
4. Time Management
5. Understand Current Economic and Industry Conditions
6. Ask Critical and Constructive Questions
7. Strategic Planning
8. Networking
9. Listening
10. Teamwork
11. Leadership



Directors agree with the entire sample that Cooperative Finance, Understanding Current Economic and Industry Conditions, Asking Critical and Constructive Questions, and Strategic Planning are all of highest priority. CEOs/GMs believe that Cooperative Finance, Asking Critical and Constructive Questions, and Strategic Planning are of highest priority. The majority of the skills are of lowest priority according to directors and CEOs/GMs, making it appear that future training programs should focus on the four skills of highest priority only.

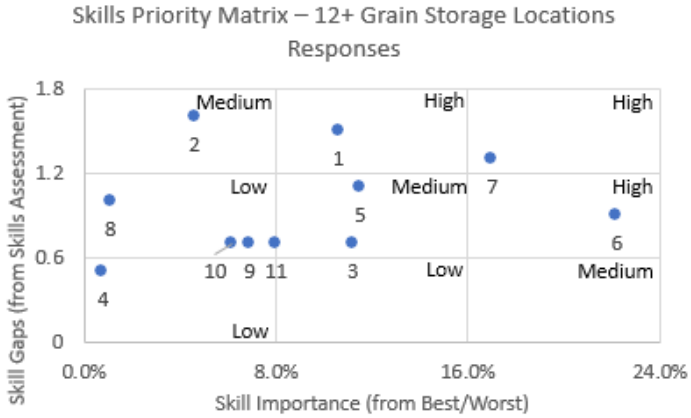
We can further analyze the Skills Assessment and Best/Worst results by segmenting the data into various demographic categories and placing the results into the Skills Priority Matrix. Next, in Figure 3.9, we observe the differences between responses from those representing cooperatives with less than 12 grain storage locations and those with 12 or more grain storage locations.

Figure 3.9 Skills Priority Matrix – Grain Storage Locations Responses



Skills Key:

1. Cooperative Finance
2. Cooperative Governance & Policy
3. Communication
4. Time Management
5. Understand Current Economic and Industry Conditions
6. Ask Critical and Constructive Questions
7. Strategic Planning
8. Networking
9. Listening
10. Teamwork
11. Leadership



Between these two matrices, we can see several differences in where each skill is placed. Those directors and CEOs representing cooperatives with less than 12 grain storage locations indicate that no skill is clearly in a high priority box. However, the argument can be made that they feel the higher priority skills are Cooperative Finance and Asking Critical and Constructive Questions. Meanwhile, directors and CEOs representing cooperatives with 12 or more grain storage locations show a higher priority should be on Cooperative Finance, Strategic Planning, and Asking Critical and Constructive Questions. Given the differences of importance stated by these two types of cooperatives, business complexity could potentially have an effect on what skills a director needs to be engaged and knowledgeable. Future training programs that are designed should keep in mind the different needs of cooperatives that vary across business complexity.

The majority of the skills appear in the low priority boxes for directors and CEOs representing cooperatives with less than 12 grain storage locations. Perhaps these less complex cooperatives place a higher emphasis on these skills as the skills gaps in these boxes are smaller than more complex cooperatives. These skills include Communication, Time Management, Networking, Listening, Teamwork, and Leadership. Some of these skills also appear on the low priority list for cooperatives with more than 12 grain storage locations, though.

It is interesting to observe the difference in the skills assessment results and the skill importance results between the two types of cooperatives. For example, Teamwork is listed in the low priority boxes for both types of cooperatives. However, even though

Teamwork is shown as having a very similar Skill Importance results between the two types of cooperatives, cooperatives with 12 or more grain storage locations indicate a larger gap when it comes to Communication compared to cooperatives with less than 12 grain storage locations. Perhaps this ties back to the business complexity aspect again, where a larger distance between locations puts a bigger emphasis on communication.

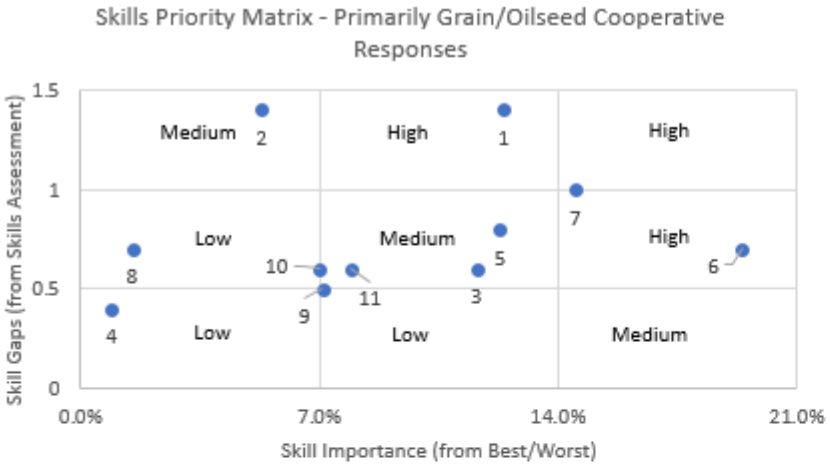
One of the biggest differences in the skills assessment result and the skill importance result can be seen in Understanding Current Economic and Industry Conditions. Those representing cooperatives with less than 12 grain storage locations assign it a higher skill importance but realize a smaller skill gap than those representing cooperatives with 12 or more grain storage locations. Smaller and less complex cooperatives may put a bigger emphasis on understanding economic conditions, leading to a smaller skill gap and higher skill importance share.

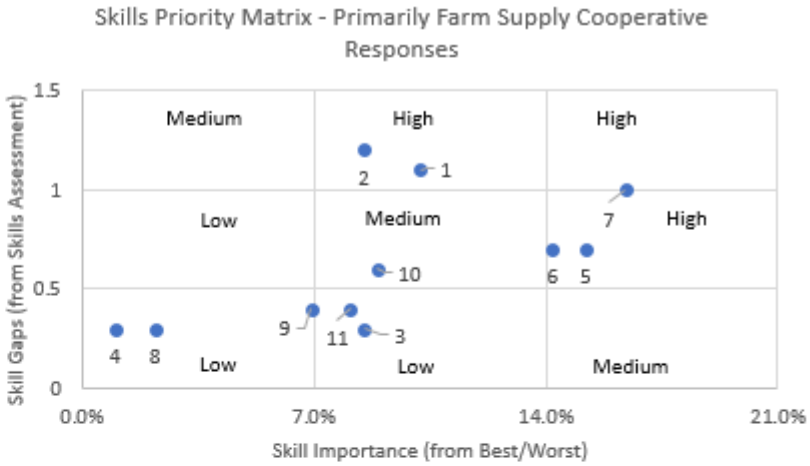
Overall, we can conclude that Cooperative Finance and Asking Critical and Constructive Questions should be of highest priority for training opportunities for all sizes of cooperatives. Strategic Planning might be of higher training priority for more complex cooperatives.

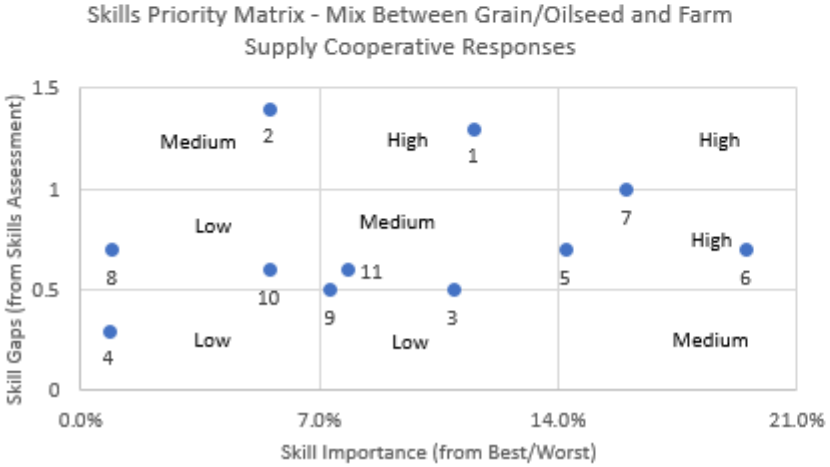
A Skills Priority Matrix can be created based on the cooperative classification. The classifications are broken down based on the primary income source for the cooperative: primarily grain/oilseed, primarily farm supply, and a mix between the two income

sources. The placement of the skills by cooperative classification, shown in Figure 3.10, is fairly consistent.

Figure 3.10 – Skills Priority Matrix – Cooperative Classification Responses







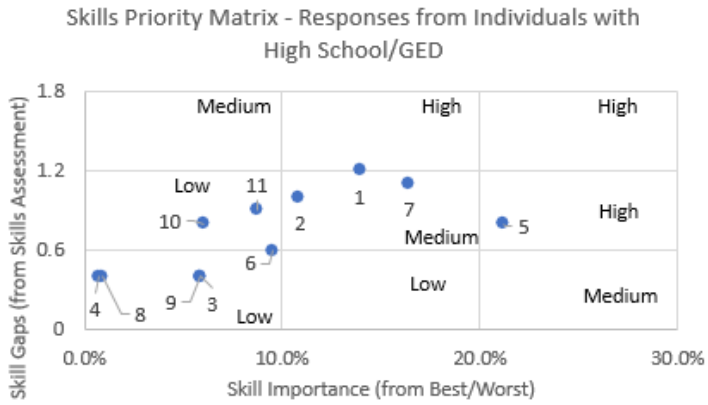
Skills Key:

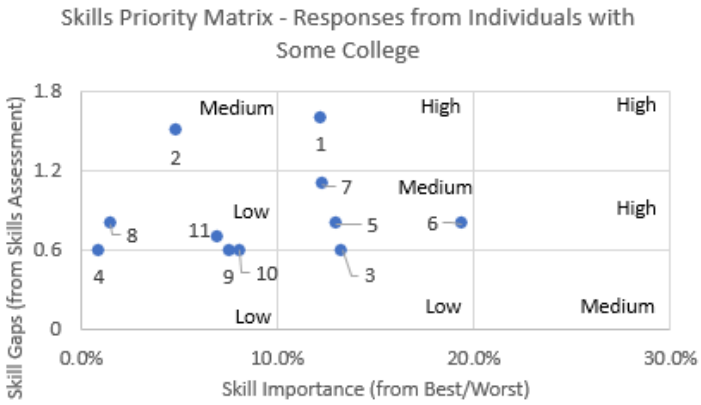
1. Cooperative Finance
2. Cooperative Governance & Policy
3. Communication
4. Time Management
5. Understand Current Economic and Industry Conditions
6. Ask Critical and Constructive Questions
7. Strategic Planning
8. Networking
9. Listening
10. Teamwork
11. Leadership

All three cooperative classifications place high priority on Cooperative Finance, Asking Critical and Constructive Questions, and Strategic Planning. Cooperatives that receive at least two-thirds of their income from farm supply (Primarily Farm Supply Cooperatives) add Cooperative Governance and Policy to the higher priority list. Those cooperatives that are primarily farm supply and those that are a mix between grain/oilseed and farm supply add Understanding Current Economic and Industry Conditions to the higher priority list. Perhaps this is because of the business type and understanding supply chains is important. However, one could also argue that understanding the state of the world and economic fluctuations would be important for grain/oilseed cooperatives as well.

Figure 3.11 shows the skills priority matrix of how individuals with varying levels of education responded to the Skills Assessment and Best/Worst scenarios.

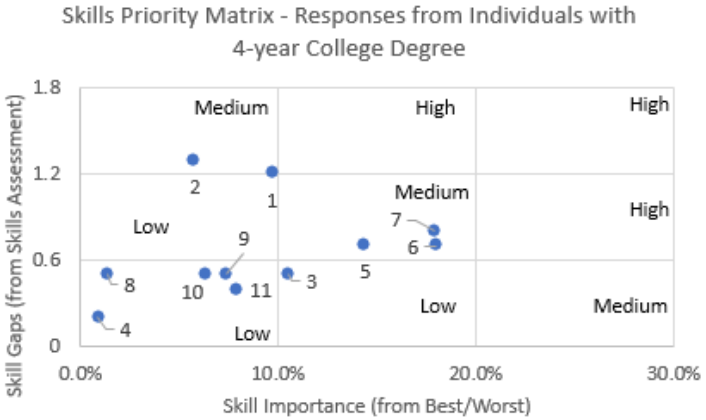
Figure 3.11 Skills Priority Matrix – Responses By Education Categories

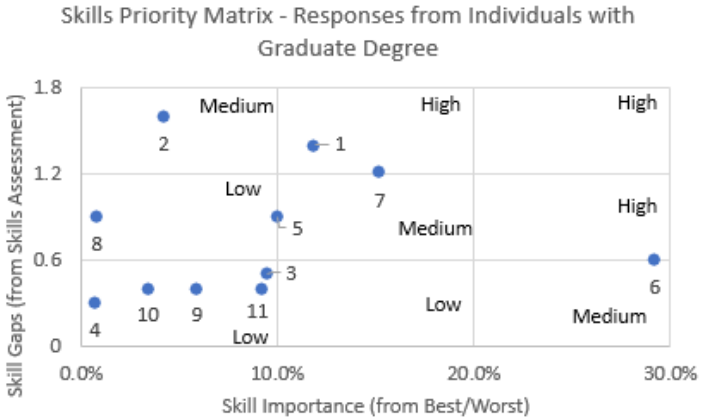




Skills Key:

1. Cooperative Finance
2. Cooperative Governance & Policy
3. Communication
4. Time Management
5. Understand Current Economic and Industry Conditions
6. Ask Critical and Constructive Questions
7. Strategic Planning
8. Networking
9. Listening
10. Teamwork
11. Leadership





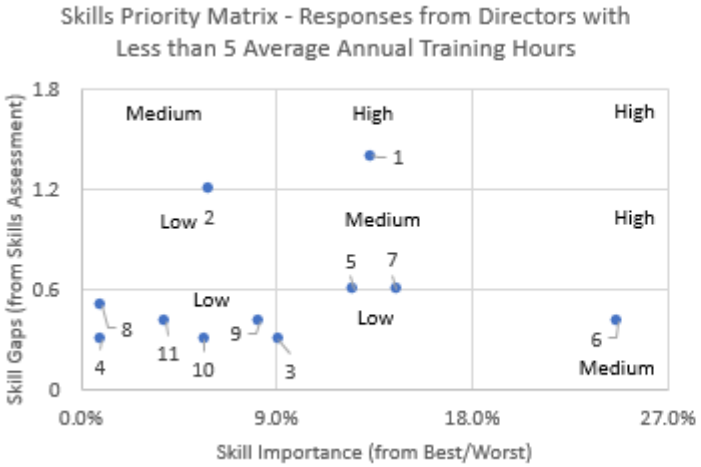
Given the scale was created to be consistent across the matrices in the given demographic group, not many skills are placed in the high priority boxes for those representing the groups with less than a graduate degree. Individuals with a 4-year college degree didn't place any skills in the high priority boxes. Cooperative Finance was placed in the high priority boxes by the remaining three groups: individuals with a high school diploma, individuals with some college, and individuals with a graduate degree. Individuals with a high school diploma added Understanding Current and Economic Industry Conditions to the high priority list while individuals with a graduate degree add Asking Critical and Constructive Questions and Strategic Planning.

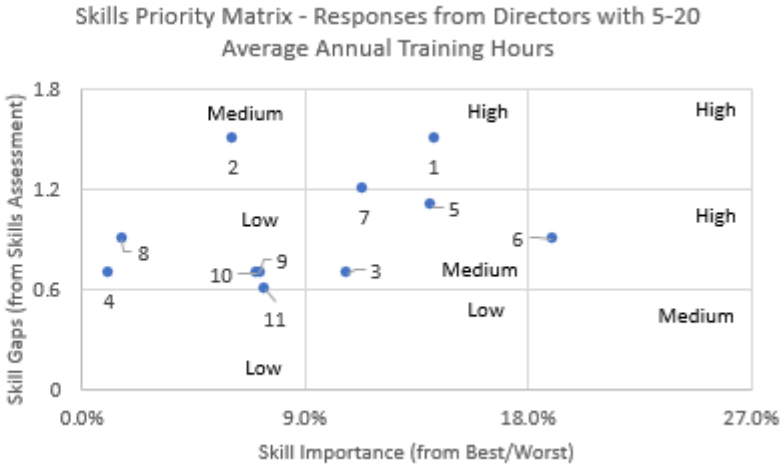
The remaining skills are fairly consistent in their placements across the four education groups. It appears as if the individual's education level may affect their expertise with the given skill as well as how important they feel the skill is for directors to possess. Looking at Cooperative Finance for example, the gap gets larger with more education. This seems slightly contradictory to logic. But, perhaps individuals with a higher level of education critique themselves a little harder when it comes to a skills assessment.

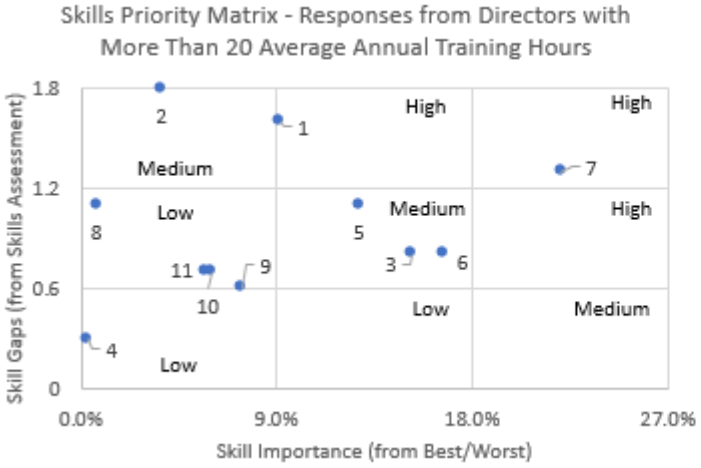
The outlier of sorts for this demographic grouping is Asking Critical and Constructive Questions. Individuals with a graduate degree place a very high importance on this skill compared to the other three education level groups. Their extended schooling and educational experiences may contribute to this assessment. Being exposed to more advanced concepts may have indicated that asking questions is important for any business role.

Finally, the skills priority matrix based on the responses by director training categories can be seen in Figure 3.12.

Figure 3.12 Skills Priority Matrix – Responses By Director Training Categories







Skills Key:

1. Cooperative Finance
2. Cooperative Governance & Policy
3. Communication
4. Time Management
5. Understand Current Economic and Industry Conditions
6. Ask Critical and Constructive Questions
7. Strategic Planning
8. Networking
9. Listening
10. Teamwork
11. Leadership

Similar skills appear as higher priority for training programs when observing the results segmented by director training hours. Cooperative Finance appears for all three training hour segments. Directors with 5-20 average annual training hours add Asking Critical and Constructive Questions and Strategic Planning while directors with more than 20 average annual training hours only adds Strategic Planning.

The placement of Asking Critical and Constructive Questions and Strategic Planning differs significantly between the three training hour segments. Asking Critical and Constructive Questions seems to lose its importance level as the annual training hours increases for directors. Could this be because directors are exposed to other skill deficits they may have as they attend more trainings, therefore pushing Asking Critical and Constructive Questions lower on their importance list? It is interesting to see that the skill gap decreases as training hours increase. Perhaps this is because the skill is highlighted during such training opportunities. Strategic Planning's importance share increases as training hours increase as well. Surprisingly, though, the skill gap also increases as training hours increase.

3.7 Conclusion and Limitations

From the Skills Assessment portion of the survey, we found that directors seem to evaluate themselves at a higher skill level than CEOs/GMs evaluate directors. Most of the skill gaps place the skill in Quadrant 2 of the Skills Assessment Matrix. Quadrant 2 represents skills that suggest training opportunities for new directors. Of interest is

Strategic Planning, which was placed in Quadrant 3. Therefore, this is a training opportunity for both new and current directors. The largest skill gaps were found in Cooperative Governance and Policy and Cooperative Finance. The considered demographics of the respondent and the cooperative they represent weren't always as important in affecting the skill level ratings as expected.

From the Best/Worst Scaling portion of the survey, Asking Critical Questions, Strategic Planning, and Understanding Current Economic and Industry Conditions were consistently in the top three skills with Cooperative Finance and Communication occasionally entering into the top three. Time Management was found as being the least important skill for directors to possess. Using the Skills Priority Matrix, we found that Cooperative Finance, Understanding Current Economic and Industry Conditions, Strategic Planning, and Asking Critical and Constructive Questions are of highest priority, based on their results from both the Skills Assessment and the Best/Worst Scaling.

These results are important for educators and cooperative managers. This will help educators create beneficial training opportunities for new and current directors to help directors focus on improving their skill deficits. It also helps cooperative managers look for certain qualities in directors when filling empty board seats. Managers and the entire board can better evaluate themselves based on the skills found to be important for directors to possess. In-house trainings can then be created to specifically target the board's skill deficits.

One limitation of this approach is the lack of defining the skills used in the survey. There may be differing definitions of the skills by each respondent, thereby affecting the skill level rating and skill importance results. The limited demographic variations may affect the results as well. For example, the small sample size as a whole and the small sample of female participants may skew the results. Ensuring an even distribution among all demographic categories could strengthen the results.

Additionally, the study was conducted primarily in the Midwest. Having participants from across the United States would allow the results to be generalizable across states. Or, perhaps the results from a broader reach would suggest different results based on specific regions, crops, or populations served. Expanding this research across cooperative disciplines and types would be beneficial as well, such as into electric, service, or grocery cooperatives.

Several future research opportunities exist from this research. For example, we found that it is important for directors to be able to ask critical and constructive questions. However, how do we teach and train directors to ask such questions? What base knowledge do they need, if any, of cooperatives in order for them to know what kinds of questions to ask? With the varying results between director respondents and CEO/GM respondents for Strategic Planning, it would be interesting to further research a director's specific role when it comes to strategic planning. Does that particular role change from cooperative to cooperative or by type of cooperative? Perhaps that then changes how Strategic Planning

is evaluated in this study. Additionally, with the rapidly changing economy and industry, this study could easily be replicated in 5-10 years to see if the director role and skills needed have changed.

Chapter 4 - Conclusion and Training Implications

Given boards of directors for firms are directly connected to firm financial performance and that economic and business structures that define a director's role are continually evolving, it is important to study the skills needed for directors to be engaged and knowledgeable. This is especially true for agricultural cooperatives. The purpose of this dissertation was to ascertain the necessary skills for today's farmer cooperative director to successfully lead their cooperative. The objectives were:

1. To identify what skills are necessary to be an engaged and knowledgeable farmer cooperative director.
2. To detect potential skill gaps between new farmer cooperative directors and current directors utilizing the list of necessary skills.
3. To recognize and suggest potential training opportunities for farmer cooperative directors, focused on the necessary skills to close skill gaps between new and experienced directors so they can become engaged and knowledgeable at the beginning of and throughout their tenure as a director.

A two-part approach was taken to address the research objectives. The first step followed a qualitative approach. A personal interview questionnaire was designed that asked open-ended questions about director skills. A set of focus groups and personal interviews were then conducted with current farmer directors as well as current farmer cooperative CEOs and general managers in Kansas. The qualitative piece provided insights into what skills are needed to be an engaged and knowledgeable farmer director.

We found that the responses were consistent among the different types of participants (i.e. CEOs, directors, and stakeholders). The eleven skills identified through the qualitative approach are cooperative finance, cooperative governance and policy, communication, time management, understanding current economic and industry conditions, asking critical and constructive questions, strategic planning, networking, listening, teamwork, and leadership. There is some overlap with our results and the results from other studies that focused more on director skills needed for larger corporation boards (Adams, et al. 2018; Asahak, et al. 2018; Leblanc 2020).

The second part was a quantitative approach utilizing the eleven skills listed above. A survey was sent out to farmer directors and agricultural cooperative CEOs across the Midwest in early 2022. The survey contained three sections: a demographic section, a skills assessment, and best/worst scaling component. The skills assessment allowed us to identify potential skill gaps using the eleven skills between new farmer directors and current directors. The best/worst approach allowed us to identify the most important skills out of the list of eleven.

By observing all survey responses from the skills assessment, we found that most of the skill gaps identified help to point toward training opportunities for new directors. Strategic Planning was identified as a significant training opportunity for both new and current directors. The largest skill gaps were found in Cooperative Governance and Policy and Cooperative Finance.

The best/worst results showed Asking Critical Questions, Strategic Planning, and Understanding Current Economic and Industry Conditions as the top three skills for directors to possess. Occasionally, Cooperative Finance and Communication entered into the top three rankings. Time Management was found to be of least importance.

Combining the identified skill gaps and skill importance, the following skills were identified as being of highest priority: Asking Critical Questions, Strategic Planning, Understanding Current Economic and Industry Conditions, and Cooperative Finance. Therefore, these should be the foremost skills that training programs are designed to improve moving forward. Our study did not analyze the effectiveness of current training topics. Consequently, we can only make suggestions of what focus areas should be included rather than pointing out what content needs to be replaced or removed.

These findings are important because they help identify training needs to develop engaged and knowledgeable directors. Reiter-Palmon, et al. (2006) found that firms with individuals who are willing and able to learn new skills based on their position's needs may have increased firm productivity. Cooperative financial performance is linked to orientation training for new directors and continued director training (Franken & Cook, 2017). Furthermore, director and management education are key for successful strategy implementation and evaluation (Boland, Hogeland, & McKee, 2011).

We recommend that director educators and training program developers evaluate their training materials to ensure they include the 11 skills presented in this research.

Furthermore, if new training programs are being created, make sure these 11 skills are of highest priority to highlight in the training materials. The skills found to be of highest priority – Asking Critical Questions, Strategic Planning, Understanding Current Economic and Industry Conditions, and Cooperative Finance – should be frequently discussed. Additionally, advanced director training programs could be created to exclusively focus on the top four, highest priority skills. These could be treated as continual learning topics of interest.

These results are important for cooperative managers as well. This will help them look for certain qualities in directors when filling empty board seats. Managers and the entire board can better evaluate themselves based on the skills found to be important for directors to possess. In-house trainings can then be created to specifically target the board's skill deficits.

The results highlighted here are just the beginning. We have only just started diving into the conclusions that can be drawn from these data. Furthermore, this line of research is just now being picked back up since it got dropped about a decade ago. Further inferences in regards to training opportunities and other deductions will be made from these data in the near future.

4.1 Limitations

Limitations of the study include the geographic area covered in the data collection process. It would be interesting to expand this research into other states or even countries

to see if the same skills list and gaps can be identified. More diverse respondents may change the results as well. For example, the majority of our respondents were male and there was not an even representation of the varying sizes of agricultural cooperatives that operate in the Midwest. Expanding this research to include various sizes and even types of cooperatives (i.e. agriculture, service, electric, grocery, etc.) would provide additional interesting contributions. Furthermore, our approach could be conducted internationally to identify director skill needs. Given our results and the provided survey questionnaires, we feel international cooperative researchers have a good start to continuing this very important work of identifying the skills necessary for a cooperative director to be engaged and knowledgeable.

Another limitation of this approach is a lack of deeper definition of skills used in the survey. There may be differing definitions of the skills by each respondent, thereby affecting the skill level rating and skill importance results. The limited demographic variations may affect the results as well. For example, the small sample size as a whole and the small sample of female participants may skew the results. Certain demographic categories had small sample sizes, such as older or more experienced directors and older or more experienced CEOs/GMs. Ensuring an even distribution among all demographic categories could strengthen the results.

4.2 Future Research

Several future research opportunities exist from this research. For example, we found that it is important for directors to be able to ask critical and constructive questions. However,

what base knowledge do they need, if any, of cooperatives in order for them to know what kinds of questions to ask? What techniques are most effective when teaching others how to ask critical and constructive questions? Additionally, with the rapidly changing economy and industry, this study could easily be replicated in 5-10 years to see if the director role and skill needs have changed.

We simply used a Likert scale approach in our study. But, perhaps there is a more rigorous approach that could be taken, such as pre- and post-position assessments. When the director is new to the board, they could take a pre-position assessment to determine what they know regarding each of the skills and their content. Midway through their director tenure, they could complete another position assessment to see if their training to date and on-the-job experience has increased their skill levels. Finally, a post-position assessment could be given when they are leaving the board. This would give us insights as to what is most effective in gaining skill expertise (i.e. formal training or on-the-job experiences) as well as what exact skill level the director has when new to the board versus when they leave the board.

With the varying results between director respondents and CEO/GM respondents for Strategic Planning, it would be interesting to further research a director's specific role when it comes to strategic planning. Does that particular role change from cooperative to cooperative or by type of cooperative? Perhaps that then changes how Strategic Planning is evaluated in this study. We could use an already-established definition of Strategic

Planning or use various survey techniques to ask directors and CEOs how they would define a director's role as it relates to strategic planning.

Further data analysis could be done with the data that was collected. Perhaps there is a correlation between cooperative sales and skills needed or between the size of the cooperative and the skills needed. For example, does the importance of understanding current economic and industry conditions vary with co-op type, size, or location? This could be expanded to then look into how available cooperative funds affect trainings offered. One might hypothesize that larger cooperatives have more funds to invest in training.

Another useful study includes evaluating current training programs for new and current directors. What is currently being trained and how does that relate to the list of skills found in this research? For example, if training programs are focusing on Cooperative Finance, are they doing an adequate job and therefore, respondents didn't show a large gap? Or, is the training around such topic not covering all important aspects of cooperative finance in order for directors to feel confident in the subject area? Furthermore, what topics should specifically be covered in trainings in relation to the top priority skills identified? And, how long does it take to close the skill gap based on skill definitions and current trainings? As a result, the next step is bridging the gap between the results of this study and the current training programs being offered.

References

Abbasi, F. K., Ali, A., & Bibi, N. (2018). Analysis of Skill Gap for Business Graduates: Managerial Perspective from Banking Industry. *Education and Training, 60*(4), 354-367. doi:10.1108/ET-08-2017-0120

Adams, R. B., Akyol, A. C., & Verwijmeren, P. (2018). Director Skill Sets. *Journal of Financial Economics, 130*(3), 641-662. doi:10.1016/j.jfineco.2018.04.010

Asahak, S., Albrecht, S. L., De Sanctis, M., & Barnett, N. S. (2018). Boards of Directors: Assessing Their Functioning and Validation of a Multi-dimensional Measure. *Frontiers in Psychology, 9*. doi:10.3389/fpsyg.2018.02425

Baarda, J. R. (2003). *The Circle of Responsibilities for Co-op Boards.* Washington, D.C.: USDA Rural Business-Cooperative Service.

Batsell, R. R., & Louviere, J. J. (1991). Experimental Analysis of Choice. *Marketing Letters, 2*(3), 199-214. doi:10.1007/BF02404072

Biggs, G. W. (1978). *Farmer Cooperative Directors: Characteristics, Attitudes.* Washington, D.C.: Department of Agriculture, Economics, Statistics, and Cooperatives Service.

Boland, M. A., Hogeland, J., & McKee, G. (2011). Current Issues in Strategy for Agricultural Cooperatives. *Choices, 26*(3).

Bond, J. K. (2009). Cooperative Financial Performance and Board of Director Characteristics: A Quantitative Investigation. *Journal of Cooperatives, 22*, 22-44.

Brown, W. A. (2005). Exploring the Association Between Board and Organizational Performance in Nonprofit Organizations. *Nonprofit Management & Leadership, 15*(3), 317-339. doi:10.1002/nml.71

Bruynis, C. L., Goldsmith, P. D., Hahn, D. E., & Taylor, W. J. (2000). Key Success Factors for Emerging Agricultural Marketing Cooperatives. *Journal of Cooperatives, 16*.

Burress, M. J., & Cook, M. L. (2010). Director Development and Board-CEO Relations: Do Recommendations from Corporate Governance Apply to the Agribusiness Cooperative? University of Missouri.

Candemir, A., Duvaleix, S., & Latruffe, L. (2021). Agricultural Cooperatives and Farm Sustainability: A Literature Review. *Journal of Economic Surveys*, 1-27. doi:10.1111/joes.12417

Cavey, B., Earnest, B., Ehmke, T., Fox, R., Halverson, T., Johnston, J., . . . Zuckerberg, K. S. (2021). *The Year Ahead: Forces that will Shape the U.S. Rural Economy in 2022.* CoBank Knowledge Exchange.

Cegielski, C. G., & Jones-Farmer, L. A. (2016). Knowledge, Skills, and Abilities for Entry-Level Business Analytics Positions: A Multi-Method Study. *Decision Sciences Journal of Innovative Education, 14*(1), 91-118. doi:10.1111/dsji.12086

Cetin, G., Demirciftci, T., & Bilgihan, A. (2016). Meeting Revenue Management Challenges: Knowledge, Skills, and Abilities. *International Journal of Hospitality Management, 57*, 132-142. doi:10.1016/j.ijhm.2016.06.008

Chapman, H. E., Holland, D. A., Kenny, S. D., MacPherson, I., Kutz, K. J., Lord, Y., . . . Crowfoot, J. (1986). *The Contemporary Director: A Handbook for Elected Officials of Cooperatives, Credit Unions and Other Organizations.* Saskatoon, Saskatchewan, Canada: Co-operative College of Canada.

Choi, E., Choi, W., Jang, S., & Park, S. (2014). Does the Effectiveness of Board of Directors Affect Firm Performance of Consumer Cooperatives? The Case of ICOOP Korea. *Annals of Public and Cooperative Economics, 85*(3), 371-386. doi:10.1111/apce.12046

Christo-Baker, E. A., Sindone, A., & Roper, C. (2017). Addressing the Skills Gap: A Regional Analysis. *The Journal of Applied Business and Economics, 19*(8), 10-21.

Cobia, D. W. (1989). *Cooperatives in Agriculture.* Englewood Cliffs, NJ: Prentice-Hall.

Cochran, W. G., & Cox, G. M. (1950). *Experimental Designs.* New York: Wiley.

Cook, M. L. (1995). The Future of U.S. Agricultural Cooperatives: A Neo-Institutional Approach. *American Journal of Agricultural Economics, 77*(5), 1153-1159. doi:10.2307/1243338

Dobis, E. A., Krumel, T. P., Cromartie, J., Conley, K. L., Sanders, A., & Ortiz, R. (2021). *Rural America at a Glance: 2021 Edition.* United States Department of Agriculture, Economic Research Service.

Dunn, J. R., Crooks, A. C., Frederick, D. A., Kennedy, T. L., & Wadsworth, J. J. (2002). *Agricultural Cooperatives in the 21st Century.* Washington, DC: USDA Rural Business Cooperative Service.

Easterly, R. G., Warner, A., Myers, B., Lamm, A., & Telg, R. (2017). Skills Students Need in the Real World: Competencies Desired by Agricultural and Natural Resources Industry Leaders. *Journal of Agricultural Education, 58*(4), 225-239. doi:10.5032/jae.2017.04225

Economic Research Service. (2021, October 13). *Commodity Costs and Returns*. (United States Department of Agriculture) Retrieved April 2022, from

https://www.ers.usda.gov/data-products/commodity-costs-and-returns/commodity-costs-and-returns/#Historical%20Costs%20and%20Returns:%20Corn

Economic Research Service. (2022, February 4). *State Fact Sheets*. (United States Department of Agriculture) Retrieved April 2022, from https://www.ers.usda.gov/data-products/state-fact-sheets/

Economic Research Service. (2022, March 24). *U.S. Agricultural Trade at a Glance*. (United States Department of Agriculture) Retrieved April 2022, from https://www.ers.usda.gov/topics/international-markets-u-s-trade/u-s-agricultural-trade/u-s-agricultural-trade-at-a-glance/

Ehmke, T. (2020). U.S. Farm Economy: A Strong 2020 Finish Boosts Potential. *2021, The Year Ahead: Forces that Will Shape the US Rural Economy*.

Erhardt, N. L., Werbel, J. D., & Shrader, C. B. (2003). Board of Director Diversity and Firm Financial Performance. *Corporate Governance: An International Review, 11*(2), 102-111. doi:10.1111/1467-8683.00011

Erickson, B., Fausti, S., Clay, D., & Clay, S. (2018). Knowledge, Skills, and Abilities in the Precision Agriculture Workforce: An Industry Survey. *Natural Sciences Education, 47*(1), 1-11. doi:10.4195/nse2018.04.0010

Eversull, E. E. (2014). Co-op Mergers, Acquisitions 2000-2013. *Rural Cooperatives*.

Finn, A., & Louviere, J. J. (1992). Determining the Appropriate Response to Evidence of Public Concern: The Case of Food Safety. *Journal of Public Policy & Marketing, 11*(2), 12-25. doi:10.1177/074391569201100202

Franken, J. R., & Cook, M. L. (2017). A Descriptive Summary of Cooperative Governance and Performance. *Journal of Cooperatives, 32*, 23-45.

Frederick, D. A. (2012). *Co-ops 101: An Introduction to Cooperatives.* Washington, DC: Rural Development, United States Department of Agriculture.

Fulton, M., & Giannakas, K. (2006). Agency and Leadership in Cooperatives: Endogenizing Organizational Commitment. In K. Karantininis, & J. Nilsson, *Vertical Markets and Cooperative Hierarchies: The Role of Cooperatives in the Agri-Food Industry* (pp. 93-113). Dordrecht: Springer-Verlag. doi:10.1007/1-4020-5543-0

Giri, A. K., Subedi, D., Todd, J. E., Litkowski, C., & Whitt, C. (2021). *Off-Farm Income a Major Component of Total Income for Most Farm Households in 2019.* United States Department of Agriculture, Economic Research Service.

Green, P. E., & Srinivasan, V. (1978). Conjoint Analysis in Consumer Research: Issues and Outlook. *The Journal of Consumer Research, 5*(2), 103-123. doi:10.1086/208721

Green, P. E., & Srinivasan, V. (1990). Conjoint Analysis in Marketing Research: New Developments and Directions. *Journal of Marketing, 54*(4).

Greene, W. H. (2012). *Econometric Analysis* (7th ed.). Upper Saddle River, NJ: Prentice Hall.

Hakelius, K. (2018). Understanding the Board of Swedish Farmer Cooperatives - Cases Focusing on Board Composition and Interaction Patterns. *Journal of Co-operative Organization and Management, 6*(2), 45-52. doi:10.1016/j.jcom.2018.06.001

Halverson, T. (2020). To Our Customers and Business Partners. *2021, The Year Ahead: Forces that Will Shape the US Rural Economy*.

Haskell, J. (2003). Cooperative Education Can Help Renew and Revitalize Co-ops. *Rural Cooperatives, 70*(4).

Herchenbach, J., Briggeman, B., Bergtold, J., Shanoyan, A., Low, S., & Miller, B. (2022). A Qualitative Assessment of Farmer Director Skills in Agricultural Cooperatives. *Working paper*.

Hine, S., Fulton, J. R., & Pritchett, J. (2005). Cooperative Director Training: Changing the Way Extension Programs Are Presented. *Journal of Extension, 43*(3).

Hogeland, J. A. (2006). The Economic Culture of U.S. Agricultural Cooperatives. *Culture & Agriculture, 28*(2), 67-79. doi:10.1525/cag.2006.28.2.67

Huhtala, K., Tuominen, P., & Tuominen, T. (2020). Director Selection in Agricultural Cooperatives: The Process and the Roles in the Finnish Context. *Cogent Business & Management, 7*(1). doi:10.1080/23311975.2020.1746171

Hunger, J. D., & Wheelen, T. L. (2011). *Essentials of Strategic Management* (5th ed.). Upper Saddle River, NJ: Prentice Hall.

Inwood, S. (2017). Agriculture, Health Insurance, Human Capital and Economic Development at the Rural-Urban Interface. *Journal of Rural Studies, 54*, 1-14. doi:10.1016/j.jrurstud.2017.05.009

Jang, H. (2016). Identifying 21st Century STEM Competencies Using Workplace Data. *Journal of Science Education and Technology, 25*(2), 284-301. doi:10.1007/s10956-015-9593-1

Johannesson, P., & Perjons, E. (2014). *An Introduction to Design Science.* Switzerland: Springer International Publishing. doi:10.1007/978-3-319-10632-8

Jones, K., Namin, A., & Armstrong, M. (2018). The Core Cyber-Defense Knowledge, Skills, and Abilities That Cybersecurity Students Should Learn in School: Results from Interviews with Cybersecurity Professionals. *ACM Transactions on Computing Education, 18*(3), 1-12. doi:10.1145/3152893

Kaufman, N. A., & Geroy, G. D. (2007). An Energy Model for Viewing Embodied Human Capital Theory. *Performance Improvement Quarterly, 20*(1), 37-47.

Key, N., Burns, C., & Lyons, G. (2019). *Financial Conditions in the U.S. Agricultural Sector: Historical Comparisons.* United States Department of Agriculture, Economic Research Service.

Kouaib, A., Mhiri, S., & Jarboui, A. (2020). Board of Directors' Effectiveness and Sustainable Performance: The Triple Bottom Line. *Journal of High Technology Management Research, 31*(2). doi:10.1016/j.hitech.2020.100390

Kowalski, D. (2020). The Global Economy: Recovery is Competition. *2021, The Year Ahead: Forces that Will Shape the US Rural Economy*.

Kuhfeld, W. F. (2010). *Marketing Research Methods in SAS: Experimental Design, Choice, Conjoint, and Graphical Techniques* (SAS 9.2 Edition ed.). Cary, NC: SAS Institute Inc.

Leblanc, R. (2020). *The Handbook of Board Governance: A Comprehensive Guide for Public, Private and Not-for-Profit Board Members* (2nd ed.). Hoboken, NJ: Wiley.

Louviere, J. (1988). *Analyzing Decision Making.* Thousand Oaks: SAGE Publications, Inc. doi:10.4135/9781412983365

Louviere, J. J. (1988). Conjoint Analysis Modelling of Stated Preferences: A Review of Theory, Methods, Recent Developments and External Validity. *Journal of Transport Economics and Policy, 22*(1), 93-119.

Louviere, J. J., & Woodworth, G. (1983). Design and Analysis of Simulated Consumer Choice or Allocation Experiments: An Approach Based on Aggregate Data. *Journal of Marketing Research, 20*(4), 350-367. doi:10.1177/002224378302000403

Louviere, J. J., Flynn, T. N., & Marley, A. A. (2015). *Best-Worst Scaling: Theory, Methods, and Applications.* New York, NY: Cambridge University Press.

Louviere, J., & Timmermans, H. (1990). A Review of Recent Advances in Decompositional Preference and Choice Models. *Journal of Economic and Social Geography, 81*(3), 214-224. doi:10.1111/j.1467-9663.1990.tb00772.x

Lusk, J. L., & Briggeman, B. C. (2009). Food Values. *American Journal of Agricultural Economics, 91*(1), 184-196. doi:10.1111/j.1467-8276.2008.01175.x

Marley, A. A., & Louviere, J. J. (2005). Some Probabilistic Models of Best, Worst, and Best-Worst Choices. *Journal of Mathematical Psychology, 49*(6), 464-480. doi:10.1016/j.jmp.2005.05.003

Mason, J. L., Johnston, E., Berndt, S., Segal, K., Lei, M., & Wiest, J. S. (2016). Labor and Skills Gap Analysis of the Biomedical Research Workforce. *The FASEB Journal, 30*(8), 2673-2683. doi:10.1096/fj.201500067R

Mather, J. W. (1990). *Cooperative Benefits and Limitations.* Washington, DC: USDA Rural Business Cooperatives Service.

McKenney, M. J., & Handley, H. A. (2020, December). Using the DSRM to Develop a Skills Gaps Analysis Model. *IEEE Engineering Management Review, 48*(4), 102-119. doi:10.1109/EMR.2020.3011704

Merrett, C. D., & Walzer, N. (2001). *A Cooperative Approach to Local Economic Development.* Westport, CT: Quorum Books.

Minichilli, A., Zattoni, A., Nielson, S., & Huse, M. (2012). Board Task Performance: An Exploration of Micro- and Macro-level Determinants of Board Effectiveness. *Journal of Organizational Behavior, 33*(2), 193-215. doi:10.1002/job.743

Nourse, E. G. (1945). The Place of the Cooperative in Our National Economy. *American Cooperation 1942 to 1945*, 33-39.

Park, J. L., Friend, D., McKee, G., & Manley, M. T. (2019). A Framework for Training and Assessment of the 21st Century Cooperative. *Western Economics Forum Journal, 17*(2).

Payne, G. T., Benson, G. S., & Finegold, D. L. (2009). Corporate Board Attributes, Team Effectiveness and Financial Performance. *Journal of Management Studies, 46*(4), 704-731. doi:10.1111/j.1467-6486.2008.00819.x

Puusa, A., & Saastamoinen, S. (2021). Novel Ideology, But Business First? *Journal of Co-operative Organization and Management, 9*(1). doi:10.1016/j.jcom.2021.100135

Ramsey, J., & Edwards, C. (2011). Entry-Level Technical Skills that Agricultural Industry Experts Expected Students to Learn through Their Supervised Agricultural Experiences: A Modified Delphi Study. *Journal of Agricultural Education, 52*(2), 82-94. doi:10.5032/jae.2011.02082

Reiter-Palmon, R., Young, M., Strange, J., Manning, R., & James, J. (2006). Occupationally-specific Skills: Using Skills to Define and Understand Jobs and Their Requirements. *Human Resource Management Review, 16*(3), 356-375. doi:10.1016/j.hrmr.2006.05.002

Reynolds, B. J., & Wadsworth, J. (2004). *Nominating, Electing and Compensating Co-op Directors.* Washington, D.C.: USDA Rural Development.

Sackman, H. (1975). *Delphi Critique.* Lexington, MA: The Rand Corporation.

Saitone, T. L., & Sexton, R. J. (2017). Agri-food Supply Chain: Evolution and Performance with Conflicting Consumer and Societal Demands. *European Review of Agricultural Economics, 44*(4), 634-657. doi:10.1093/erae/jbx003

SAS Institute Inc. (2022). *SAS/STAT User's Guide.* Cary, NC: SAS Institute Inc.

USDA Economic Research Service. (2022, January 6). *Agricultural Productivity in the U.S.* Retrieved February 4, 2022, from https://www.ers.usda.gov/data-products/agricultural-productivity-in-the-u-s/

USDA National Agricultural Statistics Service. (2021). *Farms and Land in Farms: 2020 Summary.* Washington, DC: USDA.

USDA Rural Development. (2021). *Agricultural Cooperative Statistics 2019.* Washington, DC: USDA.

Wadsworth, J. (2004, September/October). Signs of Life: Have you check your co-op's education pulse lately? *Rural Cooperatives*, pp. 26-29.

Wadsworth, J. (2011). *Cooperatives in Agribusiness.* Washington, DC: United States Department of Agriculture, Rural Business Cooperative Service.

Wadsworth, J. J. (2018). *Cooperative Directors Asking Necessary Questions.* Washington, DC: USDA Rural Business Cooperative Service.

Wadsworth, J., Kirkman, C. H., Rapp, G., Ingalsbe, G., & Duffey, P. (2015). *Co-op Essentials.* Washington, D.C.: U.S. Department of Agriculture, Rural Business - Cooperative Service.

Williams, R. D., & Saunders, L. (2020). What the Field Needs: Core Knowledge, Skills, and Abilities for Public Librarianship. *The Library Quarterly (Chicago), 90*(3), 283-297. doi:10.1086/708958

Appendix A - CEO/GM Questionnaire

*Prompts for the interviewee are listed below questions/statements in **bold print.**

1. Thank you for taking the time to meet with me. I look forward to learning more about you, your cooperative, and your thoughts on the skills of farmer directors. We'll start with some basic background questions.
    a. Briefly, tell me about yourself and your cooperative.
        i. **Age: ____**
        ii. **How long have you served as a CEO or General Manager? ____**
        iii. **How many employees work for your cooperative? ____**
        iv. **What was your cooperative's 2020 fiscal year-end total sales? ____**
        v. **Which best describes your co-op's primary source of revenue?**
            1. **____Primarily grain (more than 2/3 of income)**
            2. **____Primarily farm supply (more than 2/3 of income)**
            3. **____Mix between grain and farm supply (somewhere in-between)**
        vi. **What is your educational background? (i.e. high school, BS, MS, etc.)**
    b. How many directors serve on your co-op's board?
    c. Does your co-op board have different committees, such as an executive committee or audit committee? If yes, what are they and what function do they fulfill for your cooperative?
    d. Does your co-op board have an associate director program?
        i. If so, how many associates do you have?
        ii. Do these associate directors eventually become a director?
    e. How long are the terms for each director position? That is, how many years does a director serve per term? And, how many total terms can a director serve?
        i. Do the directors need to be re-elected for a new term?
        ii. Are there policies in place that limit how many times a director can serve in their lifetime? **(i.e. can serve for 9 consecutive years (3 consecutive 3-year terms) then have to go off for at least one year before going back on the board but there is no cap for how many 9-year stints one can serve)**
2. I am now going to ask you questions focused on skills of farmer cooperative's board of directors.
    a. What skill(s) do directors need in order to be engaged and knowledgeable?
        i. **The skills can be anything across the board. Be as specific or as general as you wish.**

    ii. **A director who is engaged and knowledgeable is one who contributes to the overall board tasks. This is not someone that just takes up a seat and is supposed to be a "yes" man. To be engaged and knowledgeable, the director is actively involved in discussions, meetings, ideas, etc.**
  b. Think about a director you admire. Why do you admire them as a director? Are there certain qualities that director possessed?
    i. **Perhaps it's something the director does on a regular basis or because they contributed something in particular that has made a difference for you. Or maybe they did something that had a positive impact on the cooperative. Think about such things and tell us what about that event or individual's characteristics made you think of that particular person.**
  c. Is there anything that we missed in particular to the skills and competencies that you feel need to be stated?
3. Now I want you to think about a new director coming onto the board.
  a. What do new directors struggle the most to understand about serving on a farmer cooperative's board of directors?
  b. What skills, behaviors, etc. do you feel are missing from incoming farmer directors?
  c. How does serving on a cooperative board of directors benefit farmers?
    i. **Do they learn new skills?**
    ii. **Are they exposed to new ways of thinking?**
4. What qualities or behaviors do you feel co-op boards should look for in potential directors?
  a. **Behaviors are "the way in which directors act and conduct themselves, particular in regard to fellow directors and management. [These] include a collection of qualities, characteristics, traits, and attributes that can be assessed and that contribute to director effectiveness."** (Leblanc, 2020, p. 20)
  b. **Do you feel as if the board should be looking for certain qualities in candidates to fill empty board seats or just bring a warm body on the board and go from there?**
  c. **Is there something you feel your board is lacking to where you wish you could find someone to fill that particular void?**
5. What recruitment practices does your co-op use to fill empty director seats?
  a. **Just pick an available warm body?**
  b. **Personal recruitment? (i.e. suggestions of people by current board members)**
  c. **Nominating committee?**
6. What do you see as a potential barrier to bringing on new directors?
  a. **Is it something going on within the local economy that prevents people becoming directors?**

    b. **Is it decreased use of cooperatives? Decreased membership?**
7. Now that we've covered some information on the skills and behaviors needed by directors, let's switch our focus to the economy surrounding the cooperative.
    a. What do you think directors need to know about the rural economy? (i.e. Rural economy trends, workforce issues, infrastructure, off-farm employment)
        i. **Rural infrastructure = broadband, roads, bridges, inland waterways**
        ii. **Trends = rural economy overall, outlook for the future of the rural economy (not just a commodity but the overall outlook, what is going on in your area that will affect your area in the future)**
    b. How do you, as a CEO, view your role in the local economy and what is the perceived impact of your cooperative?
        i. **Is there an increased status per se in the community when one serves as a co-op director and/or CEO?**
        ii. **Do you feel as if the board considers the role of the cooperative in the local economy when making decisions?**
        iii. **Do you feel as if the decisions your board has made have impacted the local economy?**
    c. Is there anything we missed that you feel is important to mention about the local economy and its connection to the cooperative board of directors?
8. Finally, I have a couple of questions about educational training for farmer cooperative directors.
    a. What have been sources for training and education for your directors? Let's first start with formal ways. Then, do you have any informal ways?
    b. What barriers are there that might prevent directors from attending trainings and taking advantage of other educational opportunities to improve their director skills?
    c. What methods do you think would be the best way to train new directors?
        i. **Workshops, required training/classes, conferences, etc.**
9. Do you have any final thoughts for me?
10. Do you have any questions for me?
11. Thank you for your time today! I really appreciate your opinions, stories, and insights! This will greatly contribute to the research project!

Appendix B - Director Questionnaire

*Prompts for the interviewee are listed below questions/statements in **bold print.**

1. Thank you for taking the time to meet with me. I look forward to learning more about you, your operation, and your role as a farmer director. We'll start with some basic background questions.
    a. Briefly, tell me about yourself and your operation.
        i. **Age: ____**
        ii. **How long have you been farming? ____**
        iii. **Do you run the operation or do you work for another farmer? ____**
        iv. **Excluding yourself, how many other full-time employees work for your farm and/or ranch? Are they year-round and/or seasonal? ____**
        v. **Total acres (rented and owned) in crop and livestock production in 2020: ____**
        vi. **Which best describes your operation's primary source of revenue?**
            1. **____Primarily crops (more than 2/3 of income)**
            2. **____Primarily livestock (more than 2/3 of income)**
            3. **____Mix between crops and livestock (somewhere in-between)**
        vii. **What is your educational background? (i.e. high school, BS, MS, etc.)**
        viii. **Is there anything else you would like to share about you and/or your operation?**
    b. Before we talk about the farmer cooperative board you serve on, do you currently serve or have you previously served on any other board of directors? If so, what are/were they and do/did you hold any leadership positions on these boards?
        i. **School board, library board, local 4-H councils, church council, etc.**
    c. Now let's focus on your farmer cooperative board of directors. How long have you been a director on the board?
    d. Do you hold a leadership position on the board? If so, what is it?
        i. **Board president, vice president, treasurer, secretary, etc.**
    e. How many directors are on the board in which you serve?
    f. Does your co-op board have different committees, such as an executive committee or audit committee? If yes, what are they and what function do they fulfill for your cooperative?
    g. Does your co-op board have an associate director program?
        i. If so, how many associates do you have?

        ii. Do these associate directors eventually become a director?
    h. How long are the terms for each director position? That is, how many years do you serve per term? And, how many total terms can you serve?
        i. Do you need to be re-elected for a new term?
        ii. Are there policies in place that limit how many times you can serve in your lifetime? **(i.e. can serve for 9 consecutive years (3 consecutive 3-year terms) then have to go off for at least one year before going back on the board but there is no cap for how many 9-year stints one can serve)**
    i. Why did you choose to be a director?
2. I am now going to ask you questions focused on skills of farmer cooperative's board of directors.
    a. What skill(s) do directors need in order to be engaged and knowledgeable?
        i. The skills can be anything across the board. Be as specific or as general as you wish.
        ii. A director who is engaged and knowledgeable is one who contributes to the overall board tasks. This is not someone that just takes up a seat and is supposed to be a "yes" man. To be engaged and knowledgeable, the director is actively involved in discussions, meetings, ideas, etc.
    b. Think about a director you admire. Why do you admire them as a director? Are there certain qualities that director possessed?
        i. Perhaps it's something the director does on a regular basis or because they contributed something in particular that has made a difference for you. Or maybe they did something that had a positive impact on the cooperative. Think about such things and tell us what about that event or individual's characteristics made you think of that particular person.
    c. Is there anything that we missed in particular to the skills and competencies that you feel need to be stated?
3. Now I want you to think back to when you first started as a director, when you were new to a cooperative board for the first time.
    a. With your current knowledge of being a director, when you were new to the board, what did you wish you knew?
        i. Did you learn things while being on the board that made you feel as if you wish you knew that prior to starting your role on the board?
        ii. Perhaps you did some training once you became a board member but you felt as if the training was lacking something as you moved throughout your board commitments.
    b. What skills, behaviors, etc. do you feel are missing from incoming farmer directors?

c. Is there anything we missed that you feel might be important to share about when you were new to the board of directors?

4. Next, let's discuss some recruitment practices and what your cooperative looks for in new board directors.
    a. What qualities or behaviors do you feel co-op boards should look for in potential directors?
        i. **Behaviors are "the way in which directors act and conduct themselves, particularly in regard to fellow directors and management. [These] include a collection of qualities, characteristics, traits, and attributes that can be assessed and that contribute to director effectiveness."** (Leblanc, 2020, p. 20)
        ii. **Do you feel as if the board should be looking for certain qualities in candidates to fill empty board seats or just bring a warm body on the board and go from there?**
        iii. **Is there something you feel your board is lacking to where you wish you could find someone to fill that particular void?**
    b. What recruitment practices does your co-op use to fill empty director seats?
        i. **Just pick an available warm body?**
        ii. **Personal recruitment? (i.e. suggestions of people by current board members)**
        iii. **Nominating committee?**
    c. What do you see as a potential barrier to bringing on new directors?
        i. **Is it something going on within the local economy that prevents people becoming directors?**
        ii. **Is it decreased use of cooperatives? Decreased membership?**
    d. Is there anything we missed that you feel might be important to share about when you were new to the board of directors?
5. Now that we've covered some information on the skills and behaviors needed by directors, let's switch our focus to the economy surrounding the cooperative.
    a. What do you think directors need to know about the rural economy? (i.e. Rural economy trends, workforce issues, infrastructure, off-farm employment)
        i. **Rural infrastructure = broadband, roads, bridges, inland waterways**
        ii. **Trends = rural economy overall, outlook for the future of the rural economy (not just a commodity but the overall outlook, what is going on in your area that will affect your area in the future)**
    b. How do you, as a director, view your role in the local economy and what is your perceived impact?
        i. **Is there an increased status per se in the community when one serves as a co-op director?**

    ii. **Do you feel as if the board considers the role of the cooperative in the local economy when making decisions?**
    iii. **Do you feel as if the decisions your board has made have impacted the local economy?**
  c. Is there anything we missed that you feel is important to mention about the local economy and its connection to the cooperative board of directors?
6. Finally, I have a couple of questions about educational training for farmer cooperative directors.
  a. What have been sources for training and education for you as a director? Let's first start with formal ways. Then, do you have any informal ways?
  b. What barriers are there that might prevent directors from attending trainings and taking advantage of other educational opportunities to improve their director skills?
  c. What methods do you think would be the best way to train new directors?
    i. **Workshops, required training/classes, conferences, etc.**
7. Do you have any final thoughts for me?
8. Do you have any questions for me?
9. Thank you for your time today! I really appreciate your opinions, stories, and insights! This will greatly contribute to the research project!

Appendix C - Full Survey Question List

[Page 1]

1. **Consent for Participation in Research Survey**

Project name: Skills Gap Analysis of Farmer-Owned Cooperative Directors and Its Connection to the Regional Economy

Funded by: Contributions made to the Arthur Capper Cooperative Center Research

Principal Investigators: Dr. Brian Briggeman; Jody Wendt; Dr. Jason Bergtold; Dr. Aleksan Shanoyan, Kansas State University; Dr. Sarah Low, University of Missouri; and Brandi Miller, Kansas Cooperative Council

Purpose of the Research Project: We hope to learn the knowledge and skills needed to be an engaged and knowledgeable director. We also hope to learn more about how cooperatives are taking steps forward to be successful employers in their rural economy.

This survey will take approximately 20 minutes of your time. We do not anticipate that there are any risks associated with your participation, but you have the right to stop the survey at any time. The first 400 respondents to complete the survey are eligible to receive a $50 completion bonus. There will be a place at the end of the survey for you to indicate your name and address so the cash can be mailed to you upon survey completion.

Confidentiality: The study itself poses no additional physical or emotional risks that might lead to a participant dropping out. Your participation is completely voluntary. Your input and the data that you provide will be kept strictly confidential. Only summaries and general findings from the data collected will be published or presented.

Questions or Feedback: For any questions or feedback please contact Dr. Brian Briggeman (bbrigg@ksu.edu or 785-532-2573) at 305 C Waters Hall, Kansas State University, Manhattan 66506.

For concerns or to gain further information about your rights as a participant, you may contact the University Research Compliance Office at 785-532-3224 or fax at 785-532-3278 or by email at: comply@k-state.edu.

You may also contact the chair of the Kansas State University Institutional Review Board (IRB), Rick Scheidt, at 785-532-3224.

By clicking "I Agree" below, you are giving your consent and agree to participate in the study.

[radio buttons]

___ I Agree
___ I Disagree (you will exit the survey)

[Page 2]

2. Please specify your gender. [radio buttons]
   ___ Male
   ___ Female
   ___ Prefer to not answer

3. In which state do you reside? [text box]

4. What is your age? [text box]

5. Please specify your highest level of education from the options below. [radio buttons]
   ___ High school/GED
   ___ Some college
   ___ 4-year college
   ___ Graduate degree
   ___ Other – Please Explain: ____ [text box]

[Page 3]

6. Please check the option that best describes your role with the cooperative: [radio buttons]
   ___ Director
   ___ CEO or General Manager (GM)
   Answer certain questions based on selection

[Page 4]
(DIRECTORS ONLY)

7. What is your primary occupation? [Radio buttons]
   ___Farmer and/or Rancher
   ___Non-farm Employment
   ___Non-farm Self-Employment
   ___Other – Please Explain: _____ [Text Box]

8. How long have you worked in this occupation? ____ Years [Text box]

9. On your operation, what were the total acres (rented and owned) in crop and livestock production in 2021? ____ Acres [Text box]

[Page 5]
(CEO or GM ONLY)

10. How many total years have you been a CEO or GM at a cooperative? ____ Years [Text box]

[Page 6]
(DIRECTORS ONLY)

11. How many years have you served as a director on a farmer cooperative board? ___ Years [Text box]

12. Please check the officer positions below that you have held on your farmer cooperative board of directors. Select all that apply. [radio buttons]
    ___ I have not served in an officer position
    ___ Board Chair
    ___ Vice Chair
    ___ Secretary
    ___Treasurer
    ___ Other – Please Explain: ____ [text box]

13. Do you currently serve or have you previously served on any other board of directors or councils outside of farmer cooperatives? [Radio Buttons]
    ___Yes
    ___No

14. Below is a set of groups that offer educational opportunities for farmer cooperative directors. Please select all groups that have hosted an education program in which you have previously attended. [Radio buttons]
    ___ State cooperative council or association
    ___ Local cooperatives
    ___ Regional cooperatives
    ___ Industry partner of cooperatives
    ___ Universities
    ___ Online Training Programs
    ___ Other – Please Explain: _____ [Text box]

___ I have not attended any formal director education opportunities in the past
Skip to Q16 if "I have not attended …" is selected

15. On average, how many hours of director educational training (i.e. cooperative director, school board, church council, etc.) do you attend each year? Please select the option below. [radio buttons]
    ___ Less than 5 hours
    ___ 5-20 hours
    ___ 20-40 hours
    ___ More than 40 hours

[Page 7]

16. The next set of questions will focus on the farmer cooperative that you serve as director, CEO, or GM.

17. How would you classify the primary source of sales for your cooperative? [Radio Buttons]
    ____ Primarily grain/oilseed (more than 2/3 of total sales)
    ____ Primarily farm supply (more than 2/3 of total sales)
    ____ Mix between grain/oilseed and farm supply
    ____ Other – Please Explain: _____ [Text box]

18. Click the sales range below that best describes your cooperative's most recent total sales. [Radio buttons]
    ___ Less Than $15 Million
    ___$15-$150 Million
    ___More Than $150 Million

19. How many total grain storage locations does your farmer cooperative own? A grain storage location can be upright, bunker, or flat storage. [radio buttons]
    ___ 0-1 total grain storage locations
    ___ 2-5 total grain storage locations
    ___ 6-11 total grain storage locations
    ___ more than 12 total grain storage locations

[Page 8]

Skills Assessment

**NOTE: For each participant, the same random order of director skills for tables 1 and 2 should be used. In other words, the skills will be randomized in table 1 for every

participant. The random order that is set in table 1 will be the same order in table 2. In other words, the skills will be randomized ONE time for both tables 1 and 2 for every survey taker. Should be able to code this in Qualtrics.**

(DIRECTORS ONLY)

20. For this next section, please complete a director skill assessment by reading te skill presented and then clicking the button that best reflects your skill level. For this first assessment, please think about your skill level **before** you were a director on a farmer cooperative board.

    For skill level definitions, please utilize the following scale in your assessment:
    a. 1 = None = possess no knowledge, understanding, or application of the skill
    b. 2 = Basic = possess limited knowledge, understanding, or application of the skill
    c. 3 = Intermediate = possess an adequate understanding and application of the skill
    d. 4 = Skilled = possess significant understanding and application of the skill
    e. 5 = Expert = possess extensive understanding and is regarded as a skill expert

    [Radio Buttons]
    (*These skills will be randomly ordered for each survey participant*)

	Your Skill Level Before You Were A Director				
Director Skills	**1 = None**	**2 = Basic**	**3 = Intermediate**	**4 = Skilled**	**5 = Expert**
Cooperative Finance					
Cooperative Governance and Policy					
Communication					
Time Management					
Understand Current Economic and Industry Conditions					
Ask Critical and Constructive Questions					
Strategic Planning					

Networking					
Listening					
Teamwork					
Leadership					

[Page 9]
(DIRECTORS ONLY)

21. Now think about your **current** skill level. Please complete a director skill assessment by reading the skill presented and then clicking the button that best reflects your current skill level.

    For skill level definitions, please utilize the following scale in your assessment:
    a. 1 = None = possess no knowledge, understanding, or application of the skill
    b. 2 = Basic = possess limited knowledge, understanding, or application of the skill
    c. 3 = Intermediate = possess an adequate understanding and application of the skill
    d. 4 = Skilled = possess significant understanding and application of the skill
    e. 5 = Expert = possess extensive understanding and is regarded as a skill expert

    [Radio Buttons]
    (*These skills will FOLLOW the SAME random order set in the previous table*)

	Your Current Skill Level As A Director				
Director Skills	**1 = None**	**2 = Basic**	**3 = Intermediate**	**4 = Skilled**	**5 = Expert**
Cooperative Finance					
Cooperative Governance and Policy					
Communication					
Time Management					
Understand Current Economic and Industry Conditions					

Ask Critical and Constructive Questions					
Strategic Planning					
Networking					
Listening					
Teamwork					
Leadership					

[Page 10]

Skills Assessment

(CEO or GM ONLY)

22. For this next section, please complete a director skill assessment by reading the skill presented and then clicking the button that best reflects the average director skill level. For this first assessment, please think about the average **new** director skill level on your farmer cooperative board.

    For skill level definitions, please utilize the following scale in your assessment:

    a. 1 = None = possess no knowledge, understanding, or application of the skill
    b. 2 = Basic = possess limited knowledge, understanding, or application of the skill
    c. 3 = Intermediate = possess an adequate understanding and application of the skill
    d. 4 = Skilled = possess significant understanding and application of the skill
    e. 5 = Expert = possess extensive understanding and is regarded as a skill expert

    [Radio Buttons]
    (*These skills will be randomly ordered for each survey participant*)

	Skill Level of the Average New Director On Your Farmer Cooperative Board				
Director Skills	**1 = None**	**2 = Basic**	**3 = Intermediate**	**4 = Skilled**	**5 = Expert**
Cooperative Finance					
Cooperative Governance and Policy					
Communication					

Time Management					
Understand Current Economic and Industry Conditions					
Ask Critical and Constructive Questions					
Strategic Planning					
Networking					
Listening					
Teamwork					
Leadership					

[Page 11]

(CEO or GM ONLY)

23. Now think about the **current** skill level for the average director on your cooperative board. Please complete a director skill assessment by reading the skill presented and then clicking the button that best reflects that **current** skill level.

    For skill level definitions, please utilize the following scale in your assessment:

    a. 1 = None = possess no knowledge, understanding, or application of the skill
    b. 2 = Basic = possess limited knowledge, understanding, or application of the skill
    c. 3 = Intermediate = possess an adequate understanding and application of the skill
    d. 4 = Skilled = possess significant understanding and application of the skill
    e. 5 = Expert = possess extensive understanding and is regarded as a skill expert

    [Radio Buttons]
    (*These skills will FOLLOW the SAME random order set in the previous table*)

	Current Skill Level of the Average Director on Your Farmer Cooperative Board				
Director Skills	**1 = None**	**2 = Basic**	**3 = Intermediate**	**4 = Skilled**	**5 = Expert**
Cooperative Finance					
Cooperative Governance and Policy					
Communication					
Time Management					
Understand Current Economic and Industry Conditions					
Ask Critical and Constructive Questions					
Strategic Planning					
Networking					
Listening					
Teamwork					
Leadership					

[Page 12-22]

Best/Worst

24. For the final section of the survey, you will now be asked 11 repeated questions that list a subset of the skills a farmer cooperative director should possess.

25. In the set of skills below, please click the button of the one skill that is MOST important for a farmer cooperative director to possess and click the button of the one skill that is LEAST important. [radio buttons]

    [Note: This is the entire list of director skills taken from interviews and literature.]

MOST Important	Director Skills	LEAST Important
	Cooperative Finance	
	Cooperative Governance and Policy	
	Communication	
	Time Management	
	Understand Current Economic and Industry Conditions	
	Ask Critical and Constructive Questions	
	Strategic Planning	
	Networking	
	Listening	
	Teamwork	
	Leadership	

[Page 23]

If you are interested in receiving $50 cash for your participation in the survey, please provide your name, email address, and mailing address below. If you are not interested in receiving a cash gift, leave the text box blank and click “Next.”

*Note: Your name, email address, and mailing address will NOT be stored with the survey responses you provided.
_____ [Text Box]