

Increasing Program Effectiveness Through use of Principles of Andragogy in Tennessee Beef Quality Assurance Programs

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# Increasing Program Effectiveness Through use of Principles of Andragogy in Tennessee Beef Quality Assurance Programs

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## **Abstract**

Tennessee Beef Quality Assurance (BQA) programs teach beef producers the importance of quality within beef industries. BQA programs assure consumers of the quality and safety of supplied beef, as well as the environmental orientation of farm production practices (Tsakiridis et al., 2021). Any active BQA certificate holder in Tennessee can apply for the Tennessee Agricultural Enhancement Program (TAEP). TAEP significantly benefits both farmers and the economy. The TAEP is a cost-share system funding over \$106 million dollars funding over thirty-seven thousand programs in the agricultural community statewide (Farm Bureau, Tennessee 2019 Resolutions, 2019). The cost-share program aids farmers to begin projects that could not have been financially feasible if the cost-share program was not available (Menard et al., 2019). The BQA program is an educational program taught as Cooperative Extensions efforts. The program aims to predominately adult beef cattle producers. Andragogy, also known as adult learning theory, was created by Malcolm Knowles to effectively teach adults. In this study, qualitative methods and quantitative methods were used to accurately identify how andragogy is being used in Tennessee BQA programs. The results showed Extension agents followed the seven-step andragogical design process and showed that BQA participants have the six andragogical principles. Recommendations for future research were identified to adapt the Andragogy in practice inventory for instructors, conduct a research study that addresses counties with smaller participation, and conduct studies with county agents in early career stages. Recommendations for the Tennessee BQA program are to have trainings for Extension agents around the andragogical process and to reevaluate the requirement for additional programs.

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## **General Audience Abstract**

Since BQA was established in 1987 by the Beef Checkoff, trainings across 47 states have been implemented to guide beef producers with the tools and training necessary to assure animal health and well-being. The program is an educational program that is typically taught by Extension education. Extension education was established by the Smith-Lever Act in 1914 which was established for the educational outreach of the Land-Grant institution for the growth of rural areas across the United States. This study aimed to identify how adult learning theory, andragogy, is used in Tennessee BQA programs and to make appropriate recommendations to ensure program effectiveness. This study is important to identify educational effectiveness in the BQA program and to ensure program participants are implementing program objectives to ensure the goals and purposes of the BQA program.

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## Chapter 1: Introduction

### Background

The Land-Grant system was created through the Morrill Act, which was passed by congress on July 2, 1890, to establish public state institutions which emphasized agriculture and mechanical arts (Morrill Act of 1862, 2022). Cooperative Extension was established through the Smith-Lever Act which was created to extend outreach programs nationally through the Land Grant Institutions to educate rural Americans (The Smith Lever Act of 1914, n.d.) Cooperative Extension organizations work together with Land-Grant Institutions, such as UTK and TSU, to reach rural areas and urban areas for non-formal education in 4-H youth development, Family and Consumer Sciences, and Agricultural and Natural Resources.

Beef Quality Assurance (BQA) programming is an adult program that teaches beef producers' practices and concepts that ensure healthy beef products. This study is needed to access how BQA program participants are taught, and to suggest programmatic changes to improve teaching and the overall success of the program's efforts. The literature identifies the benefits on BQA programming, the concepts that are being taught, and how BQA programs can affect the economy, environment, and food systems. Although, there does not seem to be any literature identified on the educational methods and approaches within the program.

The BQA program is provided through a partnership effort by the National BQA program and state BQA programs. The Tennessee BQA program is taught by county Extension agents (also referred to as agents) to beef producers in the counties they serve. These agents work in local county offices across the state, representing the land grant university, to better serve their county. Counties are a part of the Land-grant University system provided by the University of Tennessee (UTK) Extension and Tennessee State University (TSU) Extension. Through



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Extension services, BQA programs are hosted in almost every rural and urban county in Tennessee.

As a result of BQA certification in Tennessee, with dual certification with Master Beef Producer Program, producers can apply for cost-share funding through the Tennessee Agricultural Enhancement Program (TNAEP). The TNAEP was established in 2005 to create long term investments to Tennessee farms (TAEP, n.d). The TNAEP has great influence on the participation in Tennessee BQA programs by providing graduates of the program with opportunities for cost share. TNAEP supports additions of hay storage facilities, hay equipment, herd health, permanent working facilities, grain storage structures, feeding systems, and feeding equipment.

### **Theoretical and Conceptual Frameworks**

Andragogy, also known as adult learning theory, is designed to effectively teach adults. Knowles et al., (2020) stated that there are limitless potential and opportunities for qualitative research to be conducted using andragogy, as well as a variety of arenas such as professional development, nursing education, social work, criminal justice, etc. There were no educational arenas mentioned such as Extension programming. With this research, the BQA program participants, or the learners of the program, are even included in the identification process of the six principles of andragogy (1) orientation to learn, 2) motivation to learn, 3) prior experience, 4) self-directed learning, 5) readiness to learn, and 6) need to know), and how they are present or not present in their learning, further supporting efficacy of the theory.

Andragogy is an appropriate theory for this project. The theory will be used to identify how adult learning theory is being used in the Tennessee BQA program from the producer's perspective using the andragogy in practice inventory (Knowles et al., 2020). The theory will be

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used to better understand the relationship between the participants and the facilitator. Use of andragogy by agents will be explored through semi-structured interviews to identify if and how Extension agents are using the seven steps identified by Knowles et al. (2020): 1) preparing the learner and climate setting, 2) mutual planning, 3) diagnosis of learner needs, 4) alignment of objectives, 5) design of learner experience, 6) learning activities, and 7) evaluation. The seven identified steps and the six principles will be used together to pinpoint the andragogical process and the principles and how they are being used in each county.

The Andragogy in Practice conceptual framework will be used as part of this research to investigate BQA program effectiveness and andragogy usage therein. Andragogy in Practice (Knowles, et al., 2020) is “an enhanced conceptual framework to more systematically apply andragogy across multiple domains of adult learning practice” (p.79). The conceptual framework considers “the lack of homogeneity among learners and the learning situation as well as illustrating the learning transaction is a multifaceted activity” (Knowles, et al., 2020). The conceptual framework was developed by Knowles et al. (1978).

### **Relevance and Purpose**

This study is unique because it will identify the educational methods that are being used, how adult learning theory is used, and evaluate the educational program. The findings of this study will be used to incorporate recommendations for the Extension agents who are teaching the BQA programs and can be used as a research design to test on other Extension programming. Other states may benefit in using this approach, as well to evaluate their BQA programs. Extension faculty working in other program areas can use this research study as a guide to evaluate their educational programming.

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The purpose of this study was to gain insight and understanding of the role that andragogy has within Tennessee BQA programs and to create recommendations that are appropriate to increase program effectiveness. The findings of this research can be used to help Extension agents understand how andragogy is being used within a program held by Extension and can be used to help encourage the use and practice of the andragogical process while capitalizing on the principles.

### **Research Questions**

There were three research questions that were used to drive this study and to identify how andragogy was being used. The research questions are, 1) How do Extension agents follow an andragogical process, 2) What six andragogical principles do BQA participants bring into the program, and 3) What connections between teaching and learning can be made between different teaching approaches of county agents and the learning of the participants?

### **Overview of Methodology**

This study used a case study approach on the Tennessee BQA program, with four embedded case studies, to analyze the phenomenon of andragogy in the program. Semi-structured interviews and the Andragogy in Practice Inventory were used as the research instruments which were used for this study. Purposeful, random sampling was conducted in this study to provide a reliable, consistent sample size of BQA graduates in Tennessee counties. The inclusion criteria required that counties be statistically within the top tier in terms of number of BQA graduates. The initial three counties in the study were randomly selected from within this group. The fourth case used the same inclusion criteria, but used convenience sampling technique, because of the timing of their spring classes.

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The qualitative analysis of the semi-structured interviews was guided by the andragogical design process. The andragogical design process is a seven-step process including prepare the learner, climate setting, mutual planning, diagnosis of learner needs, setting of objectives, design of the learner experience, learning activities, and evaluation (Knowles et al., 2020). The andragogical design process was used as the platform to design the semi-structured interview protocol for Extension educators. The andragogical process was appropriate for the semi-structured interview protocol because it was created to identify how adult educational instructors were using the theory of andragogy. The andragogy in practice inventory (API) was used to identify the learner's perspective of the andragogical principles and the andragogical design in the BQA programs. The API is an empirical test that measures the andragogical principles and andragogical design. The API is made up of 60 questions which measures how andragogy is being used. The API was an appropriate tool to present to BQA participants to measure both the andragogical process and the principles that participants have. The qualitative analysis was used to enhance the quantitative inquiry.

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### Definitions

**Adult:** The definition of an adult as defined by Knowles et al., (2020) is psychologically, someone becomes an adult when they arrive at a time where they have self-concept of being responsible for their own lives and being self-directing. For this study, this is the definition that will be used.

**Andragogy:** Merriam -Webster, n.d. states andragogy as “The art or science of teaching adults. This will be the definition that is used in this study.

**Beef Quality Assurance (BQA):** Educational program that provides systematic information to U.S. beef producers good husbandry techniques and best management practices that can be coupled with accepted scientific knowledge to raise cattle under optimum management conditions.

**BQA Participants:** In this study, BQA producers are beef producers and people who are interested in becoming a beef producer who takes the BQA class to become certified.

**Extension Agents:** Agriculture Careers (n.d.) states “anyone who are employed by land-grant universities and serve the citizens of that particular state by serving as an expert or teacher on a topic relating to economics, community development, agriculture, family, animal production, diet and nutrition” (paragraph, 1). This definition will be used to state and reference an Extension agent.

**Producer:** Any person who grows and maintains beef cattle for the purpose of using it for beef sales.

**Tennessee Agricultural Enhancement Program (TAEP):** Cost-share program that gives support to agricultural producers to continue and grow their operation efforts.

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### Chapter 2: Literature Review

#### Cooperative Extension Model

Programming is a great outlet for county extension offices to be used as an educational outlet to better serve their county communities. Cooperative Extension education is a voluntary educational and professional development program designed to help participants meet their needs through interaction with rural and urban citizens across the nation through educational institutions (Gould et al., 2014). These educational institutes across the country were established by the Morrill Act of 1862 which provided federal support for post-secondary education, focused on agriculture and mechanical arts (Croft, 2019). The Morrill Act established Land Grant Universities that created a system for teaching and research. The Smith-Lever Act of 1914 established the Cooperative Extension System (Comer et al., 2006).

The Cooperative Extension System was created for the purpose to deliver science-based public programs to solve local problems (Wang, 2014). The Cooperative Extension Service extends outreach programs through land-grant universities to educate rural Americans about advances in agricultural practices and technology (Smith-Lever Act of 1914, 2022). Today, Cooperative Extension is a “boundary-spanning organization that facilitates research and outreach in agriculture, nature resources, and communities” (Gornish & Roche, 2017 p. 2). As well as providing a diverse educational program in agriculture and natural resources, community and economic development, family and consumer sciences, and 4-H youth development (Franz & Townson, 2008). Cooperative Extension, as stated by the United States Department of Agriculture (2022), works by

“University faculty members, who are disciplinary experts, translate science-based research results into language — written, verbal, and electronic — appropriate for targeted audiences. County-based agents work with local citizens and interest groups to

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solve problems, evaluate the effectiveness of learning tools, and collect grassroots input to prioritize future research. By living and working in communities, county agents can rely on existing relationships to respond to local needs, build trust, and engage effectively with citizens” (Paragraph 5).

The method of reaching communities is through educational programming. The use of the word programming can be seen in a variety of ways in Extension. Franz et al. (2015) states “Extension professionals use the word program in a variety of ways to describe their efforts. They may call a meeting or single educational event a program (i.e., I am holding a pesticide safety program tonight), a series of educational opportunities a program (i.e., I am teaching a five-part program on financial management), or a comprehensive effort aimed at addressing a particular issue a program (i.e., I am working on a youth leadership development program)” (p. 4). Education is a central facet in these programs. Nonformal education and formal education both are crucial learning methods in Extension educational programming.

### **Beef Quality Assurance**

As noted, Extension educational programming can be seen in a variety of ways. One of the educational programs in Extension Education is beef programming. These educational programs can be seen in a variety of forms, as well as titles. Beef programming can range from beef field days, Cattlemen’s Association meetings, Master Beef programming, and many more. The Tennessee Cattlemen’s Association (TCA) was established in 1985 to advocate for Tennessee beef producers at the local, state, and federal levels with officials on issues that affect beef cattle producers (Tennessee Cattlemen’s Association [TCA], n.d.). The TCA is comprised of youth events, as well as adult programming, and community outreach with second harvest initiative, which is a food bank. Tennessee Master Beef Producer Program is an educational

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program that is designed to provide hands-on demonstrations for topics in beef production such as beef products, economics and budgeting, facilities and cattle handling, forages, genetic selection, health, marketing and business management, nutrition, and reproduction (University of Tennessee Institute of Agriculture, n.d.). These are the main program outlets in the State of Tennessee, but individual beef program topic classes can be hosted by the individual county Extension agent.

BQA is a program taught through Cooperative Extension that stretches across 47 states in the United States, and which involves more than 90% of the beef producers in the United States (National BQA, n.d). BQA was designed to educate U.S. producers on best management practices to ensure production of a safe, wholesome beef product using humane animal care (Reinhardt & Thomson, 2015). The BQA program was created to give consumers quality beef that is healthy, wholesome, and safe (Huston, 2014). The original BQA program originally focused on reducing injection-site abscesses and drug residues in beef, and this expanded to include extensive training on animal welfare and appropriate cattle handling practices (Reinhardt and Thomson, 2015). In addition to animal welfare and appropriate cattle handling practices, environmental orientation of farm production practices is a part of the goals that BQA set (Tsakalidis et al., 2020).

BQA programs seek to create sustainability in agriculture. When aligned with the 1990 Farm Bill, BQA provides opportunities of sustainability through “environmental quality, economic viability of farm operations, and enhances the quality of life for farmers and society as a whole.” The BQA curriculum sets objectives to educate producers on how to properly handle beef cattle through herd health management, biosecurity, proper transportation, proper record keeping, nutrition, and environmental quality that intends to sustain the environment, the quality



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of life for both producers and society, and the economy (BQA Field Guide, 2020). BQA programs identify the importance of being environmentally sustainable. BQA programs teach environmental quality control points to control forage management, soil fertility, pasture chemical use, disposal of dead stock, and confined cattle (BQA Field Guide, 2020). BQA curriculum and resources give producers the educational information to implement to create environmentally sustainable actions on their own operations. Beef producers aim to be ecologically and socially responsible by caring for the natural resources beef production relies on (BQA Field Guide, 2020). BQA programs emphasize the importance of sustaining natural resources.

BQA program institutional stakeholders recognize the importance of being environmentally sustainable, as well as being economically sustainable. States such as Texas and Virginia have seen the impact that BQA programs have on the economy within the state. Texas has noted to increase \$19 million in their gross returns, as well as Virginia noted that BQA certified have an addition of 1.5 to 2 million dollars added value with state economic impact (Provo and Travis, 2012; Hyde, 2020). BQA certified producers are receiving economic sustainability returns to their own operations through the higher sell of cattle per centum per weight. A study conducted by Colorado State University showed a significant premium added to BQA-certified calves and feeder cattle sold (Mooney et al., 2019). The study was conducted with the purpose to determine if the mention of “BQA certificated” in the lot description influenced the sale prices of beef calves and feeder cattle marketed. The study identified that the effects were positive. The premiums added on these lots were \$2.71 per hundred weight (CWT) (Mooney et al., 2019). “By obtaining BQA Certification, producers can benefit from the

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economic value of committing to the fundamental principles of quality beef production” (Beef Quality Assurance, 2019).

Consumers are gaining a peace of mind of where their food comes from through certification programs, such as BQA. A study was conducted to see whether Tennessee consumers would pay a premium for BQA certified beef. The study used a choice survey instrument on Tennessee state citizens that were 18 or older with the survey participation pool of 816 participants. The answer was yes, although many consumers are unaware of BQA as a whole (Griffith et al., 2018). This plays as an importance for the motivation of producers to become BQA certified, as well as create economic profitability for themselves. This also gives a quality of life to consumers, as well as producers. The National BQA program intuitional agents understand the struggle of the cattle market. These agents have a goal in mind to incorporate economically logical concepts into their curriculum (Beef Quality Assurance National Manual, n.d.).

Food sustainability is important, especially when it comes to the quality and safety of food. Consumers are looking for quality food that is consistent, as well as safe. In 2014, 9 million pounds of meat was recalled in California because of imperfections and lack of safety (Huston, 2014). Food sustainability and safety is important for all consumers. BQA programs seek to create a market that is trustworthy and will sustain the food industry. The first objective for the BQA programs is, “Set production standards for quality and safety that are appropriate to an operation and that can be met or exceeded” (Beef Quality Assurance National Manual, n.d. p. 1). BQA understands that food sustainability is important for both the producer and the consumer, while also knowing appropriate boundaries to sustain both parties involved. Producers who implement BQA concepts, can avoid costly production mistakes and unacceptable

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production defects, for both themselves and the consumer (Beef Quality Assurance National Manual, n.d.). BQA programs have objectives on the importance of food safety, while also acknowledging the importance beyond safety, stating (Beef Quality Assurance National Manual, n.d. pg. 11.):

“Beef products sold to the consuming public must consistently meet expectations for both food safety and eating satisfaction. The bottom line is that quality in the beef industry goes far beyond the parameters of food safety. It also encompasses performance, health, carcass characteristics, and eating satisfaction which are results of management decisions made throughout the beef production system. Because factors other than food safety are involved in quality, the material in this manual is oriented toward the Total Quality Management concept. This concept establishes that every member of a production team adheres to high standards of work in every aspect of production in order to deliver high-quality products and services.”

### **Tennessee BQA Program**

Tennessee Cooperative Extension hosts the Tennessee BQA program. Extension agents have a variety of methods to conduct the program. First, agents are able to conduct trainings face-to-face utilizing the educational material provided to them. Next, recording of the program is provided to the agent to incorporate in house for the instances of producers that do not own a computer, or have missed regularly scheduled meetings. Finally, there is an online version that can be accessed by the producer to become certified. All of these modalities are derived from the same educational material. BQA provides producers with technology and information which helps with the future success of beef producers, products, and consumer satisfaction (Meeker, 1999). Tennessee BQA uses National BQA curriculum while offering live cattle in a hands-on

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workshop while learning concepts such as the importance of proper injection site, record keeping, and incorporation of buying and selling of feeder cattle (University of Tennessee Institution of Agriculture, n.d).

Tennessee BQA use the same objectives around sustainable outputs as the national program, especially when looking at food quality and environmental sustainability. Economic sustainability has been identified to be at the forefront of the impacts of Tennessee agriculture economy. The study that found Tennessee consumers would pay a premium for BQA certified beef (Griffith et al., 2018) plays as an importance for the motivation of producers to become BQA certified, as they seek economic profitability for themselves.

In Tennessee, the Tennessee Agriculture Enhancement Program (TAEP) plays a huge role in sustaining the economic viability of farming operations. TAEP benefits both farmers and the agriculture economy. TAEP is a cost-share system providing over \$106 million dollars to fund over thirty-seven thousand programs in Tennessee agriculture (Tennessee Farm Bureau Federation, 2018).

Tennessee BQA graduates can reap financial rewards through TAEP. Any BQA certificate holder in Tennessee can apply for funds through TAEP creates economic sustainability for beef producers across the state of Tennessee by allowing farmers to begin projects that might not have been financially feasible if the cost-share program was not available (Menard et al., 2019). To qualify for the cost-share program, a valid BQA certification must be obtained. "For every \$1 of TAEP investment, an additional \$6.09 is generated in the state's rural economies" (Menard et al., 2019). This boosts the economy both for the individual producer and throughout the entire state. The total amount TNAEP returns to the economy is \$1,127,757.9 (Menard et al., 2019).

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In Tennessee, counties may host the BQA program at differing times of the year, each month, or quarterly. Across Tennessee, there are agents who decide to host their BQA program classes at different times of the year compared to their neighboring counties across the state. The Tennessee State Coordinator for the BQA program sent the total amount of BQA certification holders from 2017-2022 was 13,937. The average for BQA certificates for the state each year is around 2,787. Beef producers who have been certified online was approximately around 2,800 certificates.

### **Content Model**

In traditional settings, instructors have used a content model to inform the way they instruct (Knowles, 1978). Knowles et al., 2020 states that content models are concerned with transmitting information and skills. The traditional format of learning is through a more facilitator base relaying information to participants. The traditional format of content model or pedagogical approach was focused on subject matter versus the personal learner needs with motivation to learn the subject matter is fully external from teachers, parents, or even threat of failure (Blondy, 2007).

### **Process Model**

Andragogy is a process model that differs from the content model, Knowles et al., 2020 states, “The difference is not that one deals with content and the other does not; the difference is that the content model is concerned with transmitting information and skills, whereas the process model is concerned with providing procedures for helping learners acquire information and skills” (pg. 115). Andragogy and pedagogy differ not only on process versus content model, but also through the lens in how the students are seen. Pedagogical assumptions differ from andragogical in that pedagogy assumes the “learners are dependent personalities who bring little

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to no experience to the educational activity and learners attend to such activities because they have been told they need to do so while focusing on subject matter versus personal needs”

(Blondy, 2007). In table 1, Knowles et al., (2020) shows the differences between pedagogy content model versus andragogy:

**Table 1**

*The differences in pedagogical approach (content model) and andragogical approach (process model) addressing elements.*

<b>Element</b>	<b>Pedagogical Approach (Content Model)</b>	<b>Andragogical Approach (Process Model)</b>
1- Preparing Learners	Minimal	Provide Information Prepare for Participation Help develop realistic expectations. Begin thinking about content
2- Climate	Authority-oriented Formal Competitive	Relaxed, trusting. Mutually respectful Nonformal, warm Collaborative, supportive Openness and authenticity Humanness
3- Planning	By teacher	Mechanism for mutual planning by learners and facilitator
4- Diagnosis of Needs	By teacher	By mutual negotiation
5- Setting of Objectives	By teacher	By mutual negotiation
6- Designing learning plans	Logic of subject matter Content units	Sequenced by readiness. Problem units
7- Learning activities	Transmittal techniques	Experiential techniques (inquiry)

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8-	Evaluation	By teacher	Mutual re-diagnosis of needs Mutual measurement of program
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Note: *The differences in pedagogical approach (content) and andragogical approach (process model) addressing elements* as published in Knowles et al (2020).

**Theoretical and Conceptual Framework**

Adult education takes many forms which includes non-formal education, informal education as well as formal education. Adult education accommodates all the forms of formal, non-formal, and informal aspects of education that improves community members by increasing their skills, knowledge, understanding, attitudes, and sensitivity (Nzeneri, 2008). Cooperative Extension accommodates all the needs of program participants while having a deep understanding of incorporation of both formal and non-formal education in programming.

Cooperative Extension has programs that teach adults. Cooperative Extension has grown to become the largest adult education organization in the United States- with multifaceted structures, a variety of programs and program partnerships, and diverse educational approaches (Franz & Townson, 2008). “Teaching adults is the foundation upon which rests the Cooperative Extension Mission, *‘to enable people to improve their lives and communities through learning partnerships that put knowledge to work’*” (Dvorak, 2014 p. 1). Teaching adults may not always end in a certificate or degree, but the programming can help in assisting in their daily lives.

Andragogy, also known as adult learning theory, was discovered by Malcom S. Knowles. Knowles noticed that there was only one theoretical framework for all of education. Pedagogy was the only theoretical framework for both children and adults, but pedagogy literally means the art and science of teaching children (Knowles, 1978). Andragogy is a theory that “puts the learner at the center, and it continues to be discussed as a front-runner for adult learning”

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(Cochran & Brown, 2016 pg. 73). Andragogy is a Greek word, which when translated means “the art and science of helping adults learn.” The theory is not designed as a one size fits all model, but the model provides flexibility in planning and implementing quality adult education programs (Franz et al., 2010; Knowles et al., 2020).

Extension agents are hired based on the needs of the local community. These needs may be based on subject matter knowledge. County, multicounty, or multistate Extension agents housed in local offices plan, implement, and evaluate educational experiences for their clientele. Staffing varies considerably from location to location according to local needs and available funding (Franz & Townson, 2008). Some of these Extension agents may have no background in education. Extension agents may not have been trained as agents or may not be cognizant of adult education principles, so they may not have ground their practice in educational theories [such as andragogy] that inform working with adult learners (Jackson et al., 2021). Andragogy, as a theory, may have a special presence in Extension Education (Franz et al., 2010). Extension agents today are faced with an influx of information on educational delivery, methods, design, and theories (Radhakrishna et al., 2017; Conner et al., 2018; Franz et al., 2010). Extension agents who work primarily with adults may have not been trained as agents or be cognizant of adult educational principles thus not grounding their educational practices in learning theories (Alexandra 2020). Franz, et al., 2010 states that Extension agents should know about Adult Learning Theory (andragogy) and plan programs that address the diverse needs of the adult learners. Andragogy is different compared to other adult educational theories in that “puts the learner at the center, and it continues to be discussed as a front-runner for adult learning” (Cochran & Brown, 2016 pg. 73).”



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Andragogy is based on six assumptions: the need to know, learners' self-concept, role of the learners' experiences, readiness to learn, orientation to learn, and motivation (Knowles et al., 2020). Knowles (1973) identified four assumptions early in his work of Andragogy and kept working to build on these assumptions which lead to adding two more after further research and observation (Knowles, 1984). Knowles et al., 2020 defines the six assumptions as following:

1. **The need to know:** Adults first need to know why they are learning new knowledge or skills. This plays an importance in the teaching aspect given that “the first task of the facilitator of learning is to help the learners become aware of the need to know” (p.44)
2. **The learner's self-concept:** Adults move from being dependent to self-directed learners as they mature. Facilitators can help capitalize on self-concept through creating a collaborative learning space.
3. **The role of the learner's experiences:** Adults bring in a wealth of knowledge as well as past experiences that build on their growth and development. These experiences are vital to how that participant learns. Facilitators should look to incorporate and build off these learning experiences into the educational setting.
4. **Orientation to learn:** Adults seek new knowledge or skills to address a task at hand. Application of subject material to solving problems.
5. **Readiness to learn:** Timing is a crucial element in this assumption. Learners become ready to learn those things they need to know and be able to do in order to cope effectively with their real-life situations” (p. 45).

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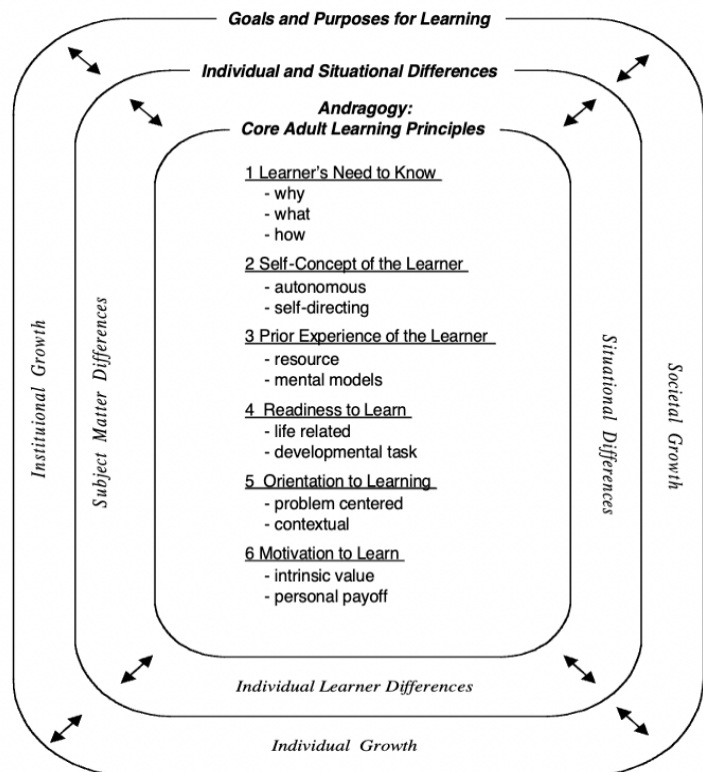
6. **Motivation:** Motivation is a key component to adult learning. It can be through external or internal sources, but internal motivation is often the most powerful source of the two.

## Andragogy in Practice Conceptual Framework

The Andragogy in Practice conceptual framework is comprised of three sectors- Goals and purpose for learning, individual and situational differences, and the six assumptions (Figure 1). The conceptual framework is consistent with program development literature because it includes analysis as being a step in developing programs (Boone, 1985; Houle, 1972; Knox, 1986 as cited in Knowles, et al., 2020). Each sector is listed below in greater detail:

**Figure 1**

*Andragogy in Practice Model*



*Note: Andragogy in Practice Inventory as published in Knowles et al., (2020 p. 80)*

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### *Goals and Purposes for Learning*

The goals and purposes for learning section is the outer ring of the conceptual model and shows the developmental outcomes of the program. The goals and purpose section is broken down into three categories: individual growth, institutional growth, and societal growth. These three categories are used by Knowles (1980) to describe the missions of adult education now connecting them directly to the six andragogical assumptions.

The BQA goals and purposes for learning are directly built into the program objectives. The goals and purposes for learning impacts the individual learner's growth, the institutional growth, as well as societal growth. BQA programs that are conducted by Cooperative Extension sets a primary goal to improve the practices beef cattle producers are using that insures healthy, wholesome, and safe beef, while meeting FDA, USDA, and EPA standards, that meet consumer satisfaction (BQA National Manual, n.d.). This goal can be broken down into the three sectors. Beef producers, collectively or individually, can have growth in knowledge of best practices when handling beef cattle. These participants have individual growth when they have implemented the practices which they have learned. Industrial growth is met when the beef that is provided on the market are meeting the FDA, USDA, and EPA standards. Societal growth is met when the consumers are satisfied knowing the beef that they are consuming is healthy, wholesome, and safe. These are influences that are a part of this study but will not be directly measured through the study.

### *Individual and Situational Differences*

The middle ring of andragogy in practice is portrayed as variables. There are many variables that impact adult learning, and these variables are grouped into categories of subject

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matter differences, situational differences, and individual learner differences (Knowles et al., 2020). These differences are situated for the BQA program below by the subject matter differences, individual learner differences, and situational differences.

Subject matter differences may require different learning strategies, such as individuals may be less likely to learn complex technical subject matter in a self-directed manner (Knowles et al., 2020). BQA curriculum and material is heavy complex technical subject matter. Subject matter plays a huge role in the learning environments, and not all subject matter can be taught or learned in the same way (Knowles et al., 2020). Therefore, the way BQA material is taught is based on the technical subject matter.

Situational differences have a broad category of variables. Situational differences are “any unique factors that may arise in a learning situation and incorporates several sets of influences” (Knowles et al., 2020 pg. 94). There are many given situational differences that could arise in the learning process. For the BQA programs, location may dictate the difference. For example, BQA programs across the United States, State of Tennessee, the Eastern region of Tennessee, and county by county are different by facilitator, location, and time of the year. Learning environments that are more rural compared to urban also makes a difference. Knowles et al., 2020 states that “learners in remote locations may be forced to be more self-directed, or perhaps less so, as well as learning in large groups may mean that learning activities are less tailored to particular life circumstances” (pg.84). The BQA program reaches counties that are rural as well as urban, with differing group sizes.

“An understanding of individual differences helps make andragogy more effective in practice, and eventually adult learning professionals use their understanding of educational differences to tailor adult learning experiences” (Knowles et al., 2020 pg. 85). There are nine

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different categories that is connected to individual learning differences (Jonassen and Grabowski, 1993): 1. general mental abilities, 2. primary mental abilities, 3. cognitive controls, 4. cognitive styles: information-gathering, 5. cognitive styles: information-organizing, 6. learning styles, 7. personality: attentional and engagement styles, 8. personality: expectancy and incentive styles, and 9. prior knowledge. The BQA program has a diverse array of participants. The individuals in the program vary in their approaches, strategies, and preferences during learning activities (Knowles et al., 2020). Individual differences are going to be a part of the BQA programs. This conceptual framework considers the unique nature of each individual participant.

The andragogy in practice conceptual framework considers the importance of goals and purposes, individual and situational differences, and the core adult learning principles. This model functions by: “1) conceptually separating the goals and purposes of learning from the core andragogical principles of the learning transaction so the interaction and adaptations can be more clearly defined, and 2) explicitly accounting for individual, situational, and subject matter differences in the learning situation” (Knowles et al., 2020 pg. 87). This conceptual framework will consider the diversity and unique nature of Cooperative Extension agent expanding from the Land-Grant University to the individual learner within a county.

### ***Six Core Adult Learning Principles***

Andragogy is built on six principles of adult learning. These six principles will be identified through the API that BQA participants will take at the conclusion of the BQA class. Listed below is a breakdown of the six principles in greater detail in addressing the conceptual framework.

1. **The Need to Know:** Knowles et al., 2020 identifies the learners need to know as the why, the what, and the how. The BQA program is an educational program that

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- addresses concepts within the beef industry, but this does not discredit the diversity of the program. Program participants will have different why, what, and how that are brought into the program.
2. The self-concept of the learner: Learner's self-concept is also different depending on the BQA participant that is coming into the program. The principle of self-concept is that the learner moves from being more dependent to more independent of their learning. Knowles et al., 2020 states that self-concept develops organically compared to how our culture does not nurture development of abilities to be self-directed and autonomous. The development and range of self-directedness of learners will also be diverse.
  3. Prior experience: Participants in the program will be just as unique as the individual participant's genetics. Participants will bring in resources and mental models that are unique to the experiences of the learner. "The richest resource for learning resides in the adult learners themselves" (Knowles et al., 2020 pg. 44). Previous experiences can also have negative impacts on the learners as well as serving to have greater impacts. These negative experiences are just as valuable as those that have a positive impact, but Extension agents need to be aware of those negative experiences as well.
  4. Readiness to learn: Knowles et al., (2020) states that adult learners become ready to learn things that they need and to be able to do effectively in order to cope effectively with their real world. These life-related tasks are also steps to greater development for the learner. These experiences will change depending on the developmental stages of the learner.

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5. Orientation to learn: This principle is broken into two sectors, problem-centered and contextual. The BQA program addresses a great number of problems that were identified in the 1990's. Participants will bring in problems that they are hoping will be addressed within the program. These problems within their lives should be confronted with a solution, which will be applied to their real-life situation making it contextual.
6. Motivation: Motivation is broken down into internal motivation and external motivation. Internal motivation is the most potent and Tough (1978) found that all adults are motivated to keep growing and developing but usually get blocked by barriers such as lack of resources. External motivations can be identified as higher salaries, job promotions, or increased money whereas internal motivation can be seen as having higher job satisfaction, quality of life, or self-esteem. These motivations, whether internal or external, will be unique to the participants in the BQA program.

Adult learners in the BQA will bring in different views and perspectives that are based on these six principles. Extension agents need to be cognoscente and address these differences to meet the needs of the participants.

### ***Andragogy in Practice Inventory***

The Andragogy in Practice Inventory (API) Assessment was created as a psychometrically sound measurement instrument to create a deeper understanding of andragogy. The API is a questionnaire implementing a Likert-type scale that ranges from strongly disagree to strongly agree. The API consists of 39 items that are designed to measure ten variables in two different domains of andragogical principles and andragogical design elements (Knowles et al., 2020). The API was developed to assess the extent to which learners observe the learning activities they

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participate match with the principles of andragogy and andragogy process design (Knowles et al., 2020). The API is divided into two sections of andragogical principles scales and andragogical design scales.

Two studies which tested the validity of the API were found in the search of the literature. Park et al. (2016) states that the reliability of the API was .82, as well as Yusoff (2011), states the reliability was .87 with Cronbach's alpha reliability analysis. Yusoff (2011) set out with a main objective to test the validity and the reliability of the API among 196 first year medical students in Malaysia. Yusoff (2011) states the reliability was .87 with Cronbach's alpha reliability analysis. Park et al. (2016) was a study with the purpose to assess the validity of the API and to examine the relationships between adult learning principles and the learner satisfaction in Jordanian context with 305 responses. The results were .82 with Cronbach's alpha reliability analysis.

**Capitalization of Assumptions- Andragogical Process.** Many critics of andragogy believed that in adult education, each adult could be taught just like a child. Knowles (1980) stated that through research on adult education that it has been increasingly apparent that adults were more than just grown-up children, and adults require different principles and techniques. Therefore, Knowles (1980) called upon adult agents to incorporate a seven-step process of creating a cooperative learning environment, planning goals mutually, diagnosing learners needs and interests, helping learners formulate learning objectives based on their needs and individual interests, designing sequential activities to achieve these objectives, carrying out the design to meet objectives with selected methods, materials, and resources, and evaluating the quality of the learner experience for the learner that included reassigning needs to continued learning to implement and capitalize on the assumptions of andragogy (Figure 2).

### Figure 2



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*Andragogical design- the seven- step process for agents to implement and capitalize on the assumptions of andragogy*



Note: Adapted from Knowles et al (2020) *andragogy in practice steps*.

The seven-step process is designed to take the six assumptions of adult learners, and to implore agents to build and implement programs based on these steps. The seven-step process was designed to provide procedures and resources for helping learners acquire information and skills. The andragogical process is most ideal when steps are completed in order.

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### **Chapter 3: Methodology**

This chapter begins with an overview of the purpose, the research questions, and the theoretical basis for this study. It is followed by an explanation of the research design which includes a summary of the selection processes for the case study and the embedded case studies, and the processes for carrying out and analyzing API and Supervisor semi-structured interviews. The chapter will conclude with the trustworthiness of the data and the study's limitations.

#### **Purpose and Research Questions**

The purpose of this study was to gain insight and understanding of the role that andragogy has within Tennessee BQA programs and to create recommendations that are appropriate to increase program effectiveness. The findings of this research can be used to help Extension agents understand how andragogy is being used within a program held by Extension and can be used to help encourage the use and practice of andragogical processes while capitalizing on the principles. The study will explore comparisons from a county-to-county base as well as an agent-to-agent base.

Two main gaps in the literature have been identified in this study, 1) there is a lack of evidence found in the literature review that educational teaching is being evaluated in BQA programs, and 2) there is a lack of evidence found in the literature review that educational theories have been researched or tested within the context of the BQA program.

Three research questions guided this research study:

1. How do Extension agents follow an andragogical process?
2. What six andragogical principles do BQA participants bring into the program?
3. What connections between teaching and learning can be made between different teaching approaches of county agents and the learning of the participants?

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Yin (2018) states that having a theory will later play a crucial role in helping you to generalize the lessons learned from the case study. Andragogy is an educational theory that is an approach to teaching adults. This educational theory is used to identify reasons participants are continuing their education and participating in the Tennessee BQA program. The connections between theory, the research questions, interview questions, and data collection are outlined below in table 2.

**Table 2**

*Alignment of Research Questions, Propositions, Semi-Structured Interview Questions, Andragogy in Practice Inventory (API) Assessment, Data Collection Methods and Supporting Literature*

<b>Research Questions</b>	<b>Proposition and Theoretical basis for research questions</b>	<b>Supporting Literature</b>	<b>Data Collection Methods</b>
1.) How do Extension agents follow an andragogical process?	Extension agents should follow an andragogical process if andragogy is present as a theory. The Extension agents will be following an andragogical process by preparing the learner, creating a cooperative climate, have mutual planning, diagnosis of	(Knowles et al., 2020) (Blondy, 20007)	Andragogy in Practice Inventory (API) assessment will identify if Extension agents are using an andragogical process.  Semi-structured interview questions asking on the 7-step andragogical process.

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	<p>the learner's needs, setting of objectives for the learners, designing the program for learner experience, creating opportunities to learn based on the diverse needs of learners, and evaluate the learner and make efforts to meet the needs of learners for life-long learning.</p>		
<p>2.) What six assumptions of andragogy do BQA participants bring into the program?</p>	<p>Extension agents should know and be able to capitalize on these assumptions using andragogy in practice.</p>	<p>(Blondy, 2007) (Kurt, 2020) (Conrad &amp; Donaldson, 2004) (Knowles et al., 2020)</p>	<p>Andragogy in Practice Inventory (API) assessment will identify what six assumptions are being used and to what extent.</p>
<p>3.) What connections between teaching and learning can be made between different teaching approaches of county agents and the</p>	<p>This question will identify how andragogy in practice is being used based on an Extension agent perspective and how learning is affected.</p>	<p>(Knowles et al., 2020)</p>	<p>Comparison of API and semi-structured interviews to see how each compare while creating a deeper understanding of the BQA program in TN.</p>

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learning of the participants?			
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### **Research Design**

This research has exploratory aspects that align with a qualitative research approach while also using quantitative data to explain the finite approach among those of andragogy. A case study is an empirical method that investigates a contemporary phenomenon in depth and within its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident (Yin, 2018; Ridder, 2017). The research is a single-case study design that is embedded with multiple units of analysis. The embedded case study is used to describe the phenomena of andragogy within the context of the individual BQA participant (student) and the BQA facilitator (Extension educator) as well as program area (County BQA Program).

The study uses multiple cases which allow greater insight into how the counties within the state of Tennessee differ and how the program varies between counties. County programs across the state vary greatly, but the selection of the counties is justified by the use of inclusion and exclusion criteria (Yin, 2009). Inclusion and exclusion criteria were used to help create a more applicable sample to select from, and to increase the likelihood of producing reliable and reproducible results. There was careful consideration in the selection of counties that was used to provide meaningful data. Focused attention was given to connect findings back to counties through the analysis of the data.

### ***County Program, Extension Educator, and Participant Selection***

Counties and Extension agents were selected through purposeful sampling. Creswell and Poth (2018) describe purposeful sampling as a sample that will intentionally sample a group of

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people that can best inform the researcher about the research problem under examination (p. 148).

The study intentionally sampled four counties that have:

1. A high number of BQA program participants that passed the program requirements to obtain a certification.
2. Extension agents rather than other personnel who taught the BQA program.

Standard deviation was calculated based on the number of BQA Program participants that were reported to the state to identify the top counties with the highest number of BQA certification holders from 2017-2022 for selection of the counties. The top 10 counties were: Greene, Lincoln, Washington, Claiborne, Wilson, Bedford, Lawrence, Overton, Hawkins, and White. All counties listed with high certification holding rates had Extension agents who teach the curriculum. Three counties out of the top 10 counties were selected using randomized purposeful sampling. The ten counties were run through Randomizer ®, a random sampling tool, and three counties were generated. The three counties randomly selected were kept anonymous. Extension agents were selected using the inclusion criteria of teaching the course and being the Extension agent in the counties selected using the inclusion/exclusion criteria. The three counties are referenced to as county A, county B, and county C.

An additional county (County D) was selected midway through the data collection process. County B does not have spring BQA programs, so an additional county was chosen for the comparison between the API and the semi-structured interviews. The county was selected after approval of the research committee. A member of the research committee reached out to the seven counties that were a part of the top 10 who were not previously selected to identify whether any agents were hosting classes soon. County D met the previously defined inclusion/exclusion criteria

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and was hosting a program in the desired timeline. The four counties were evenly distributed in the three regions of Tennessee- western, central, and eastern (two counties represented).

The four counties were selected using a purposeful sampling technique. Creswell and Polk (2018) define random purposeful sampling as adding credibility to a sample when the potential purposeful sample size is too large (p. 159). The BQA participants of each program consented to taking the API at the conclusion of the BQA program (Appendix C). The assessment was given at the conclusion of the BQA learning program as suggested by Knowles et al., (2020). Three of the selected agents handed out the API at the conclusion of the BQA training program.

The API was offered in three modes, through a web-based program called Question Pro ®, a hard copy assessment for those who prefer paper format, or orally for those who are illiterate or prefer the assessment to be given orally. Within county A, county C, and county D, those who consented all selected the paper format. The API was scanned and sent through email to the primary researcher. The API results were also sent through the postal mail system to a primary address. County B does not host a spring BQA session. The county agent sent the API web-based Question Pro survey to participants from his October class through email, but no responses were received, and it was determined this would not be consistent with Knowles (2020) API protocol.

### **Semi-structured Extension Agent interviews**

The semi-structured interviews were conducted with the Extension agents to identify if and how andragogy and the process of andragogy was used within the BQA program in the selected counties. This section outlines the process of the conducted pilot interviews, the coding process, and the development of prior codes and emergent codes. The interview protocol (Appendix B) was strictly followed and resembled a guided conversation as suggested by Yin (2018).

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### **Pilot Interviews**

A pilot test is used to help assist and guide you to refine data collection plans with respect to both the content of the data and the procedures to be followed (Yin, 2018). A pilot test was used to help refine the data collection procedures and questions of the interviews with Extension educators. Yin (2018) describes a pilot test as the “dress rehearsal,” where the data collection plan that is used is as faithful to the final plan as possible (p. 107).

Two pilot tests were conducted for this study. The first pilot test was conducted in the spring semester of 2022, and the second pilot test was conducted after Institutional Review Board (IRB) determination as not human subjects research in December 2022. The first pilot test was conducted for practice as required for a research class assignment. The first pilot test was recorded using Zoom ® and an additional recording device. This pilot test was used to practice the process of setting up the interview, recording the interview, and transcribing the recording. The first pilot test was not coded using the predetermined codes (Appendix D) because the determined codes were not yet created. The second pilot test was conducted to ensure the study research questions were being answered with the interview protocol (Appendix B). The pilot test was recorded using two recording devices- Zoom ® and an additional recording device. The recording was then transcribed using Otter.ai ®. The transcribed interview was sent back to the pilot test interviewee for member checking. The interviewee approved the document, and a preliminary reading of the interview was read through three times before the coding process began. The interview document was coded using ATLAS.ti ® with the predetermined codes (Appendix D). Once the coding process was completed, analysis of the data was then sorted to identify if the protocol questions



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answered the research questions. The pilot test was used to help refine interview protocols, questions, and data collection procedures.

The first pilot test was primarily used for practice. The second pilot test showed that there were questions present in the protocol that were needed to answer the research questions.

Through the analysis of the two pilot test data sets, changes were needing to be made regarding moving the questions in the protocol around, and questions were needing to be added. There was a question added to the protocol to answer step one of the andragogical process of preparing the learner. An additional question was added about mutually planning with program participants prior to the start of the class, as well as moving questions around mutually planning toward the first questions asked in the protocol. There were changes added to include examples of the needs around fitting the diverse needs of participants.

### **Development of predetermined codes and emergent codes**

The predetermined codes were created using Knowles et al. (2020) andragogical process. Predetermined codes were developed through research of the literature and interview questions, while emergent codes originated from the analysis of the data. The predetermined codes and emergent codes are listed as a code book in Appendix D. Only one emergent code was identified. The emergent code was alignment of objectives. The alignment of objectives code was coded in place of setting of objectives.

### ***Data Analysis***

The interviews were recorded using Zoom, and with an additional recording device. The recordings were transcribed using Otter.ai ® for the coding process. Transcripts were provided to

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the interviewees for member-checking within a week of the interview date. The approved transcript was coded using ATLAS.ti ®.

A preliminary read through of the interview transcripts was conducted three times before the coding process begins. Creswell and Poth (2018) advise to take notes while reading, sketch reflective thinking, and to summarize the field notes during the reading and memoing emergent ideas. The notes helped develop the emergent codes that were not identified with the pre-determined codes that were identified. The convergent design was used during the coding process of the qualitative data. Additional coders and the main researcher met after coding to compare the codes which they had coded. During these debriefing meetings, an additional notetaker was taking notes on the codes all coders had and where there was disagreement or agreement for intercoder reliability to be calculated.

The transcripts were transcribed using Otter.ai ® immediately after the interview was complete. Transcripts were sent back to the county agents who participated in the semi-structured interview over email. Every county agent read through the transcript and sent back they had approved it was transcribed correctly and they approved.

Once semi-structured interview transcripts were approved through member checking, the transcripts were sent to two additional coders for the coding process. Once all the coders had completed the coding, group meetings were held. The group meetings were once a week for four weeks. One transcript was reviewed each week. County C was the first transcript reviewed, then county B and county A followed. County D was the last county to be reviewed. The multiple analysts met and debriefed over the transcripts on the codes they had coded. During the debriefing sessions, the coders spoke through reasons on why they coded certain statements the

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way they coded. There were conversations about what codes were appropriate versus what codes were not for selected statements. The final decision was left up to me, the main coder.

There was an additional note taker who sat in with the three coders during the reviewing process. The note taker had the transcript in a Microsoft Word ® document. The notetaker would add comments based on what statements belonged to which code from which coder. After the conclusion of the discussion between the coders on which code belonged, the note taker added which coder had which statement coded on the side. The approach used was advised by Dean Freelon, PhD (ReCal3: Reliability for 3+ Coders, n.d.). The results were then entered into the ReCal3 ® online utility that computed intercoder reliability coefficients which calculated four of the most popular intercoder reliability coefficients: Average Pairwise Agreement, Fleiss' Kappa, Average Pairwise Cohen's Kappa, and Krippendorff's Alpha (Appendix E).

### **Andragogy in Practice Inventory (API) Assessment**

The API in this research was used to identify how participants and Extension agents used an andragogical process and the specific principles that were being used (Appendix C). The API is a Likert scale survey that contains 60 questions and measures 10 variables across the andragogical principles and the andragogical process. The principles section had questions in categories of orientation to learn, instinct motivation to learn, prior experience, self-directed learning, readiness to learn, and need to know. The andragogical process had questions in categories of prepare the learner, climate setting, mutual planning, diagnosis of learner needs, setting of objectives, design of learner experience, learning activities, and evaluation. The scoring is on a Likert scale ranging from strongly disagree to strongly agree. API results falling on the Likert scale are not weighted, meaning strongly disagree is equal to strongly agree numerically.

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This was to obtain a count of individual responses. The counts of individual responses (representative of all sampled counties) on the API were aggregated on a question-by-question basis. Answers to each question on the API were summed and grouped by each possibility on the Likert scale and then graphically displayed to show percent distribution of the BQA participants answers to the API. The graphs produced display the percent distribution within the Likert scale for answers to each question on the API e.g., for all sampled counties: 75% answered strongly agree and 25% answered agree for Question 25. For each question, the mean was calculated based on the Likert scale of: 1-1.9 strongly disagree, 2- 2.9 disagree, 3-3.9 neither agree or disagree, 4- 4.9 agree, 5 strongly agree.

In this study, the API could have been used in paper format, an online/web-based survey using Question Pro®, or given orally. The option of API being given orally was added to this study because of a conversation in a pilot session on participants not being able to read or who may not be comfortable using the other versions. All the participants took the API in paper format, no participants opted for the web-based or orally administered instrument. The API was given at the conclusion of the programs on the last day of the program as recommended by Knowles et al. (2020). The API results are confidential. Participants who responded to the API did not input their name within the survey.

The API is expressed by the two distinct domains of andragogical principles scales and the andragogical design elements. The API version four scoring key was used as listed below in Table 3 (Knowles et al., 2020). The API was used to identify the county group percentages, and to also compare the entire group (all sampled counties) API to identify the participants and how results compare across the state. The scoring key is split into two different categories to identify the andragogical principles that learners have, and to identify the andragogical process that the

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agents have followed. The *Question Numbers* column in Table 3 corresponds with the first column of the categories of andragogical principles and andragogical process. The process of determining the presence of each principle and design element in the BQA programs involved summing respondents scores for each question listed by row in the *Question Numbers* column.

The APIs that were received from each county were entered into Question Pro® in their own survey section. This step was completed for the ease of having the APIs in separate sections for exporting purposes. After these were divided by county and exported then all the counties were merged into one Question Pro® survey section. This was completed for the complete set of APIs (county A, county C, and county D) to all be in one survey for exporting purposes. Once exported, the andragogical principle group and the andragogical design categories were labeled for the purpose to have the questions group in their appropriate category (i.e. andragogical principle- mutual planning would be a group with questions 1, 4, 5, and 9). The categories were then calculated based on the percentages of the group on who answered based on the Likert scale. For each row in Table 3, if the results based on percentages in the Likert scale were high, then it was inferred that the principle or design element was likely present in the sampled BQA program.

### **Table 3**

*API Version Four Scoring Key- The scoring key is used to determine the question numbers and their specific principle or design step in the category of andragogical principles or andragogical design.*

<i>Categories in andragogical principles</i>	<i>Question Numbers</i>
Andragogical principles- Orientation to learn	1, 4, 5, 9

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Andragogical principles- intrinsic motivation to learn	2, 8, 12, 19
Andragogical principles- Prior Experience	3, 10, 17
Andragogical principles- Self-directed learning	6, 14, 16, 21, 23
Andragogical principles- Readiness to learn	7, 11, 15, 18
Andragogical principles- Need to know	13, 20, 22, 24
<i>Categories in andragogical design</i>	<i>Question Numbers</i>
Andragogical design elements- Prepare the learner	25, 27, 29, 32, 36
Andragogical design elements- Climate setting	28, 30, 33, 35, 38, 40
Andragogical design elements- Mutual planning	26, 31, 37, 39
Andragogical design elements- Diagnosis of learning needs	34, 41, 42, 49
Andragogical design elements- Setting of objectives	43, 44, 45, 47, 56
Andragogical design elements- Design of the learner experience	46, 50, 51, 52

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Andragogical design elements- Learning activities	48, 53, 55, 57, 59
Andragogical design elements- Evaluation	54, 58, 60

Note: *Table 19.1 API version 4 Scoring Key* as adapted from Knowles et al (2020). The questions associated with this scoring key can be found in Appendix E.

### **Comparison of County Semi-structured Interviews and API**

Comparison of the semi-structured interviews and the API results around the andragogical design (questions 25-60) was performed on a county-by-county basis. Questions 25-60 of the API are related the only questions in the API related to the andragogical design and are used to assess the BQA program participants feedback as to how the instructor would have implemented andragogical design as part of the program. This was tested without the need for participants to understand andragogy because the API design accounts for this knowledge gap. Each county's API results from questions 25-60 were compared against the semi structured interview that was performed before each program began in the respective counties. The analysis of this portion involved comparison of the semi-structured interviews to the API and the specifics on how each agent approached each andragogical design element which was identified in the semi-structured interview and how the BQA participants either agreed or disagreed on how the agent followed the andragogical design process, also known as the seven steps (Figure 2). This allowed assessment of the learning process and how it is in alignment with the teaching perspectives used in each county. This comparison was used to identify if the participants had identified the specific steps that were taken by the agent to follow the andragogical process, and

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the semi-structured interview was compared to identify how the agent had followed the andragogical process themselves.

### ***Trustworthiness of data***

This section addresses the trustworthiness of the data. This section is broken down into credibility, validity, and dependability. The section will conclude with the limitations of the study.

**Credibility.** Creswell & Poth, 2018 suggest that triangulation of data sources, methods, and investigators be used to create credibility. This research study used a comparison of qualitative and quantitative data, multiple analysts in the review of data, and the use of a theory (Poth, 2015; Yin, 2018). Research member checking was used as suggested as a strategy for credibility (Creswell & Poth, 2018).

Andragogy was the theory that was used in this study. The theory was used to develop the research design to identify if Tennessee BQA programs had presences of the adult learning theory and how it was being used. The andragogical process was developed as a seven-step process for adult learning instructors to use, and this was what was used to develop the semi-structured protocol. The API was developed by Knowles et al., (2020) to have learning participants to complete to identify how the instructors followed an andragogical process and the six andragogical learning principles they have. Both instruments were used for the use of the theory to develop the case study.

**Member checking.** All semi-structured interviews were transcribed and sent back to the county agents who had participated. All county agents had one week to respond before a follow up phone call was sent. In this study, all county agents responded within four days with approval that the transcript was without error.



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**Multiple coders.** There were multiple coders who coded the transcripts. The coders had a debrief meeting of their codes and what they had coded for statements. These meetings concluded with all coders agreeing with the codes.

**Intercoder Reliability.** Intercoder reliability was calculated using ReCal3. This process is used when studies have 3+ coders in a study. ReCal3 calculates the four most popular intercoder reliability of average pairwise percentage agreement, Fleiss' Kappa, Average Pairwise Cohen's Kappa, and Krippendorff's Alpha. The results for the intercoder reliability are listed in Appendix E.

**Validity.** This section will be addressed through the validity of the quantitative data and qualitative data. Quantitative research is concerned with validity at two levels: "the quality of the scores from the instruments used, and the quality of the conclusions that can be drawn from the results of the quantitative analysis" (Creswell & Clark, 2011). API has been used in previous research and has seen promising results in Cronbach alpha reliability analysis of .82 (Yusoff, 2011) and .87 (Park et al., 2016).

"Qualitative research is more focused on validity compared to reliability" which means, "assessing whether the information obtained through the qualitative is accurate through differing strategies" (Creswell & Clark, 2011 pg. 211). Creswell & Poth, 2018 suggests nine strategies for validity in qualitative research, but recommend that qualitative researchers engage in at least two in any given study. Out of the nine strategies, the research project here includes three strategies to create validity.

1. Corroborating evidence through triangulation of multiple data sources: In this study, four counties from across the state of Tennessee were included to create a deeper

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- understanding of what the overall teaching and learning findings will be form across the state. Two different data sources (semi-structured interviews and an assessment) were used to develop study conclusions. As well a theory will be used to drive this research to create external validity. Yin (2018) identified this as a tactic to create construct validity and external validity.
2. Member checking or seeking participant feedback: In this study, semi-structured interview participants were sent their interview transcripts over email to clarify anything they saw needed. The transcripts were sent a day to two days after the interview. The county agent had a week for member checking, after a week a phone call was made to the county agent. All agents had responded within four days over email. Yin (2018) identified this as a tactic to create reliability in a case study.
  3. Additional coders and the researcher debrief of data analysis: In this study, a debrief of the data and research process took place to increase validity. There was multiple discussion between coders to provide consistency and understanding in the coding process of each transcript. Yin (2018) identified this as a tactic to create internal validity.

### ***Limitations of this study***

The study has selected four cases across the state of Tennessee within each region based on an inclusion and exclusion criteria that emphasized congruency across the state of following an andragogical approach. A limitation will be that this study may not accurately represent the entirety of the state, with the inclusion and exclusion criteria, the study is missing the perspective of counties with a smaller number of participants. These four counties represent a rich picture of how andragogy is used in the top 10 counties that were chosen based on the inclusion and exclusion

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criteria. An additional study can be completed to identify how smaller number of participants can create changes.

With the Tennessee Agriculture Enhancement program being so prominent in Tennessee BQA, fall classes ranging from July to September could represent a higher number of participations. With this study being situated in the spring, lower participation in the BQA classes were evident and was a limitation to this study. County D only had four participants in the class. An additional study can be conducted to situate this study in the fall to identify a higher number of participants.

An additional limitation with the selection of counties using the inclusion and exclusion criteria where there were agents who do not teach spring classes and primarily teach fall classes. This limitation caused an unfolding of having to add an additional county of the top 10 to have a complete embedded case study with a semi-structured interview and API results.

## **Chapter 4: Findings**

### **Overview of Findings**

This section begins with an overview of the findings. The demographics of the semi-structured interview participants and the API participants. Then this section is followed by sections based on findings associated with the research questions. The section associated with Research question 1 focuses on the findings associated with the semi-structured interview results around how agents followed an andragogical process as well as questions 26-60 of the API. Research question 2 section will identify the findings associated with the API results and the six andragogical principles the participants possess. Research question 3 describes findings related to the connection between teaching in response to research question 1 and learning as related to research question 2. Responses to question 3 are presented by county to show comparison between results. Findings will conclude with how the results connect back to my conceptual framework, the andragogy in practice framework (Figure 1).

### **Demographics of Semi- Structured Interviews and API Survey Participants**

The demographics section will be addressed by county. Questions around demographics were asked of the agents who participated in the semi-structured Interviews and participants who participated in the BQA programs (Appendix B). The demographics findings are addressed within the following sections by semi-structured interviews and API participation.

#### ***Semi-Structured Interviews***

Agents were asked demographic questions as warm up questions in the semi-structured interview. The questions were: What is your title? What is your primary area of programming? Have you always been an Agriculture and Natural Resource (ANR) agent, or have you worked in another program? How long have you been an Extension educator? and How many years have you taught the BQA Program? The answers to the demographic questions are listed in Table 3

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**Table 3**

*Demographics of County Extension agents*

<b>County</b>	<b>Title</b>	<b>Multiple Extension Programming Years</b>	<b>Primary Area of Programming</b>	<b>Years agents have taught the BQA program</b>
County A	ANR Agent, Extension agent III	No Split Programming Years	Beef Cattle and Dairy Cattle	32 Years
County B	ANR agent, Extension agent III	No Split Programming Years	Beef Cattle and Row Crops	32 Years
County C	Extension County Director, and ANR, Extension agent III	9 years as a 4-H Extension Agent	Livestock and Forages	21 Years
County D	Extension County Director, and ANR, Extension agent III	19 years as a 4-H Extension Agent	Agriculture and Natural Resources	8 Years

All county agents were ANR agents, while county C agent and county D agent were both county directors. County agents were all in late career stages with promotions of agent level three.

County A and County B agents had no split programming years, while county C and County D agents both worked as 4-H youth development agent before working as an ANR agent. County D agent taught the BQA program the lowest number of years, and county B agent taught the BQA program the longest. All agents were at the highest promotion level that county agents can be promoted to as an Extension agent in Tennessee. This study demographic profile may not be typical in other counties across the state. There are agents who are in early to mid-career stages, compared to the later career stages that we identify in this study.

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### *Andragogy in Practice Inventory (API) demographics*

County A, C, and D participants all responded to the API using the paper format that was given at the conclusion of the last session in the program. During the data collection process with the semi-structured interviews, we found out that the agent in county B teaches predominately all fall classes and no spring classes, so there was not an API requested from this county.

Demographic questions were asked at the conclusion of the API survey. The demographics were the standard questions in the API. The demographic questions were: What is your gender? What is your race or ethnicity? What was the highest level of education you completed? and What is your age? A county location question was asked to keep track of what API responses were associated with certain counties. There were no surveys received from County B. The demographics are addressed by section below based on each question.

County A had 28 out of 28 participants who responded to the API with a response rate of 100%. One survey in county A was discarded because the participant was a minor. County C had 19 out of 31 participants respond to the API with a response rate of 61%. County D had 4 out 4 participants respond to the API with a response rate of 100%. There were some participants who failed or declined to answer the demographic questions. These participants were still used in the study with their responses of the API questions on the andragogical process and andragogical principles. The demographics in these counties are predominately high numbers of male, Caucasian, and over 50 years of age. County D had two participants who had master's degrees and had no participants that were over 50 years of age. When compared to the other two counties, this seems to be very different in sectors of county demographics. Compared to other parts of the state, demographics may differ significantly from urban to rural county areas.

#### **Table 4**

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### *API Demographics by Question*

API Demographics by Question													
	Gender		Race			Highest Level of Education					Age		
	Male	Female	White	Hispanic	Black	Some High School	High School	Associates Degree	BS	MS	26-40	41-55	<50
County A (n=26)	24	2	24	1	0	0	10	6	8	2	2	9	15
County C (n=19)	15	4	17	0	1	1	8	3	5	2	3	1	14
County D (n=4)	4	0	4	0	0	0	2	0	0	2	2	2	0

### **Research Question One: How Extension Agents Followed Andragogical Design**

Research question one was answered using semi-structured interviews and using the API.

The semi-structured interview was used to identify the perspective of the agents, and the API was used to identify the perspective of the participants in the program. This section will be broken up to first identify the findings from the semi-structured interviews. Then will conclude with the results from the API questions (26-60) that address the andragogical process.

### ***Semi-structured interview findings***

The Semi-structured interviewees were asked questions based on the andragogical process (Appendix B). The findings are organized by on the seven steps of the andragogical process (Figure 2). These include preparing the learner, creating a cooperative environment, mutually planning, diagnosis of learner needs and interests, setting of objectives, design of the learner experience, creation of learning activities, and evaluation of the program learning experience. The API asked questions around the design of the learner experience based on their perspective. Questions 25-60 of the API are questions that directly associated with how agents followed an andragogical process from the participants perspective. This section will begin with

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the semi-structured responses from the agents, and the section will end with the perspective of the BQA participants have on how the agents followed the andragogical seven step process.

### **Step one: Preparing the Learner and Creating a Cooperative Learning**

**Environment.** Step one of the andragogical process is to prepare the learner and create a cooperative learning environment. The first step of the andragogical process was used by the Extension agents in the early stages of planning the program, as well as within the start of the class. The findings will be listed below with supportive quotations on how the agents prepare the learner and create a cooperative learning environment.

*Preparing the Learner.* Through the analysis of the data, themes associated with preparing the learner emerged identifying the differing approaches that were taken by the Extension agents. Agents are to prepare the learner by informing the participants of what the program is and the expectations of the program so that their confidence will be increased. The seven themes identified around preparing the learner included:

- Preparing the learners through objective statements prior to the start of the class.
- Preparing the learners by talking about the program and expectations of the program through office walk-ins, prior relationships, or prior contact.
- Preparing the learners by addressing the concerns of the participants through different stages of the learning experiences.
- Preparing new learners through seeking out the beef producers who are not yet apart of the program.
- Preparing the learners by educating reasons on why beef producers should participate in the program.



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- Preparing the learners through the promotion and advertisement of the program on reasonings why.
- Preparing the new learners and not giving much thought into preparing learners who have participated in the class before.

These findings are listed below.

Two county agents stated that one of the ways they prepare the learner is through objective statements. Objective statements are what the participants will learn through the class, and how participation in the program will help assist them on their own operations. Agent A stated, "I always try to preface every class, this what we hope to learn during the class." Agent C stated,

Yeah, so usually just kind of go through the objective statement and telling them the benefits of going through the BQA program, and the things that they're going to learn that will help them on their operation that they might not have thought about before, that might help in terms of not only help their animal but marketing their animals as well.

Objective statements are one of the methods that agents used to prepare the learners in their programming class. This theme shows importance to this study because it identifies that agents are stating exactly what participants will be learning during their time in the BQA class. It also identifies that participants are being prepared on objectives that they may have not realized was part of the course initially.

Agent A shared two statements around how they prepare the learner through office walk-in visits, through prior relationships, and through prior contact. Agent A stated,

Whenever folks come in, and we have a lot of walk-ins in our office. People just come in looking for information and of course, we make them aware of everything that's available

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to them [including the BQA program]... so first of all, just making everybody aware, this is what we offer, this is what we have.

The agent also stated how they have prior contact with the participants, “Well with prior contact to probably 90% of these people through either a farm visit or an office visit or telephone call, we try to get some information from them.” Agent A prepares learners in a program by providing access to information, including the selection of programs that are available, based on their expectations and interests.

Agents with prior relationship and contact with participants can prepare learners through sharing information and addressing issues before the class, while also preparing the participants on what BQA is and the information that can be gained, and how this program can reach the needs of the participant, what programs are available to them and what to expect.

Preparing the learners by addressing the concerns of the participants through different stages of the learning experiences. Preparing the learner helps create confidence of the participants. To create confidence, there are times where participants have concerns. Agent A stated they prepare the learner through addressing those concerns. Agent A stated,

Once we get into that specific class, making sure that we covered all their concerns, even though that might lead you off the beaten path of teaching just a bit, and may take you away from your initial objectives- the main objective is to make sure they leave there with no questions.

Agents know that participants, just like most people, have concerns about starting something new. Participants may also have concerns with BQA techniques that they have addressed on their operations as well. Addressing the concerns of the participants before the

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program is preparing the learner by increasing the confidence of the participant prior to the start of the class.

Some producers in Tennessee have not participated in the program, Agent C stated that they try to find producers who have not participated in the program. Agent C stated,

When we first started BQA, you know, very few people knew even what that meant, they may have even been doing some of those things, but they didn't know that it was an organized effort by our state to designate those that know how to do the right things in term of giving medications to their animals. So, it's just a formality of identifying those folks that need to do so.

Agents seek out the producers who are not yet apart of the program, and this prepares the learner by giving the learner confidence that the agent cares about the well-being of the producers and their operations. The agent also created a relationship with the producer to understand that the producer may have a background with introducing some of the BQA objectives into their own operation without the formalized notion that this was an organized educational program. This also prepares the learner by knowing there is information that the participant is already familiar with, while also helping to create confidence to know the right handling processes with their cattle.

An agent stated that they do not take into consideration preparing the learner until there are new participants involved. Agent D stated,

My folks have been doing this since before I came into the role of ANR agent. So, they know basically what to expect. So, I don't have to do a lot of guidance, unless I have completely new farmers coming into the program.

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The participants that Agent D is most familiar have taken the class since they had begun teaching the course, so there was not much thought of preparing those learners. Although, when new producers come into the program, the agent thinks about how to better prepare those learners for the learning experience.

To follow up on participants who need to be identified, agents also inform the producers on why they should participate in the program. Agent B stated they prepare the learner through educating them on the reasons to participate in the program, stating “We basically try to go over some of the reasons why to go through the program, and the necessity of going through it to change our reputations on the standpoint of quality beef, and the production of beef that we have in Tennessee. And I think that is really the driving force behind it. Trying to improve some of the techniques and the things that we’re doing”.

Agents prepared the learner by explaining the benefits on participating in the BQA program. This prepares the learner to know what to expect, while it also gives them the confidence that is need to be able to understand the standpoints on what quality beef is, and how it could help them as a producer. It also increases the confidence to know that the techniques that they are doing on their operations will be improved.

***Creating a cooperative learning environment.*** Through the analysis of the data, creating a cooperative learning environment can be broken down into the differing themes associated with the approaches that were taken by the Extension agents. The themes associated with creating a cooperative learning environment are:

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- Agents created a cooperative learning environment by learned prior experience or prior knowledge of participants.
- Agents created a cooperative learning environment by knowing the reason for participation or the goals of the participants for other programs.
- Agents created a cooperative learning environment by knowing the goals through a prior relationship, a prior contact, or through a prior office walk-in.
- Agents created a cooperative learning environment by asking about obtainable goals and obtainable timeframes.

The findings are listed below based on the theme associated.

Agents created a cooperative learning environment through learning prior experience and knowledge of the participants. Agent A stated:

We have a lot of folks, more so now than earlier than in my career. But I see a big influx of people who have no experience whatsoever with livestock, but they have moved here, either in retirement or to follow a job and they live in the country and have a few acres, and they want to do the best job they can with it. So, they're seeking out things like Beef Quality Assurance, Master Beef Producer, and those types of programs.

Agent D also stated that he tried to create the cooperative environment through learning about the participants through creating dialogue stating, "I try to get them to talk to me."

Agents created a cooperative learning environment through creating a relationship and dialogue with the participants in the program. This creates a cooperative learning environment by knowing the participants, their goals, and their needs. When personal dialogue is created around

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why the participant is taking the program, then they can identify the goals and needs that are to be addressed during their program teaching. It also makes the participant feel like they are part of the program educational outlets.

Agents also created a cooperative learning environment through knowing the goals, reasons, opportunities for other programs, and knowing their preferred learning style to meet these goals. Agent C stated knowing participants goals for opportunities to participate in other programs, “Before the Grant program came about, they were coming because of needing information. You know they say a need to improve the health of their animals and how to do that properly... so it’ just a formality of identifying those folks that are needing to do so for that [the grant program].”

Agents created a cooperative learning environment by knowing the goals through a prior relationship, a prior contact, or through a prior office walk-in. Agents stated knowing the goals through creating and sustaining relationships through contacts with the participants. Agent A stated,

Well with prior contact to probably about 90% of these people through either a farm visit, an office visit, or telephone call to try to get some information from them- How much experience do you have? Have you done this before? What are your goals?... some people have cattle because they like seeing them. Some people have cattle to make money. Some people have cattle because of tradition. So, finding out those types of things out can kind of guide you, show how deep you go into certain subjects, and how you deal with those subjects as they come up.

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Agents made statements around knowing goals, reasons for participation, and needs of the individuals. When agents make an effort to know the participants in their programs, then they are creating a cooperative learning experience. When agents know their participants more personally, then they also get to know their goals and needs for the program as well.

Agent B stated the importance of Extension being people-centered in their practices.

Agent B stated,

I think more than anything, in Extension we are people oriented, we are in the people business, and we must build that relationship with those individuals. I can be a lot more effective after I've been in a county a certain period... I would go out and help them [participants], well not exactly help them, but I would go out and demonstrate just typical animal health practices.

Agent A stated the importance of the relationship,

Once you establish that personal relationship with 30 different people in the class, you kind of know what you need to talk about to bring forth things and work in that goal... that helps me as a I teach to know what to include, and how to present it".

Agent A stated creating a cooperative environment between them, the individual learner, and the group of learners stating, "Once you can get them interacting with everyone and they're comfortable and stating their mind then their mind is open, and I think they can learn better.

Extension was stated as being people oriented. As well, an agent stated the importance of the creation of relationships, and sustaining the relationships. When a relationship is created and sustained with participants in an educational program, there is trust that is created. With trust, it is more likely that participants will start to create more dialogue around the needs of the participants needs and goals within their operations.

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Agent D stated they ask questions to better know the participants and what their goals are, “I’ll usually asked a few preparatory questions about, if it is someone that I’m not familiar with, about what they’re currently doing in their operation”.

Agents created a cooperative learning environment by asking about obtainable goals and obtainable timeframes. Agent A stated that they ask follow-up questions on whether goals are applicable,

Once you get that [their goals], then you can start talking about, “Okay. Do you know where you are at now?” We had a person in class last night that said, “I’m wanting weaning weight of 650 pounds on my calves” So that is great, and that is a good goal to have. Now I ask, “What is your weaning weights today?” and they didn’t know. Well, first, you have to find out what they are now. Then you can identify those things that can move you from where you’re at.

Agents stated around creating a learning environment through asking questions to the participants. These questions were in alignment with what the participants goals are, as well as if they are obtainable goals with obtainable timeframes. Agents are creating a cooperative learning environment by knowing the goals and needs of the participants. As well, the agents are taking the extra step to examine if these goals are obtainable for the participant to have.

**Step two: Plan Goals Mutually.** Extension agents were not mutually planning with the participants prior to the class based on the analysis of the data. This means that agents did not work with the participants on the plan of the class prior to the start of the class. The findings suggest that agents may have previous mutually planned with participants in the past and that the agent completes solely by the agent. The themes associated with differing approaches were:

- The planning was solely by the Extension agent.



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- The agents had planned with participants in the in early career stages.

The planning was solely completed by the Extension agent. Agent C stated they planned the program themselves,

We set up a time, whether it be a hands-on type of class or a meeting in classroom type of class, and send out the notifications is ‘Hey, there is opportunities here, then producers can come if they would like.

Agent B stated, “There’s no planning with them [participants]. We promote the program, and we promote the dates and the times”. Agent D stated they look at who is participating in the class stating,

If it is, new participants, then I plan on doing the standard BQA presentation that we are provided with, if it is producers that I'm familiar with that have been through the program multiple times, then tend to be a little more fluid and talk more about current topics.

Agents were not mutually planning with the participants. Mostly all preplanning and preparing for the class were made solely by the agents. This means that agents were not preplanning the program with the participants on date of the program, any additional content, or the learning activities that participants would like to participate in.

**Step three: Diagnosis of Learner Needs and Interests.** Extension agents were diagnosing learning needs and interests in a variety of ways. The agents mentioned seeing a change in the identified needs whenever the requirement to participate in other programs came into effect. The themes associated with diagnosis of learner needs and interests are:

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- Agents diagnosed learner needs and interests by probing the participants with questions to learn as much as they can about the participants needs, interests, and goals.
- Agents diagnosed learner needs and interests by identifying their primary need as requirement for other programs.
- Agents diagnosed learner needs and interests by identifying their primary need for knowledge.
- Agents diagnosed learner needs and interests through the expiration of BQA certification.
- Agents diagnosed learner needs and interests by identification on how differences in years of experiences and needs play a role.
- Agents diagnosed learner needs and interests by using pretests to identify the needs and interest of the participants.

Agents diagnosed learner need and interests by probing the participants with questions to learn as much as they can about the participants needs, interests, and goals. Agents diagnosed learners need through asking questions, Agent A stated, “We try to find out as much as we can about all the people before they enter into the class.” Agent D stated, “I’ll usually asked a few preparatory questions about, if it is someone that I’m not familiar with, about what they’re currently doing in their operation.”

Diagnosis of learner needs is created by the agent asking questions to the participant about their personal needs and goals. Agents also asked what the current state of the producer’s beef operation was if they were not familiar with the participant to identify the personal needs

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that the participant may not be fully aware of. When agents asked questions about the participant and the reasons in partaking in the course, this was diagnosing the learners personal needs and goals, rather than assuming what they need.

Agents diagnosed learner needs and interests by identifying their primary need as requirement for other programs. With BQA being a requirement for other programs, Agents stated a great number of their participant's learning need was to be able to participate in other programs. Agent A stated,

First and foremost, this particular training is required for participation in other programs. So, that is a great incentive for folks to participate.

Agent C stated: "Well we try to market the opportunity to all producers, and one of the things we have an advantage here in Tennessee is there's an incentive for producers that they go through the BQA training and in addition to the knowledge gained and the practices that we hope that they learn to do that will improve their operation, there's a grant program that if they go through BQA, then they can qualify to get some grant funding money. So, it's a multiple approach, but in addition to teach them some things- that would be really beneficial to their farm- is a grant program opportunity in Tennessee, that draws the need to take the classes as well.

Agent B stated that their primary participant is for the requirement to participate in other programs. The agent stated,

A lot of them now are doing it because it is a requirement for Tennessee agricultural Enhancement Program. They can't apply for their cost share on their haybarns, their equipment, or their bulls unless they are BQA certified. So, I would say that is the primary motivation right now. And really the thing that is driven, because this is

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mandated from Tennessee Department of Agriculture for them to participate in the Tennessee Agricultural Enhancement Program. So, there is the carrot, and a lot of people are doing it because of that. Just to be honest with you.

Agents diagnosed learner needs and interests through the expiration of BQA certification.

Agent B stated that Tennessee Cattlemen's keeps records of current and expired BQA certifications. The agent stated that around participants having a need to become recertified, "They get a letter from the Tennessee Cattlemen's Association where they send their certification that is expired and needs to get it done."

Agents noticed a trend change whenever requirement of BQA was needed for participation in other programs. When this requirement went into effect, agents noticed that producers primary need for participation in the program was now the need for participation in other programs. Agents now had to diagnosis learners needs as primary needs for participation in other programs. Agents being aware of this, shows that these agents are learner needs based on primary interest in other programs.

Agents diagnosed learner needs and interests by identifying their primary need for knowledge. Agents stated that some participants are participating in the program because of the need to know. Agent C stated, "Before the grant program came about, they were coming because they were needing the information because they saw a need to improve the health of their animals and how to do it properly". As well as Agent B stating,

You know, there could be a segment of folks doing it for the educational component. And I definitely could see that. There are some folks that take it very seriously when we go through the training.

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Agents diagnosed learner needs and interests by identification on how differences in years of experiences and needs play a role and using a pretest as a measurable tool to measure this. Agents understood the differences in prior knowledge and experience being a variable in the participants diagnosis of learner needs. Agent C measure prior knowledge and experience through a pre-test that is given, “We actually do a pretest and posttest. So, we use that to kind of test their knowledge before they take the class”. Agent A stated the differences in the people that he interacts with stating,

In adult education, on my end, my clientele that I interact with on a normal basis is such a wide range. You can look at it two ways, you can look at it as a huge challenge to try to talk to those people who come from New York City six months ago and never seen a cow and they want to get into the cattle business. And then you have some people who have been raising cattle all their life over here on the other side. Yeah, some of my coworkers look at it as a huge annoyance to try to be able to include these people, and I look at it as a great opportunity to be able to develop the skills. You know, I hope after 38 years, I’ve been able to develop teaching skills that help a wide variety of people... You know, I try to get it to where everybody feels invested, involved, and actually want to participate.

Agents are still diagnosing the learners needs by the amount of experience participants have, and their primary need of knowledge. As stated, agents are aware of the differences between their clientele and the differences in learning needs and prior experience rather than assuming. Agents are asking questions to identify the needs of the participants.

**Step four: Helping Learners Formulate Learning Objectives Based on Their Needs and Individual Interests.** Through the analysis of the data, the research and additional coders found that setting of objectives should be changed to alignment of objectives with programs such as

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BQA. The step was identified as alignment of objectives, compared to setting of objectives, because the agents do not set the BQA program objectives. National BQA and State Institutions are the programs who set objective standards. The agents take the set BQA objectives and align the objectives to meet individual goals and other program objectives. The alignment statement shows that Extension agents do not create their own lesson objectives, but the agents are aligning the needs and individual goals back to the participate as well as other institutional and societal goals that are associated with BQA. Themes associated with alignment of objectives are:

- Agents aligned the objectives of the BQA to meet other goals of other programs in Tennessee while meeting the goals, needs, and interests of the participants.
- The Importance of meeting societal goals as well as the objectives of the BQA program and the individual goals.

The findings from the analysis of the data are found below.

Agents aligned the objectives of the BQA to meet other goals of other programs in Tennessee while meeting the goals, needs, and interests of the participants. Agent A stated, “First and foremost, this particular training is required for participation in other programs.” then following up with this statement,

We try to cover the objectives there, there is a set of objectives in BQA training, and we make sure to cover those mentioned in several different ways... Finding out those types of things [Goals] out can kind of guide you into how deep you go into certain subjects, and how you deal with those subjects as they come up.

Agent B stated,

Money. Cost share. You know, it’s the same thing on some of the other programs, whether cover crops or [Pause]. It’s all the dollars that are in demand... and that is really

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what is driving it. If there wasn't a cost share program, I don't know that we'd have a lot of participation in the BQA program.

Agent C stated, "A lot of them are doing it now because it is a requirement for Tennessee Agriculture Enhancement Program." Agent D stated around the common theme of the Tennessee Agriculture Enhancement Program, "By in large, the reason they are participating is because Tennessee Department of Agriculture requires Beef Quality Assurance in order to qualify to receive a Tennessee Ag Enhancement grant". Agent D followed with an additional statement, "The general dialogue back and forth with my producers. I'm throwing out what standard procedures would be laid out by UT or any other university, and then many times they tell me how they've adapted to fit different situations". Agent A stated they make sure that the individuals' goals and needs were met before they left the class, even though it may take the class away from the objectives, stating,

[We] want to make sure that we covered all their concerns, even though that may lead us off the beaten path of teaching a little bit and may take away from your objectives. The total objectives is to make sure they leave there with no questions.

All agents mentioned the requirement of the additional programs, the BQA program and the program's objectives, and the needs and goals of the participants. With this information, agents made it a point to align the objectives of all three to be able to meet the institutional and overall the societal goals of the program.

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Importance of meeting societal goals as well as the objectives of the BQA program and the individual goals. Agent A stated,

So, while that is one of the things that get some people involved, I think the quality of the program- the importance of understanding that we're dealing with the public, even in our rural, very agricultural county- they understand that we've got a job to do. And our job is to make sure that the general public knows what we're doing, why we're doing it, and why it's important. And that we do have a safe, wholesome product from animals that receive safe and humane care.

Agent A actually stated the main objective and mission is to meet the societal goal and need. He makes sure that participants understand that there are public entities involved, and the initial mission of BQA program was to reduce the injection site abscesses and improve consumer satisfaction. There was alignment of objectives created when the agent involved the primary BQA mission and the producers are having a safe product at the end.

**Step five: Designing Sequential Activities to Achieve These Objectives.** Extension agents designed their programming classes around their participants to meet the objectives of the program. Agents used a variety of different ways to adapt the objectives to meet the individual needs of participants. The themes identified associated around agents designing sequential activities to achieve these objectives are around the participants' general and primary mental abilities, cognitive controls, cognitive styles, learning styles, prior knowledge, and physical abilities by:

- Agents adapted their classes around the specific participants in the class.
- Agents adapted to audience members' primary language.
- Agents adapted based on audience members' cognitive abilities.



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- Agents adapted based on audience members' primary age.
- Agents did not think about adaptations prior to the learning experience.

The findings associated with step five, design of learner experience, are described in greater detail below.

Agents stated they adapted their classes to fit the diverse needs of the participants by adapting around each audience. Agent A stated they adapt their classes to tailor each class,

Well, nothing really formal, most everything has been informal. We look at our audience, think about the best way to connect with them, and get them to talking. So, it is kind of like sticking your head into the lion's mouth, you know, you just go in and every class is a little different.

Agents adapted to audience members' primary language. Agent A stated that they adapted their class around primary language of participants,

We do have a fair amount of... well, not a fair amount, but folks with... I guess challenges with the English language. So not that I am proficient in any other language, but we found a way to connect with them and how to make contact with them. And sometimes it gets kind of interesting with my smattering Spanish and English with my Appalachian dialect. But we work all of those things.

Agents adapted based on audience members' cognitive abilities. Agent C stated that some of their members cannot read or write so they try to adapt based on their primary cognitive abilities.

There are classes that we teach that we have producers that can't read or write. So, when those situations come up, you know, I try to do it in a very low-key manner not to point

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those people out. And you know, we get them to the side. So, it just personally one on one to help them go through the program.

Agent A stated around cognitive abilities with the same approach of not drawing attention to the participant,

I have one person who is hearing impaired. And it does make it difficult sometimes, but we put that person in front of the class, and make sure we face that person and talk loud and clear. And he does lip read. So, you just have to adapt as you go.

All of adaptations are mentioned by Knowles (2020) as being primary differences in learners. Agents are adapting their teaching to meet these diverse needs of their participants. These are great examples of how agents are designing a learning experience that can accommodate most all modalities, while also being cautious that there are learning differences between participants.

Adapting based on audiences' primary audience members' ages. Agents stated that they adapt their teaching to the primary audience style, as well to the age of the audience. Agent A stated, "You have to adapt as you go along. The older folks take a different approach to get them interested. There is some younger folks. And you know, it depends on why they are there."

Agent C stated they adapt to farmers primary learning style, "Well in teaching farmers they like to see things hands on... so I am a believer in utilizing as much hands-on type of learning as possible." Agent B stated they also adapted their classes around farmers,

We have had some bull calves that have been brought by Dr. [Vet name] to go over the practices, demonstrating practices, and have the farmers the opportunity to use some of the techniques, and some of the things Dr. [Vet name] was talking on. And we end up

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having just about every class in that High School filtered through that demonstration on that day. I think that shocked the both of us on participation from a lot of the kids that probably would have never had anything to do with livestock before in their lives that actually had some hands-on experience there. But we ended up, I think, having a tremendous impact.

Primary age of participant needs to be considered. There are differences between learning experiences in K-12 education of older participants and younger participants. Primary audience of beef producers or farmers is going to change the way you adapt your teaching compared to other occupations. Agents stated that they adapted they design of the learning experience based on these two characteristics of the participants.

Agents did not think about adaptations prior to the learning experience. Two of the agents did not consider much on adapting the curriculum to fit the diverse needs of the audience and limitations of participants. Agent B stated, "I don't know that we ever considered any of the limitations of the participants or our content." Agent D stated they adapted after the class started,

Well, you know, it's not something that I consciously think of, but when presenting to any group, you get a sense early on the general level of experience, and the general level of knowledge, so you just adapt to being either more basic or more advanced based on your audience.

There were some agents who did not think about adapting the learning experience, or agents who did not think about it prior to the class but adapted while teaching. These agents are not adapting the teaching, but potentially are. If agents wait to adapt when they are in the physical classroom, this is still example of adaption to teaching participants.

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**Step six: Carrying Out the Design to Meet Objectives with Selected Methods, Materials, and Resources.** Extension agents used a variety of different learning activities to meet the objectives of the BQA program, and to meet the individual needs of the participants. Through the analysis of the data, there were three themes identified with design to meet objectives with selected methods, materials, and resources. The themes are:

- Activities used during the class: hands on activities, brainstorming and problem solving, introductions, live animal demonstrations, and PowerPoint/lecture style.
- Activities used at the conclusion of the class: marketing other educational programs and opportunities to meet needs for producers, and agents are wanting to adapt to include more learning activities.
- Agents even expressed concern on the transition to the primary learning activities that are being used in the program now post pandemic.

Through the Covid-19 Pandemic, BQA transitioned primarily to teaching through a lesson recorded which was primarily online. Some agents still use this recording to teach the BQA program, so agents stated concern on the primary learning activity still being a recording. The findings associated with the learning activities that were used are addressed below.

Activities used during the class: hands on activities, brainstorming and problem solving, introductions, live animal demonstrations, and PowerPoint/lecture style. Agents used large amounts of learning activities. Agent A stated using hands on activities, brainstorming activities, problem-solving activities, and group activities,

I do as much hands on as possible, and I think people learn by doing better than they learn by listening. So, we try to have some hands-on activities, some brainstorming

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activities, and I'll give them a problem. How are we going to fix this? And we will talk about that, and we'll put them into groups. Talk about the power of involving other people in your decision making... We spend a lot of time talking about 'let's think outside of the box'... The first thing we do in every class, you know, is introduce yourself. So, your neighbor sitting next to you knows who you are, what you do, how many cattle you got, kind of what you want [out of the class], and what your end goal is. So, we kind of work that direction and then that helps me as I teach to know what to include and how to present it.

Agent C stated they used were hands on activities, demonstrations, PowerPoint/ lecture style activities, through marketing other programs, and resources. Agent C stated,

In teaching farmers, they like to see things hands on. So, that's been one of the things that have- we have tried to use a lot of. It is hard to do, sometimes depending on your situation, what you're trying to teach, but hands on. If not hands on, certainly showing something that they can see how things work. So, I am a believer in utilizing as much hands-on type of learning as you possibly can... setting up a class, inviting them to a specific time, and going through a PowerPoint. We have had opportunities where we are able to have live animals, and kind of did a BQA [class] with that. Like I said earlier, hands on is a better way of teaching and then through and through maybe a book or class with PowerPoint.

Agent B stated the learning activities they used were predominately demonstrations,

I would actually go out and help them, or not exactly help them. I would go out and demonstrate just typical animal health practices. Not that I am a vet, but just from the standpoint that I have experience on giving shots, castration, and dehorning.

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Agents stated using a variety of different learning activities to meet the BQA objectives. These activities were used to not only meet the programs objectives, but also could fit the diverse needs of the participants. Agents were following the steps of learning activities that capitalized meeting the programs objectives.

Activities used at the conclusion of the class: marketing other educational programs and opportunities to meet needs for producers, and agents are wanting to adapt to include more learning activities. Agent C stated that they advertise other programs and hands out additional materials to the participants,

I think that we're able to offer a lot of the other type of publications that might not be directly associated with the things that they learned during BQA- like where to get the shots and how to keep the records and read drug labels. We might have a marketing publication, and they might be in the stocker business. So here is a marketing tool for you or for your cow-calf business. Or health, we might have a nutrition book there for them. So, it's a way to distribute other types of beef cattle and forage type of information. I usually have a lot of handouts afterward, which they can get it if they'd like. They don't have anything to do with BQA.

Agent D stated the learning activities that were used were primarily adapted to the experience of the participant with the BQA program,

If it is, new participants, then I plan on doing the standard BQA presentation that we are provided with, if it is producers that I'm familiar with that have been through the program multiple times, then tend to be a little more fluid and talk more about current topics...

“For my new folks that haven't gone through it, I tried to give them a basic handout on

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vaccinations that describes killed and modified live, when you would use this, when you would use that, because I sense in a lot of cases that my newer producers as well as some of my... I might say, less able older participants. I think they have questions that they don't want to ask when they go look at the vaccine case, at the co-op or wherever.

Agents used learning activities and materials to continue to meet the learning needs of the participants. These materials and activities will help participants continue to meet the learning objectives of the program.

Agents even expressed concern on the transition to the primary learning activities that are being used in the program now post pandemic. Agent B stated they wanted to adapt the curriculum to fit more learning activities,

We are basically- I wish we could do some different kinds of things. I wish we could some hands-on practices, which I think would make the program more impactful because I think we are at a point where we only rely on video... BQA could be strengthened if we did it on site or more hands on, but as of now we are basically watching videos.

Agent B is very conscious that the BQA is moving predominately to watching educational materials, rather than teaching the program in-person or hands on. This shows that the agent might be having their participants watch videos. This maybe because of the COVID-19 pandemic. When educational videos are introduced and predominately used, there is not a way to introduce a variety of learning activities to reach the diverse needs of the participants.

**Step seven: Evaluating the Quality of the Learners Experience for the Learner that Includes Reassessing Needs for Continued Learning.** Extension agents evaluated their programs in a variety of ways. Through the analysis of the data there were findings that Agents evaluated their participants using materials based on the educational material that was gained.

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These include testing of participants to gauge knowledge gained, evaluation of program teaching of the agent, and through contracts that the participant will implement BQA concepts onto their operation. Evaluation was based on reassessing the needs of the participants after the conclusion of the class and follow ups with the participants for continued education. One agent even spoke on the evaluation of his own teaching. Themes that were identified are:

- Agents used evaluation materials to evaluate the quality of the learner experience and the needs of the participants.
- Agents followed up with participants and reassessed for participants needs.

Agents used evaluation materials to evaluate the quality of the learner experience and the needs of the participants. Agents used evaluation materials, Evaluation of their teaching, and evaluation for reassessment of needs through follow-ups. Agent A stated, “We do a test at the end of BQA as an evaluation of the program, and as an evaluation of retention of information and education.” As well Agent C stated they used a test as evaluation material,

So, to kind of test their knowledge before they take the class. And then of course, they must take a test after the class too, which gauges how much they've learned within the course. But if you don't know where their knowledge is to start the class, then you don't know how much they actually learned by taking it so some pre and posttest are one way of doing that... can look and see what their grade is, of course, I always go over it, make sure everybody has the opportunity to correct the ones that they miss. And I explained to them usually, always, you know, there was there may misinterpretation, and while they might have missed it, everybody understands all of that. So, you know, their grade on the on the test is one of those ways that I do that.



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Agents used a variety of modes to evaluate their programs. These evaluation techniques are tangible to be able to understand the information that was gained in the program. These evaluation techniques can be used to identify the needs that participants still may need. These statements show that agents are using the final step of the andragogical process of evaluation.

Agents followed up with participants and reassessed for participants needs. Agents reassessed the needs of participants and followed up with participants after the conclusion of the class. Agent A stated,

And sometimes they realize the goal that they set at that time wasn't really the goal that they wanted. So, you know, some folks say, "yeah, I want to be in the cattle business." And after they're in a little bit, they decide, "this is not exactly what I thought it was." you know, so sometimes you have to sit down and talk those people off the cliff and, you know, say, "Okay, this is not working for you, I appreciate that. But if you're going to get out of the business, let's do it in an orderly manner, so that we don't lose a lot of money." So sometimes you just have to, you have to help people admit defeat and help them exit gracefully. The other guys, you know, they will, they will have goals and things like that, and I just can't get this done. So, we'll make some farm visits, go out, sit down, talk with them, look at what you're doing, look at their cattle, maybe they've got the wrong bull. You know, we'll help them decide what's important in the EPD's to select that bull that can do the best thing. So, we do a lot of follow up with folks. And not just specifically with those BQA folks, but with all the folks that we work with, BQA or not.

Agent A stated they reassessed needs of participants through materials and follow-ups from the agent,

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We always give them a set of or a copy of the slides so that they can go back and look at them later. We also provide all the information that's given out in the program, whether it's a one-night program or an eight-night program, and we do a lot of those. But we include that on a Google Drive as well. And then six months or so about, after the program. I'll email them that link to that Google Drive again, I asked them if they got any questions, try to keep contact with them how you do it, you know, they'll come in the office for a sick tomato plant, and I'll go 'hey, you were in master beef, or you were in BQA. How's it going? Did you get those heifers developed? Did you get your cow herd to the number that you wanted to be at? Got any questions?' That type of thing... Well, basically, by visiting with those folks later, those emails that I send out, you know, I think it kind of helps folks think, "Hey, I've got somebody in my toolbox here that I can call anytime." Whenever I send an email out six months or a year after a class to somebody, and I can mention something that I remember. And I try to take notes during the class too. But if I've got an idea of what this guy was shooting for, if I can mention that, in that email, it kind of helps those folks think, "Hey, he still remembers me- he's here to help." You know. And that's kind of what we're after.

Agent C stated they reassessed learner needs through a variety of ways, "That gets back to if we're doing a survey, or an evaluation, we actually write it, or on paper and have them tell us on the document form is probably the most common way that that we get that information."

Agent B stated they could do a better job of evaluation on certification programs. Stating, "And I think on all of those fonts that we could do a little better job to strengthen the importance of these recertification programs. I have a bigger impact, and maybe listen to producers more."

Agent D stated around evaluation and reassessment of learner needs,

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Well, I make sure they all have my contact information, I maintain a beef email list and send out market reports and anything that's coming up that folks might be interested in, so that they do have at least a weekly contact from me, for those who do Email. I still have several folks that don't, but those folks, they tend to call or stop by the office to ask questions...I'll make farm visits and advise on their situation. You know, how it's set up. And so on and so forth.

Agent D stated they even created dialogue around the evaluation of their own teaching, "Well, basically, my evaluation of quality of the program is how much feedback and dialogue I have with the producers."

Agents realize that participants will have needs about the program after the conclusion of the class. Agents created a variety of evaluation techniques to make sure they were addressing all the needs and concerns of the participants. Agents followed an andragogical process by evaluating the participants after the conclusion of the course.

### ***The Participants Responses to the API, Andragogical Design Elements Scale- Questions 25-60***

The API was completed by the participants of the BQA program. This section houses the results from the participants of the questions 25-60 of the API which is the section which identifies the andragogical design. The andragogical design elements are preparing the learner, climate setting, mutual planning, diagnosis of learner needs, setting of objectives, design of the learner experience, learning activities, and evaluation. These concepts were dispersed across question 25-60 within the API. The question number and the association back to the principle within andragogical design elements scale is listed in Figure 4 above (Chapter 3 Methodology). The grouped API results associated with questions 25-60 are listed below based on the principle which they address. The results show the mean and the standard deviation from each individual

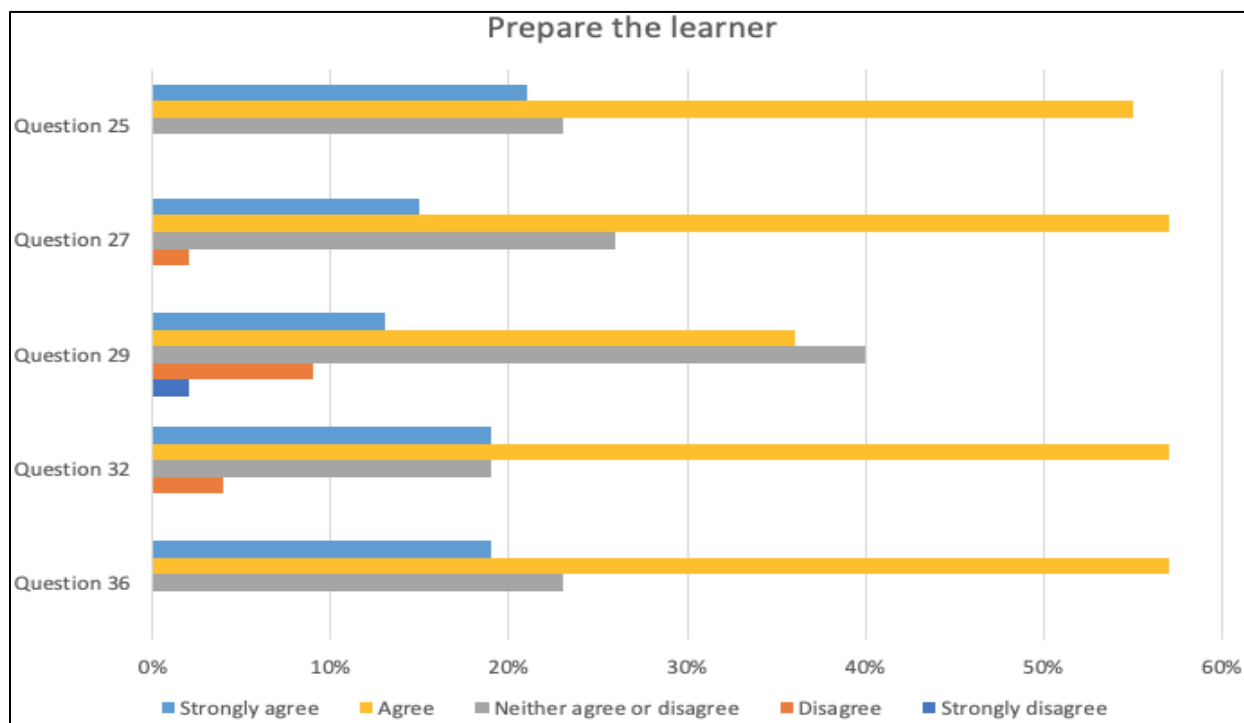
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answer. The scale for the mean is identified by 1 is strongly disagree, 2 is disagree, 3 is neither agree or disagree, 4 is agree, and 5 is strongly disagree.

**Prepare the Learner.** The API showed that the participants had high levels of agreeance on the perspectives on the process of preparing the learner. The specific findings associated with the process of preparing the learner is listed below in Figure 3. Question 25 scored the highest for agreeability where Question 29 scored the lowest.

**Figure 3**

*API Group Results- Prepare the Learner.*



*Note:* This figure demonstrates the API group results for preparing the learner based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

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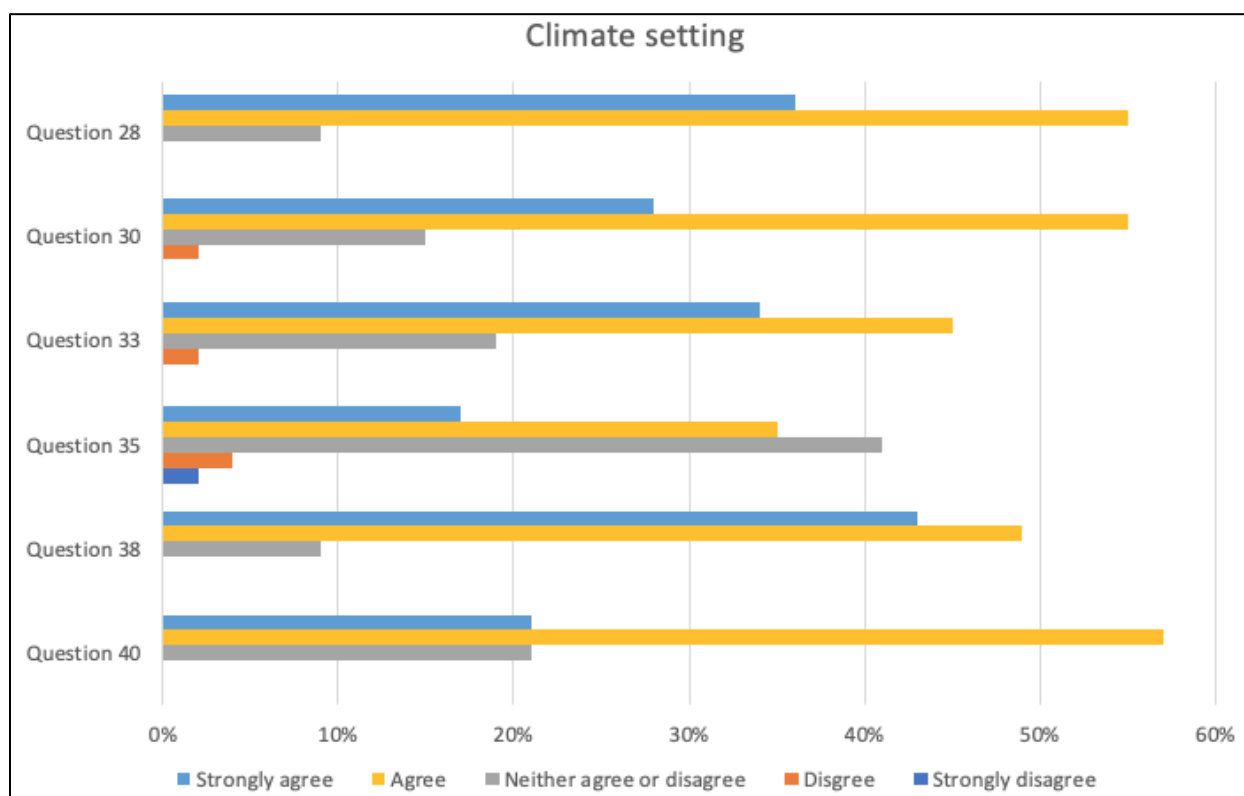
*Question 25: Sufficient steps were taken to prepare me for the learning process.* The average answer to question 25 is 3.98 while the standard deviation is 0.675. *Question 27: The way I was prepared for this learning experience gave me the confidence I needed.* The average answer to question 27 is 3.85 while the standard deviation is 0.691. *Question 29: Before this learning experience, I was given exercises or activities that prepared me for my learning.* The average answer to question 29 is 3.49 while the standard deviation 0.906. *Question 32: The learning expectations were clear to me before this learning experience began.* The average answer to question 32 is 3.91 while the standard deviation is 0.747. *Question 36: The way learner responsibilities were clarified was appropriate for this learning experience.* The average answer to question 36 is 3.96 while the standard deviation is 0.658.

**Climate Setting.** The API showed that the participants had high levels of agreeance on the perspectives on the process of climate setting. The specific findings associated with the process of climate setting is listed below in Figure 4. Question 38 scored the highest for agreeability where Question 35 scored the lowest. More detail is described blow and within Figure 4.

### **Figure 4**

*API Group Results- Climate Setting*

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*Note:* This figure demonstrates the API group results for climate setting based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

*Question 28: The instructor developed a strong rapport with the learners.* The average answer to question 28 is 4.28. *Question 30: There was an adequate amount of dialogue with my instructor regarding my learning needs.* The average answer to question 30 is 4.09. *Question 33: Learners were full partners with the instructor before this learning experience began.* The average to question 33 is 4.11 while the standard deviation is 0.787. *Question 35: The instructor and I worked together to prepare me for this learning experience.* The average answer to question 35 is 3.61 while the standard deviation is 0.906. *Question 38: The average answer to*

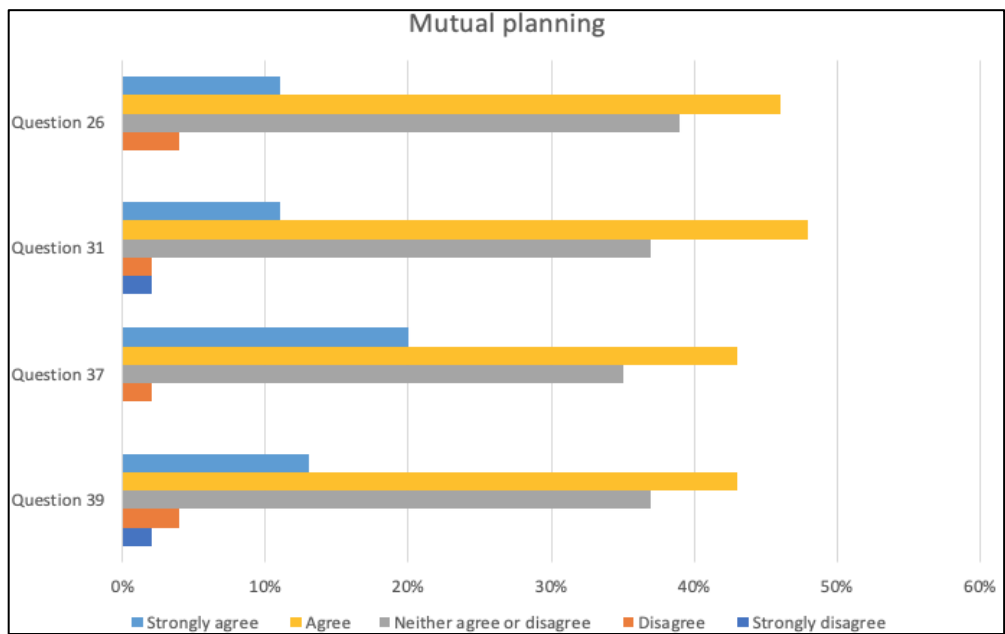
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question 38 is 4.34 while the standard deviation is 0.635. *Question 40: The climate in this learning experience was collaborative.* The average answer to question 40 is 4.00 while the standard deviation is 0.659.

**Mutual Planning.** The API showed that the participants had high levels of agreeance on the perspectives on the process of mutual planning. Question 37 scored the highest for agreeability where Question 39 scored the lowest. More detail is described blow and within Figure 5.

**Figure 5**

*API Group Results- Mutual Planning*



*Note:* This figure demonstrates the API group results for mutual planning based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

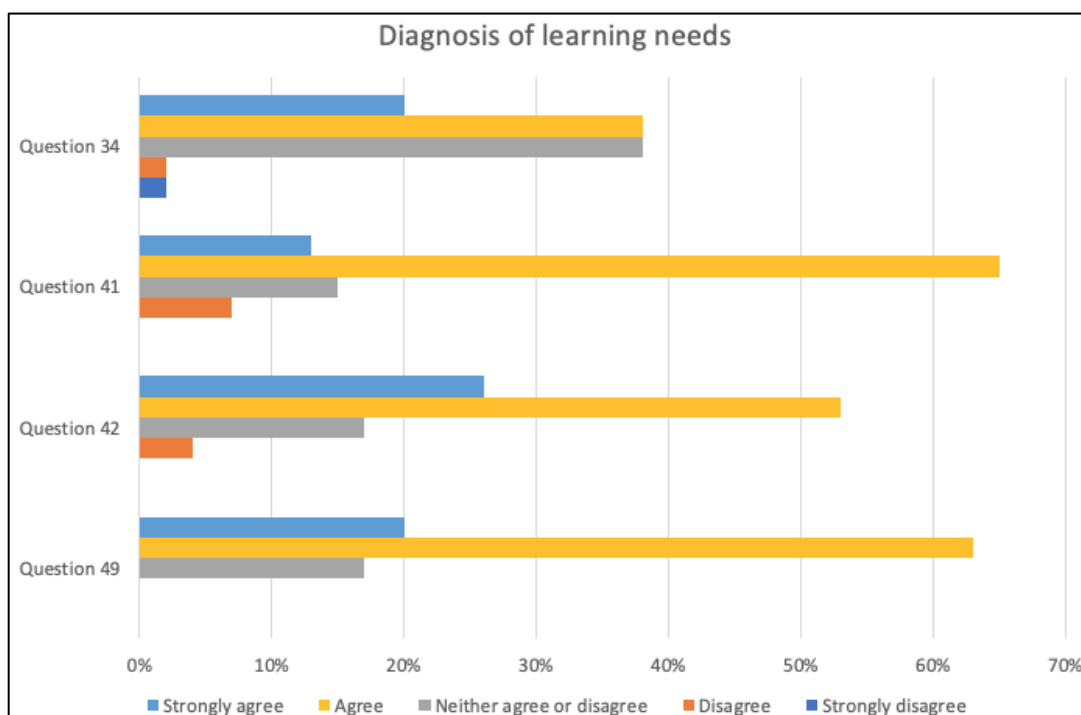
## Increasing Program Effectiveness Through use of Principles of Andragogy in Tennessee Beef Quality Assurance Programs

*Question 26: I had the opportunity to work with others to plan our learning.* The average to question 26 is 3.63 while the standard deviation is 0.741. *Question 31: We shared responsibility for planning the learning process.* The average answer to question 31 is 3.63 while the standard deviation is 0.799. *Question 37: Learners and the instructor cooperated in planning the learning.* The average answer to question 37 is 3.80 while the standard deviation is 0.778. *Question 39: We collaborated in planning the learning/instructor.* The average answer to question 39 is 3.61 while the standard deviation is 3.61.

**Diagnosis of Learner Needs.** The API showed that the participants had high levels of agreeance on the perspectives on the process of diagnosis of learner needs. Question 49 scored the highest for agreeability where Question 34 scored the lowest. The specific findings associated with the process of diagnosis of learner needs is listed below in Figure 6.

### Figure 6

#### API Group Results- Diagnosis of Learning Needs





## Increasing Program Effectiveness Through use of Principles of Andragogy in Tennessee Beef Quality Assurance Programs

*Note:* This figure demonstrates the API group results for diagnosis of learner needs based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

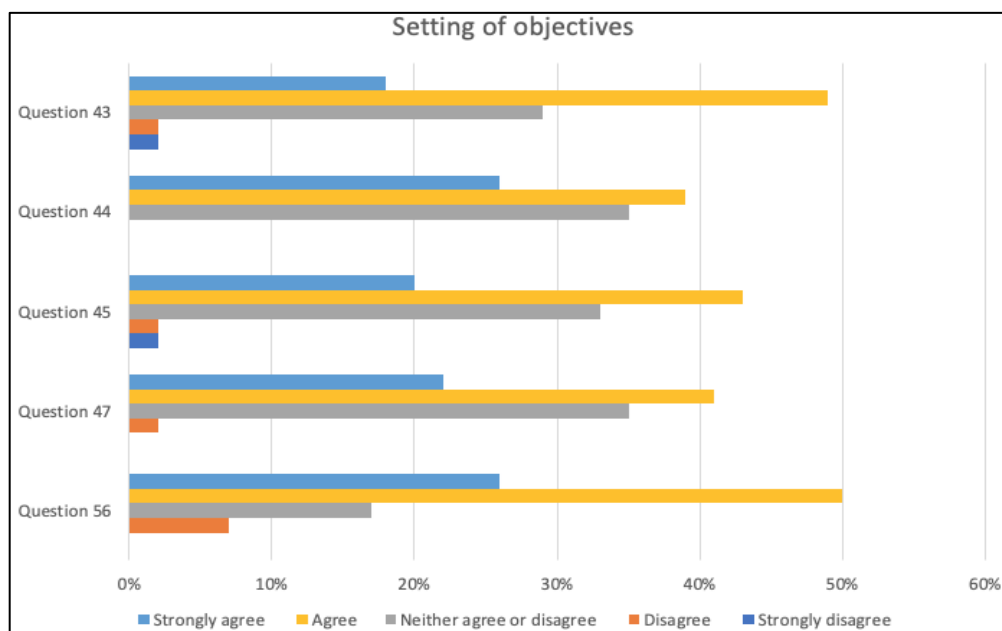
*Question 34: I was helped to diagnose.* The average answer to question 34 is 3.71 while the standard deviation is 0.895. *Question 41: I was helped to assess my weaknesses and identify my learning needs.* The average answer to question 41 is 3.85 while the standard deviation is 0.729. *Question 42: I completed activities that helped me identify my learning needs.* The average answer to question 42 is 4.00 while the standard deviation is 0.780. *Question 49: As a part of this learning experience, I did some analysis to figure out the best direction for my learning and development.* The average answer to question 49 is 4.02 while the standard deviation is 0.614.

**Setting of Objectives.** The API showed that the participants had high levels of agreeance on the perspectives on the process of setting of objectives. Question 44 scored the highest for agreeability where Question 45 scored the lowest. The specific findings associated with the process of setting of objectives is listed below in Figure 7.

### **Figure 7**

*API Group Results- Setting of Objectives*

## Increasing Program Effectiveness Through use of Principles of Andragogy in Tennessee Beef Quality Assurance Programs



*Note:* This figure demonstrates the API group results for setting of objectives based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

*Question 43:* The instructor and the learners negotiated learning objectives. The average answer to question 43 is 3.78 while the standard deviation is 0.850. *Question 44:* Learners were encouraged to set their own individual learning objectives. The average answer to question 44 is 3.91 while the standard deviation 0.784. *Question 45:* Learners and the instructor became partners in setting learning objectives. The average answer to question 45 is 3.76 while the standard deviation is 0.874. *Question 47:* The learners determined what learning objectives to pursue. The average answer to question 47 is 3.83 while the standard deviation is 0.797.

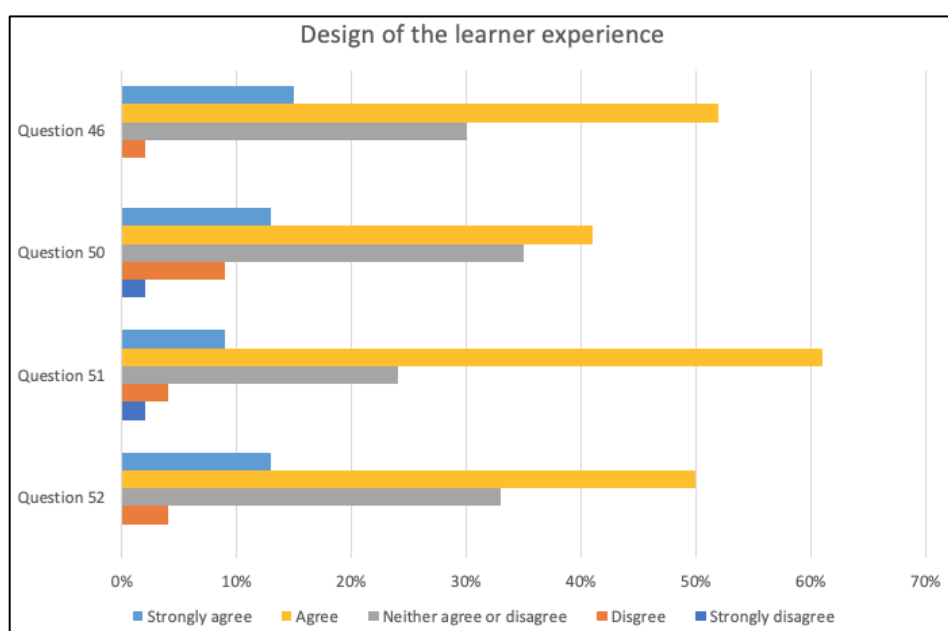
*Question 56:* Learners were encouraged to work together to make decisions about how learning would occur. The average answer to question 56 is 3.86 while the standard deviation is 0.842.

## Increasing Program Effectiveness Through use of Principles of Andragogy in Tennessee Beef Quality Assurance Programs

**Design of Learner Experience.** The API showed that the participants had high levels of agreeance on the perspectives on the process of design of learner experience. Question 46 scored the highest for agreeability where Question 50 scored the lowest. The specific findings associated with the process of design of learner experience is listed below in Figure 8.

### Figure 8

#### *API Group Results- Design of Learner Experience*



*Note:* This figure demonstrates the API group results for design of learner experience based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

*Question 46:* There were mechanisms in place to collaboratively design which learning activities would be used. The average to question 46 is 3.80 while the standard deviation is 0.719.

*Question 50:* The instructor and I worked together to design learning activities that work for me.

The average answer to question 50 is 3.54 while the standard deviation is 0.912. *Question 51:*

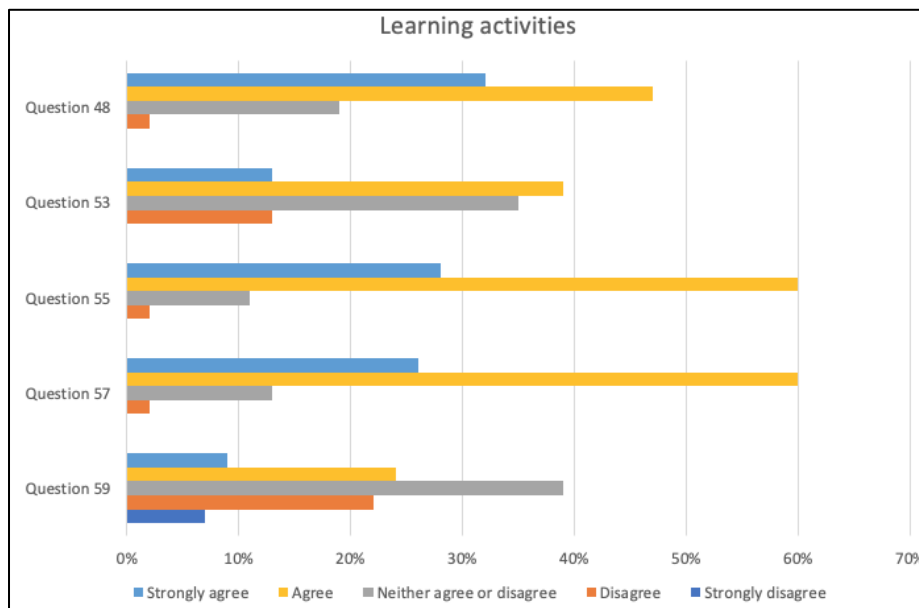
## Increasing Program Effectiveness Through use of Principles of Andragogy in Tennessee Beef Quality Assurance Programs

*Steps were taken to adapt the learning experiences to my capabilities.* The average to question 51 is 3.70 while the standard deviation is 0.785. *Question 52: An effort was made to adjust the design of the learning to fit this situation.* The average answer to question 52 is 3.72 while the standard deviation is 0.750.

**Learning activities.** The API showed that the participants had high levels of agreeance on the perspectives on the process of learning activities. Question 55 scored the highest for agreeability where Question 59 scored the lowest. The specific findings associated with the process of learning activities is listed below in Figure 9.

**Figure 9**

*API group results- learning activities*



*Note:* This figure demonstrates the API group results for learning activities based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

## Increasing Program Effectiveness Through use of Principles of Andragogy in Tennessee Beef Quality Assurance Programs

*Question 48: Many different activities were used to help learners explore and apply new knowledge or skills.* The average of question 48 is 4.09 while the standard deviation is 0.775.

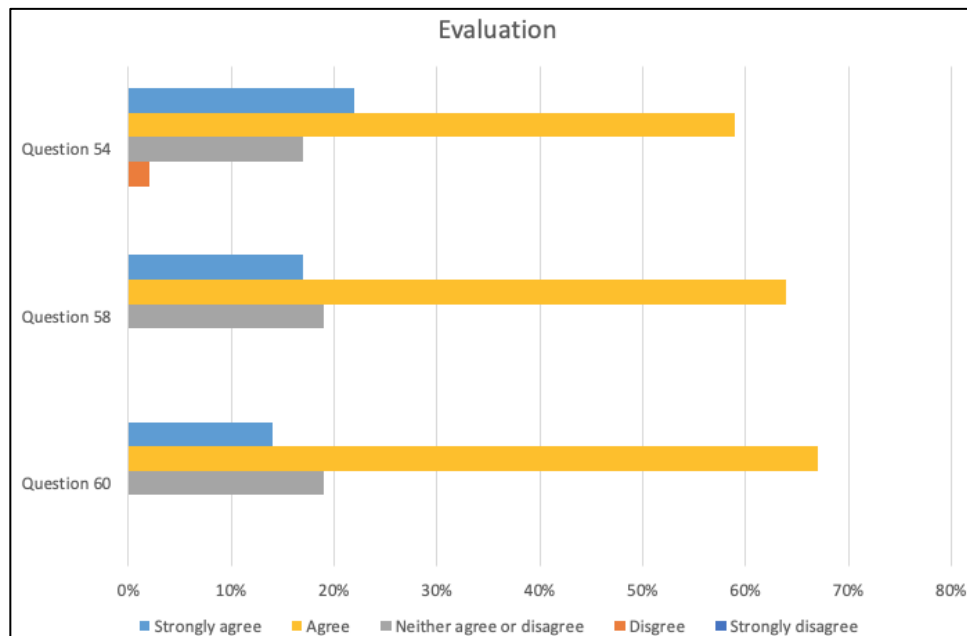
*Question 53: The instructor relied heavily on lecture.* The average of question 53 is 3.52 while the standard deviation is 0.888. *Question 55: The learning methods used to evaluate my learning in this learning experience were appropriate.* The average of question 55 is 4.13 while the standard deviation was 0.679. *Question 57: All the learning activities required full and active participation.* The average of question 57 is 4.09 while the standard deviation is 0.686. *Question 59: The learning activities required little action on my part.* The average of question 59 is 3.07 while the standard deviation is 1.041.

**Evaluation.** The API showed that the participants had high levels of agreeance on the perspectives on the process of evaluation. Question 58 scored the highest for agreeability where Question 54 scored the lowest. The specific findings associated with the process of evaluation is listed below in Figure 10.

### **Figure 10**

*API group results- Evaluation*

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*Note:* This figure demonstrates the API group results for preparing the learner based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

*Question 54:* The methods used to evaluate my learning in this learning experience were appropriate. The average for question 54 is 4.00 while the standard deviation is 0.699. *Question 58:* Evaluation methods used during this learning experience met my needs. The average for question 58 is 3.98 while the standard deviation is 0.608. *Question 60:* Evaluation methods helped me diagnose my needs for further learning. The average for question 60 is 3.95 while the standard deviation is 0.582.

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**Research Question Two: The six andragogical principles that BQA participants bring into the program.**

This section houses the combined sample of the API (Appendix C) results from the County A, County C, and County D. There were no API results from County B because the agent did not host a spring class.

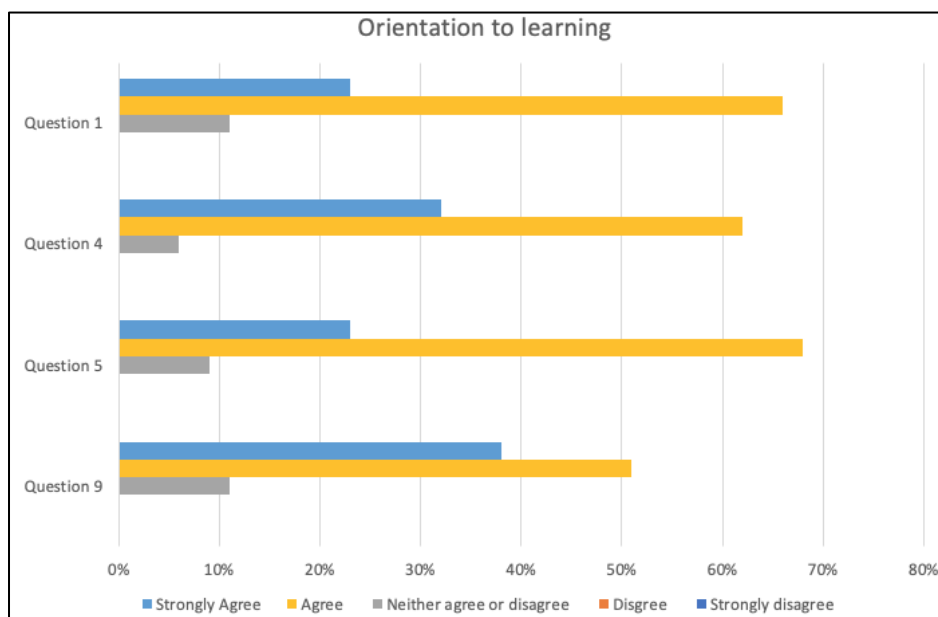
*Andragogical Principles Scales- Questions 1-24*

The andragogy principles are orientation to learn, intrinsic motivation to learn, prior experience, self-directed learning, readiness to learn, and the need to know. These concepts were dispersed across question 1-24 within the API. The grouped API associated with questions 1-24 are listed below based on the principle which they address (Table 3).

**Orientation to Learn.** The API showed that the participants highly agreed that they had orientation to learn. Question 9 scored the highest for agreeability where Question 5 scored the lowest. The specific findings associated with orientation to learn is listed below in Figure 11.

**Figure 11**

*API Group results- Orientation to Learning.*



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*Note:* This figure demonstrates the API group results for orientation to learn based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

*Question 1. The things I learned will assist me in resolving a work or life problem.* The average to question one is 4.13 while the standard deviation 0.575. *Question 4. Mastery of this material will benefit in my life or work.* The average to question four is 4.26 while the stand deviation is 0.570. *Question 5. This learning experience will make a positive change in my life or work.* The average to question five is 4.15 while the stand deviation is 0.551. *Question 9. The knowledge gained in this learning experiences were a regular part of the learning experience.* The average to question nine is 4.28 while the standard deviation is 0.649.

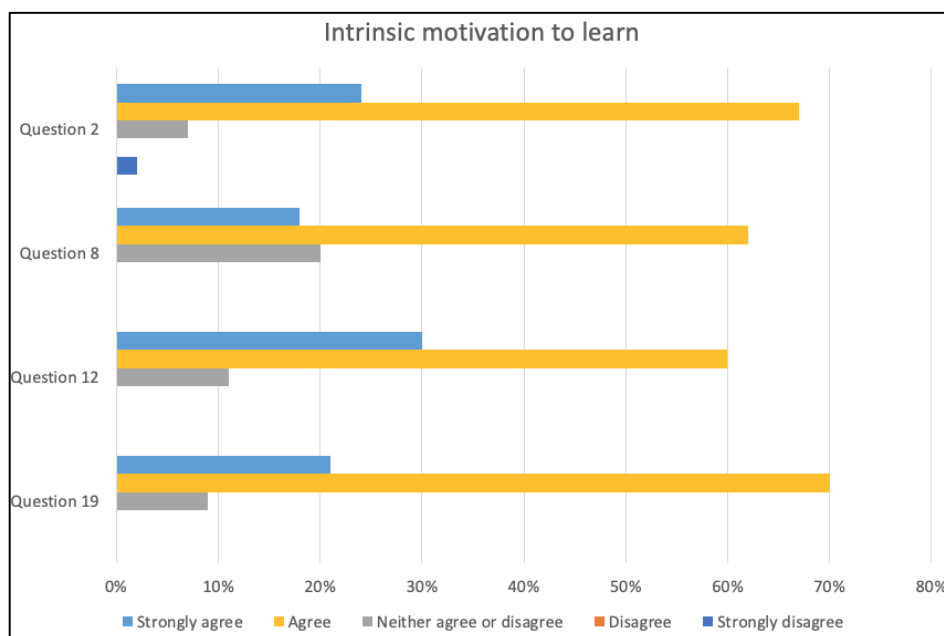
**Intrinsic Motivation to Learn.** The API showed that the participants highly agreed that they had the principle of intrinsic motivation to learn. Question 12 scored the highest for agreeability where Question 8 scored the lowest. The specific findings associated intrinsic motivation to learn is listed below in Figure 12.

### **Figure 12**

*API Group Results- Intrinsic Motivation to Learn*



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*Note:* This figure demonstrates the API group results for intrinsic motivation to learn based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

*Question 2. I learn because of the personal satisfaction it gives me.* The average for question two is 4.11 while the standard deviation is 0.706. *Question 8. I learn because of the inner fulfillment it provides.* The average for question eight is 3.98 while the standard deviation is 0.621.

*Question 12. I learn because of the pleasure of discovering new things that interest me.* The average for question twelve is 4.19 while the standard deviation is 0.613. *Question 19. I learn for the enjoyment of broadening my knowledge and skills.* The average for question nineteen is 4.13 while the standard deviation is 0.536.

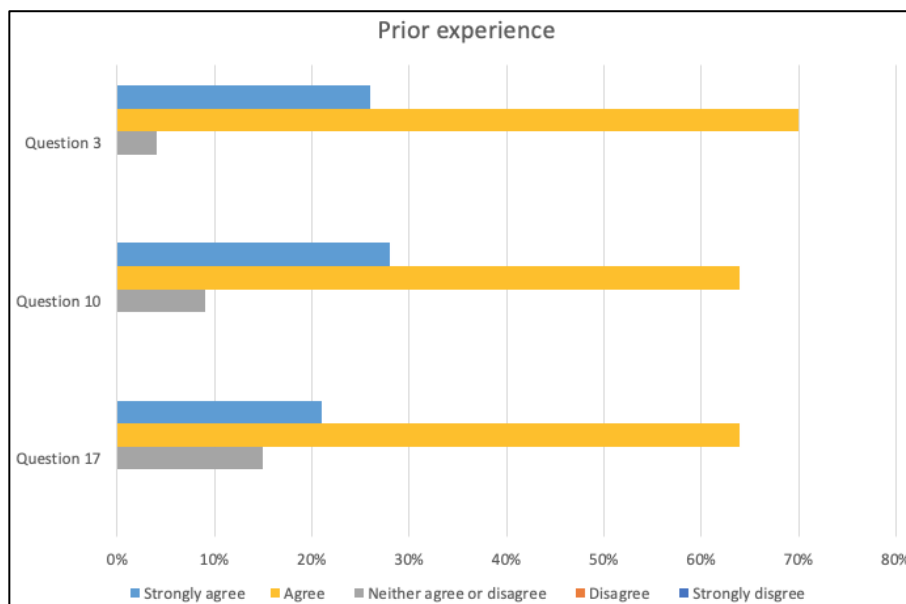
**Prior Experience.** The API showed that the participants highly agreed that they had the principle prior experience Question 10 scored the highest for agreeability where Question 17

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scored the lowest. The specific findings associated with prior experience is listed below in Figure 13.

**Figure 13**

*API group results- prior experience*



*Note:* This figure demonstrates the API group results for prior experience based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

There were no participants who strongly disagreed or disagreed on the questions around prior experience. *Question 3: I felt my prior life and work experiences helped my learning.* The average for question three is 4.22 while the standard deviation is 0.513. *Question 10: My life and work experiences were a regular part of the learning experience.* The average for question ten is 4.19 while the standard deviation is 0.576. *Question 17: I felt my life and work experiences were*

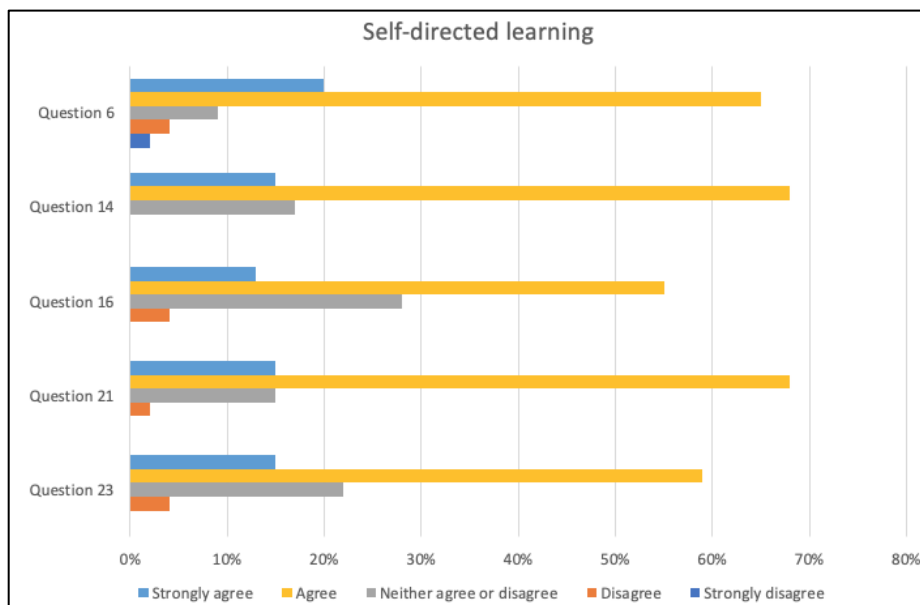
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*a resource for this learning.* The average for question seventeen is 4.06 while the standard deviation is 0.604.

**Self-directed Learning.** The API showed that the participants had mixed results on the perspectives on the principle of self-directed learning. Question 21 scored the highest for agreeability where Question 16 scored the lowest. The specific findings associated with Self-directed learning is listed below in Figure 14.

**Figure 14**

*API group results- self-directed learning*



*Note:* This figure demonstrates the API group results for self-directed learning based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

*Question 6: I felt responsible for my own learning.* The average for question six is 3.96 while the standard deviation is 0.815. *Question 14: I set my own goals for learning.* The average for

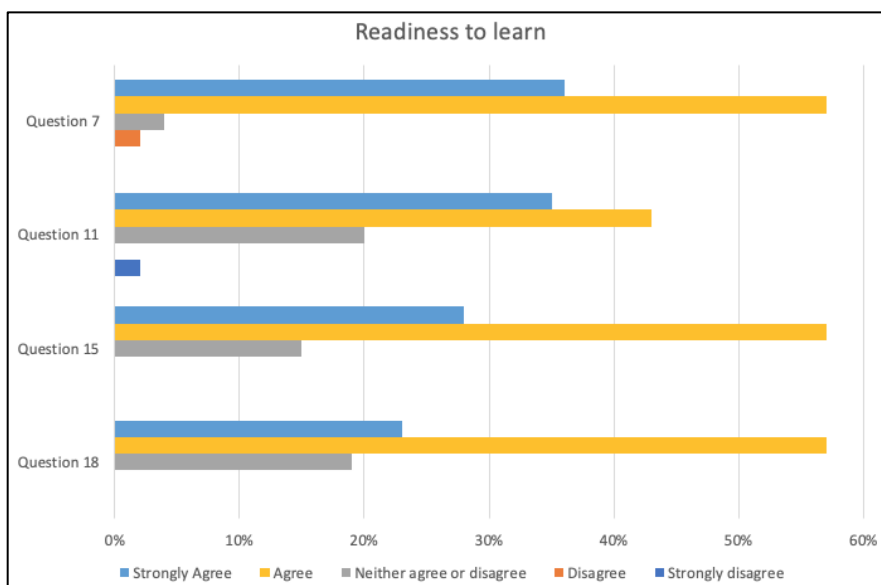
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question fourteen is 3.98 while the standard deviation is 0.571. *Question 16: I had control over what was learned.* The average for question sixteen is 3.77 while the standard deviation is 0.729. *Question 21: I had a role to play in my own learning.* The average for question twenty-one is 3.96 while the standard deviation is 0.624. *Question 23: I made the decisions about how learning progressed.* The average for question twenty-three is 3.85 while the standard deviation is 0.729.

**Readiness to Learn.** The API showed that the participants had high levels of agreeance on the perspectives on the principle of readiness to learn. Question 7 scored the highest for agreeability where Question 18 scored the lowest. The specific findings associated with readiness to learn is listed below in Figure 15.

**Figure 15**

*API Group Results- Readiness to Learn*



*Note:* This figure demonstrates the API group results for readiness to learn based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow

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shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

*Question 7: We did things that illustrated how this learning could help me address real tasks or problems.* The average for question seven is 3.85 while the standard deviation is 0.729.

*Question 11: The instructor helped me understand why the learning methods were right for me.*

The average for question eleven is 4.09 while the standard deviation is 0.865. *Question 15: The instructor explained how this learning would help me deal with changes in my life or work.* The

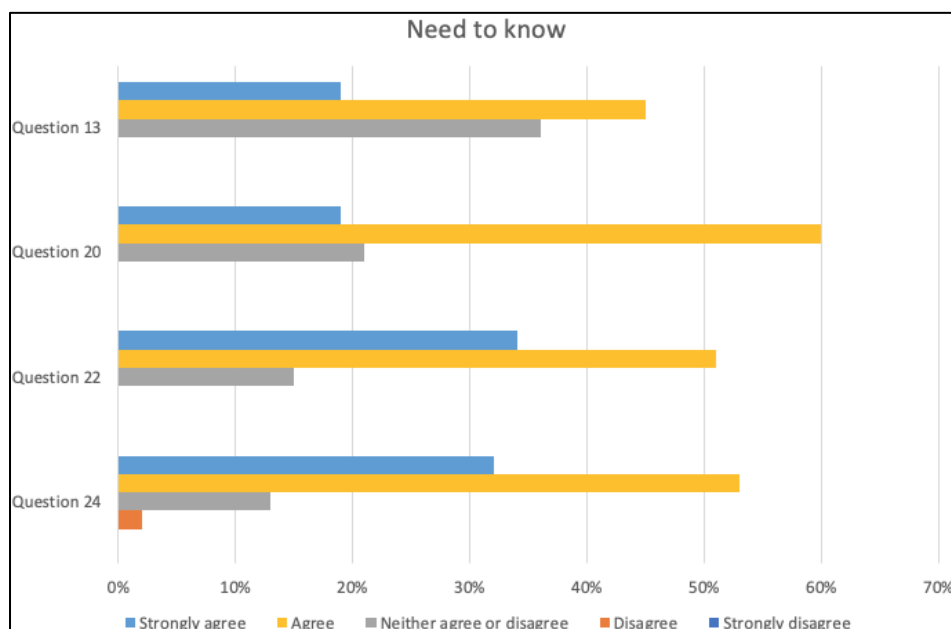
average for question fifteen is 4.13 while the standard deviation is 0.647. *Question 18: Steps were taken to make clear how the learning would fit my needs.* The average for question eighteen is 4.04 while the standard deviation is 0.658.

**Need to Know.** The API showed that the participants had high levels of agreeance on the perspectives on the principle of need to know. Question 22 scored the highest for agreeability where Question 13 scored the lowest. The specific findings associated with need to know is listed below in Figure 16.

### **Figure 16**

*API Group Results- Need to Know.*

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*Note:* This figure demonstrates the API group results for need to know based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

*Question 13: I needed this learning at this time in my life.* The average for question thirteen is 3.83 while the standard deviation is 0.732. *Question 20: The learning was necessary to help me meet the changes happening in my work or life.* The average for question twenty is 3.98 while the standard deviation is 0.642. *Question 22: This learning helped me develop the knowledge and skills I need at this time.* The average for question twenty-two is 4.19 while the standard deviation is 0.680. *Question 24: The learning was necessary for the challenges I face.* The average for question twenty-four is 4.15 while the standard deviation is 0.722.

**Research Question Three: The connections between teaching and learning that were made between different teaching approaches of county agents and the learning of the participants.**

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The findings of this research were separated by county and compared. The API results (Question 25- 60) and the Semi-structured interviews were compared against one another to identify the andragogical process from the viewpoint of the Extension agents and the participants in the class. County B was not compared because there were no surveys completed from county B because there were no classes taught in the spring. The findings from the comparisons are listed below by counties.

### ***County A***

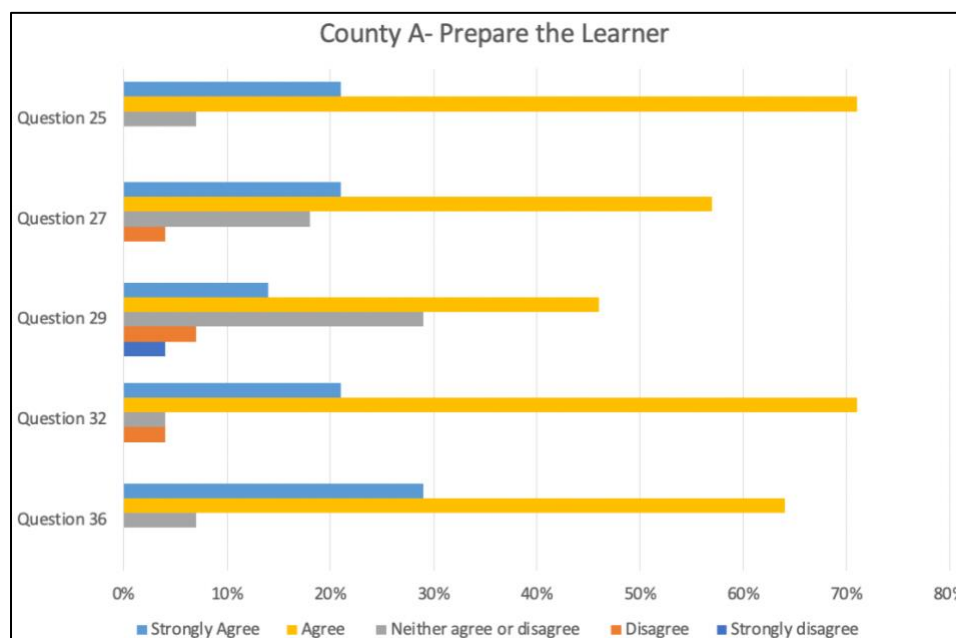
The comparison of the semi-structured Interview and the API results from County A were compared using andragogical process. County A's Semi-Structured Interview and the API process matched up very well. This section will be addressed by the steps of the andragogical process.

**Prepare the Learner.** Agent A stated statements around preparing the learner through objective statements, through prior relationships or contact with participants, and by addressing the concerns of participants throughout the class. County A participants mostly agreed that the agent followed an andragogical process. The findings from county A's API are listed below based on the questions around preparing the learning. These questions that are centered around preparing the learner are 25, 27, 29, 32, and 36. Question 36 scored the highest for agreeability where Question 29 scored the lowest. The findings from each question is listed in Figure 17.

### **Figure 17**

*Findings of API based on questions associated with preparing the learner in County A.*

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*Note:* This figure demonstrates the API results from County A around prepare the learner based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

Agent A did not mention the steps that he prepares the participants for the learning process in the interview. Although, the majority (92%) of the participants agreed that the agent took the necessary steps to prepare the learner for the BQA classes. The agent mentioned instilling confidence in participants through addressing the concerns of the participants before and throughout the class. Although, the majority (78%) of the participants agreed that the agent prepared the learning experience that gave the participants confidence. The agent never stated there was any exercises or activities given to the participants to prepare them for the learning experiences. The agent from county A stated that he prepares his participants through objective readings, and through telling the participants about the program through prior relationships and



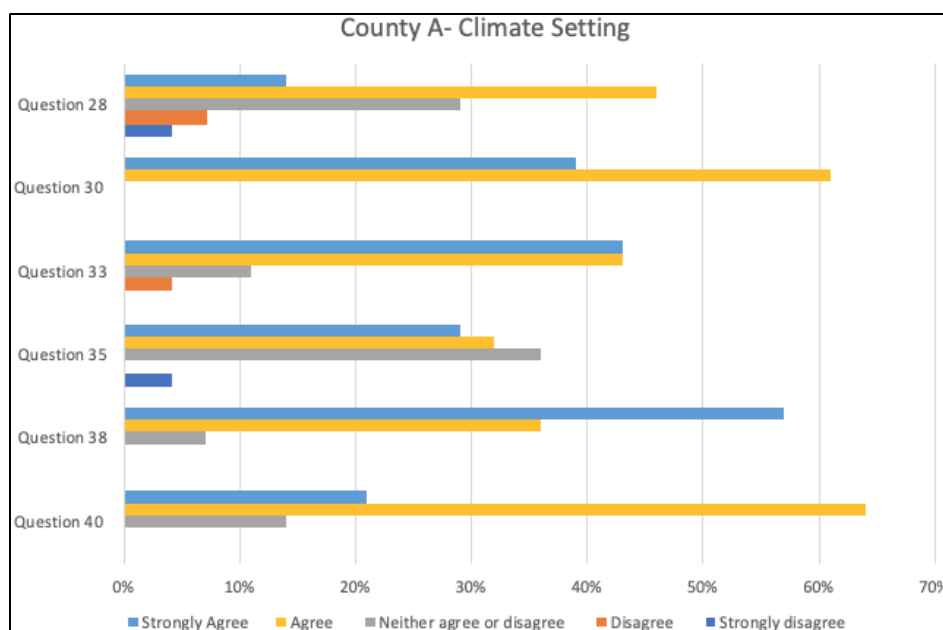
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office visits. The agent stated that they addressed the concerns of the participants throughout the entirety of the program.

**Climate Setting.** Agent A stated that they create a cooperative learning environment through learning of their participants' prior experience or the knowledge of their participants, knowing their goals and needs, asking questions on their goals and needs, knowing how individual goals and institutional goals meet, and knowing participants' preferred learning styles. County A's participants mostly all agreed that the agent followed an andragogical process of climate setting. Question 38 scored the highest for agreeability where Question 35 scored the lowest. The findings from County A's API are listed below in Figure 18 based on the questions around Climate Setting from the API.

**Figure 18**

*Findings of API based on questions associated with climate setting in County A*



*Note:* This figure demonstrates the API results from County A around climate setting based on the percentages of the group which answered by question. Light blue shows strongly agree,

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yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

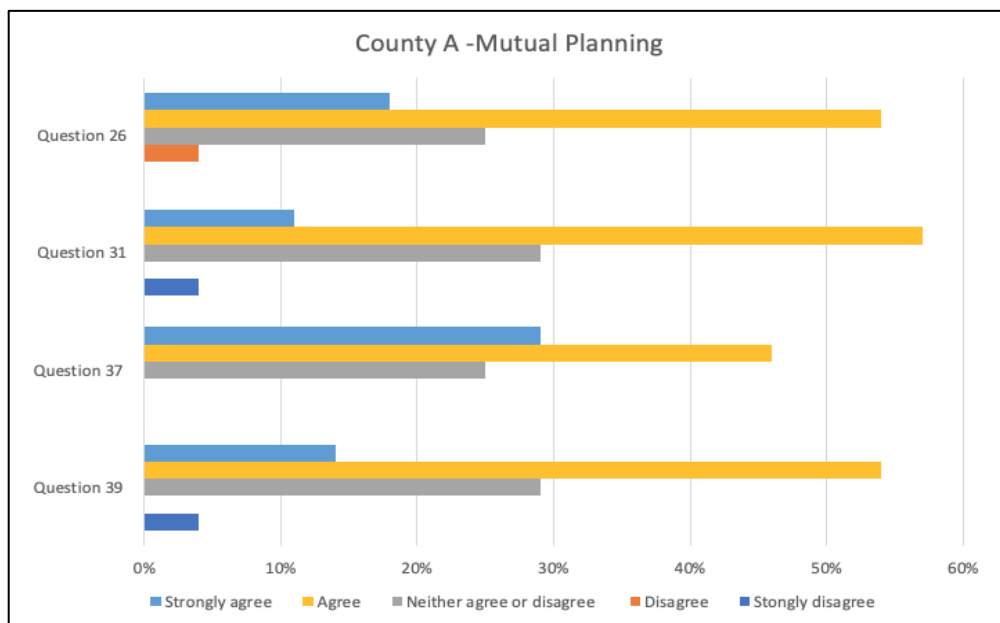
A participant wrote on the side of this question with four plus marks (++++) about creating the strong rapport with the learners, with the addition of his strongly agree answer. The agent stated that they try to create relationships with the participants before the start of the classes they teach. The agent stated they created an open dialogue around the goals and the needs of their participants. The agent did not mention in the interview they created an environment around being full partners with the participants. The agent did state around getting to know the participant's needs, but not working specifically with the participant to prepare them for the learning experience. Some may have perceived this as working together, while others may have not. The agent stated nothing around being a rich resource for their learning, but participants mostly all agreed that the agent was. The agent stated that they tried to get participants speaking about their goals and needs to each other, as well as to them to create the collaborative environment.

**Mutual Planning.** Agent A stated they previously mutually planned with the participants in the past, but now do not after being an agent for years. Although, the API had high agreeance that the agent did mutually plan with the participants. The agent may still be mutually planning with the participants from their perspective, but the agent may not think that they are still mutually planning with the participants. Question 37 scored the highest for agreeability where Question 31 scored the lowest. The findings from County A's API are listed below based on the questions addressing mutual planning from the API in Figure 19.

### **Figure 19**

*Findings of API based on questions associated with mutual planning in County A*

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*Note:* This figure demonstrates the API results from County A around mutual planning based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

The agent stated creating relationships between participants through group work, so this may be where participants had the opportunity to plan with others to plan their learning. The agent did not mention any statements on having a shared responsibility with the participants on planning the learning experience. The agent did mention that they planned with participants in their early career stages. The agent did state that there was more effort made in mutually planning with participants in their earlier career stages. The agent did not mention anything on collaborating with the participants, but participants (68% of participants) agreed that they had part in working collaboratively to plan the learning.

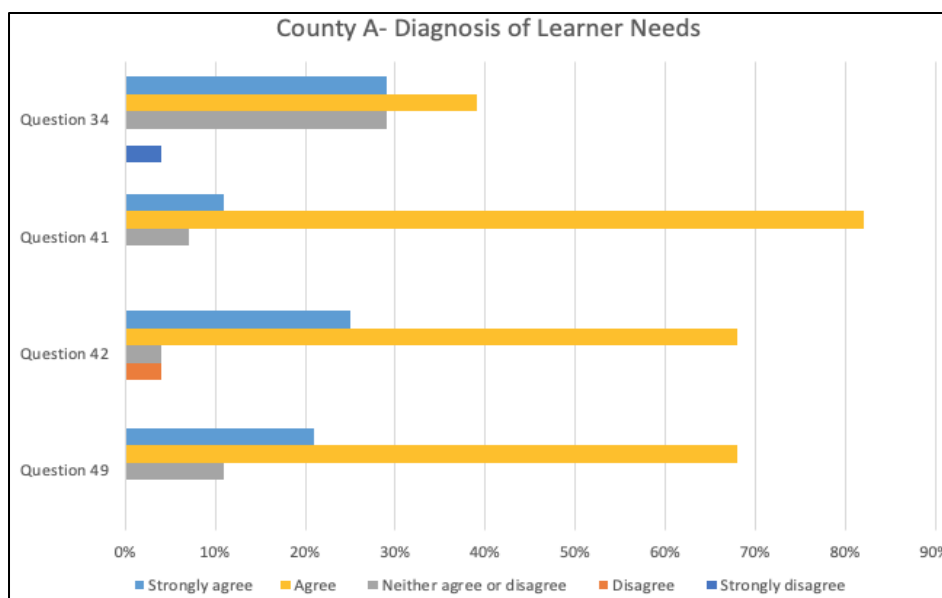
**Diagnosis of Learner Needs.** Agent A stated that they diagnosed learner needs through finding out as much as possible as the participants prior to the start of the class, identifying their

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primary need for participation in other programs, and the prior level of experience the participant had, as well as the needs around those level of experiences. The findings from the API match well with the Semi-structured interview. Question 42 scored the highest for agreeability where Question 34 scored the lowest. The findings are listed below based on the questions from the API addressing diagnosis of learner needs in Figure 20.

### Figure 20

*Findings of API based on questions associated with diagnosis of learner needs in County A*



*Note:* This figure demonstrates the API results from County A around diagnosis of learner needs based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

The agent stated that they tried to know as much about the participants as possible before the class began. The agent stated that the created activities in class to help participants gauge their obtainable goals, as well as their necessary weaknesses. The agent stated adding activities

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in the class that prompted students identify their needs within the program. Agent A stated they hoped they are able to reach a variety of people, and to develop their learning based on their needs and goals.

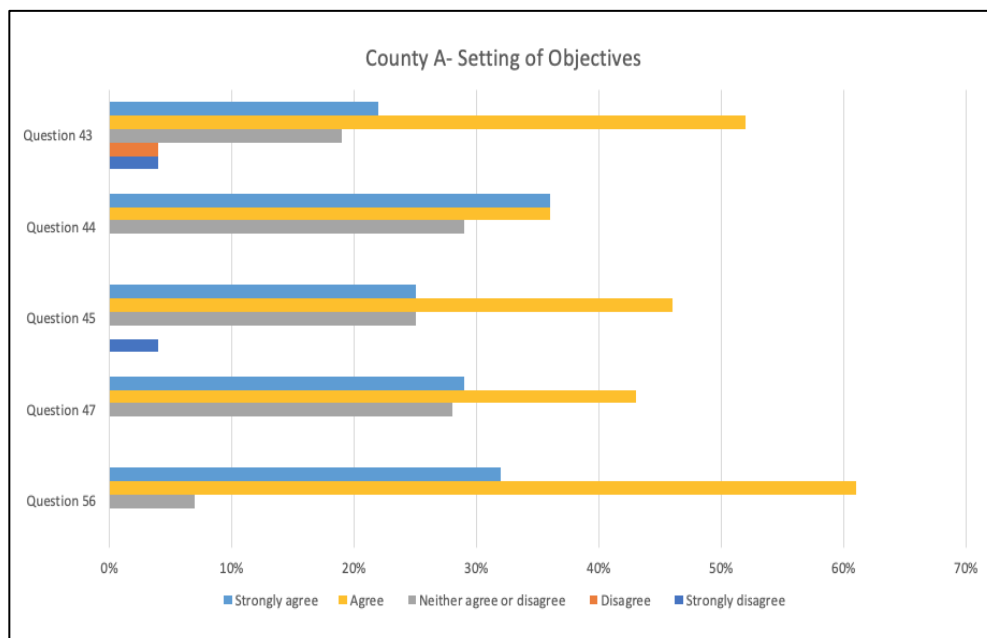
*Setting of Objectives.* Through the semi-structured interview, findings suggested that the county A agent did not set the objectives but attempted to align the objectives of the individual with the institutional and societal objectives (refer to connection to conceptual framework). The agent stated in the semi-structured interview around aligning objectives for other programs in Tennessee as well as societal goals and following BQA objectives and adapting the lesson style to meet individual need. The responses between the semi-structured interview and the API sections of setting of objectives matched well. The findings are listed below based on the questions from the API addressing setting of objectives.

The agent did not state anything specifically around negotiation of the objectives. The agent did state that if a need did arise, they would answer the question to the best of their ability even if it was not on the specific BQA objective. Question 56 scored the highest for agreeability where Question 45 scored the lowest. The findings associated with settings of objectives in more detail is listed below and Figure 21.

### **Figure 21**

*Findings of API based on questions associated with setting of objectives in County A*

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*Note:* This figure demonstrates the API results from County A around setting of objectives based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

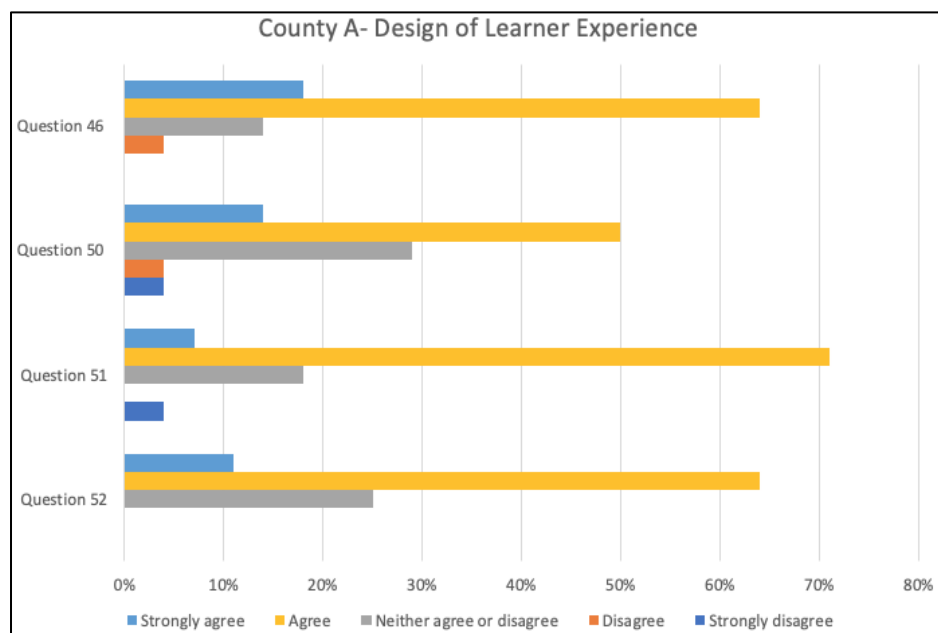
Agent A encouraged the learners by ensuring that all needs and concerns would be answered before the conclusion of the classes. The agent does not set objectives because the National BQA sets the program objectives. Nothing was stated from the agent of becoming partners with the participants, besides adapting the program objectives to meet the individual needs of the producers. The agent did not state anything about learners pursuing what objectives they see as being applicable. It can be assumed that the learners pursued objectives that were seen as a need, and that is the only statements that were made by Agent A. There were no statements around encouraging participants to work together to make decisions about how learning would occur. Majority of the participants agreed that they were encouraged, so we can assume that Agent A was encouraging the participants informally to work together.

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**Design of Learner Experience.** Through the semi-structured interview, findings suggest that the agent from County A followed the step of designing their classes around the participants. Agent A stated designing the learner experience by adapting each class around the participants in the class, adapting based on primary language, adapting based on cognitive abilities, and through adapting based on primary audience style and ages of the participants. The findings from the API matched with the Semi-structured interview that the agent designed the learning experience around the participants in the class. Question 46 scored the highest for agreeability where Question 50 scored the lowest. The findings from County A's API responses around design of learner experience is listed in Figure 22 below.

**Figure 22**

*Findings of API based on questions associated with design of learner experience in County A*



*Note:* This figure demonstrates the API results from County A around design of learner experience based on the percentages of the group which answered by question. Light blue shows

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strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

The agent did not make any statements around to plan to collaboratively design the learning activities with the participants, although only 4% of the participants disagreed. The agent stated around creating learning experiences around the learners as much as possible, although 64% agreed that the agent and the instructor and the participants worked together to design the learning activities. The agent mentioned that they took the necessary steps to adapt the learning experience to the participants capabilities, and 78% agreed that the agent took the steps to adapt to their capabilities.

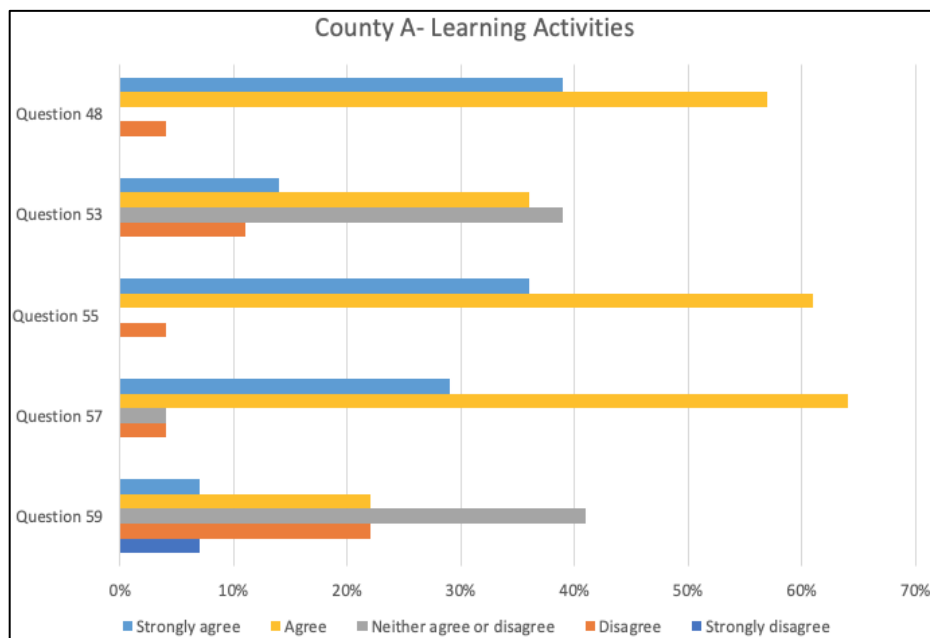
**Learning Activities.** Through the Semi-structured interview, findings suggest that the agent from County A used different learning activities to meet the program objectives. The learning activities that were identified were hands on activities, brainstorming activities, problem solving activities, introductions as learning activities, live animal demonstration activities, and PowerPoint or lecturing style activities. The API findings were promising that the Agent followed the step of designing the learner experience. Question 48 scored the highest for agreeability where Question 59 scored the lowest. The findings from the API around design of the learner experience is found in Figure 23.

### **Figure 23**

*Findings of API based on questions associated with learning activities in County A*



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*Note:* This figure demonstrates the API results from County A around learning activities based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

The agent did not make any statements around to plan to collaboratively design the learning activities with the participants, although only 4% of the participants disagreed. The agent stated around creating learning experiences around the learners as much as possible, although 64% agreed that the agent and the instructor and the participants worked together to design the learning activities. The agent mentioned that they took the necessary steps to adapt the learning experience to the participants capabilities, and 78% agreed that the agent took the steps to adapt to their capabilities.

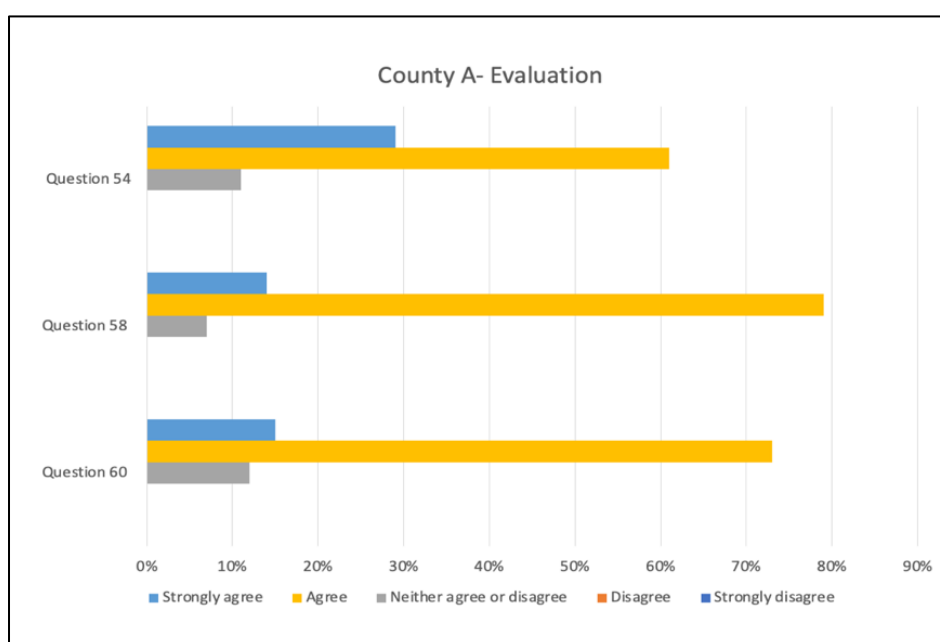
**Evaluation.** The semi-structured interview showed that county Agent A evaluated the quality of learner's experiences and reassessed the needs for continued learning through evaluation materials and through reassessment of participants needs for continual learning. The

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findings from county A's API showed that the agent followed the final step of the andragogical process, evaluation. Question 54 scored the highest for agreeability where Question 60 scored the lowest. The findings from the API associated with evaluation in county A are listed in Figure 24.

### Figure 24

*Findings of API based on questions associated with evaluation in County A*



*Note:* This figure demonstrates the API results from County A around evaluation based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

The findings from the API matched the findings from the semi-structured interview. All participants agreed and neither agreed or disagreed with all the questions around evaluation. The majority of the participants agreed that the methods used to evaluate their learning in the learning experience were appropriate, the evaluation methods used during the learning experience met the

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needs of the participants, and the evaluation methods helped me diagnose the needs for further learning. The agent stated evaluation methods were used at the conclusion of the class, as well as reassessment of participants needs for continuous learning were used.

### *County C*

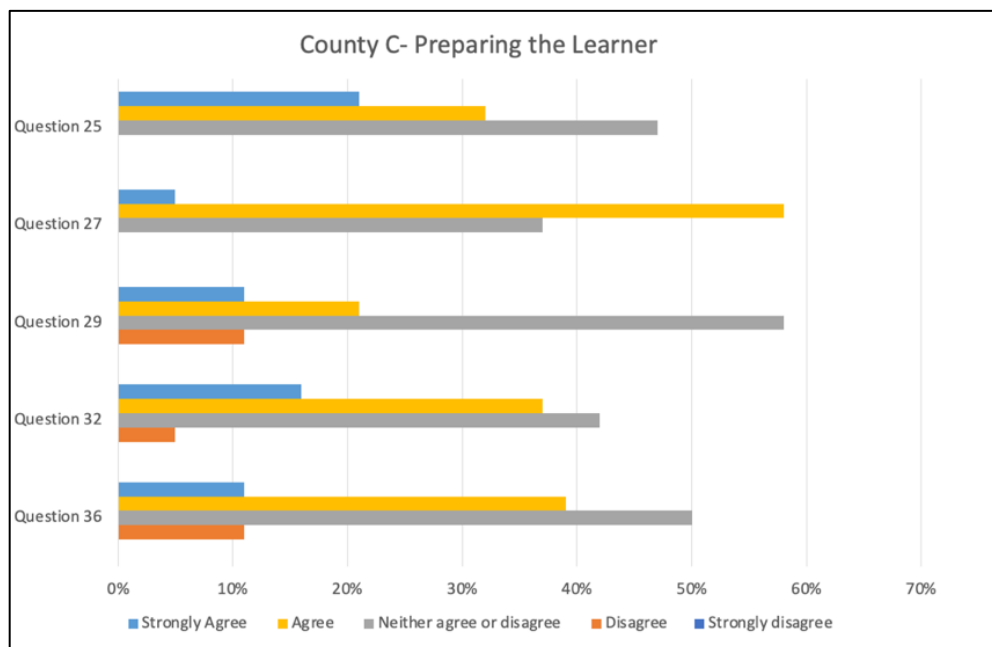
The comparison of the Semi-structured Interview and the API results from County C were compared using andragogical process. The comparison was promising for county C. County C's Semi-Structured Interview and the API process matched up very well. This section will be addressed by the steps of the andragogical process.

**Prepare the Learner.** The semi-structured interview identified that Agent C prepared the learners through objective statements prior to the start of the class and by seeking out beef producers who are not yet apart of the program. The API findings found that participants were majority neither agree or disagree to agree. Question 27 scored the highest for agreeability where Question 36 scored the lowest. The findings based on questions within prepare the learner section is described below in Figure 25.

### **Figure 25**

*Findings of API based on questions associated with prepare the learner in County C*

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*Note:* This figure demonstrates the API results from County C around prepare the learner based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

Majority of the participants neither agreed or disagreed with that sufficient steps were taken to prepare them for the learning process. The agent stated the step that is taken to prepare the learners for the learning process was reading through the objective statements. No participants disagreed that the steps the agent took prepared them for the learning experience gave the participants they needed. There were some participants that disagreed that exercises or activities were given that prepared them to learn, although some agreed that exercises or activities were given that prepared them to learn. Majority of the participants neither agreed or disagreed, 11% disagreed, and a great number of participants agreed the learner expectations were clear before the learning experience began, although less than 5% disagreed. The

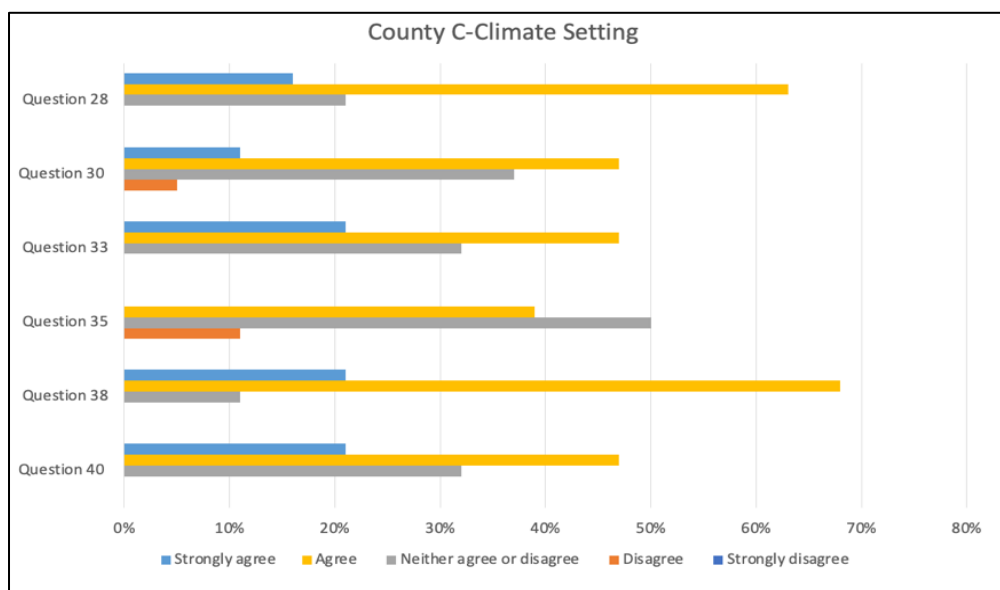
## Increasing Program Effectiveness Through use of Principles of Andragogy in Tennessee Beef Quality Assurance Programs

participants mostly stated they neither agreed or disagreed that the learners responsibilities were clarified was appropriate for the learning experience.

**Climate Setting.** The semi-structured interview identified that Agent C created a cooperative learning environment through knowing reasons of the participation or the goals of the participants for other programs. The API findings found that the majority of the participants agreed that Agent D followed the andragogical process of climate setting. Question 38 scored the highest for agreeability where Question 30 scored the lowest. The findings based on questions within climate setting section is described below in Figure 26.

**Figure 26**

*Findings of API based on questions associated with climate setting in County C*



*Note:* This figure demonstrates the API results from County C around climate setting based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

## Increasing Program Effectiveness Through use of Principles of Andragogy in Tennessee Beef Quality Assurance Programs

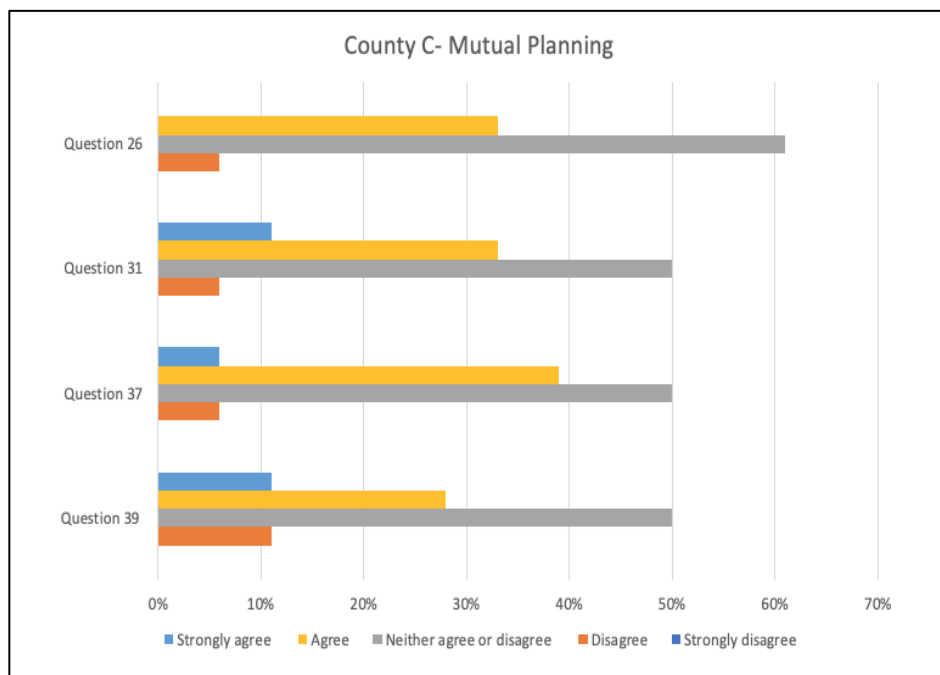
Most all participants agreed, while no one disagreed, that the agent developed a strong rapport with the learners. One participant disagreed while most all participants agreed that the agent created an adequate amount of dialogue with the instructor in the learning experience. Majority of the participants agreed that they were full partners with the agent. Majority of the participants neither agreed or disagreed that the learner and the agent worked together to prepare them for the learning experience, while two participants disagreed. Majority of all participants agreed, while no one disagreed, that the agent was a rich resource for the participants learning during the experience. Majority of all the participants agreed that the climate of the learning experience was collaborative. The agent stated statements around learning the goals and objectives of the participants. The participants mostly all agreed that the agent followed an andragogical process of climate setting, even though the agent did not make many statements around the step of climate setting.

**Mutual Planning.** The semi-structured interview identified that Agent C did not follow the andragogical step of mutual planning. The agent stated that the planning was completed solely by themselves. The API does not identify if the mutually planning step was taken by the agent or not. The API showed that there was not much agreeance on the step mutual planning, but some participants agreed that the agent followed an andragogical process of mutual planning. Question 31 scored the highest for agreeability where Question 26 scored the lowest. The findings based on questions within mutual planning section is described below in Figure 27.

### **Figure 27**

*Findings of API based on questions associated with mutual planning in County C*

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*Note:* This figure demonstrates the API results from County C around mutual planning based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

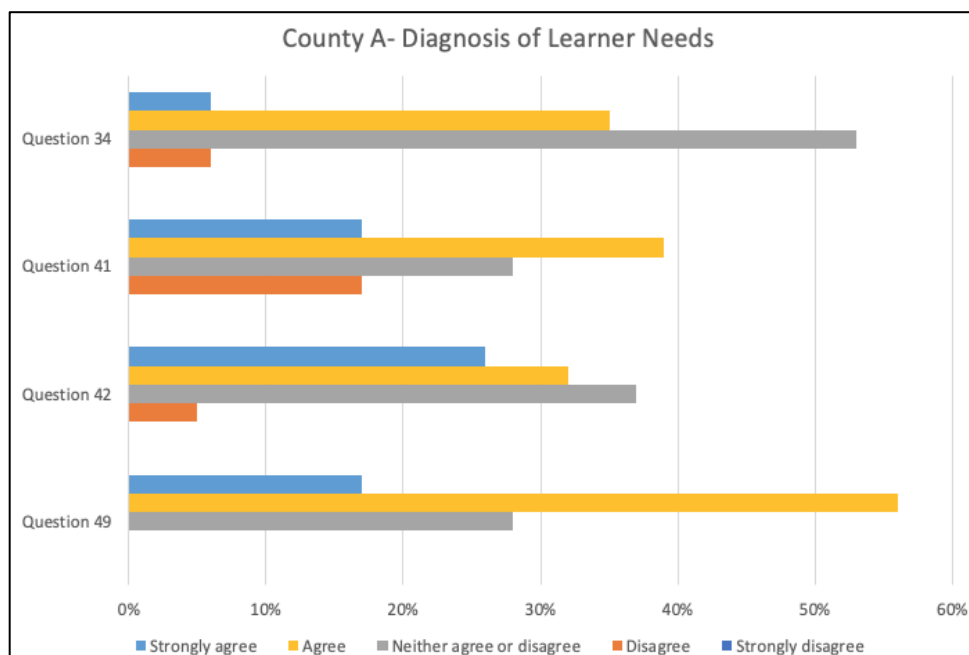
Most of the participants neither agreed or disagreed, while there were participants who agreed and some who disagreed, that they had the opportunity to work with others to plan their learning. Mostly all the participants neither agreed or disagreed, while a number of participants agreed and a few disagreed, that they share responsibility for planning the learning process. Most participants neither agreed or disagreed or agreed that the learners and the instructor cooperated in planning the learning. Majority of the participants neither agreed or disagreed, and most agreed, that they collaborated in planning the learning/instructor. The agent stated that there was no mutual planning with the participants, but the API results suggest that the agent may be mutually planning with participants compared to what was initially thought.

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**Diagnosis of Learner Needs.** The semi-structured interview identified that Agent C did follow an andragogical process of diagnosing learner needs through seeking primary need for requirement to participate in other programs, seeking primary need for the knowledge that will be gained, and conducting exams to identify knowledge that producers have. The API showed mixed results between agreement of following the step of diagnosis of learner needs. Question 41 scored the highest for agreeability where Question 34 scored the lowest. The findings based on questions within diagnosis of learner needs section is described below in Figure 28.

### Figure 28

*Findings of API based on questions associated with diagnosis of learner needs in County C*



*Note:* This figure demonstrates the API results from County C around diagnosis of learner needs based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.



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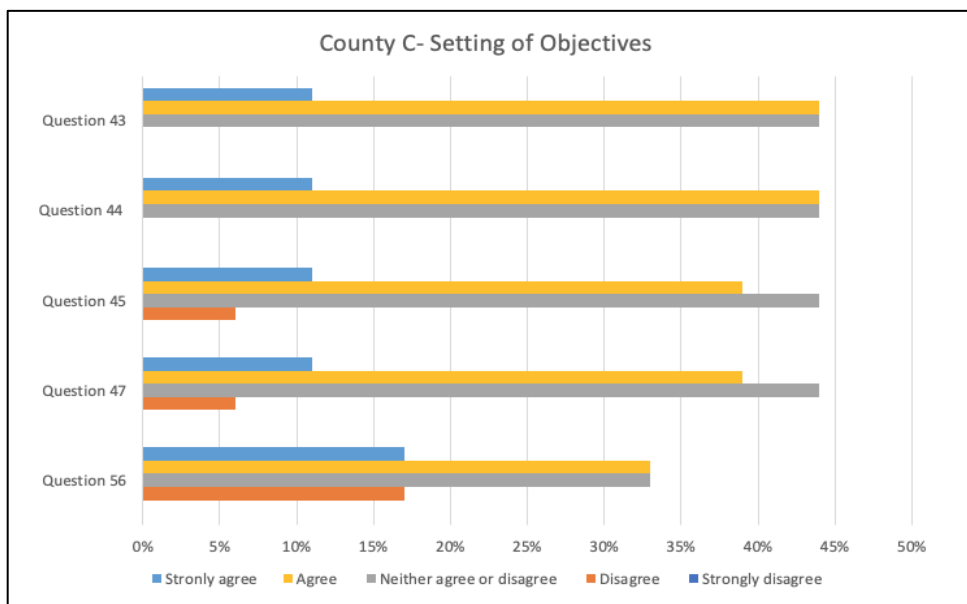
Most of the participants neither agreed or disagreed, while second majority of the participants agreed, that the agent helped the participants diagnose their learner needs. Majority of the participants agreed that they were helped to identify their learner needs, although there was a good amount of participants who disagreed. Most of the participants neither agreed or disagreed, while second majority of the participants agreed, that they were given activities to complete that helped the participants identify their learning needs. Most all participants agreed, while no participants disagreed, that there was analysis to figure out the best direction for learning and development as a part of the learning experience.

**Setting of Objectives.** The semi-structured interview identified that Agent C did follow the andragogical step of aligning objectives through aligning the objectives back to the participants goals and through a read through of the objective statement. The agents did not set objectives but found how to align objectives of the BQA to other programs and learners' individual needs. The API does not identify if the setting of objectives/alignment of objective step was taken by the agent or not. The API showed that there was mixed agreeance on the step. Question 43 and 44 tied for the highest on agreeability where Question 56 scored the lowest. The findings based on questions within setting of objectives section is described below in Figure 29.

### **Figure 29**

*Findings of API based on questions associated with setting of objectives in County C*

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*Note:* This figure demonstrates the API results from County C around setting of objectives based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

No participants disagreed that the instructor and the learner negotiated the learning objectives, although there was a tie between neither agree or disagree and agree. Over 10% of the participants strongly agreed that the learners and the instructor negotiated learning objectives. Majority of the participants agreed that the learners were encouraged to set their own individual learning objectives, while the rest neither agreed or disagreed. Majority of the participants neither agreed or disagreed that learners and the instructor become partners in setting learning objectives, although a great amount of the participants agreed or strongly agreed. Over 5% of the participants disagreed that the two did not become partners in setting learning objectives. Majority of the participants neither agreed or disagreed, while a great amount of participants agreed, that learners determined what learning objectives to pursue; over 5% of the participants

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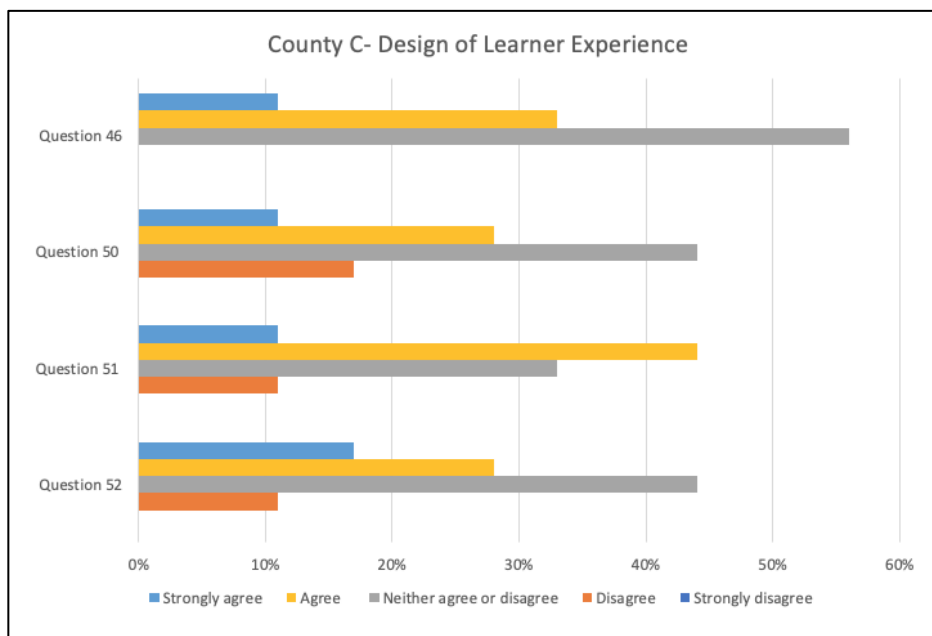
disagreed. There were mixed responses around how learners were encouraged to work together to make decisions about how learning would occur. Neither agree or disagree and agree were tied just under 35%, while disagree and strongly agree was tied just above 15%. There was mixed responses on whether the agent was setting objectives with the participants, although this could possibly be because the agent adapts the objectives that are set from national BQA to align with the learners needs and to align with programs across the state.

**Design of Learner Experience.** The semi-structured interview identified that Agent C did follow the andragogical step of designing the learner experience around those participating in the class by adapting the experience based on cognitive abilities and adapting the experience by primary audience style. The API identifies mixed results on whether the agent followed the andragogical process of designing learner experience. Question 46 scored the highest for agreeability where Question 52 scored the lowest. The findings based on questions within design of learner experience section is described below in Figure 30.

### **Figure 30**

*Findings of API based on questions associated with design of the learner experience in County C*

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*Note:* This figure demonstrates the API results from County C around design of learner experience based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

No participants disagreed that there were mechanisms in place to collaboratively design which learning activities would be use, while majority of the participants neither agreed or disagreed and most agreed in some form there were mechanisms in place. Majority of the participants either agreed or neither agreed or disagreed that the instructor and the participant worked together to design learning activities that worked for them, while over 15% disagreed. Majority of the participants either agreed or neither agreed or disagreed that steps were taken to adapt the learning experience to the capabilities of the participants, while 10% disagreed. The agent did state adapting the learning experience around the capabilities of the participants. Majority of the participants neither agreed or disagreed, with a great amount agreeing, that there

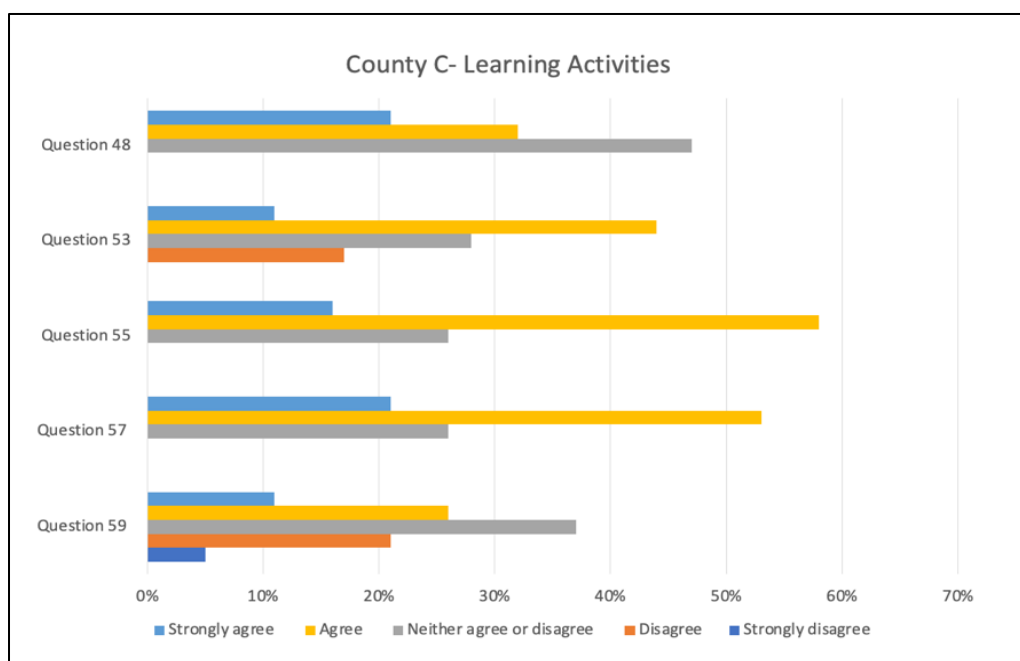
## Increasing Program Effectiveness Through use of Principles of Andragogy in Tennessee Beef Quality Assurance Programs

was an effort made to adjust the design of the learning to fit their situation, although just above 10% disagreed there was effort made.

**Learning Activities.** The semi-structured interview identified that Agent C did follow the andragogical step of addition of different learning activities such as hands on activities, PowerPoint prompted discussions, live animal demonstrations, and through marketing of other programs and opportunities to help meet the needs of the participants. The API identifies mixed results on whether the agent followed the andragogical process of designing learner experience. Question 57 scored the highest for agreeability where Question 59 scored the lowest. The findings based on questions within design of learner experience section is described below in Figure 31.

**Figure 31**

*Findings of API based on questions associated with learning activities in County C*



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*Note:* This figure demonstrates the API results from County C around learning activities based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

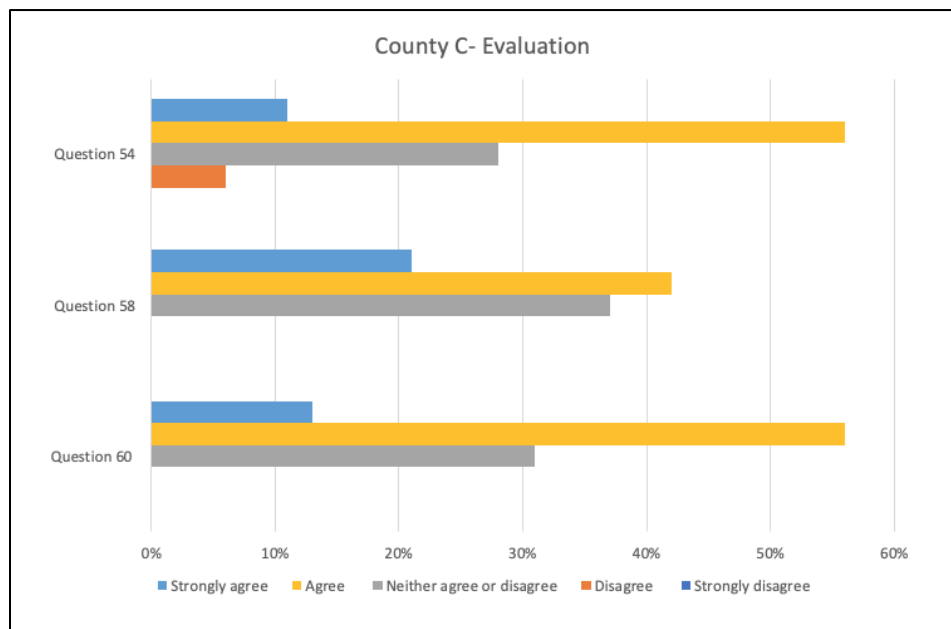
There were no participants who disagreed that many different activities were used to help learners explore and apply new knowledge, majority of the participants neither agreed or disagreed. Majority of the participants agreed that the agent relied heavily on lecture, while more than 20% neither agreed or disagreed and over 10% disagreed. The agent did state that they would go through a PowerPoint during the class, so some participants may have identified this as relying on lecture. No participants disagreed that the learning activities kept them actively involved in the learning process, while majority of the participants agreed that the activities kept them actively involved in the learning process. Majority of the participants agree, while some neither agreed or disagreed, that all the learning activities required their full and active participation. No participants disagreed that the learning activities required their full and active participation. Participants had mixed views on whether learning activities required little action on their part having 5% strongly agreeing, 21% agreeing, 37% neither agreeing or disagreeing, 26% disagreeing, and 11% strongly disagreeing.

**Evaluation.** The semi-structured interview identified that Agent C did follow the andragogical step of evaluation through evaluation materials and reassessment for participants needs. The API identifies results which matched well that the agent followed the andragogical process of evaluation. Question 60 scored the highest for agreeability where Question 16 scored the lowest. The findings based on questions within evaluation section is described below in Figure 32.

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**Figure 32**

*Findings of API based on questions associated with Evaluation in County C*



*Note:* This figure demonstrates the API results from County C around evaluation based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

The findings from the API matched the findings from the semi-structured interview. Participants mostly agreed and neither agreed or disagreed with all the questions around evaluation. 56% of the participants agreed and 11% strongly agreed that the methods used to evaluate their learning in the learning experience were appropriate, although 5% disagreed and 28% neither agreed or disagreed. 42% of the participants agreed and 21% of the participants strongly agreed that evaluation methods used during the learning experience met the needs of the participants. 56% of the participants agreed and 13% strongly agreed that the evaluation methods helped me diagnose the needs for further learning. The agent stated evaluation methods were

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used at the conclusion of the class, as well as reassessment of participants needs for continuous learning were used.

### *County D*

The comparison of the Semi-structured Interview and the API results from County D were compared using andragogical process. The comparison was promising for county D. County D's Semi-Structured Interview and the API process matched up very well. This section will be addressed by the steps of the andragogical process.

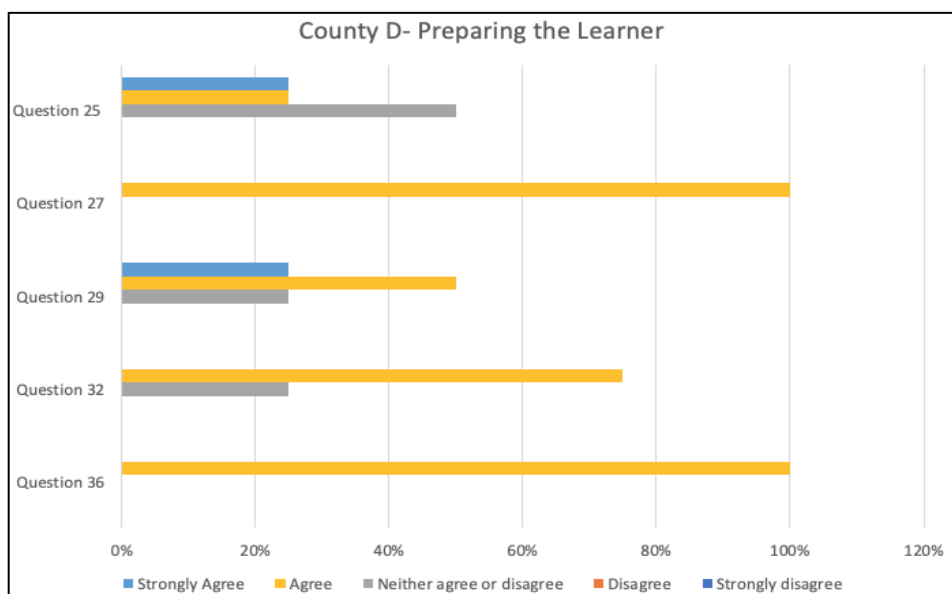
**Prepare the Learner.** The semi-structured interview identified that the participants who take the BQA program have been participating prior to the agent's time as an Agricultural and Natural Resources Extension agent. The API findings found that the majority of the participants agreed that the agent followed the andragogical step of preparing the learner. Agent D may have not stated much around preparing the learner, but the participants mostly all agreed that the agent prepared them for the learning experience. Question 36 and 27 tied, scoring the highest for agreeability where Question 25 scored the lowest. The findings based on questions within prepare the learner section is described below in Figure 33.

### **Figure 33**

*Findings of API based on questions associated with prepare the learner in County D*



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*Note:* This figure demonstrates the API results from County D around prepare the learner based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

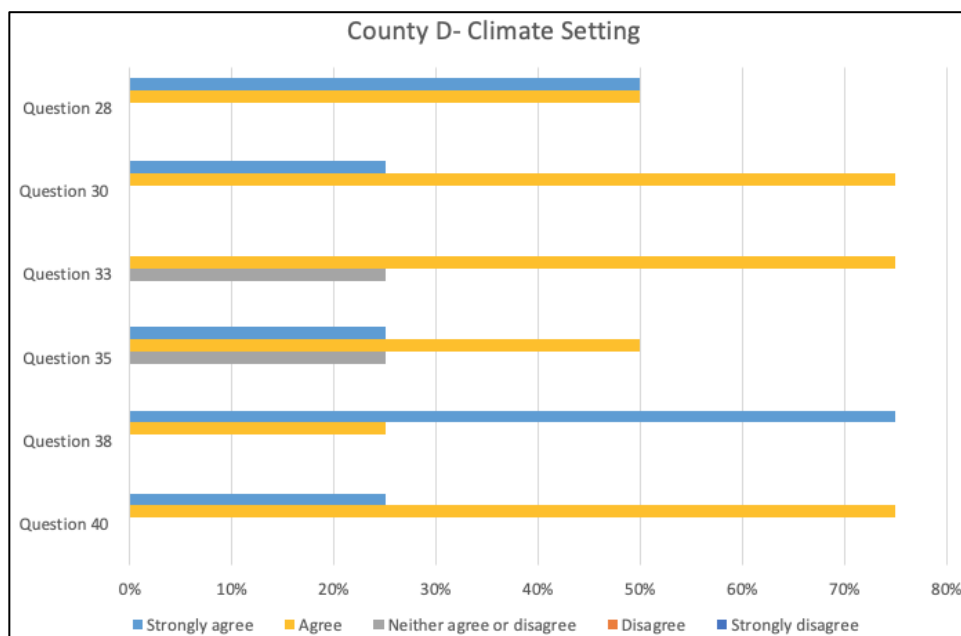
There were no participants who disagreed that Agent D followed an andragogical process of preparing the learner. 50% of the participants neither agreed or disagreed, while 25% strongly agreed and 25% agreed, that there were sufficient steps to prepare them for the learning process. All participants agreed that the way they were prepared for the learning experience gave them the confidence they needed. 50% of the participants agreed, 25% of the participants strongly agreed, and 25% neither agreed or disagreed that they were given learning activities that prepared them to learn. 75% of the participants agreed, while 25% of the participants, that the learning expectations were clear before the start of the learning experience. All of the participants agreed that the way the learner responsibilities were clarified was appropriate for the learning experience.

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**Climate Setting.** The semi-structured interview identified that Agent D created a cooperative climate through creating dialogue and conversation with the participants to learn about them and their goals. The API findings found that participants mostly all agreed to some degree (strongly agree or agree), some neither agreed or disagreed, but there were no participants who disagreed. Question 38 scored the highest for agreeability where Question 33 scored the lowest. The findings based on questions within climate setting section is described below in Figure 34.

**Figure 34**

*Findings of API based on questions associated with climate setting in County D*



*Note:* This figure demonstrates the API results from County D around climate setting based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

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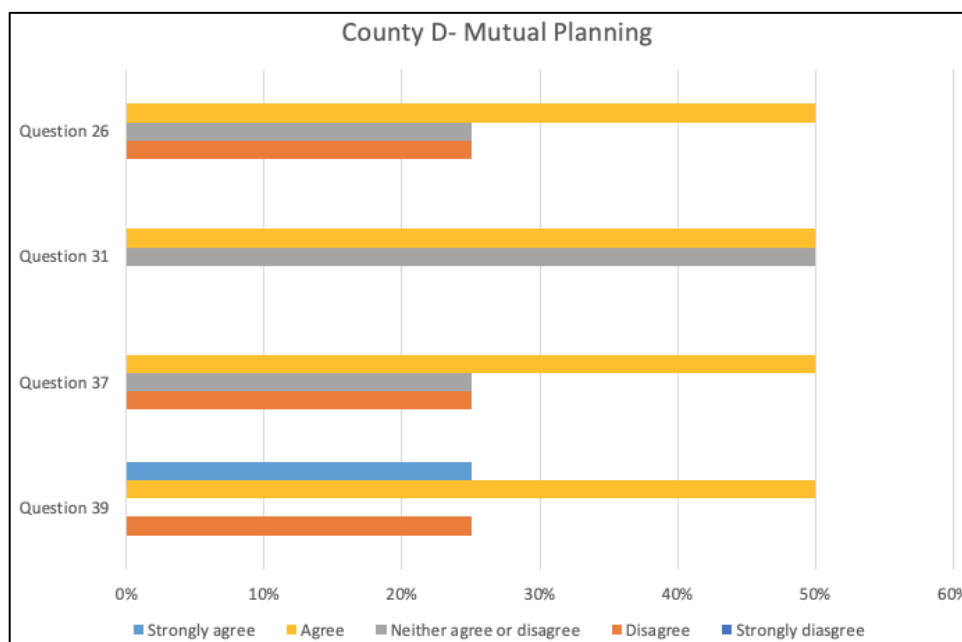
All participants agreed, 50% agreed and 50% strongly agreed, that Agent D developed a strong rapport with the learners. 75% of the participants agreed and 25% strongly agreed that there was an adequate amount of dialogue with the instructor regarding learner needs. The agent fully stated around creating dialogue with the participants about them and their learning needs. 75% of the participants agreed and 25% of the participants neither agreed or disagreed that the instructor and the learner were full partners in the learning experience. 75% of the participants agreed to some degree (25% strongly agreed and 50% agreed) while 25% neither agreed or disagreed that the instructor and the participants worked together to prepare them for the learning experience. 75% of the participants strongly agreed and 25% of the participants agreed that the instructor acted as a rich resource for their learning during the learning experience. 75% of the participants agreed and 25% strongly agreed that the learning experience was collaborative. The agent did not state much around collaboration or how they prepared the participants besides creating a dialogue between the two. Although, participants mostly all agreed that the agent prepared them for the learning experience.

**Mutual Planning.** The semi-structured interview identified that Agent D stated that they did not mutually plan with the participants and planning was planned solely by the agent. The API findings found that participants had mixed experiences or views around the mutual planning process. Question 31 scored the highest for agreeability where Question 26 and 37 tied for the lowest. The findings based on questions within the mutual planning section is described below in Figure 35.

### **Figure 35**

*Findings of API based on questions associated with mutual planning in County D*

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*Note:* This figure demonstrates the API results from County D around mutual planning based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

50% of the participants agreed that there was an opportunity to work with others to plan their learning. 25% disagreed and 25% neither agreed or disagreed that there were opportunities to work with others to plan their learning. 50% of the participants agreed, while 50% of the participants neither agreed or disagreed that there was shared responsibility for planning the learning process. Out of the participants- 25% disagreed, 25% neither agreed or disagreed, and 50% agreed that the learners and the instructor cooperated in planning the learning. 50% of the participants agreed and 25% of the participants strongly agreed that they collaborated in planning the learning, but 25% disagreed of the participants disagreed that they collaborated in planning the learning. Majority of the participants agreed that the agent mutually planned with them for

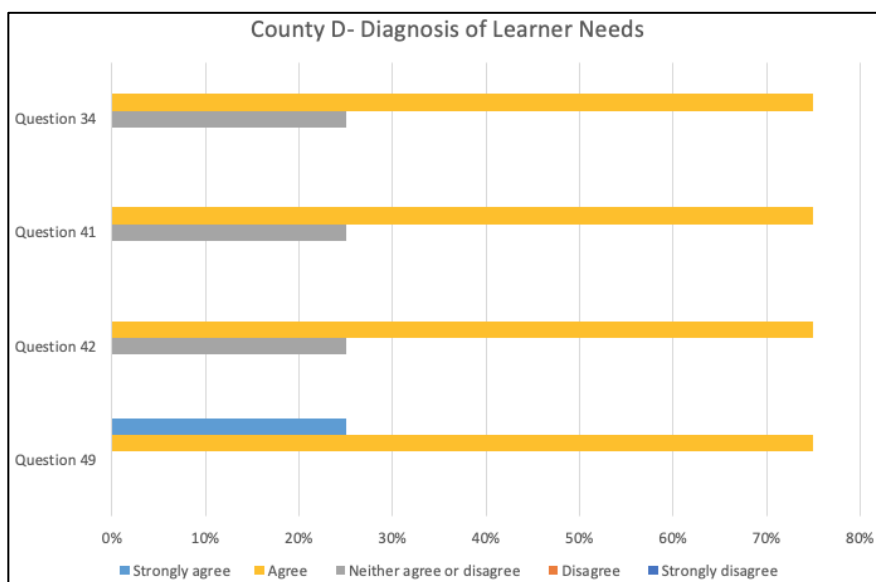
## Increasing Program Effectiveness Through use of Principles of Andragogy in Tennessee Beef Quality Assurance Programs

the learning experience, although there were no statements that the agent mutually planned with the participants in the program.

**Diagnosis of Learner Needs.** The semi-structured interview identified that Agent D diagnosed learner needs by asking preparatory questions about them, their operations, and the goals they have. The API findings found that participants mostly agreed that Agent D diagnosed their learner needs or helped them diagnosis their learner needs. Question 49 scored the highest for agreeability where Question 34, 41 and 42 tied for the lowest The findings based on questions within diagnosis of learner needs section is described below in Figure 36.

**Figure 36**

*Findings of API based on questions associated with diagnosis of learner needs in County D*



*Note:* This figure demonstrates the API results from County D around diagnosis of learner needs based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

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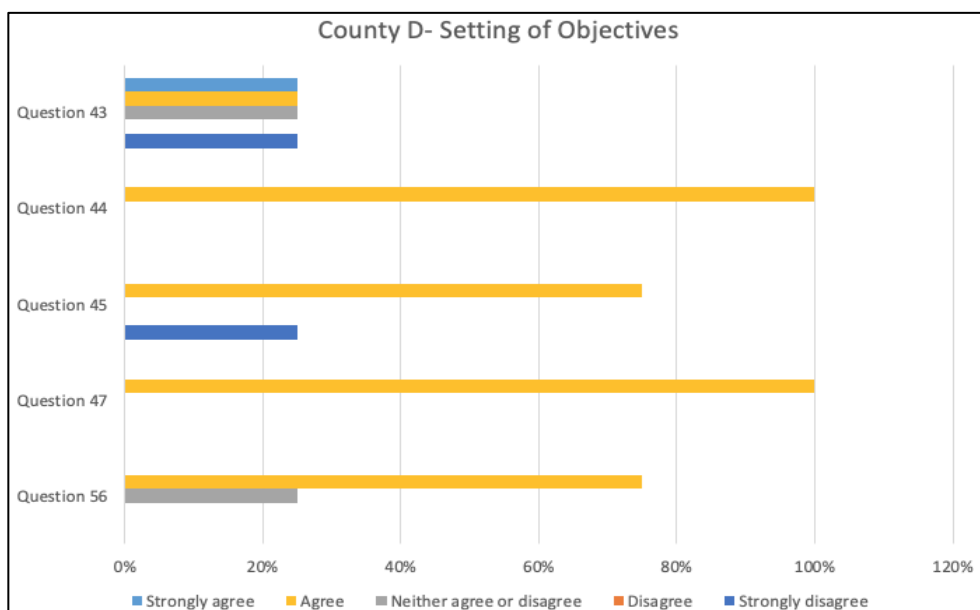
50% of the participants neither agreed or disagreed, while 50% of the participants agreed, that they were helped with to diagnose their learner needs. 75% of the participants agreed, while 25% of the participants neither agreed or disagreed, that they were helped to assess their weaknesses and helped to identify their developmental needs. 75% of the participants agreed, while 25% of the participants neither agreed or disagreed, that they completed activities that helped me identify my learning needs. 75% of the participants agreed and 25% of the participants strongly agreed that they did some analysis to figure out the best direction for their learning and development.

**Setting of Objectives.** The semi-structured interview identified that Agent D did follow the andragogical step of aligning objectives through following BQA objectives and adapting the lesson style to meet individual producer needs. The agent did not set objectives but found how to align objectives of the BQA to other programs and learners' individual needs. The API does identify if the setting of objectives/alignment of objectives step was taken by the agent or not. The API showed that there was mixed agreeance on the step. Questions 44 and 47 tied for the highest in agreeability where Question 43 scored the lowest. The findings based on questions within setting of objectives section is described below in Figure 37.

### **Figure 37**

*Findings of API based on questions associated with setting of objectives in County D*

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*Note:* This figure demonstrates the API results from County D around setting of objectives based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

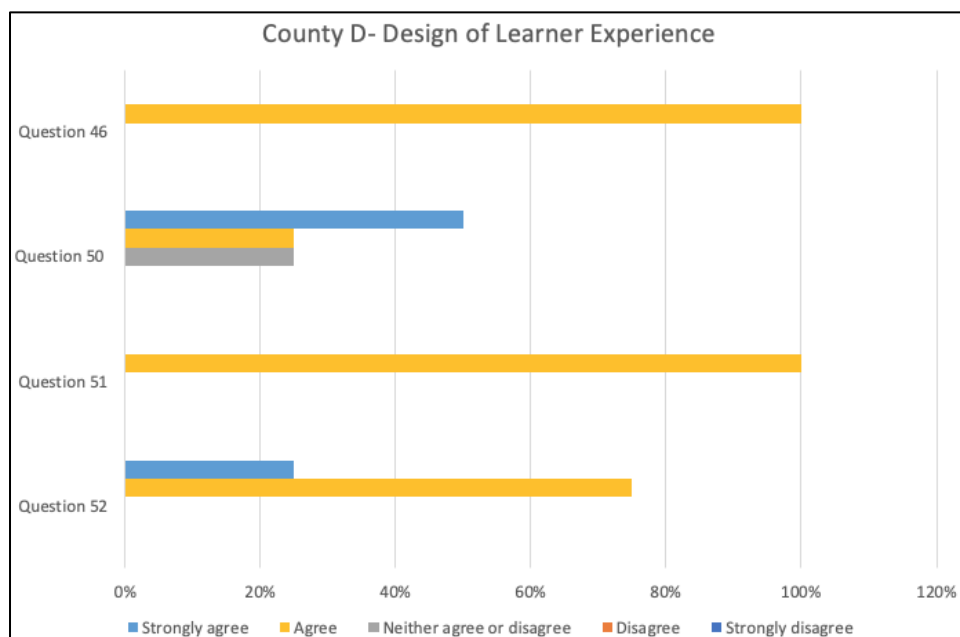
The API results showed mixed views on whether the agent and the learners negotiated the learning objectives, because there were 25% who strongly agreed, 25% who agreed, 25% who neither agreed or disagreed, and 25% who strongly disagreed. The agent did not state anything around negotiating objectives with the participants. All participants agreed that they were encouraged to set their own individual learning objectives. 75% of the participants agreed while 25% of the participants disagreed that learners and the instructor became partners in setting learning objectives. All the participants agreed that they determined what learning objectives to pursue. 75% of the participants agreed while 25% that they were encouraged to work together to make decisions about how the learning would occur.

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**Design of Learner Experience.** The semi-structured interview identified that Agent D did not follow the andragogical step of designing the learner experience around those participating in the class, because they did not consider adapting the curriculum to fit limitations. Although, the agent did state getting a sense early on who may need those adaptations to fit their abilities. The API identified the agent did follow the andragogical process of designing learner experience. The agent may be following the step during the class section but may not consciously plan prior to the start of the class. Question 50 and 52 tied for the highest in agreeability where Question 46 and 51 tied for the lowest. The findings based on questions within design of learner experience section is described below in Figure 38.

**Figure 38**

*Findings of API based on questions associated with design of the learner experience in County D*



*Note:* This figure demonstrates the API results from County D around design of learner experience based on the percentages of the group which answered by question. Light blue shows



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strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

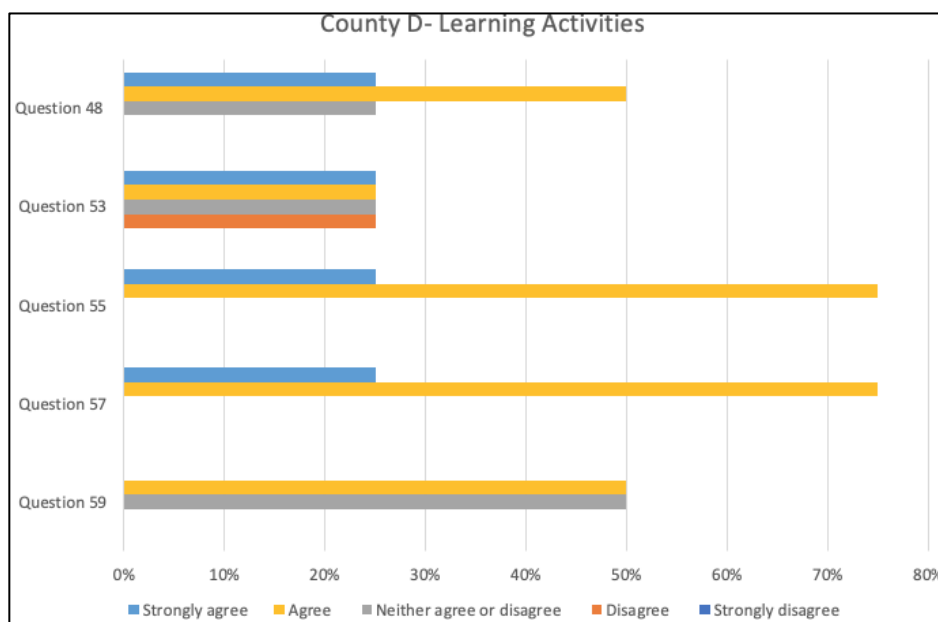
All the participants agreed that there were mechanisms in place to collaboratively design which learning activities would be used. 50% of the participants strongly agreed, 25% of the participants agreed, and 25% neither agreed or disagreed that the agent and them worked together to design learning activities that work for them. All participants agreed that steps were taken to adapt the learning experience to my capabilities. 75% of the participants agreed and 25% of the participants of the participants strongly agreed that there were efforts made to address the design of the learning to fit situations that fit their capabilities.

**Learning Activities.** The semi-structured interview identified that Agent D did follow the andragogical step of learning activities through handing out resources for participants. The API identifies mixed results on whether the agent followed the andragogical process of designing learner experience. Question 56 and 57 tied for the highest in agreeability where Question 53 and 59 tied for the lowest. The findings based on questions within design of learner experience section is described below in Figure 39.

### **Figure 39**

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### *Findings of API based on questions associated with learning activities in County D*



*Note:* This figure demonstrates the API results from County D around learning activities based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

50% of the participants agreed, 25% strongly agreed, and 25% neither agreed or disagreed that there were many different learning activities used to help learners explore and apply new knowledge or skills. 25% of participants disagreed, 25% neither agreed or disagreed, 25% agreed, and 25% strongly agreed that the agent relied heavily on lecture. The agent did state that if the class had participants who were new to the program, they would rely more heavily on the PowerPoint which the state institution provided. This may be the reason on why there are mixed results around question 53. 75% of the participants and 25% of the participants agreed that the learning methods kept them actively involved in the learning process. 75% of the participants agreed and another 25% of the participants strongly agreed that all of the learning activities

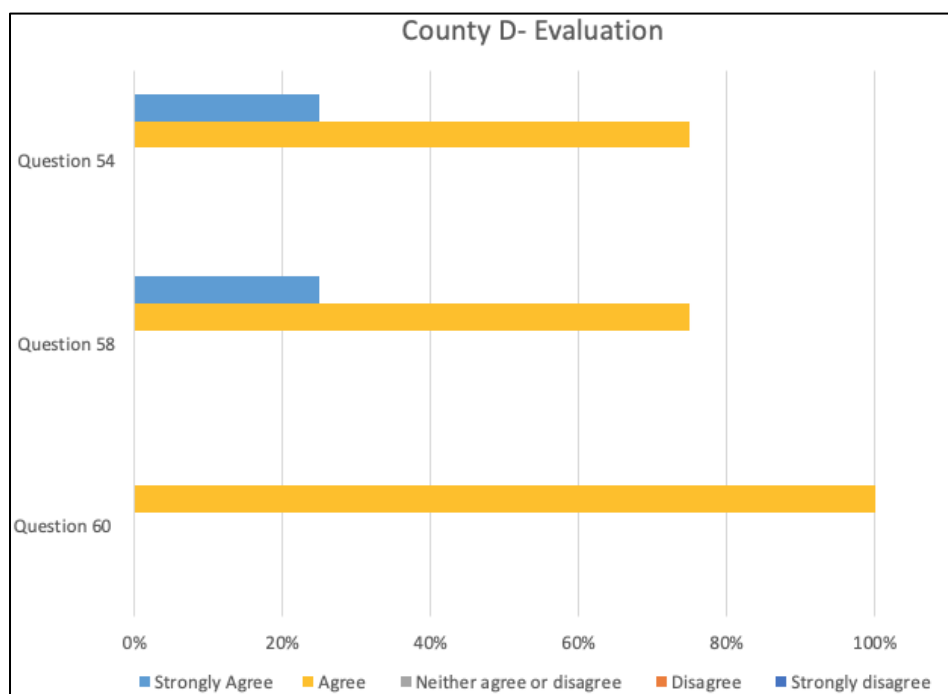
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required their full and active participation. 50% of the participants agreed and 50% of the participants neither agreed or disagreed that the learning activities require little action on their part. The agent did not state all of the learning methods that they may or may not have been used during the program, but the participants mostly agreed to some degree that they followed the andragogical step of implementing learning activities to meet the diverse needs of the audience.

**Evaluation.** The semi-structured interview identified that Agent D did follow the andragogical step of evaluation through follow ups and through evaluation of their program teaching. The API identifies results which matched well that the agent followed the andragogical process of evaluation. Question 54 and 58 tied for highest in agreeability where Question 60 scored the lowest. The findings based on questions within evaluation section is described below in Figure 40.

### Figure 40

*Findings of API based on questions associated with evaluation in County D*



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*Note:* This figure demonstrates the API results from County D around evaluation based on the percentages of the group which answered by question. Light blue shows strongly agree, yellow shows agree, grey shows neither agree or disagree, orange shows disagree, and dark blue shows strongly disagree.

75% of the participants agreed and 25% of the participants strongly agreed that the agents used methods to evaluate their learning were appropriate in the learning experience. 75% of the participants agreed and 25% of the participants strongly agreed that the evaluation methods used during this learning experience met their needs. All participants agreed that the evaluation methods helped me diagnose their needs for further needs.

### **Connection to Conceptual Framework**

Knowle's (2020) Andragogy in Practice conceptual framework was used in this study to identify how andragogy is used in the Tennessee BQA program. The purpose of this section was to identify how the conceptual framework was used in the Tennessee BQA program, more specifically how it was used in the four counties that participated in this study.

### ***Goals and purposes for learning***

The goals and the purposes for learning are summarized into three sections of institutional growth, individual growth, and societal growth. These sections will be addressed with the connection to the findings from the study. The connections to the findings are listed below within the three sections.

**Institutional Growth.** There are several institutions that play a role in the success of the BQA program. To identify institutional growth that was associated with this with this study was mostly identified with an initial literature review, and through statements made by the agents. The BQA was initiated through funding of the Beef Checkoff. The Extension services and Land-

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grant universities are the primary educational outlet for the BQA program. Governmental services also play a role in the BQA program. The institutions and their goals and purposes are listed below.

The Beef Check off program funded the BQA program startup costs and continues to fund the project. The institutional goal and program for the Beef Checkoff is a national leadership that provide program assistance to state BQA programs through the process (Beef Quality Assurance Partner Programs, 2023). The goal of the Beef Checkoff is to show “how common-sense husbandry techniques can be coupled with accepted scientific knowledge to raise cattle under optimum management and environmental conditions, BQA helps beef producers capture additional value from their market cattle, and more. It also reflects a positive public image for the beef industry and instills consumer confidence in it” (Beef Board FQA, 2023). The Beef Checkoff manages all the BQA certificates on the national level.

Governmental agencies also have a growth through the goals that are set out. The Food and Drug Administration (FDA), the Environmental Protection Agency (EPA), the United States Department of Agriculture (USDA), and State Department of Agriculture all have growth matching the goals and purposes of the BQA. The FDA regulations and goals are embedded into the objectives of BQA. The BQA objectives also meet the goals and purposes of the EPA through the teaching of the guidelines of pesticide usage, pasture management, and disposal of animals. The Tennessee Department of Agriculture meets the goals of economic growth through the Tennessee Agricultural Enhancement Program. An agent stated, “This [The BQA Program] is a mandate from the Tennessee Department of Agriculture for them to participate in the Tennessee Ag Enhancement Program.”

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Extension and Land Grant institutions work together to replicate the BQA programs to the county and state level. At the state level through the Land Grant institution, state Extension Veterinarians, also state coordinators for the BQA program, are guiding hands for the training of Extension agents to be successful agents in their county. The University of Tennessee Institute of Agriculture (n.d.) states that, “the reason we offer BQA is simple. Many buyers of feeder cattle are seeking out BQA Certified, source-verified calves”. Extension ranges from the state level through BQA down to the county level. Both works together for the goal to have producers have BQA training to be able to sell the wholesome beef. An agent stated, “We go through the benefits of them going through the BQA program and the things that they’re going to learn that will help on their operation that they might not have thought about before. It might help in terms of not only helping their animals but marketing their animals as well.”

**Societal Growth.** Societal growth is located on the right side of the conceptual framework within the goals and purposes section. Through this study, the societal members that were mentioned the most were Tennessee citizens and specific county members. Through analysis of the data, there is a conclusion that is effects goals of United States citizens and consumers outside of the United States. The societal members and the goals and purposes have societal growth from the county citizens, Tennessee state citizens, United States citizens, and finally Exports of United States beef internationally.

Societal goal of the BQA program is for societal members to have the peace of mind they are consuming healthy, wholesome, and safe beef (Reinhardt & Thomson, 2015). In the Semi-structured interviews, agents stated meeting societal goals. An agent stated, “I think the quality of the program, the importance of understanding that we’re dealing now with the public, even in our rural, very agricultural, used to be county. They understand that we’ve got a job to do. Our

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job is to make sure that the general public knows what we're doing, why we're doing, why it's important, and that we have a safe, wholesome product from animals that receive humane care.”

**Individual Growth.** Individual growth is located at the bottom of the goals and purposes section. The individuals in the BQA program are the participants who take the class. The program's goals for these participants are to take the knowledge gained through the program and directly apply the knowledge to their operations. Findings from the semi-structured interviews identified three goals and purposes for individuals in the program of growth in knowledge of best practices, situations that need to be fixed on operations, and funding opportunities.

Individual goals of the BQA participants fluctuate depending on the participant. Although, common themes around knowledge of best practices, problem solving on their operations, and funding were identified by the three agents who were interviewed. An agent stated the influx of individuals participating for funding verses those who are seeking knowledge, “There a number of different reasons. First and foremost, this particular training is required for participation in other programs. So that is a great incentive for folks to participate. The other thing is we have a lot of folks, more so now than earlier in my career- I see a big influx of people who have no experience whatsoever with livestock... they have a few acres, and they want to do the best job they can. So, they are seeking out things like Beef Quality Assurance.” Another agent stated individuals who are participating for a need to address problems, “Before the grant program come about, they were coming because they were needing the information because they saw a need to improve the health of their animals and how to do that properly.” An agent stated how the grant program was the primary goal of individuals in his county to participate in the program, “Money. Cost share. You know, it is the same thing on some of the other programs.”

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### *Individual and Situational differences*

The individual and situational differences section is the second level of the conceptual framework. This section is portrayed as variables. The individual and situational differences section is summarized by subject matter differences, situational differences, and individual learning difference. The connections to the findings are listed below within the three sections.

**Subject matter differences.** Knowles et al. (2020) stated that individuals may be less likely to learn complex technical subject matter in a self-directed and may require different learning strategies. From the semi-structured interviews, county agents relied heavily on the different approaches that were used to present the BQA subject matter. The findings that are situated around the learning approaches that were taken by the county agents are addressed above with the answers to research question one. learning strategies that were used to address the complex technical subject matter in alignment with this study was adapting to the audience, taking hands-on approaches, brainstorming activities, problem-solving activities, group activities, conducting demonstrations, and following up with farm visits and additional resources.

All agents stated that they preferred using hands-on activities with farmers with the subject matter. An agent stated, “We try to get people involved and apart of the class, which I do as many hands on [activities] as possible. I think people learn by doing better than they learn by listening. So, we try to have some hands-on activities.” Another agent stated that farmers like to learn hands on, “Well in teaching farmers, they like to see things hands on. So, that has been one of the things that we’ve tried to use a lot of. It’s hard to do, sometimes depending on the situation, and what you are trying to teach... I am a believer in utilizing as much hands on type learning as you possibly can.” One agent stated that there was a missed opportunity when



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teaching the BQA program, “I think we’re missing an opportunity, I think the hands-on component would be a better- would be a better option.”

An agent stated that they adapted their class learning activities based on the participants in the specific classes. The agent stated, “Everything has been informal- kind of look at your audience, think about the best way to connect with them, involve them, get them talking.” The agent also stated that adapting your lesson to your audience helps you know how to teach the subject matter based on their prior knowledge. The agent stated, “Finding those types of things out kind of guide you and how deep you go into certain subjects, and how you deal with those subjects as they come up.”

Agents stated that they use different group activities to help assist in their teaching. These activities are typically around group discussions, brainstorming activities, and problem-solving activities. An agent stated, “I’ll give them a problem. How are we going to fix this? And we’ll talk about that. we’ll put them into groups to talk about the power of involving other people in your decision making. Once you get them to talk, and both to you and the other people in the class, I think you’ve overcome the first hurdle of good education.” Another agent stated, “We spend a lot of time thinking outside of the box. You know, if you continue to do things the way you’ve always done it, whether it is animal care, whether it is animal health, whether it’s production in general, you’re never going to get a different result. But everybody comes expecting to have a different result.”

Agents stated that hands on activities were the desired activity for their teaching. Another learning activity that was addressed was conducting live animal demonstration as a part of the teaching of the program. An agent stated, “If not hands on, then certainly showing something that they can see how things work.” Another agent co-taught using demonstrations with the state

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Extension Veterinarian stating, “We’ve had some bull calves brought out, and Dr. [Vet name] went over the practices, demonstrating practices, and gave the farmers the opportunity to use some of the techniques.” An agent stated having live animal demonstrations, “We have had opportunities to actually have live animals.”

Agents stated that they used farm visits and additional resources as a learning approach to connect farmers with more information from the program. One agent stated they offer farm visits for BQA participants in BQA classes, “One of the things that I always tell them, as an Extension agent, one of the jobs that we have- that we can do is to make farm visits. So especially for the newer folks, I tell them that if they need further advice, or would like a farm visit, then I can come out and do one.” Another agent stated they hand out the BQA handbook stating, “We do hand everyone the beef quality assurance handbook that’s available to producers to take with them, and some take them, and some do not.” An agent stated going on farm visits, “I would for folks, is I would typically go out and help them, or not exactly help them. I would go out and demonstrate just typical animal health practices.” An agent stated that they hand out other resources around beef cattle and forages, “We are able to offer a lot of other type of publications that might not be directly associated with the things that they learned during BQA.”

**Situational Differences.** In this study, not many situational differences were identified through the semi-structured interviews. There were two situational differences that could be addressed around differences in counties and differences around facilitators. Knowles et al., (2020) noted the differing variables between macro and micro level systems. Within the frame of this study, the study is situated within the micro-level. “At the micro-level, different learning situations may dictate different teaching/learning strategies. For example, learners in remote locations may be forced to be more self-directed, or perhaps less so” (Knowles et al., 2020 p.

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84). An agent stated, “In adult education on my end, and my clientele that I deal with on a normal basis, it is just such a wide range. You can look at it two ways, you can look at it as a huge challenge to try to talk to those people who came from New York City six months ago and never seen a cow, and they want to be in the cattle business. And then these people have been raising cattle all their life over here on the other side. Yeah, some of my co-workers looked at as a huge annoyance to try to be able to include those I look at as a great opportunity to develop skills.” The agent stated around variables around differences in counties and facilitator differences.

**Individual Learner Differences.** Knowles et al., (2020) stated, “individuals vary in their approaches, strategies, and preferences during learning; an understanding of individual differences help make andragogy more effective in practice. Effective adult learning professionals use their understanding of individual differences to tailor adult learning experiences in several ways” (p. 85). These differences are tailored around nine specific categories: general mental abilities, primary mental abilities, cognitive controls, cognitive styles: information gathering, cognitive styles: information organizing, learning styles, personality: attention and engagement styles, personality: expectancy and incentive styles, and prior knowledge. In this study, agents adapted their program around the individual needs of their participants. Agents did not state around the nine categories, but the findings suggest that the agents tailor around the individual needs of participants in the program. The categories where agents stated around individual needs are primary mental abilities, cognitive styles, learning styles, personality: expectancy and incentive styles, and prior knowledge.

Primary mental abilities that were mentioned through the Semi-Structured interviews were around not being able to read or hear. One agent stated, “We’ve faced that over the years.

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Things such as hearing impairments, those types of things... We work all those things, and I have one person now in class that is hearing impaired. And it makes it difficult, but what we do we put that person on the front row of the class, make sure we face that person, and whenever we're talking, we talk loud and clear. He does a lot of lip reading. So, you know, you just have to adapt." Another agent stated, "There are, you know, there are classes that I teach that there are producers who can't read or write. So, when those situations come, you know, I try to do it in a very low-key manner to not point those people out... We get them to the side, so it is just personally one on one to help them go through the program... even if it takes more time." The agents adapted to meet the individual learner differences within the BQA class around their primary mental abilities.

The second category that was identified through the findings were the cognitive styles of information gathering. The information gathering through demonstrations. Knowles et al., stated that a section of the cognitive style is through the visualizer and verbalizer (2020). Agents created learning activities to increase demonstration to meet these individual learner needs. An agent stated, "If not hands on, certainly showing them something that they can see how things work." Agent used demonstrations to show visualization while verbalizing the processes.

The agents mention more than hands on activities that were used. For individual learning styles, agents identified that farmers and producers prefer hands on learning activities. An agent stated, "A part of the class, which I do as much hands on as possible. I think people learn by doing better than by listening, so I do as much hands on activities." Another agent stated, "In teaching farmers, they like to see things hands on." Another agent stated, "I think we are missing the opportunity; I think the hands-on component would be a better option." All the agents stated

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that the hands-on component works better for the audience which they are teaching in BQA classes.

The fourth category that was around personality of expectancy and incentive styles. A sub section of the category was the individual differences of extroversion and introversion and achievement motivation. An agent stated around the individual differences around achievement motivation between the participants stating, “the older folks, takes a little different approach to get them interested. There’s some of the younger folks. And it depends too on why they’re there. If they’re there just for participation in other programs.” Another agent stated around getting participant out of their primary incentive style of introversion or extroversion stating, “Once you get them to talk, both to you and the other people in the class, I think you’ve overcome the first hurdle of good education... You can get them interacting with everybody, and they are comfortable stating what’s on their mind, then their mind is open, and they can learn.”

The final category that was identified through the semi-structured interviews were the individual differences of participants’ prior knowledge. An agent stated that they accessed the participants prior knowledge through prior contact by asking questions, “With prior contact with probably about 90% of these people through either a farm visit or an office visit or telephone call, to try to get some information from them. How much experience do you have? Have you done this before? What are your goals?... We try to find out as much as we can about all these people before they enter into the class, so that we know- we change the class up a little bit depending on who we’re talking to.” Another agent seeks to understand prior knowledge of individuals and their needs through a pre-test stating, “We actually do a pretest and posttest, so we kind of test their knowledge before they take the class.”

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### *Andragogy: Core adult learning principles*

The core adult principles, learners need to know, self-concept of the learner, prior experience of the learner, readiness to learn, orientation to learn, and motivation to learn, all had prevalence in this study. The API found that most all the participants had a sector of each principle through the responses having very high agreeance. The variables of the andragogy principles show that the BQA participants have differing perspectives on their agreeance on how they identify each core adult principle, although all stated in some agreeance to the questions around each principle that they have these andragogical principles to some degree.

### **Chapter 5: Conclusion and Recommendations**

This chapter begins with the conclusion of the thesis study. Followed by the answers to the research questions. This is followed by the recommendations for future research. Then concludes with an executive summary of the thesis.

#### **Conclusion**

This research aimed to identify how andragogy was being used in the Tennessee BQA programs. Based on the qualitative analysis of the andragogical design (Figure 2), and the quantitative analysis of the API, it can be concluded that agents are following an andragogical design and participants have the andragogical principles. Findings from the two analyses were appropriate methods to identify the use of andragogy in the Tennessee BQA programs in this study. The findings were summarized based on their connection to the research questions, while also making distinct connection to the andragogy in practice conceptual framework (Knowles et al., 2020). The limitations and recommendations for future research were addressed. This study generated gathered data from four counties. Three counties (county A, county C, and county D) had gathered both qualitative data (semi-structured interviews), and quantitative data (API instrument responses). One county only taught spring class, so there were no APIs that were collected from county B. Through the analysis of the data, we can conclude that agents were following the andragogical design of preparing the learner, climate setting, mutual planning, diagnosis of learner needs, setting of objectives, design of learner experience, learning activities, and evaluation. For this study, Extension agents were not setting their own objectives because the BQA program institutional board members were creating learning objectives. Although agents were aligning the BQA objectives to other state programs and to participants goals and interests. Participants had high agreeance that the Extension agents (aside from county B) in this

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study were following an andragogical process, as well the participants had high agreeance on all the andragogical principles.

Future research studies around the recommendations that were addressed will help show an enhanced picture of how the Tennessee BQA program follow an andragogical design from a holistic viewpoint rather than from the sole perspective of later career agents and counties with the top 10 highest participation. Future studies to create a sound API instrument that is aimed toward instructors of educational programs will have an andragogical instrument to measure whether educators are following the andragogical steps that are specified in the API. In conclusion, the Tennessee counties in this study follow an andragogical process that capitalize on principles.

### **Answer to Research Questions**

Through the analysis of the data, all research questions were answered. Agents did follow an andragogical process, BQA program participants mostly all (51 participants) carried all the andragogical principles into the program, and the comparisons of each county's semi structured interview showed an enhanced view of the API. The following will address how each research question was addressed in this research.

### ***Research Question 1: How do Extension Agents follow an andragogical process?***

Through the semi-structured interviews, questions around the andragogical process were asked (Appendix B). All the agents identified that they were following the andragogical process aside from mutual planning. Some agents identified that they had followed the andragogical process more strictly in early career stages rather than in late career stages. Three of the county agents (A, C and D) had their statements validated by their participants in their programming



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classes through the API. County B did not have any APIs completed by participants because there are no spring classes taught, so there was no API connected in this county.

### ***Research Question 2: What six andragogical principles do BQA participants bring into the program?***

All participants agreed to some degree they had all the andragogical principles in the API. There was high agreeance on the questions around the andragogical principles (questions 1-24 on the API). Participants also had very high agreeance that agents followed the steps of the andragogical process. These findings suggest that the agent did follow on andragogical process that was evident to the participants.

### ***Research Question 3: What connections between teaching and learning can be made between different teaching approaches of county agents and the learning of the participants?***

The semi-structured interview findings identified the specific ways and methods that agents were following the andragogical process steps, rather than just the generalized questions around each API question. Through the semi-structured interviews, we know more thoroughly understand how the participants identified the agents' methods, and the individual agent used differing approaches and methods to follow the andragogical process that may be different than their colleague in the field. Through each county comparison between their semi-structured interviews and their API results, it was evident that the interview provided the enhanced understanding of the API that was questioned through identifying the main differences between counties, and the specific methods and ways the agents followed the andragogical process. The only weakness in answering this research question is there were no questions asked in the semi-structured around the andragogical principles. Therefore, there was not an enhanced understanding of participants andragogical principles in the BQA classes in these three counties.

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### **Recommendations**

Recommendations for the Tennessee BQA program are 1) to have trainings for Extension educators around the andragogical process and 2) reevaluating the requirement for additional programs. Recommendations for future research in this study are threefold. The three recommendations for are for future research to be conducted are: 1) adapt the API to aim the instrument for instructors to answer questions around the andragogical design rather than just a participant perspective, 2) conduct a research study that addresses the counties with smaller participation around the state, 3) conducting studies around county agents who are in earlier careers rather than late careers. 4) studies to identify the teaching approaches of the Extension Veterinarians who teach the course.

Through this study we have found that experienced, late career agents are following an andragogical process and BQA participants have andragogical principles. For onboarding purposes, a recommendation is to have an additional onboarding session on the andragogical process of preparing the learner, climate setting, mutual planning, diagnosis of learner needs, setting of objectives, design of the learner experience, learning activities, and evaluation. This will onboard new agents or early career agents to understand an educational theory that is aimed toward teaching adults.

Agents mentioned that a great amount of the producers were participating in the BQA program for the requirement of other programs. The requirements for additional programs are now opportunities for producers to learn more about the BQA and implement objectives. Although, some participants may be participating solely for the opportunity to participate within a cost-share program. Participants may not be implementing the objectives from the BQA program. A recommendation would be to conduct site visits to the producers operation to

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identify the objectives that are being implemented, and reassess the needs of the participants to ensure program effectiveness.

The main recommendation that has been identified is to create an API that is aimed for instructors to take. The semi-structured interviews were an appropriate approach to identify the specific ways each agent followed an andragogical design. Although, the agents stated that they did not mutually plan with their BQA participants, and the API identified that there was high agreeance (54%) that agents followed the andragogical design step of mutual planning. There is an assumption that can be made that agents were not identifying specifics on mutual planning and the wording was confusing. If there was an API that was aimed toward instructors than there can be specifics around each andragogical design that may be addressed. After the conclusion of the API, then qualitative data can be used as a method to build a protocol to still have the exploratory approach within the study.

The second recommendation is to conduct this study but with an inclusion and exclusion criteria with counties who have medium to low participation. With this study being situated with counties who have high participation, there are numerous counties within the standard deviation that have not been conducted that may look different. There will be a more enhanced picture of how andragogy in Tennessee BQA programs will be with the perspective of agents and BQA participants in lower participation counties.

As noted in this study, the agents in these counties were agents who were in later career stages. The third recommendation is to conduct this study but to have the perspectives of early career stage agents to identify how they are following an andragogical process compared to later career stage agents. These agents' perspectives will also create a more enhanced view on how andragogy is being used across the state of Tennessee.

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Through the study, there were some findings that suggest that Extension Veterinarians were teaching the program. Extension agents' primary job is to educate the county participants. Veterinarians job may look differently day to day where education is not their primary job. So, a recommendation would be to conduct a future study that identifies the primary teaching methods of the veterinarians who are teaching these courses.

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### **Executive Summary of Thesis**

This section begins with a summary of the introduction and propose statement. Followed by a summary of the connection to the andragogy in practice conceptual framework model. A summary of the methods and data collection. This section ends with a summary of the results.

### **Introduction and Purpose Statement**

The BQA program objectives set out to ensure that participants gain the information needed to be successful in producing healthy, wholesome, and safe beef products. In Tennessee, BQA participants have a special opportunity to participate in a cost share program, the TNAEP. The TNAEP program is a cost-share program that sets out goals to ensure that Tennessee Agriculture is profitable. BQA participants gain economic benefits from their participation in the BQA program with benefits from the cost-share, and through beef cattle market sales.

Through the literature review, there were no studies found that an educational method research study has been conducted on BQA programs. This makes this study unique that it quite possibly could have been the first one conducted. The purpose of this study was to gain insight and understanding of the role that andragogy has within Tennessee BQA programs and to create recommendations that are appropriate to increase program effectiveness. Three research questions guided this research study: 1) How do Extension agents follow an andragogical process? 2) What six andragogical principles do BQA participants bring into the program? 3) What connections between teaching and learning can be made between different teaching approaches of county agents and the learning of the participants?

The theory that was used in this research study was Malcom Knowles' andragogy. Andragogy was created at a time when adult learning was just like K-12 education of pedagogy. Knowles set out to create a theory which would be aimed to teaching adults. The theory has six principles which adult learners have: orientation to learn, instinct motivation to learn, prior

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experience, self-directed learning, readiness to learn, and need to know (Knowles et al., 2020).

Knowles et al (2020) then set out the andragogical design, which is a seven-step process for adult agents to follow. The seven steps are preparing the learner, climate setting, mutual planning, diagnosis of learner needs, setting of objectives, design of learner experience, learning activities, and evaluation.

### **Conceptual Framework**

The conceptual framework that was used for this research study was the andragogy in practice model (Figure 1). The conceptual model gave a deeper meaning to the andragogical principles because of the individual goals and purposes for learning, and individual and situational differences really helped to shine altering perspectives to this study. The model helped identify that the program effects people outside of beef production, Extension services, Land Grant systems, and National and Tennessee BQA programs.

### **Methods and Data Collection**

This research study was a case study of the Tennessee BQA program. The case study was an embedded case study with three of the top 10 counties that were selected using a randomized purposeful sampling technique. One county did not teach spring classes; therefore, an API could not be obtained. The API could not be obtained because it would have gone against the recommendation of Knowles et al (2020) to give the API at the conclusion of the course. The need for another comparison to complete the embedded case study yielded that another county needed to be selected. An email was sent to the rest of the top 10 counties to ask if any agents were teaching a BQA class soon, and one agent responded. The agent was interviewed, and the API was given to the participants at the conclusion of the program.

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All Semi-structured interviews were considered and analyzed. The interviews were conducted over Zoom and recorded using Zoom and an additional recording device. The recording was then transcribed using Otter ai, then sent back to the agents for member checking. A preliminary reading of the transcripts was read before the coding process began. The transcripts were coded using the pre-determined codes that were determined through research. Additional codes followed the same coding process. Weekly meetings were conducted to compare codes through debriefings.

All APIs were given as a hard copy at the conclusion of the program. There were 28 APIs completed from County A, 19 APIs completed from County C, and four APIs completed from County D. County A and County C had more participants because of their BQA classes being a part of a spring Master Beef programming series. County D had a lower number of participants because the county agent hosts a BQA class once a month on the first Monday night.

### **Results**

Through the semi-structured interviews, results were that agents followed an andragogical process, besides mutually planning. Mutual planning was not identified as being used by any of the four agents. We found that agents were not setting objectives but aligning objectives. The BQA objectives were being aligned with participant goals and objectives for learning, as well as being aligned with other programs objectives and societal goals. The API showed that all agents followed all aspects of the andragogical process. We can assume that agents may be mutually planning with the participants even though they identified that they did not. Through the API we identified that the participants did have the andragogy principles.

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### **Acknowledged Limitations**

The study has selected four cases across the state of Tennessee within each region based on an inclusion and exclusion criteria. With the inclusion and exclusion criteria, the study is missing the perspective of counties with a smaller number of participants. These three counties represent a rich picture of how andragogy is used in those counties, but a limitation will be that this study may not accurately represent the entirety of the state. With the Tennessee Agriculture Enhancement program being so prominent in Tennessee BQA, fall classes ranging from July to September could represent a higher number of participations. With this study being situated in the spring, lower participation in the BQA classes were evident and was a limitation to this study.

Through this case study, the limitation that was most ran into were the selection of agents who do not teach spring classes. Some agents across the state teach their BQA program classes predominately in the fall to prepare participants for the requirements of the TAEP applications which are due in October. While other counties teach their BQA program classes as part of a master beef multi- night session, and some teach BQA program classes one night of every month. With the counties selected:

- County A and C conducts BQA classes as part of Master Beef as well as separate BQA program classes.
- County B conducts BQA program classes predominately all as late summer courses and fall courses.
- County D conducts BQA program classes the first Monday of every month.

The limitation of having counties host classes differently throughout the year is having a class during the time of data collection. As a part of this limitation, there are counties who have lower



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data collection numbers compared to others. This is a limitation when looking at the county comparisons. For example, county A and C had a greater number of participants compared to the number of participants in county D.

Agent A sent their APIs through an email list serv. There were no participants who responded through the list serv API sent. When working with farmers, this seems to be a limitation for a way for participants to respond to the API. The limitation was addressed by having these participants complete the API at the last class. This served as limitation for a time during the data collection process.

The final limitation that was identified was all the agents in this study were in later career stages compared to earlier career stages. The average years that these agents taught the BQA program were 25.75 years. The average years working in Extension are 32.25 years. The assumption that can be made is that agents have adapted to teaching adults and know the best practices to teach Extension audiences. This leads to questions around how the andragogical process could be carried out with earlier career agents.

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## Appendices

### Appendix A: Virginia Tech Institutional Review Board Approval



Division of Scholarly Integrity and  
Research Compliance  
Institutional Review Board  
North End Center, Suite 4120 (MC 0497)  
300 Turner Street NW  
Blacksburg, Virginia 24061  
540/231-3732  
irb@vt.edu  
<http://www.research.vt.edu/sirc/hrpp>

#### MEMORANDUM

**DATE:** November 16, 2022  
**TO:** Karen Vines, Lisa Diane Ellis  
**FROM:** Virginia Tech Institutional Review Board (FWA00000572)  
**PROTOCOL TITLE:** Increasing Program Effectiveness Through use of Principles of Andragogy in Tennessee Beef Quality Assurance Programs

**IRB NUMBER:** 22-629

Based on the submitted project description and items listed in the Special Instructions section found on Page 2, the Virginia Tech Human Research Protection Program (HRPP) has determined that the proposed activity is not research involving human subjects as defined by HHS and FDA regulations.

Further review and approval by the Virginia Tech Human Research Protection Program (HRPP) is not required because this is not human research. This determination applies only to the activities described in the submitted project description and does not apply should any changes be made. If changes are made you must immediately submit an Amendment to the HRPP for a new determination. Your amendment must include a description of the changes and you must upload all revised documents. At that time, the HRPP will review the submission activities to confirm the original "Not Human Subjects Research" decision or to advise if a new application must be made.

If there are additional undisclosed components that you feel merit a change in this initial determination, please contact our office for a consultation.

Please be aware that receiving a "Not Human Subjects Research" Determination is not the same as IRB review and approval of the activity. You are NOT to use IRB consent forms or templates for these activities. If you have any questions, please contact the Virginia Tech HRPP office at 540-231-3732 or irb@vt.edu.

#### PROTOCOL INFORMATION:

Determined As: **Not Human Subjects Research**  
Protocol Determination Date: **November 16, 2022**

#### ASSOCIATED FUNDING:

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

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**Appendix B: Semi-Structured Interview Protocol**

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Semi-structured Interview Protocol  
(IRB 22-629) /Deemed "Not Human Subject Research"

**PROTOCOL**

The Semi-Structured Interview moderator will follow a standard protocol for each session that includes:

1. Welcome and opening remarks
2. Informed consent form review
3. Established guidelines
4. Questions and answers period
5. Wrap-up and thank you

**WELCOME AND OPENING REMARKS**

Hello, I am Lisa McCormick. I am a masters studying Extension Education in the Agricultural, Leadership, and Community Education Department at Virginia Tech University. Thank you for agreeing to participate in this semi-structured interview on your participation in BQA programs. I look forward to hearing how you are educating beef producers within the program in your county. This project is looking at the specifics of how adult learning theory has a role in Tennessee BQA programs, and how we can increase program effectiveness through the use of the principles of andragogy. You may choose not to participate at any time in this process by indicating this to me. Do you have any questions related to your consent to participate in this research at this time?

**GENERAL GUIDELINES**

- This Interview will be recorded using a recording device and will be recorded by Zoom to ensure that I capture all your thoughts and answers.
- Please speak loud and clear. Please do not use your name or anyone else's name but feel to address yourself and other participants by their initials.
- We would like to spend no more than 60 minutes in this Interview meeting. We have a series of pre-formed questions.
- Please be honest with us as much as possible when you answer our questions.

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- There are no right or wrong responses to the questions- we just want your thoughts and opinions.
- Please silence or turn off all electronic devices
- Just as a reminder, this interview will be recorded on Zoom and with a digital recording device. As another reminder, your identities will remain anonymous.
- Another reminder, you can stop your participation at any time, and you can refuse to answer any questions you do not feel comfortable answering.

### Semi-Structured Interviews Questions

#### Warm-Up Questions

1. Let's quickly go around and share a few facts so that I can understand the demographics of this interview:
  - a. What is your title?
  - b. What is your area of expertise?
  - c. How long have you worked in Extension Education?
  - d. How long have you taught the BQA program in your area?

**Adult Education-** In teaching the BQA programs, your primary audience is adults. Adult education is different compared to teaching children. We would like to explore some of this area and your prior knowledge of this area.

1. In your experience in teaching adult classes, do you know any adult learning theories that inform your teaching?

**Andragogy-** Knowles (1972) identified 6 assumptions of adult learning. These assumptions are 1) the need to know, 2) the learner's self-concept, 3) the role of the learners' experiences, 4) readiness, 5) orientation to learning, and 6) motivation. We would like to explore these areas and how they apply in Tennessee BQA programs.

1. How do identify the reasons that adult learners are participating in BQA programs?
2. How do you guide the participant of the expectations of the program prior to the start of the program?
3. How do you work to understand prior knowledge and experience of the BQA Participate with the educational content of the program?
4. How do you plan with the BQA participants prior to the program class?
5. How do you adapt your curriculum to fit the diverse adult audiences? i.e. for mental abilities, cognitive controls and styles, learning styles, and physical abilities.

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6. What factor do you believe is the strongest motivating factor for beef producers who participate in the programs?
7. How do you create a cooperative learning environment between you and the adults who are participating in the BQA program?
8. How do (or what are some of the ways) you ask the beef producers what their personal goals and objectives are when they participate in the program?
9. What additional materials are given to the participants at the conclusion of the program, if any?
10. Do you provide additional support for BQA certificate holders after the conclusion of the program to achieve the producers' personal goals/objectives?
11. How do you evaluate the quality of the program?
12. How do you address the needs of the learners after the conclusion of the program?

**Wrap up and thank you.**

We are now finished with our Semi-structured questions. I want to sincerely thank you for your time and input. If you have any final comments, please feel free to share them now.

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**Appendix C: Andragogy in Practice Inventory (API) Assessment Survey**

Hello: You are invited to participate in our andragogy in practice inventory (API) assessment. In this survey, Beef Quality Assurance program participants are asked to complete a survey that asks questions about the program learning experiences. It will take approximately 10-20 minutes to complete the questionnaire. Your participation in this study is completely voluntary. There are no foreseeable risks associated with this project. However, if you feel uncomfortable answering any questions, you can withdraw from the survey at any point. It is very important for us to learn your opinions. Your survey responses will be strictly confidential and data from this research will be reported only in the aggregate. Your information will be coded and will remain confidential. If you have questions at any time about the survey or the procedures, you may contact Lisa McCormick at 423-268-5346 or by email at ldellis42@vt.edu Please read each of the following statements and circle the number (1,2,3,4, or 5) that most closely reflects your opinion of the learning experience you have just completed. There is no right or wrong answer. Your first impression or reaction is usually the most accurate. Thank you very much for your time and support. Consent is implied when you press the continue button below to begin. Please start with the survey now by clicking on the Continue button below.

For the following items, please think about the specific learning event or experience you have just completed

	Strongly Disagree	Disagree	Neither agree or	Agree	Strongly agree
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			disagree		
The things I learned will assist me in resolving a work or life problem.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I learn because of the personal satisfaction it gives me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt my prior life and work experiences helped my learning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mastery of this material will benefit my life or work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
This learning experience will make a positive change in my life or work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt responsible for my own learning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We did things that illustrated how this learning could help me address real tasks or problems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I learn because of the inner fulfillment it provides.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The knowledge gained in this learning experience can be immediately applied to my life or work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My life and work experiences were a regular part of the learning experience.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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The instructor helped me understand why the learning methods were right for me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I learn because of the pleasure of discovering new things that interest me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I needed this learning at this time in my life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I set my own goals for learning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The instructor explained how this learning would help me deal with changes in my life or work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I had control over what was learned.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt my life and work experiences were a resource for this learning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Steps were taken to make clear how the learning would fit my needs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I learn for the enjoyment of broadening my knowledge and skills.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
This learning was necessary to help me meet the changes happening in my work or life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I had a role to play in my own learning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
This learning helped me develop the knowledge and skills I need at this time.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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I made the decisions about how learning progressed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
This learning was necessary for the challenges I face.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sufficient steps were taken to prepare me for the learning process.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I had the opportunity to work with others to plan our learning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The way I was prepared for this learning experience gave me the confidence I needed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The instructor developed a strong rapport with the learners.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Before this learning experience, I was given exercises or activities that prepared me to learn.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There was an adequate amount of dialogue with my instructor regarding my learning needs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We shared responsibility for planning the learning process.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The learning expectations were clear to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



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before this learning experience began.					
Learners were full partners with the instructor in this learning experience.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I was helped to diagnose my learning needs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The instructor and I worked together to prepare me for this learning experience.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The way learner responsibilities were clarified was appropriate for this learning experience.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Learners and the instructor cooperated in planning the learning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The instructor acted as a rich resource for my learning during this learning experience.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We collaborated in planning the learning/instruction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The climate in this learning experience was collaborative.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I was helped to assess my weaknesses and identify my development needs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I completed activities that helped me identify my learning needs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The instructor and the learners negotiated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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the learning objectives.					
Learners were encouraged to set their own individual learning objectives.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Learners and the instructor became partners in setting learning objectives.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There were mechanisms in place to collaboratively design which learning activities would be used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The learners determined what learning objectives to pursue.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Many different activities were used to help learners explore and apply new knowledge or skills.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
As a part of this learning experience, I did some analysis to figure out the best direction for my learning and development.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The instructor and I worked together to design learning activities that work for me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Steps were taken to adapt the learning experience to my capabilities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
An effort was made to address the design of the learning to fit situations that fit my	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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capabilities.					
The instructor relied heavily on lecture.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The methods used to evaluate my learning in this learning experience were appropriate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The learning methods kept me actively involved in the learning process.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Learners were encouraged to work together to make decisions about how learning would occur.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
All of the learning activities required my full and active participation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Evaluation methods used during this learning experience met my needs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The learning activities require little action on my part.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Evaluation methods helped me diagnose my needs for further learning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

What is the name of the county you just experienced this course in?

1. Option 1
2. Option 2
3. Option 3

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What is your gender

1. Male
2. Female

What is your race or ethnicity?

1. Asian
2. Black or African American
3. Hispanic or Latino
4. Middle Eastern or North African
5. Multiracial or Multiethnic
6. Native American or Alaska Native
7. White
8. Self-describe below:
9. Native Hawaiian or other Pacific Islander

What was the highest level of education you completed

1. elementary
2. Some high school
3. High school
4. Associate degree
5. BS/BA
6. MS/MA
7. JD/MD

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8. PhD
9. N/A

Which of the phrases listed best describes your main goal for engaging in this learning experience? (select the one that best fits)

1. Personal growth/ self-improvement
2. Upgraded skills for current job
3. Upgraded skills for a different job
4. Preparation for a new career
5. Required to attend by employer
6. Complete a degree/certificate program
7. Personal interest

What is your age?

1. 25 or younger
2. 26-40
3. 41-55
4. 56 or older

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**Appendix D: Code book- predetermined codes and emergent codes associated with the six andragogical principles and the andragogical process.**

Andragogical Process Codes	Description (Knowles et al., 2020)
Preparing learner	Facilitators of BQA programs is preparing the learner by guiding the participant of the expectations of the programs which helps increase confidence prior to the program.
Climate setting	Facilitators of BQA programs is creating a cooperative learning climate by understanding the participants in their program and the needs and goals of the individual.
Mutual planning	Facilitators of BQA programs worked with the participants on the plan prior to the program (i.e., date of program)
Diagnosis of learning need	Facilitators of BQA programs accessed the needs of the learners by asking questions and not assuming the knowledge of participants.
Alignment of objectives	Facilitators knew and understood the purpose and goals of the program as well as the participants and capitalized on the goals of individuals and institution to meet societal goals.

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**Design of the learner experience** Facilitators know the participants and adapt the learning experience to fit their individual needs (general mental abilities, primary mental abilities, cognitive controls, cognitive styles, learning styles, prior knowledge, and physical abilities).

**Learning activities** Facilitators used a variety of learning activities and skills to address the diverse needs of the learners.

**Evaluation** Facilitators evaluated the learners experience at the conclusion of the course and then reassessed the needs for continuing learning.

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### Appendix E: Calculated Intercoder Reliability

After the conclusion of the discussion between the coders on which code belonged, the note taker added which coder had which statement coded on the side. The approach used was advised by Dean Freelon, PhD (ReCal3: Reliability for 3+ Coders, n.d.). The results were then entered into the ReCal3 ® online utility that computed intercoder reliability coefficients which calculated four of the most popular intercoder reliability coefficients: Average Pairwise Agreement, Fleiss' Kappa, Average Pairwise Cohen's Kappa, and Krippendorff's Alpha

County Document	Average Pairwise % Agreement	Fleiss' Kappa	Average Pairwise Cohen's Kappa	Krippendorff's Alpha	# of Cases
County A Document	44.633%	-0.0107	-0.097	-0.101	59
County B Document	40.426%	-0.192	-0.168	-0.183	47
County C Document	46.377%	-0.081	-0.068	-0.073	46
County D Document	45.833%	-0.095	-0.086	-0.084	32