TEACHERS' PERCEPTIONS OF PEDAGOGICAL CHANGE THROUGH THE INGO FIELD OF HOPE'S INTRODUCTION OF AN AGRICULTURAL EDUCATION CURRICULUM IN UGANDA – A MIXED-METHODS CASE STUDY

By

ROBIN SHUFFETT

Bachelor of Arts in Spanish - International Business

Georgia State University

Atlanta, Georgia

2018

Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
MASTER OF SCIENCE
December, 2021

TEACHERS' PERCEPTIONS OF PEDAGOGICAL CHANGE THROUGH THE INGO FIELD OF HOPE'S INTRODUCTION OF AN AGRICULTURAL EDUCATION CURRICULUM IN UGANDA – A MIXED-METHODS CASE STUDY

Thesis Approved:

Dr. M. Craig Edwards

Thesis Adviser

Dr. Shida Henneberry

Dr. J. Shane Robinson

Dr. Bailey Norwood

ACKNOWLEDGEMENTS

I want to recognize the emotional, spiritual, mental, and physical support from my family, and my friends, who have uplifted me in prayer and comfort while pursuing my dreams. To Fe, with all of my love, thank you for being so bright, silly, and entertaining when I needed a writing break. Dad, you are worthy of all of my gratitude and love for your faith, patience, understanding, and cheer. I would not have been able to see it through these challenging times of the pandemic and altered research plans, without you.

I am profusely thankful for my committee and for their mentorship, through which I was able to complete this project. It has been an honor to work under the guidance of such talented minds. Dr. Edwards, I cannot express the value of your presence and advisership during this study. Thank you for taking me and my research under your wing at the last minute, and for making me a better writer, investigator, and analyst. If my writing ever gave you a headache like I suspect it did, you channeled your frustration into encouragement, inspiration, and constructive input. Thank you for breathing clarity and cohesion into my work.

Dr. Henneberry, who activated my adaptability and creativity in the midst of uncertainty and upheaval, I thank you for your professional expertise and academic support. Thank you for providing me my first job in academia as a graduate research assistant. I enjoyed having an office space in Ag Hall! You empowered me in so many ways. Moreover, thank you for caring for my wellness and for your Zoom calls and

emails with advice and newsletters. The way you can generate research topics out of thin air through casual conversation is sheer brilliance. Thank you for sparking my mind.

Dr. Ochoa, thank you for being so welcoming and accommodating, despite my inexperience and disorientation in the beginning of my time in the MIAP program. You never hesitated to make a phone call to get me in contact with the appropriate people toward my project interests. Thank you for allowing me to attend your talks and lab trainings and plant virology team meetings. You and Mrs. Olympia are such a blessing to the department and the university. ¡Que Dios les bendiga!

Dr. Robinson, thank you for your guidance and expertise through the process of this study. You have been so welcoming and positive in your feedback in our meetings and emails, and I would not have been able to complete this project without you. Dr. Norwood, your patience and professional input in our committee meetings were timely and essential to my success. Dr. Cartmell, you have seen me change research directions and flounder in knee-deep water of uncertainty and panic, and your advisership has supported and lead me to the completion of this study and the fulfillment of my requirements. Thank you for your support and advice, and for always answering my questions. Mrs. Bay, I was always uplifted and equipped through your positive words and your answers to my consistent barrage of miscellaneous questions. Thank you for holding my hand and walking me through this graduate program, every step of the way. You have been a beacon of light in this whole process!

To Field of Hope, who inspired, informed, and guided this study, I am eternally grateful for your presence and support, and for the work that you do. Alexa, thank you for the opportunity to intern with such an exceptional organization. Thank you for putting me

in touch with so many amazing people of faith such as Agnes, Walter, Nick, Jessica, Dr. Redwine, Mike, Cathy, Whitney, and Emma. I pray for the continued success and the touched lives of Field of Hope through agricultural education.

Emma, thank you for taking the time to answer my questions and for aiding in the building and completion of this study. Your work with Field of Hope and the Vivayic team is helping students and agricultural educators to explore and develop their love and appreciation for farming and agricultural knowledge. Thank you for your vision, drive, and passion.

To my fellow cohorts in the MIAP program and in other departments, I wish all of you success, support, and amazing experiences. Reach for the stars and know that you deserve your wildest dreams and ambitions. It has been a blessing to know you, work with you, learn with you, and from you!

Name: ROBIN SHUFFETT

Date of Degree: DECEMBER, 2021

Title of Study: TEACHERS' PERCEPTIONS OF PEDAGOGICAL CHANGE THROUGH THE INGO FIELD OF HOPE'S INTRODUCTION OF AN AGRICULTURAL EDUCATION CURRICULUM IN UGANDA – A MIXED-METHODS CASE STUDY

Major Field: INTERNATIONAL AGRICULTURE

ABSTRACT

Agricultural education should provide practical experiences for school-aged youth to learn, interpret, reconceptualize, and apply such while acquiring the technical skills needed to successfully practice agriculture (Barungi et al., 2016; Mukembo, 2014, 2017). Initiatives from national agencies have been supported by international donors to optimize pedagogical change in secondary schools that transforms agricultural theory into agricultural practice in Uganda and elsewhere. This study featured the initiatives set forth by the U.S.-based, international nongovernmental organization (INGO), Field of Hope (FoH), which released an agricultural education curriculum for lower secondary grades S1-S4 in Uganda to be taught in concert with its national curriculum (Cannon, 2019; Major, 2018). A critical case sampling method was employed in this study. Fifty-six teacher participants were chosen based on having had neither prior exposure to FoH's curriculum nor experience with their training workshops. The survey questionnaire responses of these agriculture teachers were selected for analysis, including selected pre- and post-training observations. The study's findings, including seven emergent themes and 21 related subthemes, indicated predominately positive attitudes regarding FoH's agricultural curriculum and the professional development supporting its use, as well as teachers' desires for continuous training. These findings supported and affirmed previous studies done on FoH's curriculum and teacher training workshops (Cannon, 2019; Thurmond, 2019), as well as further validated and expanded on such due to this study's sample of newly attending teachers. Based on the teachers' critiques of the curriculum and their perceptions regarding future implementation, FoH should review the curriculum's scope and content to condense it to address the respondents' concerns regarding time constraints presented by their schools' class schedules. Expanding FoH's training services to include school administrators may also facilitate the teachers acquiring more support and resources for teaching agriculture, as well as their school leaders understanding that agriculture is an important course for students to study and a potentially fruitful career for many to pursue as a future livelihood.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

A nation rich in cultivated land, with an increase from 6.75 to 6.9 million arable hectares between 2010 and 2016 (World Bank, 2018), is facing economic and nutritional threats. Although employing 72% of its labor market (Trading Economics, 2020), agricultural raw exports in Uganda were only 3.7% of total merchandise exports in 2018 (World Bank, 2018), and continue to shrink, despite a burgeoning youth population with nearly 8 in 10 Ugandans under the age of 30 (Ahaibwe et al., 2013). Agricultural productivity is being stymied by a deficiency in vocational interest and knowledge of the important role that farming plays in economic stability and food security among school-age and working-age young people in Uganda and in many other nations (FAO, 2009; Mukembo et al., 2014).

Rural youth participation in small-scale farming is also decreasing and studies have connected this to negative perceptions and misconceptions of farming, increasing urbanization, as well as limited access to land, to agricultural inputs, and to credit (Ahaibwe et al., 2013; United Nations [UN], 2016). Tendencies for some teachers to use gardenwork to punish their students (International Movement for Catholic Agricultural and Rural Youth (MIJARC [Mouvement International de la Jeunesse Agricole et Rurale Catholique]), International Fund for Agricultural Development [IFAD], & FAO, 2012),

combined with the dissonance of the youth's misconceptions about their personal capacity and the occupational opportunities in agriculture (Mukembo et al., 2014, 2015), indicate that a disconnect and imbalance exists in the education and training on the subject, especially as a livelihood opportunity.

Teaching Rural Youth in Uganda

Much of the pedagogy in Uganda is limited in expression to rote learning, memorization, and theory-based content knowledge, which are often not appropriate especially with the limited resources available to most teachers (W. Thurmond, personal communication, December 6, 2020; World Bank, 2007). Resources are also limited and expensive for families who must pay for school fees, supplies, and housing where boarding schools are common in much of Uganda (Cannon, 2019; Deininger, 2003; Major, 2018; Thurmond, 2019). Although education continues to advance in technical and practical content, many teachers in Sub-Saharan Africa (SSA), including in Uganda, are unable to practice more student-centric pedagogies without proper resources and related professional development support (Cannon, 2019).

Rural youth face different and perhaps greater problems than their urban peers in terms of accessibility, availability, and affordability of school. Uganda is the most electricity-scarce nation in Africa; some rural communities are completely without electricity (Orr, 2020), and subsequently lack modern learning technologies (Cannon, 2019). A lack of resources, coupled with lecture-based, teacher-centered, and often overly theoretical agricultural curricula leaves educators with very little to provide learners the skills and practical experiences needed to participate successfully in Uganda's on-farm or off-farm agriculture sectors. The effects of poverty and

malnourishment can further increase school absence among students, as well as teachers (FAO, 2009), thus perpetuating a causal nexus of low-quality education. The disconnect between educational policy, school curriculum, and implementation, especially regarding teaching, likely comes from a lack of consideration for the needed subjectivity or contextualization of curriculum, which is critical to tackling the education and employment crises in Uganda.

Developing education policies for teachers and school-age students can be a challenge if the policymakers are removed from the situational needs of those individuals most impacted by such (MIJARC, 2012; Sumberg et al., 2012). However, where government oversight falls short in curriculum development and implementation and effective educational planning, non-governmental organizations (NGOs) with extension and outreach programs can supplement (Worth, 2008). Although not without their positive attributes, the growing number of NGOs in the international development sector often leads to an oversaturated presence, duplication of services, and the tendency to "assume a holistic approach to helping an often vaguely defined target group" (Barr & Fafchamps, 2007, p. 612). However, due to their immersive proximity in the communities and experience with the local customs, challenges, and circumstances, local and international NGOs can inform policymakers of the nation's supply and demand environments and assist in developing targeted educational reforms. This can make education policy and curriculum more relevant to the respective nation, while better facilitating its implementation. Of such, further research and assessment was needed to understand the impacts these organizations have on youth perceptions and participation in

agriculture (Mukembo et al., 2014), and on communities who depend on it the most in Uganda (Thurmond, 2019).

Problem Statement

Agriculture is the largest employer of rural youth in Africa (Yeboah & Jane, 2020), and competence in the sector is essential for socioeconomic development of individuals, societies, and nations (FAO, 2014; Ministry of Agriculture [MoA], 2013). A study conducted with 272 children by Bandura et al. (2001) showed that youth perceptions regarding occupational efficacy (career choice) were more determined by their personal self-efficacy than by academic performance (test-taking). As education continues to shift to more project-based methodologies that enhance student capacity for real-world problem solving (Mukembo, 2017), teachers must be equipped with the knowledge, the resources, and the professional development support to successfully prepare their students, including teachers of agriculture. In rural settings, however, teaching capacity is often limited because supplies, support, and relevant curriculum content are in short supply (Cannon, 2019). In addition, government policy that focuses on Western economic models of development may be removed from the reality of rural communities that rely on subsistence agriculture and smallholder farming, rather than on cash crops and large-scale, industrial models of agriculture and related economic development schemes (Özerdem & Roberts, 2012).

Uganda has long-recognized the power of building coalitions with NGOs and INGOs to facilitate academic learning and context-specific vocational training (African Union, 20; MoA, 2013). The nation's Ministry of Education and Sports' (MoES) success in educational reform could be further propelled and implemented with the help of

community outreach that seeks to meet its needs and objectives. These local and international groups seek to offer support that includes general education and vocational training, and financial inputs corresponding with the demand environment of a nation and/or its specific regions. Some evidence exists on the effectiveness of such education outreach intervention programs, but research on *how* impactful such are is scarce (Cannon, 2019). More work is needed to inform future initiatives in agricultural education and outreach in developing countries. It is this need that inspired the purpose and design of the current study regarding such work in northern Uganda.

Background and Purpose: Agricultural Education in Uganda and the Field of Hope Curriculum

"Education and training are two of the most powerful weapons in the fight against rural poverty and for rural development" (FAO, 2013, p. 2). Following Uganda's implementation of its Universal Primary Education (UPE) policy in 1997 and the Universal Secondary Education (USE) policy in 2007, student enrollment in primary and secondary education increased by 22% and 99%, respectively, from 2005 to 2016 (Kakande, 2019; MoES, 2016). When the United Nations forged the 17 Sustainable Development Goals (SDGs) in 2015, to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" was its priority four (U.N., 2020). Uganda experienced a 13% increase in secondary school enrollment during the next year in 2016 (MoES, 2016). Still, disparities in public investment, gender representation, affordability, and resource equity between urban and rural schools continue to plague the nation's educational spaces (Cannon, 2019; FAO, 2013; Major, 2017; Molyneaux, 2011; Mukembo et al., 2018). This has challenged the effective implementation of new

curricula by the nation's MoES and its National Curriculum Development Centre (NCDC). Curriculum reforms in Uganda have encountered obstacles in implementation and adoption by teachers at all levels, especially in its secondary schools (Molyneaux, 2011). After having found a disconnect among the supply and demand factors of Uganda's public policy, labor force, and human capacity (Molyneaux, 2011; Mukembo et al., 2018; Sumberg, 2012), the INGO Field of Hope teamed with Uganda's NCDC and the U.S.curriculum developer, Vivayic, to create and facilitate implementation of agricultural education curricula relevant to secondary school teachers and students in northern Uganda (see Figure 1). FoH is a U.S.-based INGO that specializes in agricultural education, extension, and outreach to rural youth, smallholder farmers, and women in Uganda and India (FieldofHope.org, 2020). In alignment with their mission "to develop agricultural knowledge and enthusiasm among youth and smallholder farmers to

Figure 1.

Regions of Uganda (Mapsopensource, 2020)

develop communities to be both nutritionally food secure and economically empowered" (FieldoFoHope, 2020, para. 1), the senior 1 (S1) agricultural education curriculum was developed in 2016. It was guided by the NCDC's Secondary Level Teaching Syllabus, by the knowledge and recommendations of teachers in northern Uganda, and by a project-based learning (PBL) pedagogy that engages students in real, competency-based practicums (Cannon, 2019; W. Thurmond, personal communication, December 6, 2020). This blueprint increased the likelihood that the S1 curriculum in concert with the teachers' national syllabus and fitted to local environmental factors would facilitate students demonstrating competency on national examinations, as well as vocational and entrepreneurial knowledge in and about agriculture for their region (Cannon, 2019; Smith & Rayfield, 2016; W. Thurmond, personal communication, December 6, 2020).

Importance of Perception

The ways in which individuals perceive their environment affects their actions, emotions, thoughts, and behaviors (Ansari, 2020.). As defined by Ansari (2020), perception entails a cognitive process through which the individual selects, organizes, and derives meaning from sensory stimuli. Perception is a subjective experience that differs across individuals and provides the basis for understanding and managing human behavior, as well as facilitates "interpersonal working relationship[s], selection of new employees, and performance appraisal[s]" (Ansari, 2020, p. 7). It is affected by personal factors such as past experiences, motives, expectations, personality, and attitudes (Perception: Definition, Importance, Factors, Perceptual Process, Errors, 2021).

Understanding how people behave or are likely to act on the basis of their perceptions is an important element in anticipating and predicting individuals' future

behaviors when undergoing change (Perception: Definition, Importance, Factors, Perceptual Process, Errors, 2021). Through these perceptions, we can acquire information about the situational variables and factors critical to successful performance in the future. In this regard, exploring teachers' perceptions of their learning environment, related training experiences, and changing job contexts were important to understanding their navigation of educational and curricular reform.

Purpose of Study

This purpose of this study was to explore the perceptions of Ugandan secondary school teachers regarding FoH's agricultural education curricula (see Figure 2), including the teaching methods supported by its design that they found most important to implement, the overall influence the related professional development had on their attitudes about teaching agriculture, and on their teaching practices altogether. Project-based learning was the primary methodology designed into the curriculum for the agricultural education of school-aged youth in northern Uganda. This framework described the recommended lessons comprising the curriculum to be taught by secondary school teachers of agriculture. Secondary data analysis informed the four objectives that guided this study:

Objectives

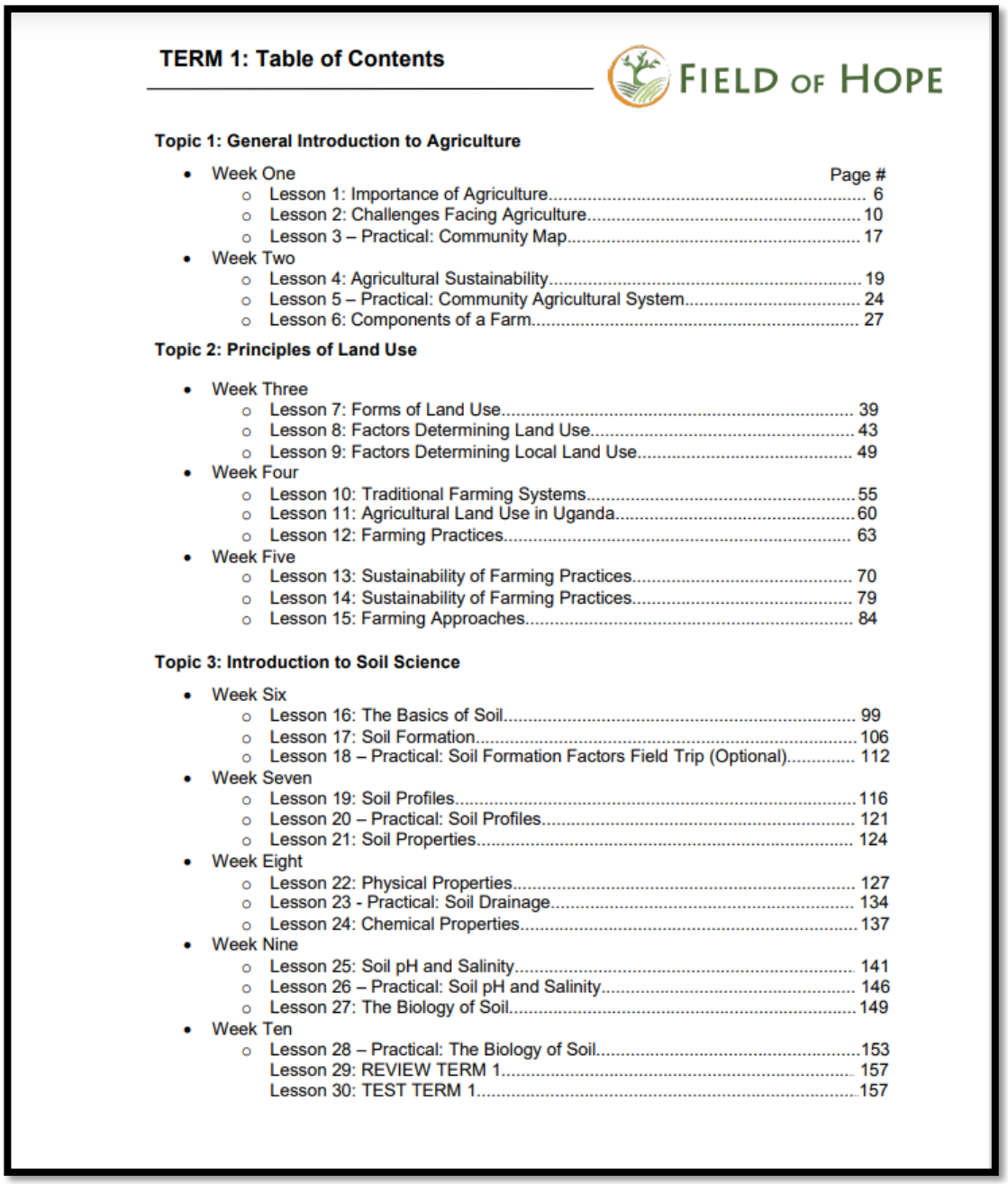
1. Describe the factors that would support teachers' intentions to implement the FoH curriculum.
2. Identify ways to improve the FoH curriculum as perceived by teachers who participated in the FoH training workshop.

3. Describe the teachers' perceived value of the FoH curriculum to their teaching practices.

4. Identify teachers' perceived needs for additional professional development.

Figure 2.

Senior 1 Field of Hope's Agriculture Education Curriculum. (This figure represents two pages from the Table of Contents of the S1 Curriculum Teacher's Guide, Field of Hope Organization, n.d.).



TERM 1: Table of Contents

FIELD OF HOPE

Scope and Limitations

1. The scope of this study was limited to secondary school teachers in the northern region of Uganda who were first-time participants in FoH's professional development training held during January of 2020.
2. The findings of this study were limited to the teachers' perceptions who completed the study's questionnaires.
3. The teachers' perceptions were gathered using survey questionnaires which were similar but not identical, and not designed by me, who made some judgements regarding the similarity, intent, and meaning of selected items.
4. As a purposeful sample, i.e., FoH workshop participants, the findings derived from their responses may have limited generalizability.

Assumptions

1. I assumed that the survey participants were honest and forthcoming in their responses.
2. I assumed that the agricultural educators were not intimidated by questions pertaining to their teaching methods, teaching styles, or decision-making practices regarding how they operated their classrooms and delivered instruction.

Definitions of Terms

A-Level and O-Level: Uganda's school system is comprised of six years of secondary education (Senior 1-Senior 4 as lower secondary, or O-level 'Ordinary level' and Senior 5-Senior 6 as upper secondary, or A-level 'Advanced level'), which is similar to the 7th-12th grades in the United States. The A-level secondary is the Honorary Secondary Education curriculum for S5 and S6 and awards its students with

the Uganda Advanced Certificate of Education (UACE) [MoE, 2008; Education Uganda, 2016].

Agriculture: "[T]he ways in which crop plants and animals sustain the global human population by providing food and other products" (Harris & Fuller, 2014, para. 1).

Agricultural Education: "a systematic program of instruction available to students desiring to learn about the science, business, technology of plant and animal production and/or about the environmental and natural resources systems" (National FFA Organization, 2021, para. 2).

Agricultural Extension: the (non-formal) education of farmers on new agricultural practices and scientific research (The United States Department of Agriculture [USDA], 2021).

Cluster Center Systems: "the grouping of schools within the same geographical location aiming to improve the quality and relevance of the education in the schools" (Mphahlele, 2012, p. 340).

Compulsory Agriculture Levels: agriculture classes are mandatory for levels Senior 1 (S1) and Senior 2 (S2) in Uganda's schools, and elective courses are offered in upper levels Senior 3 (S3) and Senior 4 (S4) [MoES, 2010].

Curriculum/Curricula: "a set of plans made for guiding learning in the schools and is usually represented in retrievable documents of several levels of generality: and the actualization of those plans in the classroom, as experienced by the learner and as recorded by the observer [i.e., teacher]" (Glatthorn et al., 2011, p. 3). This study described teachers' perceptions and impressions regarding the agricultural education

curricula designed and distributed by FoH for lower secondary school students in northern Uganda.

In-service training: "training that is concurrent to official teaching responsibilities to improve teachers' qualifications and skills" (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2021, para. 1).

International Non-Governmental Organization (INGO): also known as a "civil society" organization (Folger, 2021, para. 1; U.S. Department of State, 2021, para. 2) and may include international not-for-profit institutions created outside of an inter-governmental agreement with objectives to deliver aid, services, or support for local, national, or transnational communities (Ahmed & Potter, 2006; UN, 2019).

Ministry of Agriculture, Animal Industry, and Fisheries (MAAIF): the governing body responsible for monitoring and regulating the agricultural sector in Uganda. Their mandate is to "formulate, review and implement national policies, plans, strategies, regulations and standards and enforce laws, regulations and standards along the value chain of crops, livestock and fisheries" (MAAIF, 2020, para. 1).

Ministry of Education and Sports (MoES): the governing body that supervises public education and sports in Uganda. Their mission is "to provide for, support, guide, coordinate, regulate and promote quality education and sports to all persons in Uganda for national integration, individual and national development" (Government of Uganda, 2020, para. 2).

National Curriculum Development Centre (NCDC): "a corporate autonomous body of the Ministry of Education and Sports (MoE&S), responsible for inter-alia

development of curricula and related materials for various levels of education (i.e. Pre-Primary, Primary, Secondary and Tertiary)" (NCDC, 2020, para. 1).

National FFA Organization: a U.S.-based "intracurricular student organization for those interested in agriculture and leadership" (FFA.org, 2021, para. 1). This model of youth development has inspired some aspects of agricultural education and extension programs for youth in SSA (Mukembo et al., 2014).

Non-Governmental Organization (NGO): also known as a "civil society" organization, (Folger, 2021, para. 1; U.S. Department of State, 2021, para. 2) includes any not-for-profit institution created outside of an inter-governmental agreement with objectives to deliver aid, services, or support for local, national, or transnational communities (Ahmed & Potter, 2006; UN, 2019).

Practical teaching methods: often referred to as a hands-on approach to learning by which knowledge is transmitted through a multisensory approach to facilitate prolonged information retention, understanding, and application (Riyad et al., 2020).

Project-based Learning (PBL): "an instructional approach to classroom teaching and learning that is designed to engage students in the investigation of real-world problems to create meaningful and relevant educational experiences" (Cervantes et al., 2015, p. 50).

School-Based Agricultural Education (SBAE): "an intracurricular elective taught as a Career and as a Technical Education (CTE) program [and most often] in a public-school setting" (Eck et al., 2020, p. 229) in the United States. Croom's (2008) three programmatic components that comprise SBAE include: classroom and

laboratory instruction, supervised agricultural experience, and agricultural youth organization participation, i.e., FFA.

Self-efficacy: a person's belief in their capacity to perform behaviors necessary to produce specific attainments or outcomes (Bandura, 2001).

Smallholder Farmer: Farmers and farm households relatively marginalized by land and resource capacity and market access. Export commodities may be produced as a main livelihood source. (Women in Informal Employment: Globalizing and Organizing [WIEGO], 2019). Smallholder farmers cultivate 80% of arable land and produce most of the world's food in Africa and Asia, yet are the most food insecure (FAO, 2014).

Sub-Saharan Africa (SSA): includes 49 nations, of which Uganda is one (World Bank Group, 2018).

Subsistence farming: Growing crops and other outputs that contribute to the household, livelihood, and survival rather than for the market. "This method is most common in SSA, especially among the poor" (Major, 2018, p. 16).

Sustainable Development Goal (SDG) 4.C: A subcategory of one of the 17 goals set forth by the United Nations to be reached by the year 2030. SDG number 4 pertains to Education, and SDG section 4.C aims to "substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small island developing states" (UN, 2020, para. 4).

Technical Vocational Education Training (TVET): also known as career and technical education (CTE), refers to the education and training required to "acquire

the practical skills, know-how and understanding necessary for employment in a particular occupation, trade or group of occupations or trades" (Moodie, 2002, p. 250).

Theoretical teaching methods: instruction by which knowledge is presented through written material, usually using textbooks and teacher-centric approaches. Theoretical learning is usually limited to audiovisual stimuli related to rote memorization that often depends on examinations to test the content retention of learners (Riyad et al., 2020).

Urbanization: the increasing portion of the residential population shifting from rural to urban areas for their places of residence and livelihoods (Cohen, 2015).

Chapter Summary

To address economic and nutritional insecurities in Uganda, agricultural education has become a main objective of the INGO FoH's outreach and extension programs. Attempts at curriculum reform in SSA in the past often had limited success due to inadequate implementation strategies (Mukembo et al., 2014; Rogan & Grayson, 2003). However, with adherence to the differing environmental, economic, and political structures, agricultural extension and education has the potential to improve the youth's perceptions regarding their self-efficacy and related occupational opportunities available in Uganda's agricultural sector (Mukembo et al., 2014, 2015). I aimed to provide insight on educators' perceptions of effective teaching methods in rural educational spaces that builds on other studies regarding FoH's agricultural education curriculum and their related outreach initiatives in northern Uganda (Cannon, 2019; Major, 2018). I was inspired by an internship experience with FoH to explore teachers' perceptions and

pedagogical practices regarding teaching agriculture in Uganda's secondary schools, through the lens of the instructors involved in its agricultural education and outreach programs during 2020.

CHAPTER II

REVIEW OF LITERATURE

Introduction

This chapter describes the literature and frameworks that underpinned the study. The literature reviewed in this chapter addressed the following: agricultural development in Uganda, the nation's educational system and related in-service teacher training services, and FoH's intervention through the education and extension outreach it offered to secondary school instructors who teach agriculture there. I framed the current study through well-regarded conceptual and theoretical frameworks on curriculum development, implementation, and related professional development for instructors. The content reviewed by I in this chapter conceptualized agricultural education pedagogy and related teacher professional development services that were intended to complement the respective forces and factors in northern Uganda.

Agriculture-for-Development in Uganda

In Uganda and other nations of SSA, agricultural extension and outreach has evolved from their British missionaries, practices of early research stations, selective agro-input dealers, and cash-crop industry investors and implementors (Barungi et al., 2016; Mukembo & Edwards, 2015), to more "decentralized, liberalized, and privatized" approaches and systems (Mangheni et al., 2003, p. 413). In some cases, semiautonomous bodies under the Ministry of Agriculture, Animal Industries, and Fisheries (MAAIF)

existed that incorporated thematic trends present in practical agricultural education. This may have included modernization by providing technical information and sharing of resources, such as radios and other ICT equipment, professional development through in-service training, and enhancement of human capital via demonstrations and real-world applications, i.e., field tours to nearby innovative farmers with similar conditions and challenges (Barungi et al., 2016; Mangheni et al., 2013).

Extension and other types of non-formal education have often stressed making initiatives to work in tandem with public and private sector outreach to smallholder farmers in rural communities, through two-way communication between service providers and assessments based on farmer/stakeholder satisfaction and service responsiveness (Barungi et al., 2016). The fusion of extension outreach delivery and formal education can promote the empowerment of rural farmers, youth, and women who are too frequently disenfranchised from agricultural inputs, sources of financial credit, and quality education experiences in northern Uganda (Wilcox et al., 2021).

The World Bank's vision for future growth is in accord with this and referred to it as *agriculture-for-development* (World Bank, 2008). Agriculture-for-development supports a rural economic model, which is inclusive of all parts of the agricultural value chain: entrepreneurs, producers, consumers, manufacturers, smallholder farmers and their supportive producer organizations, as well as commercial farmers (World Bank, 2008). This type of cooperation, however, requires participation and ease of function between and among policymakers and public-private partnerships. Institutions such as agricultural extension agencies and organized farmers groups can help facilitate local market activity by connecting producers to traders and markets.

As explained by the World Bank (2008), the Agriculture-for-Development agenda is guided by four policy objectives:

1. Improve market access and establish efficient value chains.
2. Enhance smallholder competitiveness and facilitate market entry.
3. Improve livelihoods of those involved in subsistence agriculture and low-skill rural occupations.
4. Increase employment in agriculture and the rural nonfarm community; enhance skills. (p. 228)

With such a vast youth population, Uganda's ability to achieve the third and fourth objectives relies on the success of its schools in empowering girls through secondary school enrollment, strengthening human capacity with professional and vocational training, and enhancing agricultural skills and techniques (FAO, 2013; Major, 2018; Mukembo et al, 2014; Thurmond, 2019; Wilcox et al., 2021). This is especially imperative in rural communities such as in Uganda's northern region, where limited access to educational resources is the norm.

Uganda's Education System

Ugandan historian, educator, professor, and university dean, Dr. J. C. Ssekamwa (1997), described that after October of 1962, the three greatest challenges faced by the education system of the newly independent nation included: the explosion of skilled and educated labor force demand due to the withdrawal of European and Asian civil servants; stimulating the economy to supply government services for educational investment; and overcoming the inferiority Ugandans felt toward the western world due to Great Britain's

departure. Ssekamwa (1997) asserted that much of the structure of the British education system was retained yet slightly altered, such that:

> (a) The Primary school course is for seven years instead of six.
>
> (b) The Junior Secondary section of two years was abolished. The Farm Schools, the Rural Trade Schools, the Home Craft Centres and the Secondary Modem Schools were turned into academic secondary schools. The above kind of schools had created the impression that they were for failures. The Commission wondered whether the new nation of Uganda would be built on the 'backs of young people who have been made to feel as failures.'
>
> (c) The Senior Secondary section O-Level to last 4 years.
>
> (d) The Senior Secondary section A-Level to last two years. (para. 6)

Along with these changes, the teacher training services provided for educators with lower-level secondary education (O-level secondary education) and primary school education were phased out (Ssekamwa, 1997), compromising the quality of teachers and education available to Uganda's rising youth population.

Political instability of the 1970s and 80s resulted in a financial disinvestment in education by western countries who publicly denounced Idi Amin's militant and dictatorial regime, further depleting resources necessary for textbooks and scholastic materials (Ssekamwa, 1997). And although practical education had been a principal teaching method in Uganda as early as 1925 (Bazalio, 2020), educational disinvestment and political strife made teaching this way all but impossible, due to a lack of resources and diminished abilities and attitudes for learning vocational and agricultural skills, in a

move by many Ugandans to urbanize and to acquire service sector jobs (Ssekamwa, 1997).

Investments in the primary education system during the 1990s caused a sharp increase in Uganda's demand for secondary schools and was guided by a curriculum framework that featured agriculture as its own course rather than a part of science education (Epeju, 2020). A White Paper Committee was created and is currently used to review and inform educational policy in Uganda (Bazalio, 2020; Cannon, 2019). Under this committee and President Musevini's administration, Uganda was able to provide free universal education via primary and secondary schools in 1997 and 2007, respectively, contributing to what is known as enrollment shock, and a subsequent decline in the quality of education due to the overcrowding of schools and increased teacher workloads (Bazalio, 2020).

Even with public schools ostensibly being free, costs for uniforms, supplies, and miscellaneous fees continue to plague many families, and in rural areas of Uganda where fewer schools exist, boarding schools further require families to pay for tuition as well as room and board (Cannon, 2019; Major, 2018; Outreach Uganda, 2007). Some schools in the rural parts of Uganda hold classes under a tree, others are without electricity, many classrooms have a student to teacher ratio of 100:1, and an occasional class may exist that is absent of a teacher altogether (Cannon, 2019; Outreach Uganda, 2007). "Currently, there are 1,200,000 students enrolled in secondary schools in Uganda and only 20,000 secondary school teachers, meaning there is a teacher to student ratio of 60:1" (Cannon, 2019, p. 16).

Taking these conditions into consideration, it is alarming that Uganda has the lowest education spending relative to GDP in East Africa (Bazilio, 2020). With so many promising young people continuing to enroll in primary and secondary schools, the lack of investment for educational infrastructure in rural areas, including professional development and teacher training programs, warranted intervention by nongovernment actors, such as the INGO FoH.

Teacher Training for Professional Development

In-service training for teachers and their continuing professional development were staples of Uganda's educational framework since the implementation of the British colonial Phelps-Stokes Commission in 1925, which reviewed and shaped Uganda's educational curriculum and structure (Ssekamwa, 1997, 2000). However, in the wake of the nation's independence and consolidation of public services, in-service training was largely phased out due to ongoing political and economic stress factors (Nzarirwehi & Atuhumuze, 2019). Because of this, many teachers new to the profession were not provided with the skills or experiences needed to effectively instruct their students.

The need for qualified teachers in primary and secondary schools remained a continuous challenge that Uganda addressed with guidance from its Teacher Development Management Systems (TDMS), introduced in 1994 by the MoES and geared toward "supporting and enhancing professional development of teachers through in-service teacher training" (Nzarirwehi & Atuhumuze, 2019). Findings of Nzarirwehi and Atuhumuze (2019) on the efficacy of TDMS' in-service teacher training for 610 primary school teachers in Uganda revealed that overall, the service was positively associated with heightened academic qualifications and improved job-related attitudes of

the participating teachers (Nzarirwehi & Atuhumuze, 2019). However, they insisted that the design and implementation of teacher training be context specific and relevant to the teacher's work environment, stating that "beyond in-service training, a teacher's performance is a reflection, to a larger extent, of the context within which he or she is working" (Nzarirwehi & Atuhumuze 2019, p. 32).

In addition, Nzarirewehi and Atuhumuze (2019) concluded that other than qualifications and positive attitudes, in-service training:

> also plays a big role in equipping, broadening and deepening teachers' knowledge and skills, which in turn fosters an increase in teachers' competence, reliability, and responsibility. Further, the training equips head teachers and teachers alike with the administrative skills necessary to enable proper implementation of various education policies and programs. (p. 31)

Many investigations have been conducted to quantify the efficacy of in-service training in developing nations, including a comparative study by Hussein (2004) on the performance differences between trained and untrained primary school educators in the Hazara district of Pakistan. Hussein (2004) concluded that due to in-service education, the trained teachers performed significantly better than the untrained teachers, and that these programs should be needs-based and compatible with the respective society's value system. Mbiti (1990) as well as Nzarirwehi and Atuhumuze (2019) also supported this position.

The objective of in-service teacher professional development programs "to enhance professional and personal development of teachers to provide its benefits to the students they teach, their classes and schools where they serve" (Mahmood, 1999, p. 1),

complements the educational development initiatives set forth by the United Nations' Sustainable Development Goal 4.C (UN, 2015). The World Bank's Uganda Secondary Education Expansion Project (USEEP) and the MoES' TDMS (Ward et al., 2006; World Bank, 2020) have worked in tandem with the United Nations in guiding Uganda's national policy that decentralizes the educational system and localizes school networks within their communities (Namukasa et al., 2007). Some overlapping themes contained within the international USEEP and the government's TDMS objectives include quality assurance and assessment; teacher/peer support network; head teachers as educators for teachers in training; continuous professional development (CPD); cluster center systems; refresher courses; instruction materials/resources; and integration of pre- and in-service education (Ward et al., 2006; World Bank, 2020).

With greater outreach capacity as an international organization, the USEEP was able to provide additional services such as building new schools, ICT resources and training, refugee hosting communities, retention, reward, and motivation strategies, and rural outreach (Ward, et al., 2006). The TDMS, on the other hand, worked at a closer proximity with stakeholders, thus providing customized services such as teacher certification (i.e., a diploma in Teacher Education), syllabus and curriculum reform, and community participation outreach (Ward, et al., 2006). Both programs, if integrated to work in a complementary way, could offer holistic services that are flexible, continuous, and sustainable, and manageable.

The TDMS, though deemed successful by local and international education development standards, only lasted for three years, from 1995 to 1998, and was focused on primary education. Although every effort counts, Craig et al. (1998) recommended

that in-service teacher support programs be anywhere from two to six years in duration and sometimes life-long such as some in-service programs in United States, the United Kingdom, Australia, the Netherlands, Germany, and Sweden. If the programs are school-based and short-term, Craig et al. (1998) suggested such be equipped with ongoing support and mentorship.

To combat the tendency toward repetitive services especially by some NGO actors (Major, 2018), or the offering of oversimplified, top-down teacher training services within diverse social, political, and cultural settings, Craig et al. (1998) suggested a general framework for an effective in-service program:

> Effective in-service programs tend to:
>
> • focus on concrete and specific training for instructional and management practice;
>
> • are appropriate to the current needs of the teacher;
>
> • involve teachers and other staff in the planning and implementation of both short and long-term activities;
>
> • include small group workshops, peer observations and feedback, coaching/mentoring, and demonstrations;
>
> • ensure implementation in the classroom of the acquired learning;
>
> • provide continuous guidance and support (head teacher, peers and other teachers);
>
> • have the support and participation of the head teacher and other school leaders;
>
> • enable participation through release time;
>
> • provide regular meetings for problem solving, often within a school cluster;

• fit within the context of the local community and school culture; and

• fit within the broad, long-term professional development and school improvement program. (p. 118)

The resources required for a holistic in-service teacher training program such as the USEEP, the TDMS, and the one that Craig et al. (1998) recommended, imply that a continuous, ongoing, and needs-based intervention from a donor or supporting agency that works in concert with the beneficiaries, communities, and government is needed. By providing ongoing support, professional development services cultivate teacher capacity for technological advancements, including in agriculture, and encourage adoption of pedagogies that properly teach new content and relevant innovations to their students (Nzarirwehi & Atuhumuze, 2019). As well as being effective, professional development and lifelong learning for teachers also should be sustainable.

Educational Change and Curriculum Reform in Uganda

Tedla (1992) asserted that "the term education is a Western concept that does not speak to the traditional African reality, in which the entire community is continually engaged in learning and teaching" (p. 3). Transitioning away from traditional, precolonial, and indigenous methods of education to more industrial, structural, thematic models (Mubangizi, 2020; Ssekamwa, 1997) of western schools of thought, was a trend that many developing countries and former colonies engaged in at different times post-independence. Lynch (2016) asserted that education is influenced by the existing social, political, and economic conditions of the time. These educational reforms and transitions, deemed as a standard of social and economic success by international donor agencies and multinational institutions, were adopted by many nations with emerging economies

seeking to align with global market standards, to increase productivity, and to enhance the livelihoods of their citizens.

For educational change and policy reform to be practical and implementable, teachers must be continuously supported so that they can consistently acquire new knowledge, increase their competence, and the capacity necessary to learn, review, critique, and implement new concepts and curricula over time (Craig et al., 1998). Due to a lack of sufficient information that supports the implementation of change, educational stakeholders and policymakers often fail to view curriculum reform as a critical stage and its interdependence with the other stages of reform, instead viewing it as independent and disconnected (Mubangizi, 2020; O'Sullivan, 2002).

Nations of Africa (O'Sullivan, 2002; Rogan & Aldous, 2005; Serbessa, 2006; Tabulawa, 1998), Latin America (Alberto et al., 1995; Noel, 2009), and Asia (Pardhan et al., 2004) have made varying progress in reforming educational policies and curriculum to complement their changing societies. In particular, these reforms reflect and prioritize industrialization, modernization, market liberalization, democratization, and human capital development (Almendarez, 2010; Bazilio, 2019; Namukasa et al., 2007; Ssekamwa, 1997; Tabulawa, 1998, 2003). These changes have been mostly attempted at the governmental level, yet, in some cases, problems with corruption and bureaucracy prompted efforts to decentralize the cognizant government agencies, and, subsequently, the nations' education sectors (Namusaka et al., 2007). Uganda is no stranger to these needs, challenges, and constraints.

Agricultural Education in Uganda

When agriculture was first introduced to Uganda's national curriculum for elementary and secondary schools in the 1970s, its prioritization was credited with increasing the nation's agricultural and economic productivity (Mukembo, 2017). The National Curriculum Development Center (NCDC) was created in 1973 as a policy framework to guide the national syllabus for primary and secondary schools in Uganda (MoES, 2020), with an aim to address the nation's need for "a holistic education for personal and national development" (Mubangizi, 2020, p. 2). As such, for a time before the increase in economic, military, and political stress of the late 1970s and 80s, Uganda was known for having the best educational system in Central and East Africa (Cannon, 2019; Namukasa et al., 2007; Ssekama, 1997). After regaining political and economic stability, structural changes were made to its educational governing bodies and programs, providing space for new curriculum content and other educational reforms, starting with infrastructure for primary schools, and for secondary schools a decade later (Bazilio, 2020; Mubangizi, 2020). In accordance with the new curriculum objectives posited by the NCDC to reduce content overload through curriculum integration, "agricultural education will be integrated with other vocational subjects such as foods and nutrition, entrepreneurship, and computing to comprise the Technology and Enterprise learning area" (Mukembo, 2017, p. 69).

In Mubangizi's (2020) policy brief of the new curriculum under the Curriculum, Assessment and Examination (CURASSE) project for Uganda's lower secondary school levels (Senior 1-4), the brief's terms included:

1. To promote effective learning and acquisition of skills.

2. To address the needs of all students and lay the foundation for improved pedagogy and assessment procedures which allow learners to more effectively realise their full potential and demonstrate their achievements.
3. To address the social and economic needs of the country by meeting the educational needs of learners who will take jobs in the world of work, become self-employed people or pursue academic studies beyond senior four.
4. To allow flexibility to absorb emerging fields of knowledge in a rapidly changing world.
5. To reduce content overload by specifying a realistic set of expected learning outcomes with a range of essential generic skills at the heart of the curriculum. (Mubangizi, 2020, p. 3)

Under this framework, pedagogical themes affirming social paradigm shifts in Uganda's new education curriculum, included outcome-based education (1 and 3), learner-centered (or student-centered or -centric) teaching methodologies (2 and 3), thematic curriculum design (5), and integration of subject matter with practical teaching methodologies (1, 4, and 5). These themes were addressed by this study, as secondary teachers' perceptions of the agricultural education curriculum designed by FoH were collected, analyzed, and interpreted for meaning and implications.

Select Educational Schools of Thought and Related Teaching Methods

Ebert (2012) denoted behaviorism and constructivism as the two guiding yet opposing theories in secondary education practice and discourse. As technology is further incorporated into learning spaces, the question as to which philosophy is more effective, or if both should be integrated into secondary education practice in varying ways (Ebert,

2012), is an ongoing debate worldwide. The behaviorist theory, which dates to American psychology's renowned cognitive behavioral theory of positive and negative reinforcement (reward and punishment) and observable learned behavior (Thorne & Henley, 2005), stresses teaching methods based on lectures, memorization, recording notes, and taking examinations to assess students' knowledge retention (Cannon, 2019; Thorne & Henley, 2005).

Although behaviorism dominated much of the dogma regarding traditional teaching methods since the beginning of the 20th century (Weegar & Pacis, 2012), especially in much of vocational education, it was noted by one of its founders, B. F. Skinner (1958), and in later research by Webb (2007), that the theory's limitation lies in its scientific framework. As Webb (2007) explained, it "is based on a positivistic approach to science, that is, a reductionist view in which all that can be addressed is the relation between sensory stimuli and the unique corresponding response" (p. 1086). This ignores the fact, as concluded by Skinner (1974), that humans are more complex than animal research subjects and can react to sensory stimuli and their environments based on prior learning experiences (Weegar & Pacis, 2012).

The limitation in behaviorist theory is that it "denies human thought and cognition" (Rothfield, 2007, p. 376) and therein presents an advantage for the constructivist approach to learning, due to its attention to and consideration of the student as an integral part of the learning process (Weegar & Pacis, 2012). Constructivist theory is more interactive with the transference of information and understanding than its behaviorist counterpart, which tends to view the teacher and the student as a dispenser and container of knowledge, respectively, and essentially (Weegar & Pacis, 2012).

Rather, constructivism regards the learning process as an active and collaborative effort (Jumaat, et al., 2017) with and between the content, the learners, and the teachers. Constructing knowledge that involves having experiences and reflecting on such (Kolb, 1984) allows learners to create their own understanding and meaning of a curriculum's content, which may increase knowledge retention and enhance critical thinking (Jumaat et al., 2017; Laur, 2013). Many different teaching methods can be considered extensions of constructivist theory, e.g., group work, problem solving, and active engagement (Weegar & Pacis, 2012). These methods are student-centered at their core and can "help build the foundation for [a] curriculum['s] design" (Weegar & Pacis, 2012, p. 7) and its use by teachers.

Project-based Agricultural Education in Uganda

A big part of recent educational change and curriculum reform involves the transition from a behaviorist theory-based, rote-learning pedagogy that stresses memorization and is mainly teacher-focused, to a constructivist pedagogy that is more student-centered (Mubangizi, 2020). In Uganda, this has been approached in different ways, but primarily by curriculum change to integrate technical information into different subject matter areas. And, by an intentional objective to "address the social and economic needs of the country by meeting the educational needs of learners who will take jobs in the world of work, become self-employed people or pursue academic studies beyond senior four" (Mubangizi, 2020, p. 3). The plan for teachers using a project-based approach to learning was implied by the third curriculum objective proposed by the NCDC, as mentioned above. Moreover, this student-centered learning method could support achieving that objective.

To address the growing needs of Uganda's unemployed and underemployed youth and the needs of their most employed sector, agriculture, students should be equipped with the knowledge and vocational skills necessary to competitively engage in on-farm and off-farm agricultural jobs and careers. Project-based learning is a constructivist pedagogy that is cooperative and action-oriented in its approach (Jumaat et al., 2017). The method focuses on educational activities that require both *hands-on* and *minds-on* exposure to and interaction with the learning content presented (Jumaat et al., 2017), by which the students are given real-world examples and contexts to assess and evaluate that can be posed as problems and issues to address, investigate, resolve, or overcome.

Educators play a fundamental role in this type of learning and are viewed as facilitators in instructing and shaping the learning experiences of their students (Ebert, 2012; Mukembo, 2017). As a long-standing pillar of agricultural education, project-based learning has been incorporated into the teaching methodology of agricultural extension and education programs since their inception (Mukembo, 2017). Agriculture, after all, is a subject that requires scientific methodology and experimentation to evaluate the efficiencies of agricultural systems and processes (Edelstein, 2020). The U.S. model of school-based, agricultural education (SBAE) has traditionally included practical pedagogical methods that are hands-on, applied, and experiential to teach technical concepts to learners (Croom, 2008; Mukembo, 2017), which warrants certified, innovative, and competent teachers who understand agriculture from nationally and

technically relevant points of reference (see Figure 3). As illustrated in Figure 4, extensive research in the target region of northern Uganda was done prior to curriculum design and dissemination by FoH. In 2016, a partnership was formed between FoH and Vivayic, a U.S.-based company that designs educational solutions, and a plan to create an agricultural education curriculum for secondary school teachers in northern Uganda was realized after observing teachers and undergoing tropical agricultural training for

Figure 3.

Field of Hope - Overview. This image depicts the three pillars that guide FoH's programs (Field of Hope Organization n.d.a.).

contextual understanding of their target communities (Cannon, 2019; Thurmond et al.,

Figure 4.

Timeline and Evolution of FoH's Agriculture Education Curriculum in Uganda. The steps taken before and during FoH's curriculum design and development (Cannon, 2019, pp. 22-24)

Table 1

Timeline and Evolution of Field of Hope (FOH) Curriculum in Uganda

Date	Occurrence	Outcome
2014–2016	U.S. volunteer taught agriculture at a school partnering with FOH. The volunteer was developing lesson plans to supplement bare Ugandan agriculture education curriculum.	Needed assistance in lesson plan writing for agriculture education curriculum.
2016	FOH reached out to Vivayic about partnering on a Ugandan agriculture education curriculum project.	Partnership was formed.
October 2016	Vivayic and FOH took an exploratory trip to Uganda to determine if a curriculum was plausible.	Uganda doesn't have a curriculum, just a bare syllabus. Critical-thinking and problem-solving skills would be beneficial.
January 2017	Vivayic and FOH underwent tropical agriculture training at ECHO Global Farm & Research Center in Florida while brainstorming possibilities of curriculum.	Three versions of the curriculum layout were created and sent to stakeholders (trainers, teachers, & FOH) for review. S1 curriculum was created.
October 2017	Vivayic and FOH took pilot trip to Uganda to test curriculum and decide on its relevancy.	Project-based learning content needed to be watered down, and curriculum is relevant.
March 2018	Vivayic presented oral presentation at the Association for International Agricultural & Extension Education in Mexico about *why* they began creating the Ugandan Agriculture Education Curriculum and asked for research to be conducted.	Researcher was introduced to project and chose this as a research study.

2018)

Table 1 (continued).

May 2018	Teachers in Uganda at schools partnering with FOH received S1 curriculum during FOH visit to schools.	Reveal and distribution of S1 curriculum.
June 2018	First professional development training for teachers using curriculum in Uganda.	Teachers exposed to critical thinking and project-based learning.
January 2019	Second professional development training for teachers using curriculum in Uganda, school visits, and data collection for the study.	Reveal and distribution of S2 curriculum. S1 is distributed to first-time attendees. Teachers exposed to critical thinking and project-based learning.
June 2019	Third professional development training for teachers using curriculum in Uganda, school visits, and recruitment of new schools.	S1 & S2 distributed to all new teachers. Teachers exposed to critical thinking and project-based learning.
(Expected) January 2020	Fourth professional development training for teachers using curriculum in Uganda.	Reveal and distribution of S3 curriculum. S1 & S2 given to first-time attendees.
(Expected) January 2021	Fifth professional development training for teachers using curriculum in Uganda.	Reveal and distribution of S4 curriculum. S1, S2, & S3 given to first-time attendees.

FoH provides agricultural extension and education services to smallholder farmers, youth, and women in northern Uganda. Youth Agricultural Development, Smallholder Farmer Advancement, and Leadership Development are the three pillars that inform FoH's extension services (see Figure 3). As described by Cannon (2019), the Youth Agricultural Development pillar includes, but is not limited to, the creation of school gardens, and the Inspiring Students in Agriculture Grant (FoH.org 2021). Schools that partner with FoH can apply for the grant that awards partial funding for teachers to buy resources to use in their agricultural education courses.

To complement the NCDC's syllabus for secondary schools, FoH and Vivayic developed a comprehensive, agricultural education curriculum for secondary school teachers to instruct alongside other content in their syllabi (Cannon, 2019). Services that have been provided by FoH to beneficiaries in northern Uganda include:

1. A women's program that links women farmers, agricultural inputs, and financial literature with practical techniques for their empowerment and improved crop yields, respectively;
2. In-service teacher training to enhance professional development and facilitate understanding and implementation of curricular content knowledge;
3. Quality assessment and analysis for potential member schools in northern Uganda;
4. Community Outreach Trainings for local farmers;
5. Financial services and agricultural inputs extended to FoH beneficiaries as disaster relief from the coronavirus pandemic to smallholder farmers who have experienced limited access to various resources; (Cannon, 2019; Field of Hope Organization, n.d.)

FoH experienced growth in outreach from 2019 to 2020 and continued to extend services to new teachers and farmers with each semester and growing season (see Table 1). The quick rise in beneficiaries of FoH's services, especially the number of teachers trained, and the students impacted by the agricultural curriculum booklets given to their teachers, may indicate a positive impression or perceptions regarding compatibility of the learning resource and the complementary in-service teacher training. Rogers (2003) supported this assertion: "An idea that is incompatible with the values and norms of a

social system will not be adopted as rapidly as an innovation that is compatible" (p. 15). Previous attempts to implement an agricultural education curriculum in Uganda were considered "too theoretical to be able to make [a] meaningful impact" (Shizha, 2013, p. 13) by some stakeholders. This study, however, sought to distill the perspectives of secondary school teachers in northern Uganda regarding practical, applicable, agricultural content that was constructivist in its learning approach to improve the self-efficacy of students regarding agriculture as well as their related perceptions toward it as a livelihood choice.

Table 1.

Field of Hope Impact Report for years 2019 and 2020 (FoH Organization, n.d.)

FoH Services	**2019**	**2020**
Teachers Trained	103	234
S1 & S2 students impacted by FoH curriculum booklets	16,598	40,665
Students benefitting from improved teachers' practices	22,467	63,205
Drip gardens installed in Uganda and India	6	6
Students exposed to drip garden practices	500	500
Schools awarded $5k Grant	6	5

Ugandan university scholarship recipients	1	1

Conceptual Framework for Curriculum Reform and Implementation

A framework developed by Rogan and Grayson (2003) and conceptually embedded in this investigation has been applied in various studies on curriculum implementation, including research done on FoH's Senior 1 agricultural curriculum by Cannon (2019). This framework was used because of the ease with which it has been adapted to fit the criteria of different countries, all with varying needs, conditions, and circumstances (Govender, 2018). Macdonald and Pálsdóttir (2008) applied Rogan's and Grayson's (2003, 2007) theory for educational curriculum implementation in developing countries as guided by three concepts: "A. profile of implementation, B. capacity to support innovation, and C. support from outside agencies" (p. 2). And defined it with six propositions:

- Innovation should be just ahead of existing practice. Implementation should occur in manageable steps.
- Capacity to support innovation should be concurrent with efforts to enrich the profile of implementation.
- Outside support should be informed by the other two constructs, matching outside support with capacity, and capacity with desired implementation.
- All role players need to reconceptualise the intended changes in their own terms and context.
- Changing teaching and learning is a change of culture not a technical matter.

- There should be alignment between the three constructs and the primary level (e.g. the learning experience) [p. 2]. The framework is discussed below in further detail.

Profile of Curriculum Implementation

Rogan and Grayson (2003) characterized the *profile of implementation* theme by a systematic compartmentalization of curriculum implementation into stages, or levels, rather than as a singular phenomenon. Under this concept, implementation is mapped out in stages. The first stage is *orientation and preparation*, which is the time teachers spend learning and getting ready to implement the new curriculum. The *mechanical and routine use* stage follows with a rigid instruction of curricular content, which should be "used as envisaged by the developers with little addition or adaptation to the local context" (Rogan & Grayson, 2003, p. 1181). The following stages, *refinement, integration,* and *renewal,* signify the ability for teachers to take ownership of curriculum implementation and reconceptualize it as they see fit (Rogan & Grayson, 2003).

Rogan and Grayson (2003) insisted that these initial stages of curriculum implementation be teacher-centered, by limiting student participation to question and answer and note-taking. This reinforces rigid instruction of the curriculum by the educator and facilitates a comfortable and rigorous understanding of curricular content by both the educator and the learner. The progress from initial stages of curriculum implementation to later stages consists of a transition from a teacher-centered, close-ended pedagogy to a more learner-centered, open-ended approach (Rogan & Grayson, 2003).

Capacity to Support Curriculum Innovation and Related Pedagogy

The research and exploratory phase of curriculum implementation is geared toward obtaining a better understanding of what is known as *capacity to support innovation* (Rogan & Grayson, 2003) and affirms the profile of implementation concept by explaining that schools implement innovation vis-à-vis their own capacity, and at different times than others. Factors that indicate capacity to support innovation include: physical resources, teacher factors, learner factors, and school ecology and management (Rogan & Grayson, 2003).

Support from Outside Agencies

Support from outside agencies constitutes an array of governmental and NGOs in the effort to facilitate innovation in schools (Rogan & Grayson, 2003). These efforts look different to each organization, as they all have varying spheres of influence and abilities to apply pressure, referred to as authority and credibility (Rogan & Grayson, 2003). In other words, where a government educational body can pass policies as an attempt to implement change, NGOs are limited to the use of "persuasion and inspiration" (p. 1192). However, when working under the guidance of policymakers, an NGO or donor agency can use the credibility of government educational departments as a tool to increase their sphere of influence, facilitating implementation at a greater capacity.

Material support was described by Rogan and Grayson (2003) as physical resources such as school buildings, school supplies, school lunch programs, and other tangible assets which can be provided by donor agencies and other organizations. On the other hand, *nonmaterial support* is more abstract and usually in the form of professional development, in-service teacher training (INSET), and other intrinsic school-based

development efforts. As implementation progresses, an increased emphasis on professional development and INSET at the teacher level will further enhance ownership of curricular and pedagogical change. Moreover, in some instances, internal pressures from governing bodies can "evoke 'learning center forces,'" eliciting the most meaningful change (Rogan & Grayson, 2003, p. 1194). It was FoH's provision of both kinds of support – material and nonmaterial – to the teachers of agriculture in northern Uganda whose related perceptions were studied.

Theoretical Framework for Adoption of FoH's Curriculum

FoH's rise in adopters (users) of their agricultural education curriculum can be examined and understood through a lens that Everett Rogers (2003) developed to understand change, i.e., diffusion of innovations theory. Rogers (2003) defined an innovation as "an idea, practice, or object that is perceived as new to an individual or another unit of adoption" (p. 137). Five specific attributes were described by Rogers (2003) of an innovation or innovative practice that impact the adoption of such:

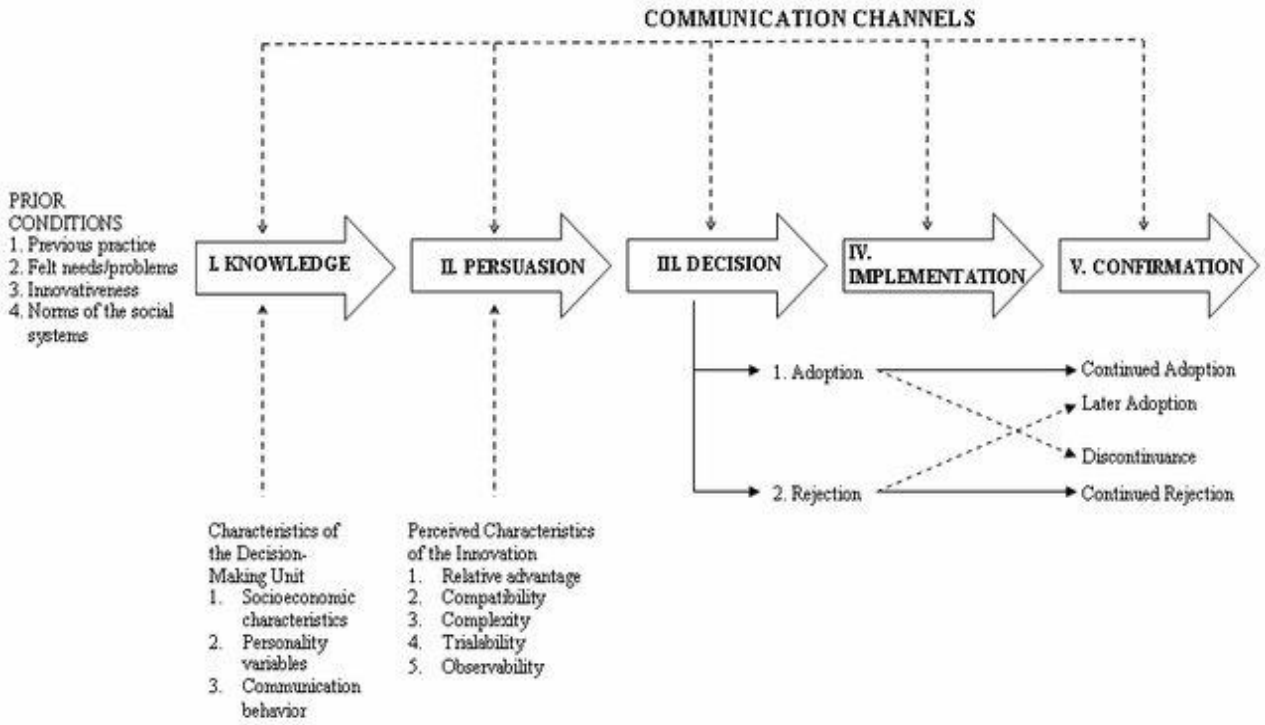
1. Relative advantage: the extent to which an innovation is perceived as superior to the idea it supersedes. It is not only economic units of measurement, but also perceptions of convenience, satisfaction, and social pressures that inform potential adopters about this attribute.
2. Compatibility: the extent to which an innovation is perceived to be aligned with the experiences, cultural values, and needs of the potential adopters. Past experiences are used heuristically by an individual to assess new ideas, providing a point of reference by which to interpret and evaluate an innovation. The perceived compatibility of an innovation is positively correlated with its rate of adoption.

3. Complexity: the perception of utility or comprehensibility of an innovation. Some innovations are easier to comprehend or understand than others and are therefore likely to be adopted more readily.
4. Observability: the extent to which individuals can see the results of an innovation before adopting it. This type of visibility and often demonstration facilitates peer discussions and shared evaluations of the innovation prior to an adoption decision.
5. Trialability: the extent to which an innovation can be tested prior to its full adoption. Change agents can incentivize adoption through product samples or test-runs, as this helps reduce uncertainty and strengthen potential adopters' comprehensibility.

Rogers' (2003) diffusion of innovations theory describes a rate of diffusion that follows an S-shape curve by which members of a given social system adopt new and innovative concepts, ideas, and technologies. Adopters undergo each stage of the innovation-decision process as they consider an innovation and decide whether to adopt it (Rogers, 2003). Rogers (2003) described diffusion as the progressive adoption of an innovation by members of a social system. Over time he called it the *innovation-decision process* (see Figure 5).

Figure 5.

Model of Five Stages in the Innovation-Decision Process. (Source: *Diffusion of Innovations*, Fifth Edition by Everett M. Rogers. Copyright (c) 2003 by The Free Press.



The Knowledge Stage

When an individual is first exposed to an innovation and gains understanding of what it is and how it works, the knowledge stage of the innovation-decision process has begun (Rogers, 2003). According to Rogers (2003), three types of knowledge may be involved: *awareness-knowledge*, *how-to-knowledge*, and *principles-knowledge* (Rogers, 2003).

Rogers (2003) regarded awareness-knowledge as the understanding that an innovation exists, which may encourage an individual to pursue further information about the innovation and involve the other types of knowledge. How-to-knowledge is important in that it facilitates understanding of how to optimally utilize an innovation and can

impact the probability of adoption, rejection, or discontinuance of an innovation (Rogers, 2003). Rogers (2003) explained that the greater the complexity of an innovation, the more how-to-knowledge is likely required by potential adopters, but that few diffusion studies examine this facet. Principles-knowledge frequently consists of scientific and/or mathematical concepts that undergird an innovation regarding how and why it works. Roger (2003) warned that while adoption is possible without this type of knowledge, in some instances, the possibility of misusing the innovation is heightened in its absence. It was emphasized and urged by Rogers (2003) that change agents, the FoH curriculum development team and implementers in the case of this study, enhance their capacity for sharing how-to-knowledge with the potential adopters. This would reinforce conceptual understanding and optimal use of the innovation, rather than them only emphasizing the introductory, awareness-knowledge associated with the curriculum. FoH's in-service training workshop was where this was likely to have occurred.

The Persuasion Stage

Attitude formation by a potential adopter, as "an organization of an individual's beliefs about an object that predisposes his or her actions" (Rogers, 2003, p. 175), usually occurs during the persuasion stage of the innovation-decision process (see Figure 5). How individuals interpret, utilize, accept, or reject the messages and concepts surrounding an innovation is commensurate with their capacities, predispositions, and needs (Rogers, 2003). Rogers (2003) explained certain strategies that change agents can employ to facilitate the ease of transition between persuasion (an attitude that is positive and in favor of the innovation) to the decision to adopt (see Figure 5), such as free samples or providing other resources of utility. *Demonstration* of the innovation is

another method mentioned by Rogers (2003) that can speed the persuasion process in a positive way that increases the likelihood of adoption.

The Decision Stage

The part of the innovation-decision process that leads to the choice of whether to adopt or reject an innovation was referred to by Rogers (2003) as the decision stage. Here, rejection was described as degrees of action: *active rejection, passive rejection,* and *discontinuance*. The first occurs when a decision not to adopt an innovation supersedes an earlier consideration to adopt (Rogers, 2003). On the other hand, the rejection of an innovation without having previously considered its adoption is passive rejection. Discontinuance implies that an earlier decision to adopt occurred, but the adopter later reverses that action (Rogers, 2003). Also stressed was the concept that sociocultural variables influence adoption decisions, and that the views and positions of a community or group of individuals can weigh heavily during this stage, and sometimes more than the complexity, trialability, or relative advantage of the innovation (Rogers, 2003).

The Implementation Stage

When an individual finally decides to adopt and put an innovation to use, their experience transcends the mental action of thinking and deciding from the previous innovation-decision stages to an action-oriented experimentation, known as the implementation stage (Rogers, 2003). Though the decision to adopt has been made, Rogers (2003) pointed out that uncertainty about the potential consequences of this decision still exist, which can prolong the rate of implementation, depending on the innovation's perceived complexity. Implementation implies that a change in behavior was made by the adopter toward the innovative idea becoming "institutionalized as a

regularized part of an adopter's ongoing operations" (Rogers, 2003, p. 180). When this occurs, Rogers (2003) explained that the separation between the preceding notions of uncertainty and the new idea will likely dissipate. This likelihood of sustained adoption, however, is also dependent on the overarching positive perceptions of the innovation by society at large (Rogers, 2003). According to Rogers' (2003) posits, FoH should find that in the best interest of achieving its objectives is to help teachers perceive high relative advantage, compatibility, and reduce any perceptions they may have of complexity regarding the innovation and its related behaviors, i.e., the curriculum and recommended teaching methods. Rogers' (2003) attributes of observability and trialability are also implied here.

If applying Rogers' (2003) diffusion of innovations theory to this study, teachers participating in FoH's curriculum training workshop were presented the opportunity to become knowledgeable, i.e., the knowledge stage, as well as be persuaded about the innovation's relative advantage and compatibility to them and their students. Assuming the teachers were sufficiently convinced to adopt the new curriculum reflected by their decisions or intentions to teach it, such would presage the implementation stage of Rogers' (2003) innovation-decision process. Therefore, Rogers' (2003) model for understanding change, in this case the behaviors of teachers toward a new curriculum and its recommended teaching methods, was chosen as this study's theoretical framework.

Chapter Summary

Uganda's MoES released a curriculum in February 2020 for lower secondary education in response to national demands for a future generation of young people skilled, qualified, and competent for the labor market (Mutesi, 2020). Changes between

the old and new curricula include a condensed number of subjects, some compulsory and others, including agriculture, vocational, practical electives (Mutesi, 2020).

The curriculum contains content that is less theoretical, more practical, and aimed at enhancing learners' capacities for contemporary skills such as critical thinking, collaboration through teamwork, ICT, and information literacy (Mutesi, 2020). This curriculum reform taking place in Uganda is reflective of a trending phenomenon that is transitioning away from a behaviorist educational approach, which views the teacher and student as unilateral and noninteractive parties in the learning process and can hinder knowledge retention and student self-efficacy (Ebert, 2012). The transition toward a constructivist approach to education prioritizes the student's experience, reflection, and demonstration of the subject matter, and is more hands-on, student-centered, and practical (Weegar & Pacis, 2012). In this educational shift, resources are needed to support more practice-oriented and applied approaches to teaching and learning, including laboratory equipment, electronic devices such as computers and projectors, and miscellaneous materials for projects and experiments. Teacher training is also of paramount importance in this process, to facilitate teachers' understanding of the new curriculum, and having the confidence and the competence to implement it (Hussein, 2004; Nzarirwehi & Atuhumuze, 2019).

Concerns regarding the feasibility of curriculum reform and implementation are often related to affordability and resource allocation from the government. Where these shortcomings exist, NGOs can support government efforts by assisting with needs-based educational assessments and investments in curriculum reform and implementation (Cannon, 2019; Pardhan et al., 2004) to provide high-quality extension and outreach

services to respective communities and their schools. FoH is an example of how to align extension and outreach services and in-service training for teachers with Uganda's NCDC educational standards, while complementing national development goals and labor market demands (Cannon, 2019; Mahmood, 1999; Major, 2018).

Agriculture, as an indispensable portion of Uganda's employable and productive economic sector (World Bank, 2018), has declined in terms of its productivity and the youth's perceptions of its viability, as an increasing portion of young people migrate to the cities for service jobs, which are perceived to be more lucrative and reputable than careers in the sector (FAO, 2009; Mukembo et al., 2014, 2015). In FoH's agricultural education curriculum for lower secondary education, the subject is approached through a practical, student-centered lens that can help teachers and students to build rapport, as well as collaborate intellectually and reflectively, while acquiring relevant attitudes, knowledge, and skills (FieldoFoHope.org, n.d.). From 2019 through 2020, FoH's outreach to teachers and students in northern Uganda increased by more than 100% and 300%, respectively (see Table 1); outreach quantity likely reflects the quality of services provided by FoH, which include a curriculum guidebook or booklet and continuous in-service teacher training for teachers of agriculture.

This study aimed to distill the perceptions of FoH's beneficiaries, by analyzing survey responses of the teachers who had no previous exposure to the agricultural education curricula, as designed and distributed by FoH, prior to participating in its training workshops. These findings look to inform readers of how pedagogical shifts from theoretical, teacher-centric approaches to practical, student-centric teaching methods were perceived by educators who teach agriculture to secondary students in

Uganda and had participated in FoH's in-service training on such curriculum and pedagogy.

Rogan's and Grayson's (2003) model for curriculum implementation was employed as the study's conceptual framework, especially regarding FoH's role as the provider of material and nonmaterial resources. Moreover, Rogers' (2003) diffusion of innovations theory served as the investigation's lens for describing teachers' perceptions of the new curriculum and related teaching methods they learned as participants in FoH's professional development workshop, including their likelihood of adopting and implementing such in the future.

CHAPTER III

METHODOLOGY

Introduction

This chapter highlights the research methodologies and procedures used to conduct this study, and includes: design of the study, methods, data analysis, and researcher reflexivity. This mixed-methods inquiry is a multifarious case study that constructed meaning through secondary data analysis. As explained by Tate and Happ (2018), qualitative secondary analysis (QSA) is the use of data that were collected by someone else, or which originally answered a previous research question. To assure quality of the study, I employed both Tate's and Happ's (2018) criteria for QSA, and Tracy's (2010) Eight Criteria for Excellent Qualitative Research. The study's descriptive data were derived from survey questionnaire items, Likert-type, and open-ended items that could be analyzed, either quantitatively or qualitatively.

Purpose of Study

This purpose of this study was to explore the perceptions of Ugandan secondary school teachers regarding FoH's agricultural education curricula (see Figure 2), including the teaching methods supported by its design that they found most important to implement, the overall influence the related professional development had on their attitudes about teaching agriculture, and on their teaching practices altogether. Project-

based learning was the primary methodology designed into the curriculum for the agricultural education of school-aged youth in northern Uganda. This framework described the recommended lessons comprising the curriculum to be taught by secondary school teachers of agriculture. Secondary data analysis informed the four objectives that guided this study:

Objectives

1. Describe the factors that would support teachers' intentions to implement the FoH curriculum.
2. Identify ways to improve the FoH curriculum as perceived by teachers who participated in the FoH training workshop.
3. Describe the teachers' perceived value of the FoH curriculum to their teaching practices.
4. Identify teachers' perceived needs for additional professional development.

Mixed-Methodology Design

The original research survey design contained both open-ended and close-ended questions, prompting a mixed-method approach to the study and analysis of the data. This approach is described as a mixing of qualitative (open-ended) and quantitative (close-ended) data into a systematic, integrative form of inquiry (Wisdom & Creswell, 2013). Mixed method research contains a multidimensional scope to studies with interventions or complex phenomena that require a multifocal interpretive lens (Clark & Clark, 2016).

Clark and Clark (2016) defined interventions as "integrated components to promote change in important outcomes" (p. 1). Educational extension and outreach initiatives that contain multiple components, which are integrated to invoke "new and

powerful emergent effects" (Clark & Clark, 2016, p. 2), exemplify such interventions. In evaluation of these initiatives, a mixed-method, convergent research approach can better and more fully describe these interventions and shed light on the mechanisms of such, rather than only assessing outcomes; this can be accomplished by using qualitative data to support quantitative results (Clark & Clark, 2016; Wisdom & Creswell, 2013). Referred to as a *convergent design* by Wisdom and Creswell (2013), I employed this method to color and contextualize intervention mechanisms set forth by FoH in their efforts to create new and powerful emergent effects regarding agricultural education in Uganda through the provision of new curriculum and related training to teach it.

Critical Case Sampling Method

For an intervention to be rigorously evaluated, Patton (1990) pointed out that a purposeful sampling methodology can be used to highlight experiences in qualitative research that best "illuminate the questions under study" (p. 169). This methodology is distinguishable from sampling methodologies in quantitative studies, which often rely on larger sample sizes that are randomly selected (Patton, 1990). In the case of purposeful sampling, the critical case sampling method was employed by I in the attempt to extract from the entire sample population, a demographic that would "yield the most information and have the greatest impact on the development of knowledge" (Patton, 1990, p. 174). The critical case studied by I featured the survey respondents who identified themselves as having no prior exposure to the FoH curriculum before participating in the January 2020 Teacher Training. This responding sample included 56 teachers who participated in FoH's four-week long training in Lira, Uganda.

Qualitative Secondary Analysis (QSA)

QSA, simply stated, is the analysis of pre-existing data (Heaton, 2008). The methods and conceptualizations surrounding secondary analyses of data are many, with a consensus that QSA aims to explore the possibility of new research questions, or to extend the original research aims (Heaton, 2008; Tate & Happ, 2018). I obtained and analyzed data through *informal data sharing*, whereas I was given data by officials of FoH, i.e., providers of the teacher training workshop, and who had no part in analysis of the data (Heaton, 2018). The data had not been analyzed prior to this study and were obtained during my internship with FoH in 2020. The survey was designed, piloted, and collected by FoH researchers and scholars of another institution, and where it received approval from the latter's Institutional Review Board (IRB). I and other interns were given the survey questionnaire responses and instructed to enter the data into Microsoft Excel spreadsheets. I was inspired during data entry to interpret the survey responses and derive meaning from the participants' experiences with FoH's agricultural education curriculum, as a way to evaluate the curriculum, including its potential for use.

The concerns regarding the ethical, legal, and practical standings of QSA have been long debated. Matters of preserved confidentiality and relevance between original and secondary time, space, and context are sometimes raised to question or challenge the validity or suitability of secondary analysis for scientific scholarship (Mauthner et al., 2014). Tate and Happ (2018) listed several considerations in assuring that the secondary analysis of data is appropriately contextualized and evaluated.

The first caveat pointed out by Tate and Happ (2018) was that QSA researchers should decide if the primary data meets the needs of the QSA. The need for I to analyze

the primary data of this study lies in the absence of data analysis by the original researchers, i.e., developers of the instrument, and collectors of the data. Although the data were gathered from the FoH workshop participants, it was not synthesized, interpreted, and reported. my internship with FoH sparked an awareness of this and prompted her to identify and extract the essences from the participants' survey responses that were meaningful, informative perceptions regarding their participation in FoH's training and the agricultural education curriculum they received.

The second postulation is that the passage of time between the primary and secondary studies, or research processes, should be considered, reconciled, and clarified by the QSA researcher (Tate & Happ, 2018). Because context and other variables change over time, the data and the relationships between it and the original researchers are subject to the same constraints (Tate & Happ, 2018), i.e., the time elapsed between the collection of survey responses in northern Uganda, to its analysis six months later, in a distant location. The time between when participants took part in the survey in January of 2020, and the entry of the survey data to codify and standardize formatting during my internship with FoH in June 2020, and data analysis thereafter, overall, was about one and one-half years. FoH's need for evaluation and assessment of their agricultural education curricula, which has been released on an annual basis beginning in 2017 and coupled with in-service training for the participating teachers, warranted a systematic analysis.

The third stipulation proposed by Tate and Happ (2018) is that the settings and context in which the data were originally collected, must be taken into consideration because these factors cannot be easily reproduced during secondary research. Often, QSA

occurs outside of the setting in which the primary research took place, and advances in computing and preparing qualitative data for archiving and sharing have facilitated the ease of preserving, transferring, and accessing these datasets from the original to the secondary researchers (Heaton, 2018). A close relationship between the primary research team and the secondary researcher can inform and contextualize these differences to complement and validate the QSA process, ensuring a quality analysis, which was the case in this study.

Tate and Happ (2018) affirmed this dynamic by concluding that the kind and substance of the relationship between the primary and secondary studies will determine the condition and validity of the secondary data to be analyzed. Details on the contractual arrangement, if any, procurement, access to the original team by the secondary investigators, and formatting of the data between both parties are required to improve the likelihood of the data being "true" or valid (Tate & Happ, 2018).

Criteria for High Quality Qualitative Research

Further undergirding the validity, or in qualitative parlance the trustworthiness of this study, is what I did by following Tracy's (2010) eight guiding criteria to substantiate the quality of the research. These criteria serve as a holistically interpretive approach for ensuring the strength and quality of qualitative research, through a reflexive, transparent methodology. Tracy's (2010) eight criteria for excellent qualitative research consist of: "(a) worthy topic, (b) rich rigor, (c) sincerity, (d) credibility, (e) resonance, (f) significant contribution, (g) ethics, and (h) meaningful coherence" (p. 831).

According to Tracy (2010), the *worthiness* of qualitative research in Uganda is subject to the context of relevance, significance, interest, or evocativeness. That the study

was motivated by an availability of data containing the unheard and unexamined teachers' perspectives regarding agricultural education curriculum and pedagogy, spoke to I as a topic that was worth deep reflection, investigation, analysis, and expression. Through the exploration of the responses of secondary school educators as fostered by FoH's agricultural education curricula and related professional development teacher training, I aimed to provide insight into the experiences of pedagogical change as perceived by the study's participants.

The limitations embedded in secondary research, i.e., my distance in time and space from the original study and the participating agriculture teachers' location in northern Uganda, warranted an analysis of the data that addressed these constraints by providing a *rich and rigorous* "transparency regarding the process of sorting, choosing, and organizing the data" (Tracy, 2010, p. 841). This was presented in my journal, which contained a thick description of the operationalized methodologies for coding and memo notes that occurred throughout the process of data management, organization, and analysis. Through this approach, Tracy's (2010) call for *sincerity* was also addressed, vis-à-vis the transparency and self-reflexivity with which the secondary analysis occurred in acknowledging the constraints and limitations of such methods. The self-awareness with which I was confronted during data analysis, i.e., having had no prior experience in formal education as a teacher, was also incorporated in the memo notes throughout the process, as well as her reflexivity statement.

By detailing and richly describing the process of data management, organization, and analysis, I employed thick description and multivocality of the teachers' responses as methods to ascertain the study's *credibility* (Tracy, 2010). Assessing the FoH

intervention required highlighting provocative responses from teachers who were new to the FoH teacher training workshop. This provided insight on their impressions, expectations, and concerns regarding learning and adopting new ways to teach agriculture by including "multiple and varied voices in the qualitative report and analysis" (p. 844) portion of the study.

The voices and perspectives of the teachers who participated in the teacher training workshop were articulated in a way that was restorative and artistic in expression, to evoke the sense of *resonance* from the reader. Tracy (2010) defined resonance as an "ability to meaningfully reverberate and affect an audience" (p. 845). Tracy (2010) contextualized resonance through the lens of transferability, generalizability, or aesthetic merit. Due to the limited generalizability inherent within a purposeful sampling technique, meaning was derived and expressed in a way that "aesthetically affects its significance to each reader" (p. 845). Some qualitative open-ended questions were quantified by calculating word and theme frequencies, as derived from the teachers' responses, to generalize the sample's views and provide a triangulation of meaning, coupled with the study's qualitatively based interpretations (Tracy, 2010).

This study extends knowledge pertaining to FoH's extension and education services offered to secondary school teachers of agriculture in northern Uganda, thus adhering to Tracy's (2010) criterion that requires high-quality qualitative research be of *significant contribution*. Specifically, in vocalizing the perspectives of FoH's agriculture instructors, I ". . . [made] visible what [was] hidden or inappropriately ignored and generate[d] a sense of insight and deepened understanding" (Tracy, 2010, p. 846) regarding the efficacy of FoH's agriculture curriculum, teacher training workshop, and

related pedagogical practices. Though this study was essentially an analysis of archival data, the findings were original and based on no previous interpretations or analyses, which can enhance its significance in terms of heuristics and practicality (Abbot, 2004; Tracy, 2010) by inciting curiosity for further research and utility within the reader.

I employed Tracy's (2010) criteria of *situational ethics* to justify the use and analysis of FoH's archival data. Situational ethics address the potential harm of research practices and their moral justifications (Tracy, 2010). However, reflection on myself as a "human instrument" in the process of data analysis warranted thoughts about the *moral ethics in relation* to my own biases, inexperience, and "mutual respect, dignity, and connectedness" (Tracy, 2010, p. 847) between me and the agriculture educators, to whom this study was giving voice.

Finally, the importance of this study in achieving its stated purpose, objectives, and in using methods that seamlessly aligned with my chosen conceptual and theoretical frameworks, was defined by Tracy (2010) as *meaningful coherence*. Research and findings that are meaningfully coherent will coordinate skillfully with the design, review of literature, analysis, and goals of a study (Tracy, 2010). The findings and discussions within this study intended to address and ensure such alignments existed.

The Study's Questionnaire

The Likert Attitude Questionnaire (1932) is one of the most common rating scales used to measure attitudes and was used to develop a portion of the study's survey questionnaire. The design presented participants with a ten-point response scale ranging from *Confident (10)* to *Not Very Confident (1)* in response to two forced-choice questions, which asked, "how confident are you in an external setting (like the garden)

and in leading your students?" and "how confident are you in your classroom and leading your students?" The advantages to this approach to data collection are the familiarity and ease of response for participants, the cost effectiveness in comparison to other forms of data collection such as audio and video recordings, and the reliability of representation in the design (ten Klooster et al., 2007). Other item types included Yes/No responses and the narrative listings of participants' answers to select items.

Data Analysis

I organized and standardized the data after receiving the Microsoft Excel files from fellow FoH interns who had digitized the teachers' responses. Thereafter, I employed Crabtree's and Miller's (1999) three methods of data management: data preparation, data organization, and data manipulation. The survey responses were imported into the qualitative data analysis software (QDAS) called NVIVO, a tool used to assist data analysis by organizing and computing survey instrument information (Saldaña, 2009). I then created research questions that correlated with the survey questions, and subsequently refined the study's objectives to better correspond to these changes (see Table 3). This procedure was in preparation for preliminary data analysis through the first round of coding.

Of the 30 response items originally available from the pre-training and post-training questionnaires, I strategically selected 19 to be analyzed – one question through qualitative coding, one as a quantitative, purposeful stratifying or sorting attribute, i.e., participating teachers who had no previous experience with the FoH curriculum, and the remaining 17 items, which were coded using an integrative mixed methods approach.

This approach included aggregated word frequencies and response percentages of words, phrases, and preliminary themes.

My research questions and the study's objectives – not intended to be interchangeable or synonymous, but rather to interrelate cohesively to the inquiry's purpose – correlated with eight items on the study's questionnaires, as developed by FoH (see Table 3). Such were coded qualitatively while quantifying the coding frequencies among those and the remaining 13 questions (see Tables 3 & 4). As seen in Table 4, I considered two additional research questions pertaining to the teachers' responses that did not strictly inform the objectives, but that could facilitate further discussion or recommendations for future practice and research.

Table 2

Selected Questions, Collection Points, and Data Types, from the January 2020, FoH Four-Week Teacher Training Workshop in Lira, Uganda

Questionnaire Items	PRE Only	POST Only	Both	QUANT	QUAL
1	X				X
2	X				X
3			X	X	
4			X	X	
5	X			X	
6		X		X	
7		X			X
8	X			X	
9	X			X	
10	X			X	
11	X			X	
12	X			X	

13		X			X
14		X		X	
15		X		X	
16		X		X	
17		X		X	
18		X		X	
19		X			X

Table 3

Alignment of Selected Questionnaire Items: Construction of Working Research Questions and the Study's Objectives around the Data and Emergent Research Codes

Questionnaire Items	Research Questions	Study's Objectives	Research Codes
7. Do you think your school director and administrators understand your role as an agriculture instructor? How can we help them understand your role/job? **17. How can FoH better support you using the curriculum in your school?**		**1. Describe the factors that would support teachers' intentions to implement the FoH curriculum.**	**Implementation Variables**
15. What part of the curriculum needs the most improvement? Why? **16. What are your concerns with using the curriculum in your classroom?**		**2. Identify ways to improve the FoH curriculum as perceived by teachers who participated in the training workshop.**	**Suggestions for Improvement**
13. Regarding FoH curriculum, do you think it is helpful in teaching agriculture? **14. What is your favorite part of the FoH curriculum? Why?**		**3. Describe the teachers' perceived value of the FoH curriculum to their teaching practices.**	**Valuable Aspects**
6. As an instructor, what areas do you feel you need more training in?		**4. Identify teachers' perceived needs for additional professional development.**	**Perceptions of Self-Efficacy**
10. If you have not seen the curriculum yet, what are you hoping it includes?	**What expectations did teachers have of the FoH curriculum?**		**Teacher Expectations of FoH Curriculum**
18. What methods used by the trainer will you use in your own classroom following this training?	**What acquired skills did teachers plan to utilize?**		**Acquired Skills**

I ascertained an analytic imagination (James, 2013), reflection, and understanding of what teachers may have perceived during their time with FoH, through employing in vivo, concept, descriptive, and simultaneous coding methods to analyze and interpret their meaning. As Saldaña (2009) explained, while in vivo coding emphasizes the essence in the participants' *exact words*, concept and descriptive coding summarize these words and phrases into meaningful abstractions that are representative of an emergent theme or category for further reflection.

Saldaña (2009) defined *concept coding* as deriving meaning at a micro level from words and phrases during data analysis. The embedded concept in a word or phrase is an expansive symbol for greater meaning and conceptualization that takes form as the coding process ensues (Saldaña, 2009). Using an inductive approach to begin coding, I aimed "to condense the raw data, make connections between the research objectives and categories emerging from the raw data analysis, and provide a theory based on these emerging categories" (Dufour & Richard, 2019, p. 4).

I sorted through responses pertaining to the assortment of preliminary codes for research questions to prepare for the first round of coding. Notes were made as word frequencies became potential themes within the codes. Lichtman (2013) asserted that most qualitative studies in education will generate 80 to100 different codes that can be organized into 15 to 20 categories and subcategories, which eventually synthesize into five to seven major concepts. By scanning responses within each survey question, it became evident that the answers were informing different dimensions of perceived value of FoH's curriculum as well as the teaching guide provided to the participants during the training workshop.

I employed *descriptive coding* to extract further meaning that would explain *why* participants favored certain aspects of the FoH curricula and/or teacher training. Descriptive coding assigns a topic to a corresponding word or concept, with the intent to support and describe what was discussed or elucidated (Saldaña, 2009). *Simultaneous coding* was used to not only account for the multiple services provided by FoH that participants found valuable, but also to characterize their pedagogical preferences for teaching the curriculum as presented by the FoH intervention.

Axial coding was employed during the second cycle of coding to construct categorical, thematic, and conceptual organization of codes that had appeared from the first cycle of analysis (Saldaña, 2009). Through axial coding, potential themes and subthemes emerge based on code frequencies and perceived patterns.

These responses informed not only what teachers found valuable from the FoH curriculum and teaching guide, but also whether they found it helpful in teaching agriculture to their students. This added another scope by which to evaluate the FoH intervention.

Quantifying Select Qualitative Data

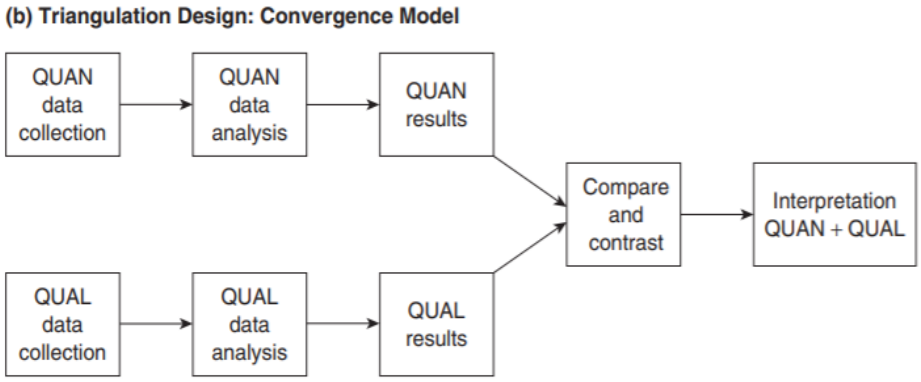
Although qualitative data is non-numerical in most cases, the assignment of numeric values by counting the frequencies and percentages of responses can quantify what were open-ended responses to select questions and facilitate generalizability (Maxwell, 2010). In this regard, I used Creswell's (1990) (see Figure 6) model for a concurrent triangulation mixed methods design to converge and interpret both the qualitative and quantitative aspects of the survey questionnaire. To further characterize emerging themes, I filtered survey responses to participants who had no previous

exposure to FoH's agricultural education curricula and calculated the word and phrase frequencies among the responses of those with this specific attribute. I triangulated the survey data and obtained meaning from the teachers through the emerging trends derived from the prevalence, convergence, and divergence of their responses.

For example, methods the teachers expressed their intentions to use in teaching the curriculum's lessons were of particular interest to me after reviewing responses to this question: "What methods used by the trainer will you use in your own classroom following this training?" The question was therefore coded as a thematic research question code (RQC) under *Acquired Skills* (see Table 3). Using in vivo and concept coding, I generated 31 *dominant* or *emergent* codes and phrases and calculated the frequency of which they occurred (Dufour & Richard, 2019). This mixed-methods, investigative approach was used for each item I selected for analysis and reporting of related findings in chapter four.

Figure 6

Designing and Conducting Mixed-Methods Research by Creswell (1990): Triangulation Design: Convergence Model



Secondary Researcher Reflexivity

Discourse on the utility of QSA as a worthy alternative to conducting a primary study with a similar epistemological framework, centers around questions previously mentioned by Mauthner et al. (2014) and Tate and Happ (2018), along with any preconceptions that informed the original research design (Malterud, 2001). Awareness of how these preconceptions influenced the research design, data collection, results, and interpretation, comprise research reflexivity. A researcher's cognizance of how these preconceptions were informed by their professional research history and personal experiences, is her, his, or their researcher reflexivity (Mauthner et al., 2014). It is then appropriate to suppose that the secondary researcher's cognizance of the original research team's "pre-study beliefs" (Malterud, 2001, para. 1) and experiences, is essential prior to QSA and in addition to their own respective self-scrutiny. We refer to this as secondary researcher reflexivity.

I employed *bracketing* as an intentional reflexive strategy aimed to set aside any a priori assumptions that may have affected the interpretation and analysis of the presented data (Tufford & Newman, 2010). The lack of a consensus on the definition of bracketing can facilitate a flexible, subjective lens by which to self-assess an investigator's biases and preconceptions prior to conducting a study (Tufford & Newman, 2010). In employing this method, I kept a journal of memos and notes that graphically scoped the data analysis process and informed the coding cycles prescribed by Saldaña (2009).

Mauthner et al. (2014) cited several arguments in defense of the secondary researcher's reflexivity in QSA as sufficiently systematic in its own epistemology. If assuming that the archiving and privileging of detailed accounts and fieldnotes belonging

to the original researchers are all-encompassing in deeming the dataset as complete or whole, Mauthner et al. (2014) insisted that would limit the scope and utility of both studies. By stating that the meanings and findings derived from the data are not found "in the data, but [are] to be made by those doing the interpreting" (Mauthner et al., 2014, p. 735), equitable accountability and shared reflexivity is created between the original and secondary researchers and can facilitate a cohesive understanding of both preexisting contexts by the latter.

Having no primary researcher prepare, manage, manipulate, or interpret the dataset prior to this study, I was confronted with a limited preconception of the original study's research aims, fieldnotes, and design processes. This precondition was satisfied through my unique position as an intern with the FoH organization, which allowed me an opportunity to familiarize myself and assist in the management of the data, a task that should not be underestimated in its power to evoke and resurrect authentic inquiry (Mauthner et al., 2014). It is also provocative yet appropriate to presume that in the absence of a precontrived framework in what would have been the primary analysis, I was allowed creative freedom to construct my own research methodology, while being guided within the parameters originally set forth by the primary researchers' methods and procedures. This study sought to extend the primary researchers' aims by extracting and resurrecting their original, authentic meanings through an examination of the survey instrument and participants' responses regarding and informed by the FoH curriculum and its training intervention.

The Researcher's Reflexivity

As a Black, cisgender, upper-middle class, nondisabled, Christian woman of color, my beliefs, privileges, and oppressions have challenged and enriched my professional and personal experiences through multifocal frames of reference. Born and raised in Georgia, I came from a line of sharecroppers and tenant farmers from North Carolina; a story shared by many African American southerners in the United States and indicative of a singular, diasporic culture. Similar to them, race and gender dynamics shaped my early educational and social experiences, and they continue to do so. Growing up in the suburbs yet attending public school in inner city Atlanta, Georgia, where supplies, infrastructure, and public services were either dilapidated or nonexistent, provided me with a dialectical and critical understanding of socioeconomics and their implications.

An early inclination for farming and gardening was instilled by my sharecropping lineage that reluctantly drug me to summer visits to my great-grandmother's farm in Currie, North Carolina, and that later found me sweating under a merciless, hot Georgia sun as I weeded my grandmother's vegetable gardens. Once the distaste for manual labor subsided with growth and maturation, my inclination for farming extended to the urban gardening communities where I began volunteering and eventually working for organizations geared toward addressing food insecurity in low-income communities around the metropolitan areas of southwest Atlanta while pursuing my undergraduate degree. I became a coordinator and youth organizer for Park Pride Atlanta where I worked for three years organizing community gardens and volunteering efforts for neighborhoods in Atlanta referred to as *food deserts* where the scarcity of grocery stores

and places with nutrient-rich food options existed. This experience sharpened my awareness of the importance of local community involvement, and the paucity of food and resources available to low-income families in America.

I obtained my Bachelor of Arts degree in Spanish and International Business from Georgia State University, where I had my first international experience. In a Women's Gender and Sexuality Studies course, I was given the opportunity to spend three weeks in Ecuador where I studied biodiversity, gender equality, and natural resources extraction policy at similarly superficial glances. While in the countryside and headed toward the Amazon rainforest, I was confronted by the beauty of the rolling hills of growing corn, the exhilarating bustle of the fresh markets, the harsh reality of social inequalities and poverty, the negative effects of resource extraction policies, and the consequential displacement of indigenous communities. This experience was profound in eliciting a desire to expand my knowledge of farming and agriculture and starting my journey to postgraduate studies in agriculture, agricultural education, and rural development in developing countries.

My passion for the land and for local community engagement intersected with academic and professional experiences with urban youth and food production providing points of reference as an FoH intern and as a research instrument for this study that was constructive, dialectical, and critical. By setting aside my preconceptions derived from these experiences and adopting an approach during data management and analysis that was transcendental, objective, and boundless, I was able to "take a fresh perspective toward the phenomenon under examination" (Creswell & Poth, 2018, p. 78), with an open mind and a critical curiosity.

CHAPTER IV

FINDINGS

This chapter outlines and reports the study's findings. These findings are the results of a mixed methods survey design and secondary analysis of data. The survey responses came from secondary school educators, who had intentions to implement the INGO Field of Hope's agricultural educational curriculum for lower secondary school students in northern Uganda, and who also participated in a related teacher training workshop for professional development.

Purpose of Study

This purpose of this study was to explore the perceptions of Ugandan secondary school teachers regarding FoH's agricultural education curricula (see Figure 2), including the teaching methods supported by its design that they found most important to implement, the overall influence the related professional development had on their attitudes about teaching agriculture, and on their teaching practices altogether. Project-based learning was the primary methodology designed into the curriculum for the agricultural education of school-aged youth in northern Uganda. This framework described the recommended lessons comprising the curriculum to be taught by secondary school teachers of agriculture. Secondary data analysis informed the four objectives that guided this study:

Objectives

1. Describe the factors that would support teachers' intentions to implement the FoH curriculum.

2. Identify ways to improve the FoH curriculum as perceived by teachers who participated in the FoH training workshop.

3. Describe the teachers' perceived value of the FoH curriculum to their teaching practices.

4. Identify teachers' perceived needs for additional professional development.

Sample Size

The critical case sampling method was employed by I with the aim to extract from the sample a demographic that would "yield the most information and have the greatest impact on the development of knowledge" (Patton, 1990, p. 174). The critical case studied by I featured the survey respondents who identified themselves as having no prior exposure to the FoH curriculum before participating in the provider's January 2020 Teacher Training Workshop. This responding sample included 56 teachers who participated in FoH's four-week long training in Lira, Uganda. The teachers' identities were anonymized into codified identifiers.

Discussion of Themes and Subthemes

To derive the findings of this study, I sorted through archival survey data from FoH's teacher training workshop which took place in January 2020. The teachers were given survey questionnaires to complete before (pre-training) and after (post-training) participating in the workshop, and I selected 19 of 30 available items to analyze (see Table 2). This analysis generated 845 codes, from which seven themes and 21

subthemes emerged (see Table 4). The seven themes were *pedagogical shift: from agricultural theory to agricultural practice; material and nonmaterial support; alignment with Uganda's NCDC; pedagogical shift: integrating theory and practice; professional development and subject matter knowledge; centering the student; and "a better Uganda": teacher and community outreach* (see Table 4).

The research questions and objectives were organized sequentially for the purpose of depicting the teachers' experiences with the FoH curriculum and training intervention in story form, as appropriate for narrative case studies (Creswell, 1998). The expectations, perceived values, and intentions for future professional development of teachers with no prior exposure to FoH services were captured and framed for display to and reflection by the reader.

Table 4

Emergent Themes and Subthemes Related to the Study's Research Questions and Research Objectives

Research Question 1: What expectations did teachers have of the FoH curriculum and teacher training?	
Theme 1	**Pedagogical Shift: from Agricultural Theory to Agricultural Practice**
	Building Practical Agricultural Skills
	New Teaching Methods
	Increasing Teacher Knowledge
Research Objective 1: Describe the factors that would support teachers' intentions to implement the FoH curriculum.	
Theme 2	**Material and Nonmaterial Support**
	FoH Relationship with School Administrators
	Training for School Officials
	Continuous Training
	Resources
Research Objective 2: Identify ways to improve the FoH curriculum based on teachers' perceptions.	
Theme 3	**Alignment with Uganda's NCDC**
	Time and Resource Factors
	Preparation for National Examinations
Research Objective 3: Describe the teachers' perceived value of the FoH curriculum to their teaching practices.	

Theme 4	**Pedagogical Shift: Integrating Theory and Practice**
	Practical Methodologies
	Comprehensibility of Curriculum
	Relevant to Daily Life
Research Objective 4: Identify teachers' perceived needs for additional professional development.	
Theme 5	**Professional Development and Subject Matter Knowledge**
	Areas of Need
	Teacher Confidence
Research Question 2: What acquired skills did teachers plan to utilize?	
Theme 6	**Centering the Student**
	Group Participatory Methods
	Demonstration Methods
	Interest Approach Methods
Theme 7	**"A Better Uganda": Teacher and Community Outreach**
	Improving Student Skill and Performance
	Building Positive Student Attitudes Toward Agriculture
	Introduce More Teachers to Curriculum
	Community Engagement

Research Question 1: What Expectations Did Teachers Have of the FoH Curriculum and Teacher Training?

Theme 1: *Pedagogical Shift: from Agricultural Theory to Agricultural Practice*

As schools transition from traditional practices of instruction, such as teacher-centered lectures and top-down approaches, to more concrete experiences that students may find more motivational and useful, understanding how teachers and students are navigating these shifts could assist in sustaining such. Before the training began, teachers in this study expressed hopes of acquiring techniques for applying agricultural theories and concepts in practical ways that would be comprehensible to their students.

Building Practical Agricultural Skills

To ensure transfer of knowledge and related technical skills from teacher to student, it is important that the teachers themselves are equipped with the skills and competencies for the demonstration of agricultural practices (Weegar & Pacis, 2012). This premise was affirmed by one teacher's hope for "[h]ands-on practices for proper skilling of the youth" in response to the survey question, "If you have not seen the curriculum yet, what are you hoping it includes?" That this teacher sought methods which could help to retain knowledge and build skills, i.e., hands-on, practical learning experiences for their students and themselves, aligned with the study's review of literature regarding in-service training (Craig et al., 1998), as well as Uganda's agricultural education reform for secondary schools involving more practical, demonstrative instruction (Barungi et al., 2016; Mangheni et al., 2013; Mukembo, 2014, 2017). It is important for both the teachers and their students to acquire the technical and

practical skills associated with agriculture and its practice to increase the likelihood of competency acquisition and the application of such in everyday life.

New Teaching Methods

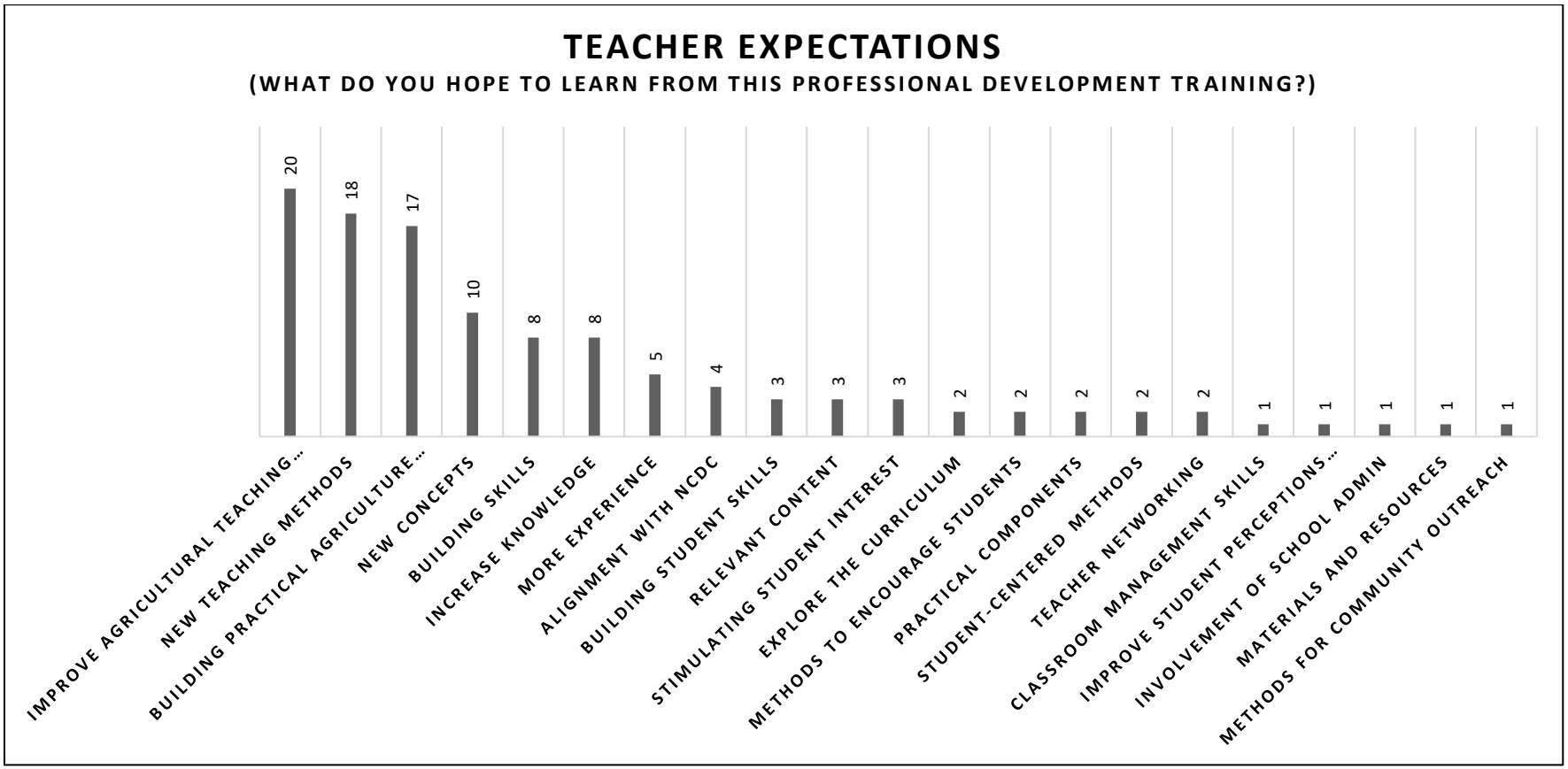
The *shift* from agricultural theory to agricultural education that is *more* practical, was conveyed by the teachers throughout the study, as the adjective *more* indicated a comparative relationship between one state and another, between a curriculum that is less practical, toward FoH's curriculum which contains a greater amount of practical content. Three nearly identical responses to the survey question "If you have not seen the curriculum yet, what are you hoping it includes?" attested to the need and expectation for a pedagogical shift: "[m]ore practical skills," "[t]he curriculum to be more practical than theoretical," and "[m]ore practical work [than] theory." One teacher positioned the new teaching methods as superior to the former by indicating "[p]articipatory learning, improved student motivation for learning, [and] better teaching methods" when asked what their expectations were of the FoH curriculum. An indication, perhaps, that previous teaching methods were not always effective at stimulating student interest to participate in the lessons.

Rogers' (2003) framework for *innovation* through the lens of adopting and implementing a new curriculum and its related teaching strategies, came to mind while reading through each response to this question. The respondents' hopes to acquire new teaching methods from the FoH professional development workshop were expressed in 32% of the responses during coding and analysis (see Figure 6). As such, *how to* apply agricultural theory in a practical way, that would garner student interest, stimulate motivation to participate in the lesson, and undergo practical learning experiences to

prolong knowledge retention and increase understanding were implied (Riyad et al., 2020). In accordance with Rogers (2003), the knowledge and persuasion stages of the innovation-decision process of implementation of the FoH curriculum constituted a need for a high amount of *how-to knowledge* by the teachers.

Figure 7

Teachers' Expectations of the Professional Development Training before the Workshop (*n* = 55)



Increasing Teacher Knowledge

According to the findings displayed in Figure 7, several teachers expressed hopes to increase their knowledge regarding agriculture and ways to teach it, in response to the survey question "What do you hope to learn from this professional development training?" Interests were divided in parts between desires for agricultural knowledge and effective teaching practices. One-half of the 20 teachers expressed a need to gain more knowledge of agriculture subject matter content through replies such as "[m]ore skills and knowledge in agriculture, "[n]ew ideas, knowledge and skills," and "[m]ore experience, skills, and knowledge." The remaining one-half specified a need for knowledge regarding how to effectively teach their students agriculture, i.e., "[b]eing more equipped with the knowledge and methods of teaching," and "[m]ore knowledge on how to motivate students into practical learning."

This division of interests suggested teachers anticipated that the FoH intervention would be holistic in providing content knowledge and ways to teach agricultural content, as well as how to practice agriculture. An example of this came from a teacher whose response "[l]earn more skills and innovative ways to earn a living," paired with another teacher's reply "[k]nowledge and skills to utilize agricultural opportunities," suggesting other means by which to value the utility of FoH's services. Although I was not entirely confident that they were referring to themselves rather than their pupils, the former contemplation envisaged the teachers as more than just educators, and alternately as farmers and agriculturalists, who could also capitalize on the practical experiences and training as provided by FoH's extension and education services.

Research Objective 1: Describe the Factors that Would Support Teachers' Intentions to Implement the FoH Curriculum.

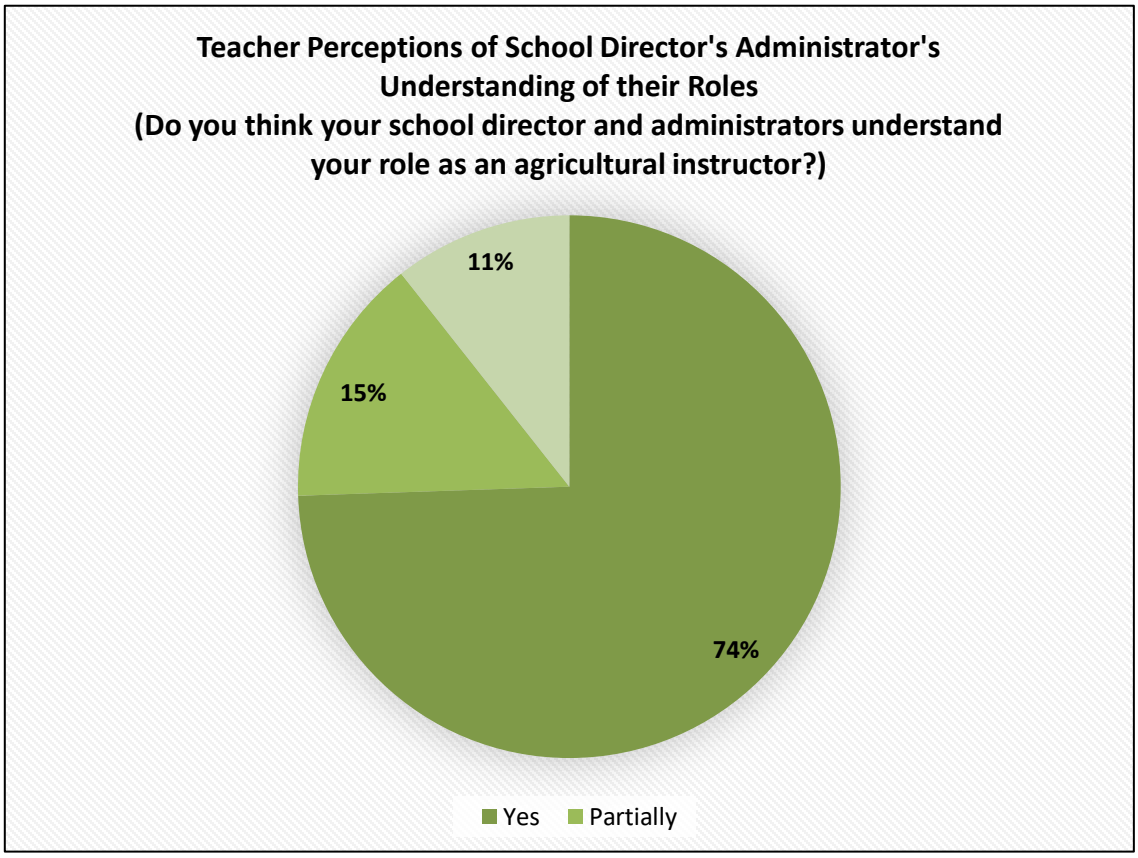
Theme 2: *Material and Non-Material Support*

Rogan and Grayson (2003) explained that curriculum reform and implementation in developing countries are sometimes facilitated through various levels of support from outside agencies and organizations in concert with national initiatives. They distinguished material and nonmaterial support as those that comprise physical resources and professional development services, respectively, with the goal to bring about educational change (Rogan & Grayson, 2003). When asked how FoH could support implementation of the agricultural education curriculum, teachers' views reinforced concepts of agency through both forms of support, as framed through Rogan and Grayson (2003). As such, I framed them into forms of material and non-material support, respectively, and conceptualized *relationship between FoH and school administrators* as an overarching theme for nonmaterial support.

When asked whether teachers felt that school directors and administrators understood their roles as agricultural educators, 35 out of the 47 participants answered *Yes* and five said *No* (see Figure 7). The follow-up question, "How can FoH help school administrators understand your role as an agricultural educator?" generated a strong request for a more direct and symbiotic relationship between the teachers' school administrators and FoH officers that could facilitate what I conceptualized as *agricultural education awareness* among the school officials and community trustees of the schools.

Figure 8

Teachers' Perceptions of School Director's and Administrators' Understanding of their Roles as Agricultural Instructors. (n = 47)



In response to the school administrators only partially understanding or not understanding their roles as agricultural instructors, teachers indicated that the school administrators were either unaware of the importance of agriculture as a course, i.e., because it is an elective in Uganda, or as an integral part of Uganda's economic backbone. Some teachers suggested that FoH promote their services while spreading awareness of the importance of agriculture, both as a course and as a vital sector of the nation's economy, by either extending training to the school administrators, or by funding school projects, such as demonstration gardens and by providing agricultural inputs.

The need for *persuasion* was derived from the teachers' responses to the question "How can FoH help school administrators understand your role as an agricultural educator?" and warranted reflection. Rogers (2003) defined persuasion as the second stage in the innovation-decision process (see Figure 5) when an attitude is formed that is favorable or unfavorable toward an innovation. Because this stage follows the knowledge stage, which involves learning about the innovation, the attitude being formed in the persuasion stage involves *feelings*, or "affective thinking" by an innovation's potential adopters (Rogers, 2003, p. 175). In this regard, teachers said:

"Yes, they do understand my roles. FoH can come and talk to the administrators to re-emphasize the role of agriculture teachers";

"Yes. Tell them more about the benefit of this initiative";

"Not fully; please come on board and sensitize both the school director and administrators"; and

"Yes, but you can continue communicating to them so that they understand more and more and be more supportive."

Perhaps what was expressed by the teachers through this post-training survey question, after having experienced the professional development workshop and acquiring how-to knowledge (Rogers, 2003) regarding the curriculum, was a desire for their school administrators to be persuaded in understanding the importance of agriculture as a profession, and, by association, their roles as agricultural educators. I inferred that introductory knowledge of the FoH curriculum − awareness-knowledge as defined by Rogers (2003), through its presentation − and the teacher training could complement the

persuasion stage by creating greater understanding of the agricultural educators' roles in their school settings and communities.

FoH Relationship with School Administrators

The teachers' responses presented above envisioned persuasion as FoH making school visits and holding discussions with school officials, which supported Rogers' (2003) emphasis on the essential role of *interpersonal communication* during this stage of the innovation-decision process (see Figure 5). Face-to-face interactions between multiple individuals characterize the interpersonal channel of communication and are more effective in formulating positive attitudes toward an innovation with later adopter categories than earlier adopters (Rogers, 2003). In facilitating school support of agricultural instruction, teachers took time to intricately portray the ways they saw interactions between their directors and FoH officers as supporting factors in the alignment of school administrators' and teachers' values regarding the teaching of agriculture. One teacher's answer explained this:

> Yes, they do, but not to a large extent. By organizing a seminar for the administrators such that they empower agriculture and also making them aware that agriculture is important in all aspects; by telling them to create time for practical lessons . . .

It depicted an impactful exchange between FoH and school administrators, through an organized seminar to promote agricultural awareness, as well as persuading school officials to create time or other resources for practical learning experiences to occur. Unsure as to what extent school administrators could alter time periods for courses determined by the NCDC, I considered the teachers' intentions to be focused more on

illuminating the national syllabus framework's limited space for agriculture as a compulsory subject that warranted time in the school day for practical application.

Indicators that relationships between FoH and school administrators could support teachers' intentions to implement the agricultural education curriculum emerged from responses to the survey question, "How can FoH better support you using the curriculum in your school?" In equal parts, 20% of teachers' responses mentioned undergoing continuous training, and school visits as integral to their capacities to support sustained adoption of the curriculum innovation and related teaching practices (see Figures 9 & 10). Initiatives such as these depend on optimizing the utility of the interpersonal communication channel between the change agents and potential adopters at both micro and macro levels, i.e., teachers and their school administrators, respectively. Rogers (2003) asserted this claim by stating that even if an individual knows about an innovation, whether they feel it is relevant to their life informs their likelihood of adoption:

> Consideration of a new idea does not go beyond the knowledge function if an individual does not define the information as relevant to his or her situation, or if sufficient knowledge is not obtained to become adequately informed, so that persuasion can then take place. (Rogers 2003, p. 174)

Figure 9

Teachers' Perceptions of How FoH Could Help School Administrators Understand their Roles as Agricultural Educators (n = 54)

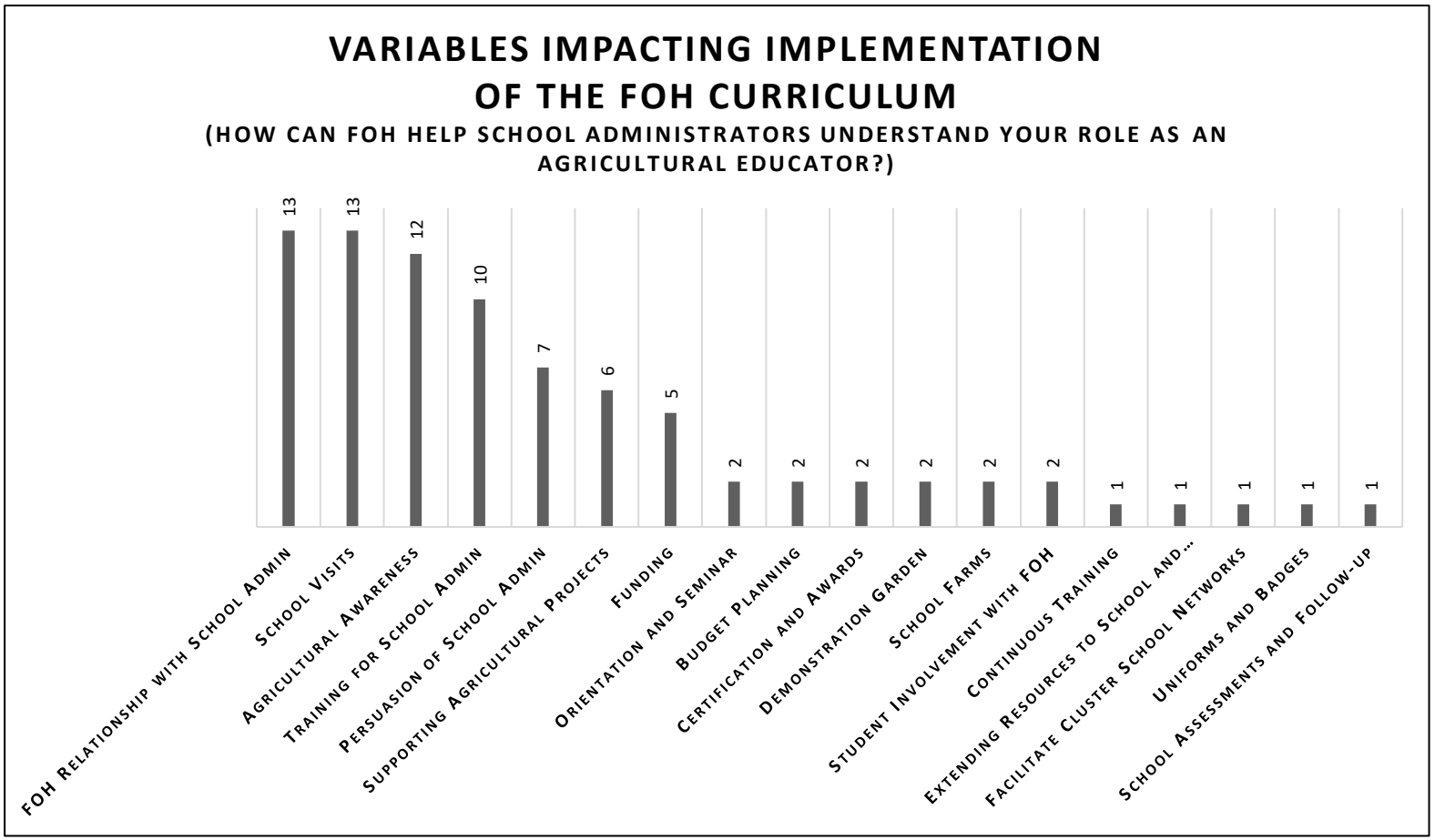
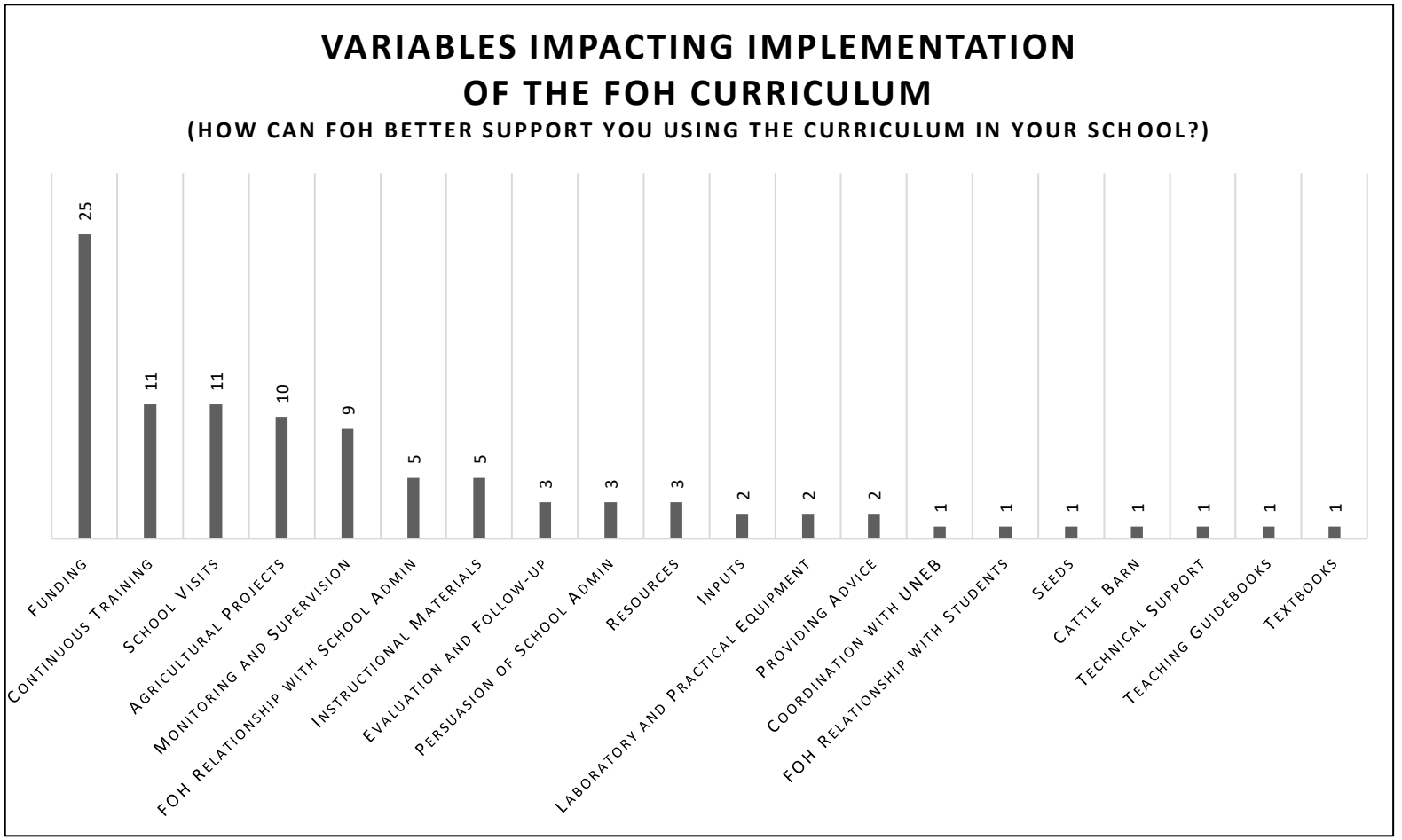


Figure 10

Teachers' Perceptions of How FoH Could Better Support their Using the Curriculum (n = 53)



Continuous Training

Supporting the results of previous studies conducted on the perspectives and voices of teachers who participated in FoH's professional development workshops in 2018 and 2019 (Cannon, 2019), as well as research regarding the efficacy of other in-service trainings (Craig et al., 1998; Hussain, 2004; Nzarirwehi & Atuhumuze, 2019; Shah et al., 2011), are findings that described teachers' desires for further professional development to support sustained curriculum implementation (see Figure 10). Craig et al. (1998) recommended that these services be continuous, ongoing, needs-based, and lasting anywhere from two to six years, and lifelong in some cases. Hussain (2004) concluded that teachers who participated in an in-service training workshop from 2005 to 2009 in the Hazara district of Pakistan performed significantly better than teachers who had not undergone training (Shah et al., 2011). Cannon (2019) found that, after conducting semi-structured interviews with eight teachers from FoH's professional development workshop in 2019, continuous training was an emergent theme concerning factors supporting innovative curriculum adoption and the practice of new teaching methods.

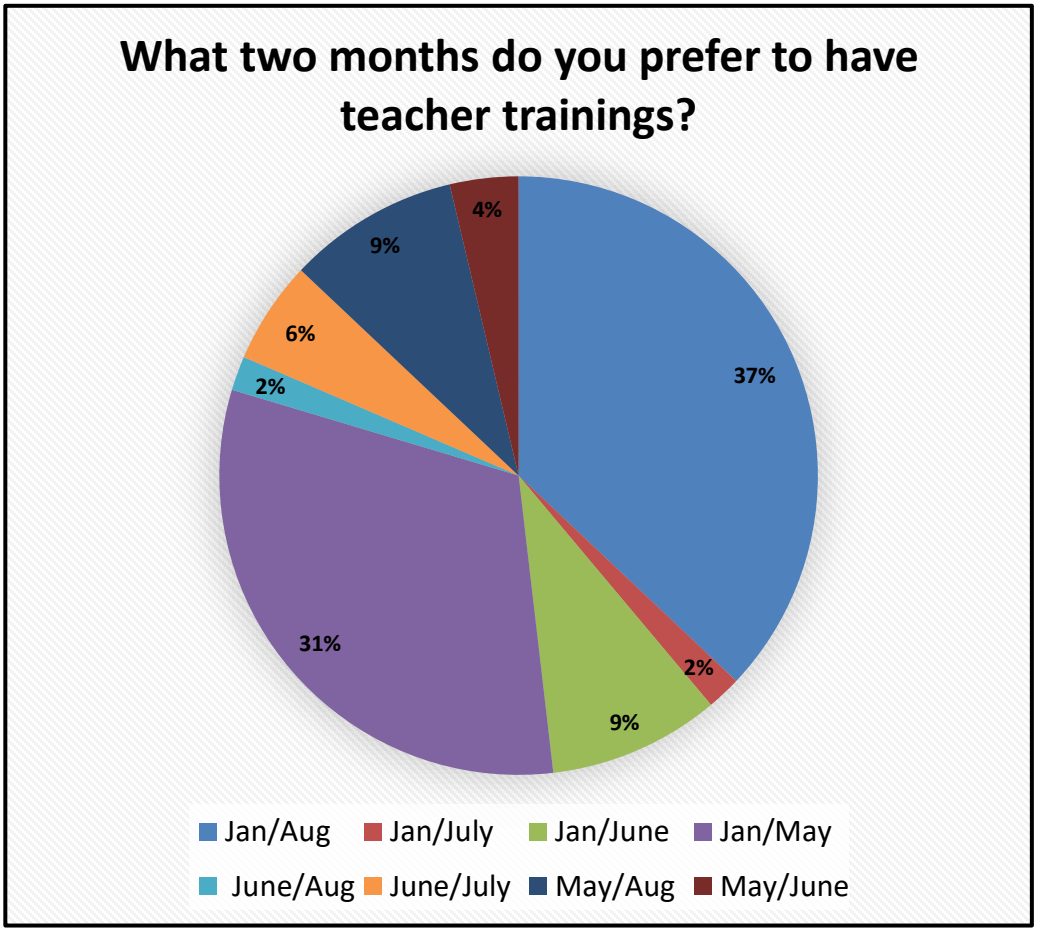
This may have been the case here because embedded in the framework of the FoH teacher training were the ideas espoused by Rogers (2009) that support curriculum adoption, i.e., *relative advantage* and *trialability*. Voiced through their expectations of the new agricultural curriculum and the related training to include better teaching methods, opportunities related to agriculture, and improved skills, teachers expressed perceptions of relative advantage associated with adopting and implementing the curriculum, as well as indicated its superiority to previous curricula that were "too theoretical to be able to make [a] meaningful impact" (Shizha, 2013, p. 13). The

opportunity provided by FoH for teachers to take the curriculum on a test-run during the workshop and afterward, indicated the high trialability designed in the curriculum and the related professional development workshop. One teacher's response to the question "How can FoH better support you using curriculum at your school?" provided additional insight into opportunities for increased assessment and evaluation protocols that could enhance needs-based curriculum design. The teacher said: "By monitoring the schools and more trainings in areas of weaknesses after [such] evaluations." Through this response, the FoH follow-ups could be considered productive by facilitating trialability, by lowering perceptions of complexity while enhancing how-to knowledge, and thereby increasing the likelihood of sustained adoption (Rogers, 2003).

To the pre-training survey question, "What two months do you prefer to have teacher trainings?" 37% of the responding teachers expressed desires for training during the months of January and August, and 31% preferred January and May (see Figure 11). Responses to this survey question were presented to provide insight for future professional development workshops as provided by FoH.

Figure 11

Teachers' Preferred Months for Future In-Service Training (n = 54)



Training for School Officials

Professional development workshops for head teachers, school administrators, and other teachers emerged as subthemes from the questions of how FoH could help teachers' school directors and administrators understand their role in agricultural education, and, to some extent, from the survey question of ways FoH could support curriculum implementation (see Figures 9 & 10). This supported contentions by Craig et al. (1998) and Nzarirwehi and Atuhumuze (2019) who suggested the inclusion and training of school administrators and head teachers to facilitate sustainable educational

change and reforms. The extension of training services to members outside of the targeted potential adopters was expressed as a supporting factor for facilitating the agricultural education awareness of school administrators as well as fomenting curriculum implementation. This was seen as a way to interpret the high value teacher participants associated with FoH's services after participating in the professional development workshop. Such responses included:

"You as FoH, need to organize a workshop for [school officials] and create awareness in them to learn what I am as an agricultural teacher in [their] school";

"Yes; Field of Hope can help them understand my role through organizing workshops for the school administrators"; and

"[y]es. Having physical contact with them at school; holding radio/television talk shows; providing them lists of requirements, tools, equipment, etc. needed for agriculture; organizing seminars and workshops with them."

Organizing workshops for school administrators intended to create awareness of the importance of agriculture as a national priority, and therefore, a high-value subject area in schools, stood out as a reasonable inference.

Concerning curriculum implementation, teachers perceived that training should be continued for those who had completed the January 2020 workshop, and some expressed that it should be offered to colleagues they knew who had never before attended a training. One teacher said: "By offering grants, providing regular trainings, involving the administrators and other teachers." This response included three different dimensions of support to optimize curriculum implementation, i.e., funding, continuous training, and extending services to more teachers as well as school administrators. Another teacher

reinforced these targets by replying: “FoH should source instructional materials relevant to the topics; FoH should plan continuous professional development levels for our team of instructors, fund.” The respondent added another factor to consider, i.e., learning materials. These suggestions, as viewed through the lens of Rogan and Grayson (2003) were factors of material and non-material support as perceived by the teachers.

Resources

Figure 9 provided a visual of how one-fourth of the teachers perceived that financial support was integral to sustaining the curriculum’s implementation and adoption of its related teaching methods. Teachers expressed limitations in learning materials and supplies for practicals and agricultural projects and suggested that funding for such was essential in changing their teaching strategies to include more student-centered, hands-on learning experiences. They said:

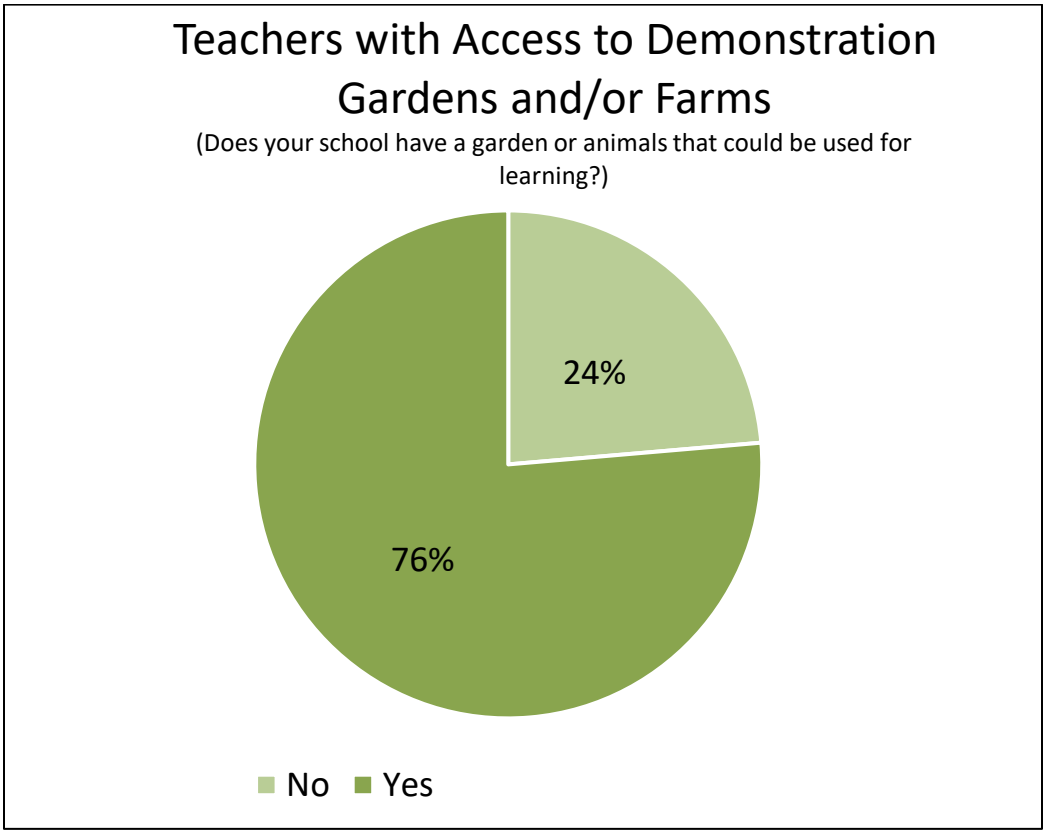
“Talking to administrators to allow them [to] release the items exemplary for practicals whenever needed and establishing some lacking facilities, if possible”; and

“[m]ajorly the school administrators complain of agriculture being expensive in terms of establishing demonstration gardens hence if FoH supports schools with inputs such as seeds etc.”

From these responses, inputs were categorized into separate, working forms of financial and material support, i.e., projects, practicals, and school-provided learning materials. The teacher who voiced the first response confirmed that their school had a demonstration garden in which to conduct practicals, but the teacher who expressed the latter lacked access to a demonstration garden or school farm (see Figure 12).

Figure 12

Teachers' Access to Demonstration Gardens and/or School Farms (n = 55)



This finding brought into question the extent to which varying conditions of school infrastructure impacted the practical teaching of agricultural content, because teachers who had access to school gardens and/or animals, responded in similar ways to teachers without, regarding limited space, resources, or funds for agricultural projects and demonstrations. The need to support the development of infrastructure and the procurement of instructional resources from outside agencies was brought forth by this finding. The fostering of an ongoing relationship between school administrators and agricultural extension education organizations such as FoH was further reinforced.

Research Objective 2: Identify Ways to Improve the FoH Curriculum Based on Teachers' Perceptions.

Theme 3: *Alignment with Uganda's NCDC*

This theme was revealed through the exploration of three post-training survey questions: "What are your concerns with using the curriculum in your classroom?" "What part of the curriculum needs the most improvement?" and "Why?" Nearly one-half of teachers' responses expressed concerns with the amount of time available to correctly execute all sections of the curriculum in their classrooms, and a lesser trend emerged related to the relevance of subject matter and topics (see Figures 13 & 14). Another teacher concern that implied the need for further discussion was the capacity of practical subject matter to successfully prepare students for national examinations. Through these questions and the teachers' responses regarding barriers that appeared to limit optimal implementation of the curriculum, the elasticity of the national educational framework to accommodate curriculum and pedagogical change such as the design provided by FoH was brought into question. The teachers' responses may serve as suggestions for further reflection and investigation into the synergy between national governments' and INGOs' attempts at collaboration and provision of complementary services to improve teacher performance and student learning.

Figure 13

Teachers' Concerns with Implementing the FoH Curriculum (n = 54)

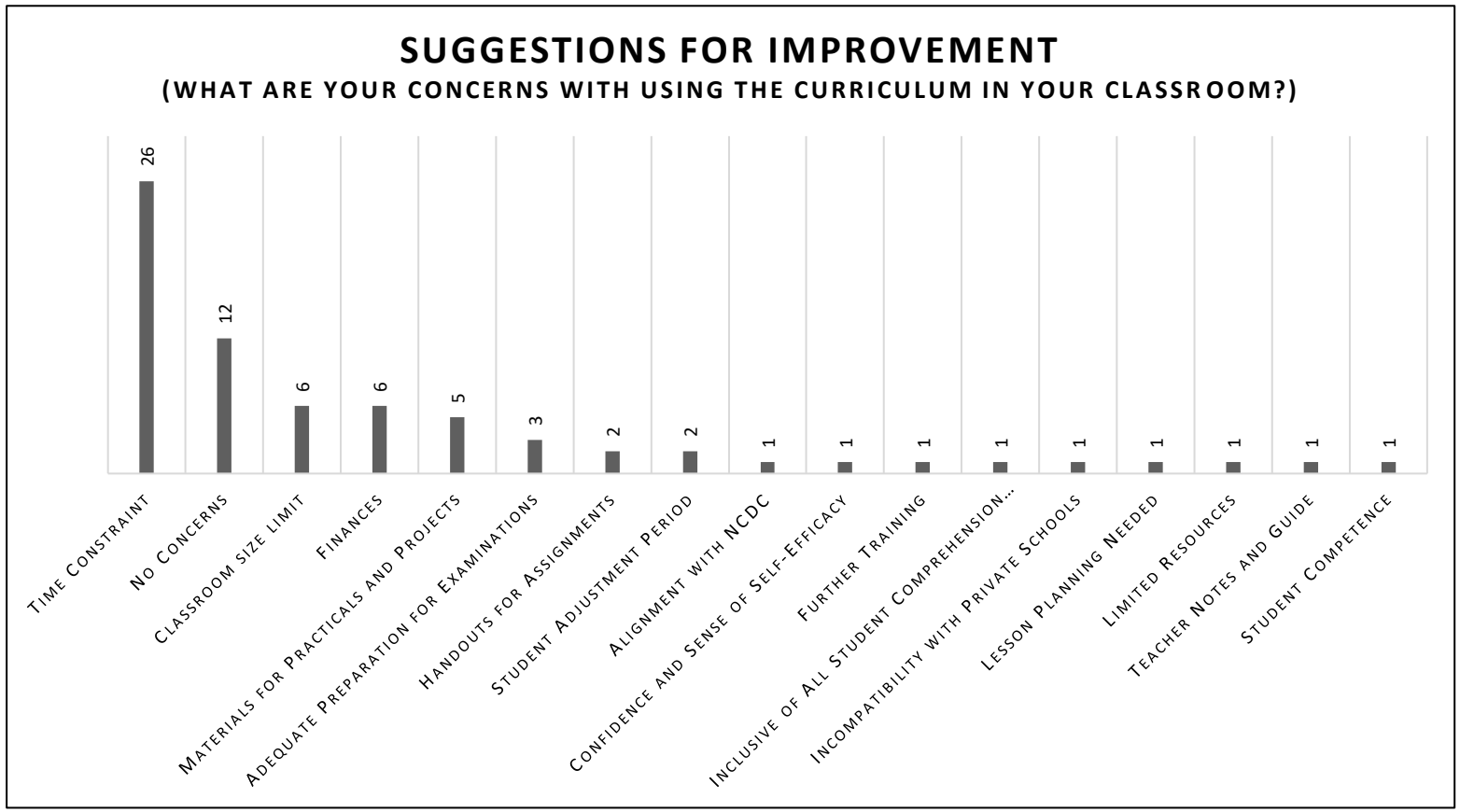
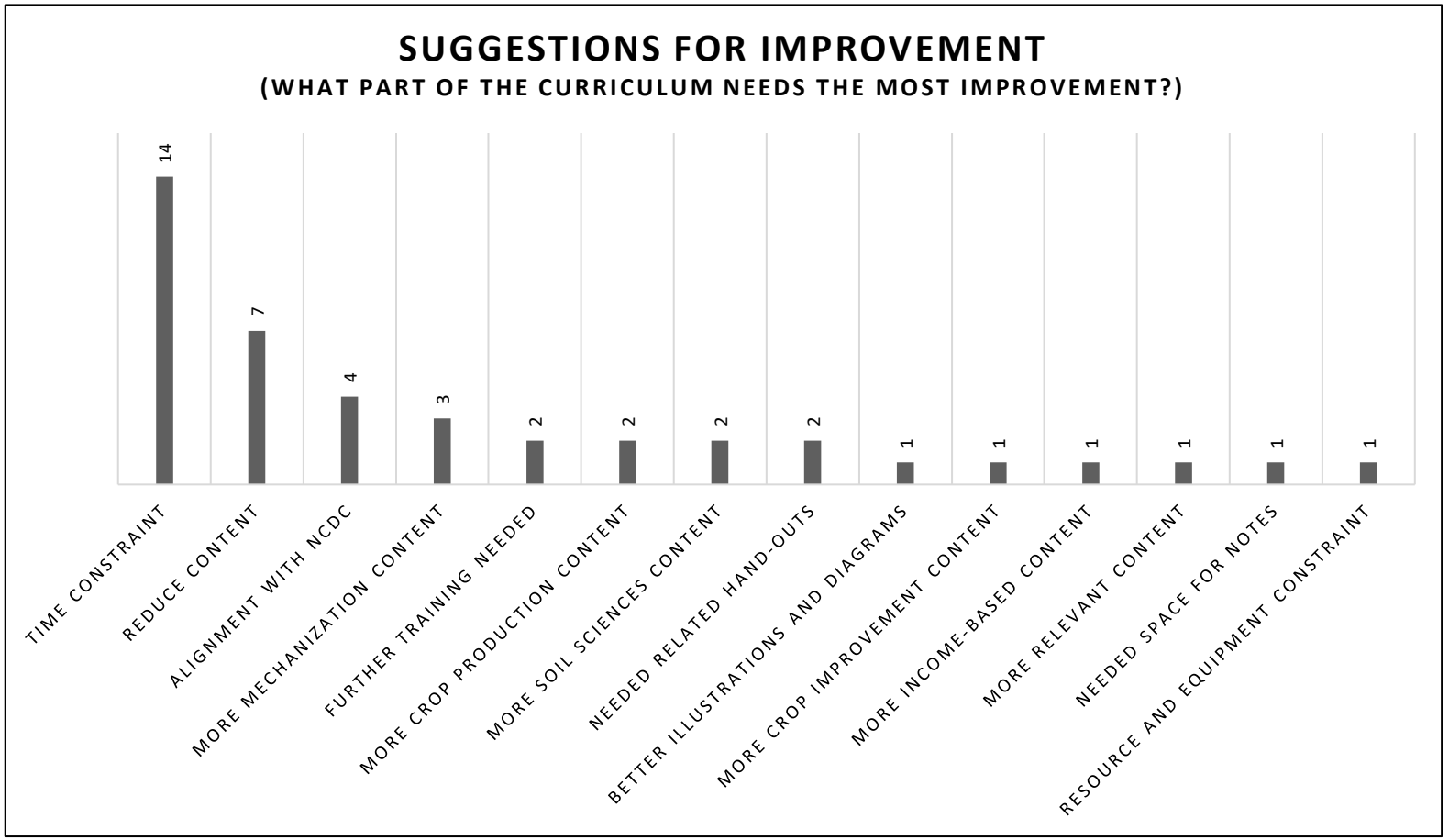


Figure 14

Teachers' Suggestions for Improving the FoH Curriculum (n = 49)



Time and Resource Factors

I perceived that practical procedures and experiential components of the FoH curriculum were demanding in terms of lesson planning and time allocation, i.e., "[b]ulky and requires planning before the lesson commences," as one teacher stated. To contextualize FoH's curriculum design, Cannon (2019) explained:

> The new curriculum provides three class periods of agriculture instruction each week, which is the same as when using Ugandan curriculum . . . . However, when using the new curriculum, the change calls for two of those three days to be spent in the class and one day is 'practical,' where the students change environments and visit the garden, animals, nearby community, field, or the closest environment that matches what they have learned in class that week to allow for real-world application. (pp. 67-68)

Because a vocational elective course is limited to 40 minutes, three days a week for agriculture, as stipulated by Uganda's NCDC, the teachers' responses favored condensing course material to topics relevant to the national curriculum and specific to agriculture in Uganda. For example, a teacher said: "[Regarding] time allocation for session. To me, I think it should be plan[ned] like 40 mins single and double 80 mins but not 100 mins double." And another stated: "Need to adjust lesson time frame to suit the Ugandan setting. It should be adjusted so that a period is 40min." A third teacher shared: "Content; reviewing the content so that only the most relevant topics are covered." All responses called for a curriculum that is aligned with the NCDC's framework for lower secondary level school course scheduling:

1. All Secondary Schools shall be obliged to offer the 11 compulsory subjects

for Senior 1 and 2 as indicated in [a] above.

2. School instructional time is from 8.00am to 2.55pm but the school day will run up to 4.30pm each working day.

3. Each lesson is 40 minutes which will total to 40 periods per week. (Baguma, 2020, p. 3)

Issues with time were articulated in multiple responses through the concern of not having enough to complete the national syllabus within the term. This supported the likelihood that the national syllabus for lower secondary education does not fully support the teachers' using practical agricultural pedagogy. As an elective and not compulsory, this places less importance on agriculture regarding instructional time allocation and resource expenditure, as attested by a teacher's response describing their school administration's position on agriculture being expensive due to its practical nature that requires demonstration gardens and technical equipment.

The resources needed to teach agriculture in practical ways that build students' skills comprise a vast body of context and levels of operation. Teachers reported shortages in materials and equipment that ranged from stationery for worksheets and written assignments – "Giving handouts to students may not be properly achieved in schools that lack stationery materials mostly village schools like mine." – or the provision of summarized notes and textbooks for students. "The notes in each topic; textbooks that cover the whole curriculum from S1 - S4 should be printed to help the teachers and learners," as one teacher noted. Regarding the materials needed for initiating agricultural practicals and projects, a teacher added: "It is okay; except that you can avail us with textbooks, items for practicals."

School infrastructure also emerged regarding a lack of resources that hindered curriculum implementation, including class size (see Figure 13). Room space and student numbers were concerns that teachers expressed as constraints when implementing the participatory methods prescribed by the activities in the FoH Teacher's Guide. One teacher responded to the question "What are your concerns with using the curriculum in your classroom?" by saying that "[t]he curriculum needs a lot of space and time for both group-making and practical lessons, respectively." This observation called attention to the relationship between group-oriented teaching strategies and classroom size, and between practical teaching methods and time-use, respectively. Other testaments from teachers along this line, included: "It may be challenging for bigger classes of learners," and "[t]he arrangement of the bigger classroom may be a bit difficult and time consuming." The teachers' positions reinforced previous literature concerning large student-teacher ratios in certain districts and substandard school infrastructure in others (Bazalio, 2020; Cannon, 2019).

Preparation for National Examinations

The teachers also mentioned concerns regarding the FoH curriculum in providing adequate preparation for Uganda's national examinations (see Figure 13). One teacher said: "Encouraging skills which may not be perceived well in case students don't perform well in national exams [where] the school administrators and parents need to know that agriculture is a practical subject." Were social norms and related perceptions detaching agricultural education from its scientific bases and practical applications of such, to suggest an inverse relationship between it and the students' performances on examinations? If national examinations that assess student competence in agricultural

education are overly standardized and not sufficiently practical or reflecting the curriculum's scientific grounding and applicability in laboratory and field settings (Davison & Dustova, 2017), perhaps this also implied that Uganda's national curriculum framework is not conducive to FoH's recommended approaches for teaching agricultural education? One teacher's words supported such an interpretation:

> My classrooms are overcrowded which may not facilitate learning by FoH curriculum; it requires a student to critically think yet some learners lack such capabilities; our evaluation (UCE/UACE) is more theoretical requiring much theory to be covered rather than practical work.

This response reflects an educator who recognized the inherent value of the FoH curricula, but also felt pressured to meet the national examination standards set by Uganda's UNEB. This may have been overwhelming and generated a sense of incongruence in their teaching environment and the demands embedded in the FoH curriculum and the UNEB. Because the teacher also mentioned critical thinking as an attribute that not all of their students had, this may raise a concern regarding the capacity of FoH's curriculum to be inclusive of all learning types. The question of which could be more impactful on students' effective preparation for national examinations, i.e., adjusting subject matter content to reflect the textbooks prescribed to them by the NCDC (2020), or instead recalibrating FoH's curriculum design to be more inclusive of diverse learning abilities and account for the resource limitations previously described, is worthy of deeper exploration.

Research Objective 3: Describe the Teachers' Perceived Value of the FoH Curriculum to their Teaching Practice.

Theme 4*: Integrating Theory with Practice*

FoH's curricula include a paired Teacher's Guide and Teacher's Supplement for each lower secondary grade level (Appendix D). While the Teacher's Guide is an explicative instructional resource complete with the learning objectives, needed materials, interest approaches, and scripted discussion sections to teach the lessons, the Teacher's Supplement contains volumes of subject matter content, tests, assessments, and visual learning aids. Teachers' responses to the questionnaire included answers referring to the FoH curriculum in general, yet certain words or attributes shed light on which aspect of the curricula materials the teachers were describing. For example, the recurring responses regarding "objectives" prompted a word search through the curricula for its occurrence, to find that the word was not present in the Teacher's Supplements, but rather as a thematic section in each of the Teacher's Guides. Indicators that the Teacher's Supplements were being invoked emerged in responses appraising or critiquing the materials' diagrams and illustrations, as well as the group assignments.

The concept of a pedagogical shift reoccurred during the analysis of two post-training questions that informed Theme 4: "Regarding the FoH curriculum, do you think it is helpful in teaching agriculture" and "What is your favorite part of the FoH curriculum?" These questions motivated an exploration for a word to describe an emerging concept, i.e., why the curriculum the teachers found the subject matter content and the general curriculum layout to be detailed yet simplified, easy to understand, and easy to teach. The word "comprehensive" became an overarching exploratory subtheme

to represent certain attributes, such as “easy to teach” and “easy to understand,” which were treated as separate entities during simultaneous coding to better grasp the nuanced meanings, rather than collapsing them. This method was deemed appropriate as prescribed by Saldaña (2009) for “when the content of the data suggests multiple meanings that necessitate and justify more than one code” (p. 95) [see Figures 15 & 16].

Figure 15

Teachers' Perceptions on Valuable Aspects of the FoH Curriculum (n = 55)

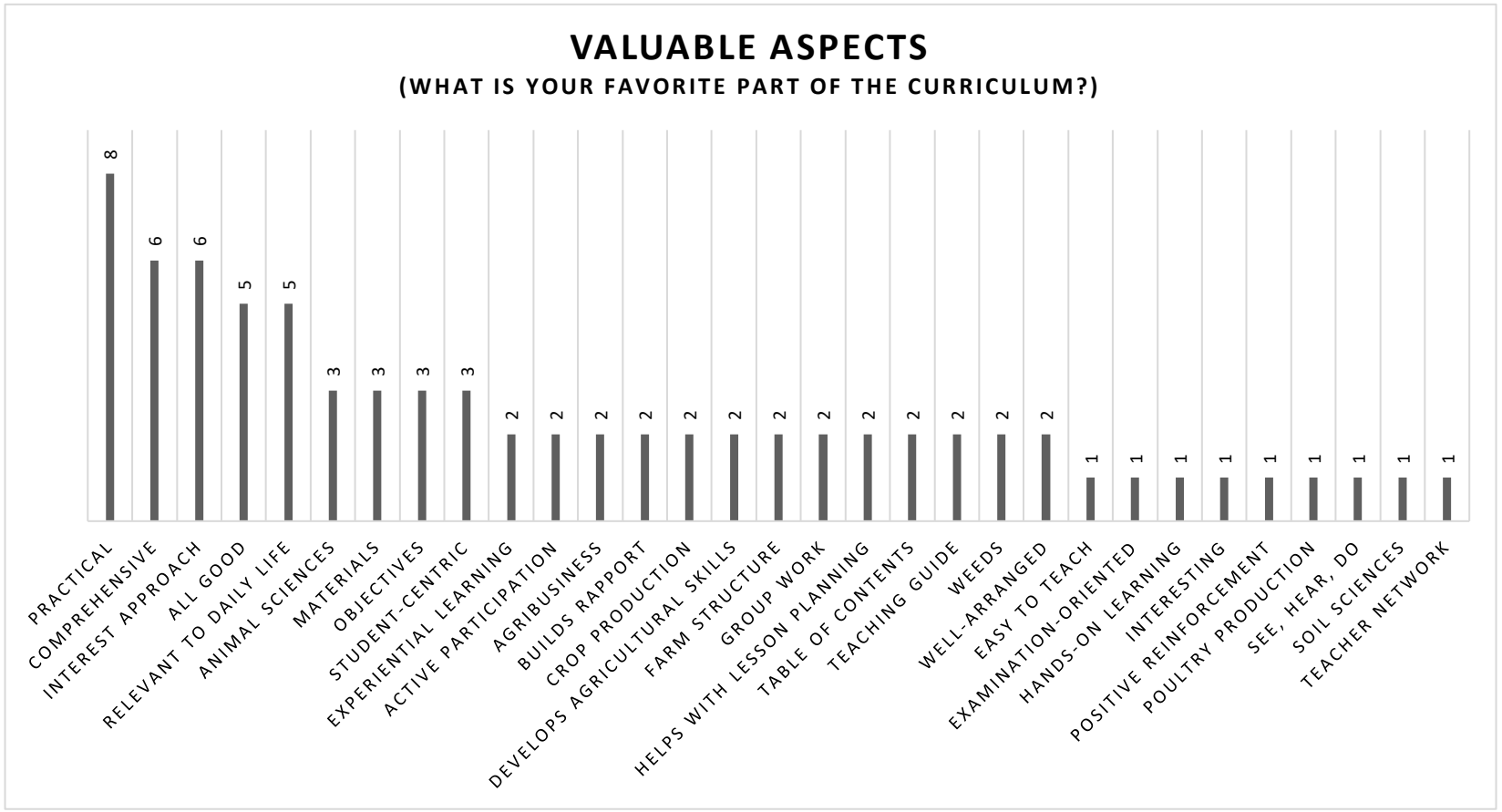
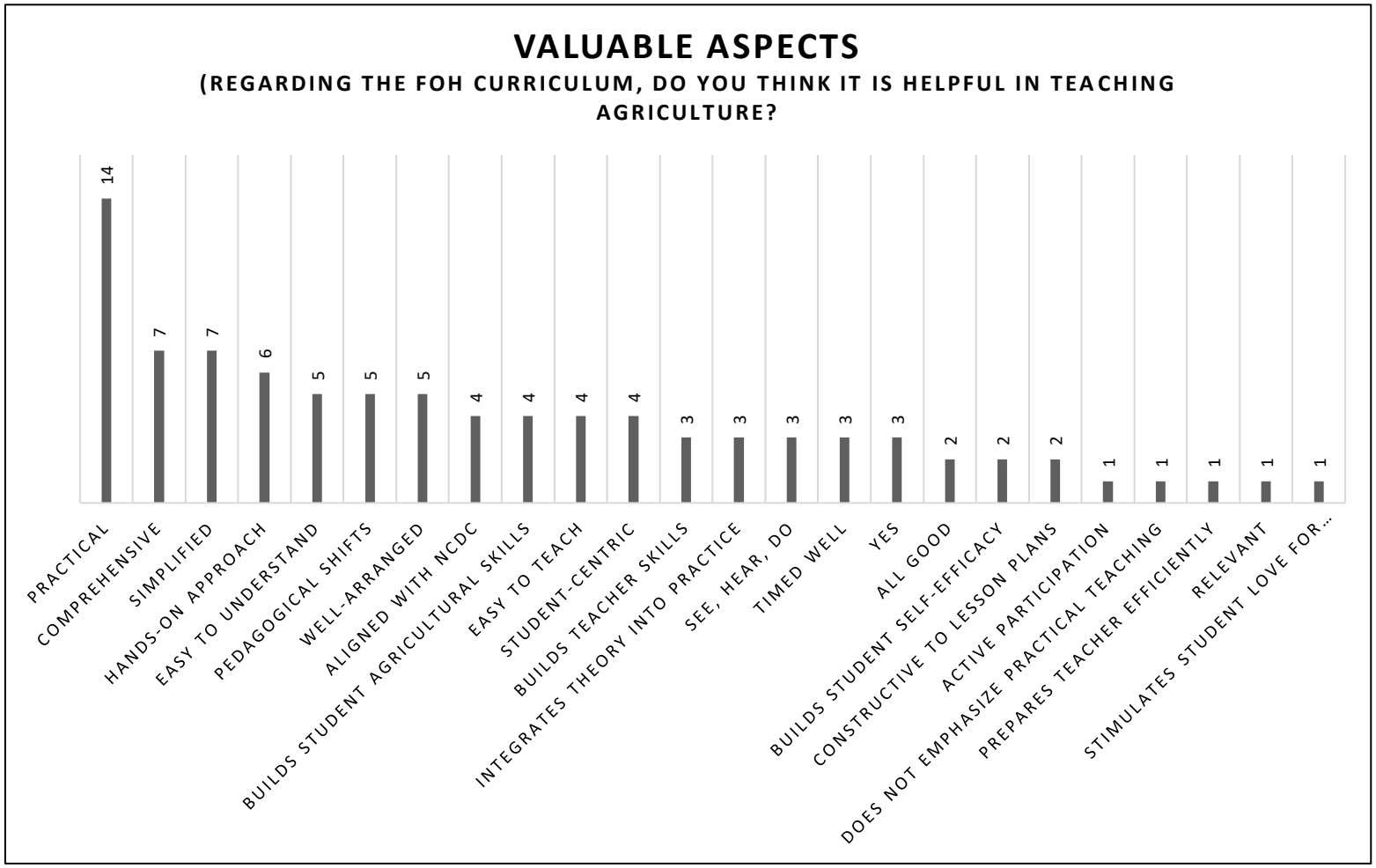


Figure 16

Teachers' Perceptions on the Utility of Teaching the FoH Curriculum (n = 56)



I inferred that the teachers' responses related to different dimensions of perceived value of the FoH curriculum. For example, the design of each question, the former being open-ended yet limited to themes within the curriculum as a form of semi-forced-choice, with the other more of a mixed method designed response item containing forced-choice or close-ended and open-ended aspects, supporting a mixed semantical analysis of the teachers' responses. This was confirmed by the emergence of subcodes within the second question that were not present in the first, such as "time constraint," "aligned with NCDC," and "simplified" (see Figure 16). These responses not only contextualized what teachers found valuable from the Supplement and the Guide, but also whether they found such to be helpful in teaching agriculture to their students, as a form of affirming the efficacy of FoH's extension and outreach intentions by adding another dimension of evaluation.

Based on this analysis, the concept of integrating agricultural theory with practical teaching methods was a key attribute to the pedagogical shift the teachers experienced during this training, and therefore emerged as the theme for Research Objective 3. The binary view of constructivist and behaviorist approaches to education seemed, in this case, to serve more as a dialectical point of intellectual discourse, than as poles of difference, i.e., one did not exist without the other during curriculum implementation in this study, but rather in concert. One teacher succinctly described this congruence of pedagogical partnership: "Yes, because it is summarized and also hands-on, that is to say both theory can be handled with practice at once."

Through that response, the symbiotic integration of agricultural, science-based theory with practical teaching methods was facilitated through a hands-on approach to

teaching, vis-à-vis an agricultural education curriculum that the teacher perceived as simplified and summarized, but still sufficiently scientific or theory based. As expressed by another teacher: "Yes, because it has improve[d] both theory and hands-on training." As such, the design added value to the curriculum by *improving* the agricultural science theory and related teaching practices, and not simply transmitting theoretical concepts. These dynamics of a pedagogical shift were underpinned by the attributes embedded within the FoH curriculum's Teacher's Guide and Teacher's Supplement that teachers valued in easing the integration of theory with new and innovative teaching methods.

Practical Teaching Methods

Incorporating practical pedagogies into secondary agricultural education is an effort initiated by Uganda's NCDC that FoH has expanded through needs-based assessment and design of a curriculum that features practical, hands-on learning activities that build student critical thinking and problem solving skills (Cannon, 2019; W. Thurmond, personal communication, December 6, 2020; Wilcox et al., 2021). Teachers assigned value to the practical components of FoH's curriculum with code frequencies of 8% and 25%, both ranking first among the related subcodes (see Figures 15 & 16). The teachers' perspectives supporting preference for practical teaching methods to traditional, theoretical lectures and teacher-centered strategies, included:

"It is good because it is learners-centered and more practical";

"The curriculum is very helpful to teach agriculture because it is practical oriented and allows learners to participate in the learning process"; and

"Yes, because it is easy to adopt and can be used in line with Uganda curriculum and emphasizes practical work to students."

Through their insights, identified benefits were related to practical teaching as designed in and prescribed through the FoH curriculum that the teachers perceived as valuable and constructive to their professional development and to the education of secondary school youth. The curriculum was seen as knowledgeful, practical, student-centered, easy to adopt, aligned with the NCDC, and engaging for students (see Figures 14 & 15). The value of FoH's Teacher's Guide, Teacher's Supplement, and the related professional development was affirmed by the voices of these teachers.

Comprehensibility of Curriculum

Teachers also assigned value to the curriculum due to its practicality and comprehensiveness, as the coding demonstrated with 13% and 11% code frequencies and ranking second among all subcodes (see Figures 15 & 16). In code frequency, such tied with Interest Approach (see Table 4 & Figure 14). Words and phrases, as provided by teachers' voices that contextualized a comprehensive curriculum, included: detailed, easy to teach, elaborate, well-arranged, logically organized, sequentially organized, systematic, orderly, easy to follow, well-described, and understandable.

Teachers' comments that attested to the curriculum's comprehensibility follow: "The topics and the contents are well-arranged, which makes it easy to teach known to unknown"; "[m]y favorite part of the FoH curriculum is the ease in scheming and orderliness, easy to follow, fact-oriented"; "[v]ery helpful, because it is detailed and student-based; enhances experienced learning"; "[y]es, because the topics are well laid out, clear content and material provided in the curriculum"; and "[y]es; [the curriculum] is detailed and comprehensive."

I visualized, through the lens of Rogers (2003), that the teachers spoke of an increased likelihood of adoption, changed behavior, and sustained curriculum implementation owing to the student-centric, practical content that they perceived as easy to teach, follow, understand, and eased lesson planning. Through this prism, perceptions of *complexity* of the FoH curriculum were contested by the findings from these post-training questions. And, according to Rogers (2003), "innovations that are readily comprehended by most members of a social system" (p. 16) support the knowledge acquisition and implementation required to "develop new skills and understandings" (p. 16).

Relevant to Daily Life

Another principle espoused by Rogers (2003) on the ease of adopting an innovation was that it should be *compatible* with the "existing values, past experiences, and needs of potential adopters" (p. 240). I connected the subtheme *relevant to daily life* with the concept of compatibility as described by Rogers (2003). In this regard, understanding the relevance that teachers found in the FoH curriculum to their daily lives occurred by exploring the *reasons* they perceived the curriculum to be helpful in teaching agriculture. Two post-training questions related to Theme 4 were "Regarding the FoH curriculum, do you think it is helpful in teaching agriculture?" and "What is your favorite part of the FoH curriculum?" Relevance was coded to represent 9% of teachers' responses to the latter question, and 2% for the former (see Figures 15 & 16). These lower frequencies may have been due to the concepts' recurrence as a subtheme in responses to other questions (see Figures 7 & 15).

The question "What is your favorite part of the FoH curriculum?" described the relevance of specific components of the curriculum, as characterized by these teachers' responses: "Poultry, because there is a lot of income from this nowadays"; "Weeds control, because they are in our daily practice"; and "It teaches us more on practical work to earn a living." Relevance to teachers' daily lives in terms of farming practices and earning a living, was represented by their expressions that named specific subjects from the curriculum, such as poultry production and weed control.

Research Objective 4: Identify Teachers' Perceived Needs for Additional Professional Development.

Theme 5: *Professional Development and Subject Matter Knowledge*

To furnish a rich illustration of desires for continuous training that teachers new to FoH's professional development training expressed, their answers to the post-training question "As an instructor, what areas do you feel you need more training in?" supplied a spectrum of perceptions. From these responses, a trend was noted toward answers related specifically to areas of subject matter, i.e., course topics, rather than teaching methods (see Figure 17).

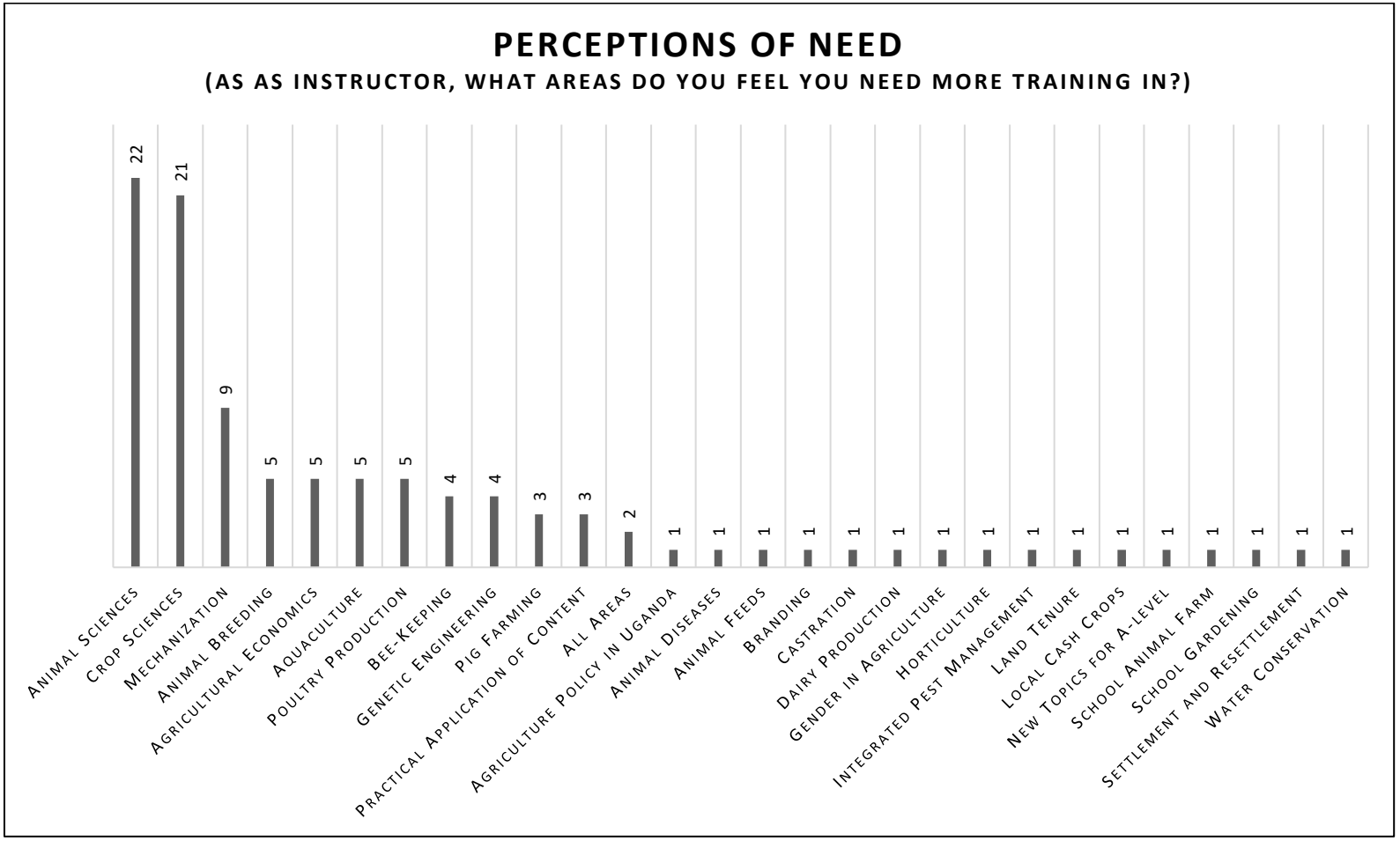
Areas of Need

At almost identical frequencies, Animal Sciences and Crop Sciences appeared in 39% and 38% of teachers' responses, respectively (see Figure 17). These agricultural sciences included subtopics such as nutrition, production, improvement through breeding, castration, apiculture (beekeeping), and aquaculture (fish-farming), vegetable propagation, and pest management. It was noted that many of the topics mentioned by the teachers were related to the American National Standards Institute (ANSI), which

oversees voluntary market and goods compliance (ANSI.org, 2021). More than one-half of the teachers' responses generalized topics to one-word responses, i.e., "Animals" or "Crops." Mechanization was ranked third in code frequency, which was divided between that terminology and "agricultural engineering" in the teachers' answers. Some teachers expressed a need for additional professional development under the Practical Application of Content subcode (see Figure 17). This prevalence of perceived needs for further training in subject matter content, rather than professional development on pedagogy, supported further discussion regarding the assessment of teachers' knowledge content, and the necessity of related training.

Figure 17

Teachers' Perceptions of Subject Matter Areas in Which They Need More Training (n=54)



Teacher Confidence

Gauging teachers' attitudes through two Likert-type response items regarding their confidence in *leading* students in the classroom as well as in the school garden or laboratory revealed a variety of responses from teachers who were *highly confident, fairly confident,* and *not very confident* (see Figures 18 & 19). The responses to these questions were measured on a scale of *1 = not very confident* to *10 = very confident.* However, no responses were found for values two or three, although several teachers answered with a one. For teachers with written responses that were representable numerically, such as one teacher's response "I am moderately confident," the value of five was assigned during the coding process, because the word *moderate* is usually considered as the midpoint when measuring attitudes (Brown, 2010; Mcleod, 2019). Responses expressed as "very confident" were coded with a value of 10.

Teachers' perceived confidence *in the classroom* remained more or less stable between pre-training and post-training observations, with a mean difference of 0.2605. Eleven cases of increased confidence, four cases of decreased confidence, and the attitudes of 32 teachers remained constant before and after the professional development workshop. As a group, the teachers were slightly more confident post-training. Teachers' confidence was more varied regarding outside of classroom settings, e.g., the school garden, with a mean difference of 0.3085. Seventeen cases of increased confidence emerged, eight cases of decreased confidence were found, and the confidence levels of 23 teachers remained constant before and after the teacher training (see Figures 18 & 19). As a group, the teachers' perceived levels of confidence increased after having participated in FoH's training.

Figure 18

Teachers' Perceived Levels of Confidence in the Classroom, Pre and Post-Training (n = 47)

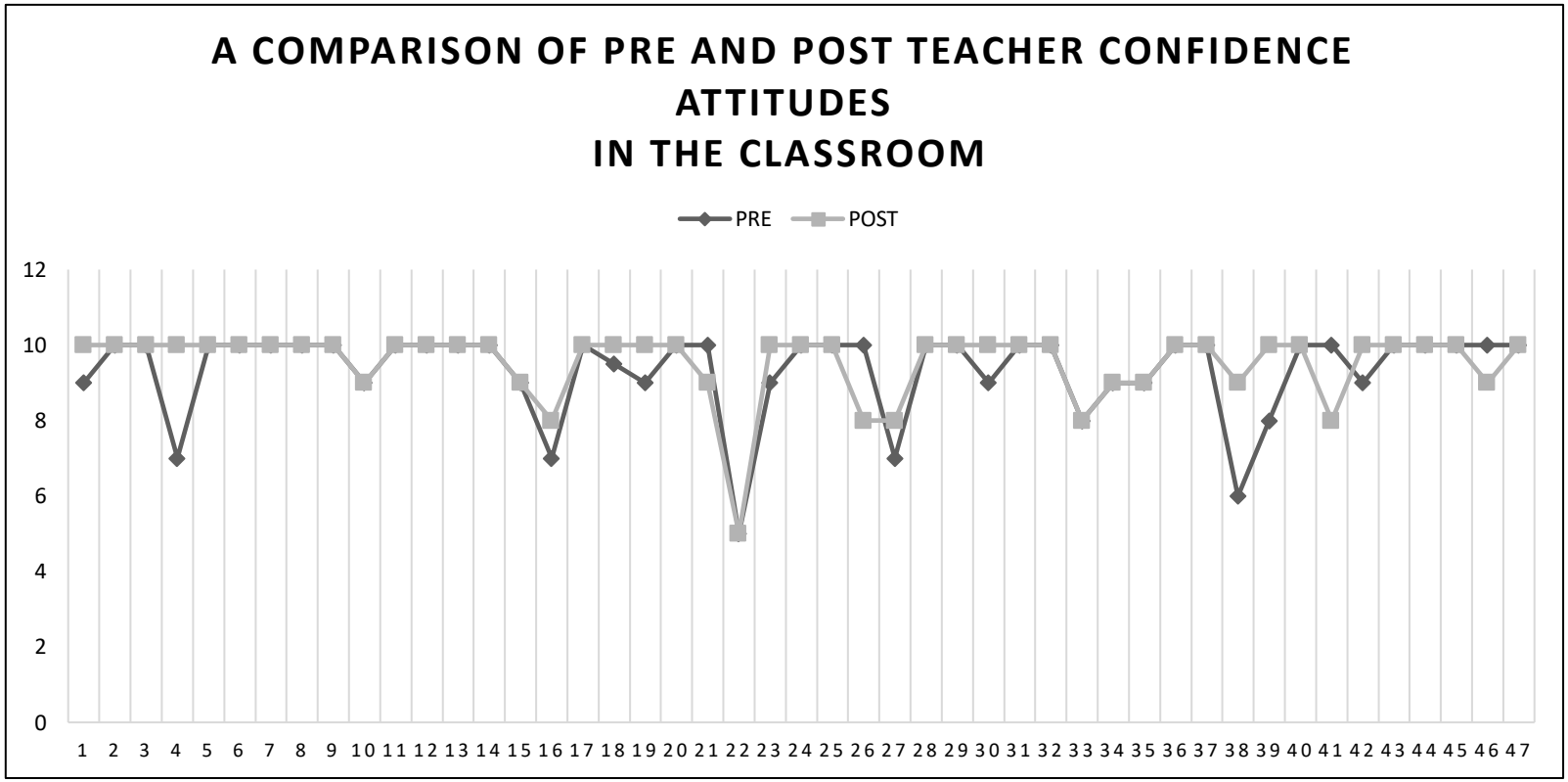
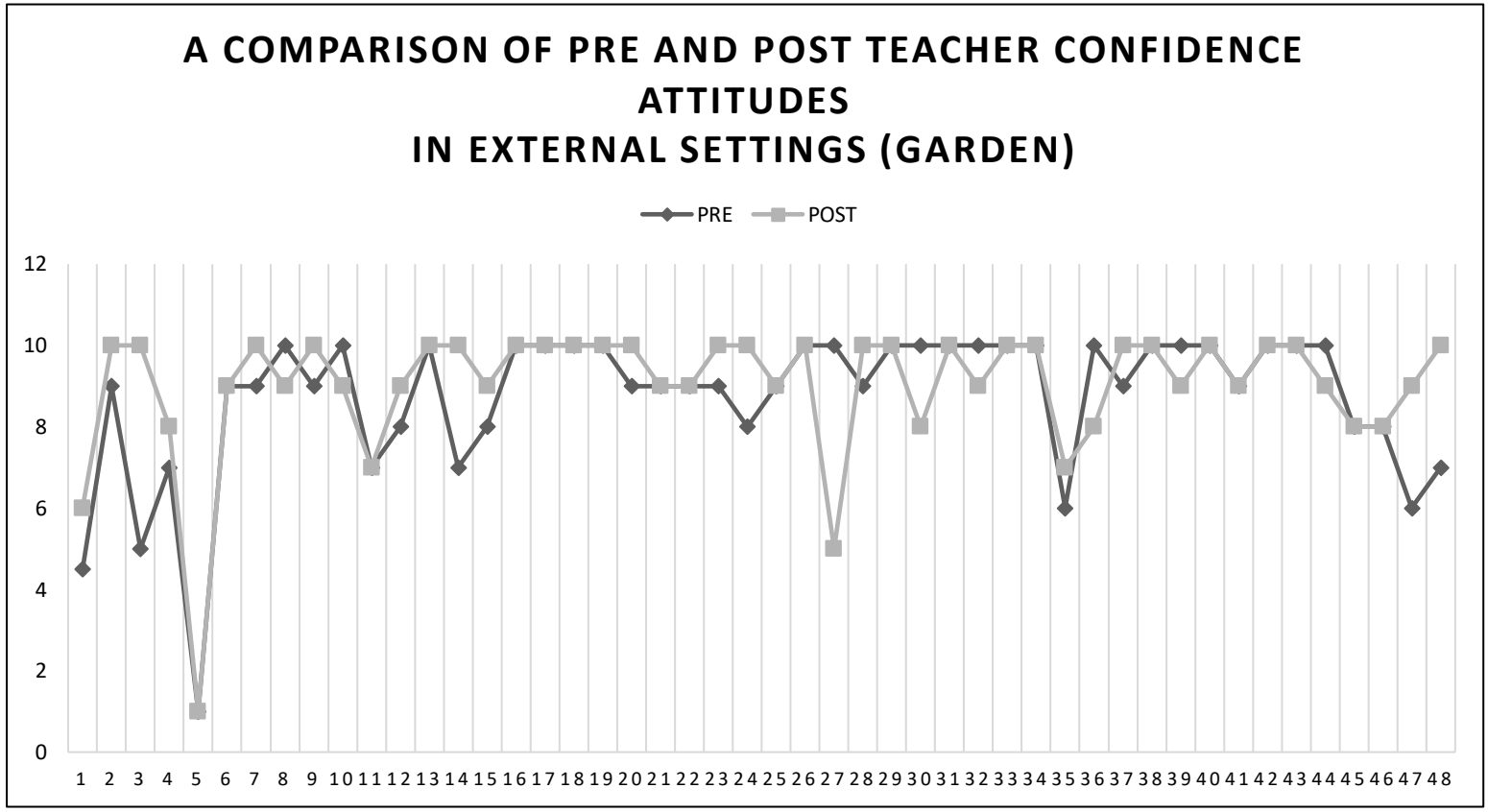


Figure 19

Teachers' Perceived Levels of Confidence in the School Garden and Demonstration Farms, Pre and Post-Training (n=48)



Overall, teachers' confidence in classroom settings averaged at $\bar{x}_{PRE} = 9.33$ before the teacher training and $\bar{x}_{POS} = 9.532$ after the training, and their confidence levels outside of classroom settings such as the school garden averaged $\bar{x}_{PRE} = 8.809$ before and $\bar{x}_{POS} = 9.085$ afterward.

Expressions of self-doubt were sometimes accompanied by the teachers' explanations of why they had misgivings about their instructional abilities. For example, one teacher rated their confidence in leading their students in external settings a seven and explained that "because I don't have the skills." Their reasonings for these perceptions, although considered more than moderately confident quantitatively, but still a concern to the teachers, suggested lacking adequate experience in learning settings outside of the classroom. A need for opportunities to instruct students in practical learning settings such as gardening and other hands-on learning experiences, e.g., in demonstration farms was revealed.

On the other hand, expressions of teachers' confidence were also accompanied by explanations of why they were confident in their teaching abilities: "9; I am confident because my students like and love the subject and they are doing it well"; "8 because I always go to class well prepared"; and "10 - I am very confident because I do my work well and evaluate learners at the end."

These sentiments appeared to have been based on the respondents' intrinsic motivations (Cannon, 2019; Njura et al., 2020), i.e., teaching a class of enthusiastic students who love agriculture and the rewards of planning effectively for the day's lessons. The subtheme Continuous Training complemented teachers' needs for more

content knowledge, and such acquisition could also further their self-efficacy and build confidence whether teaching in the classroom or outside of it.

Research Question 2: What Acquired Skills Did Teachers Plan to Utilize?

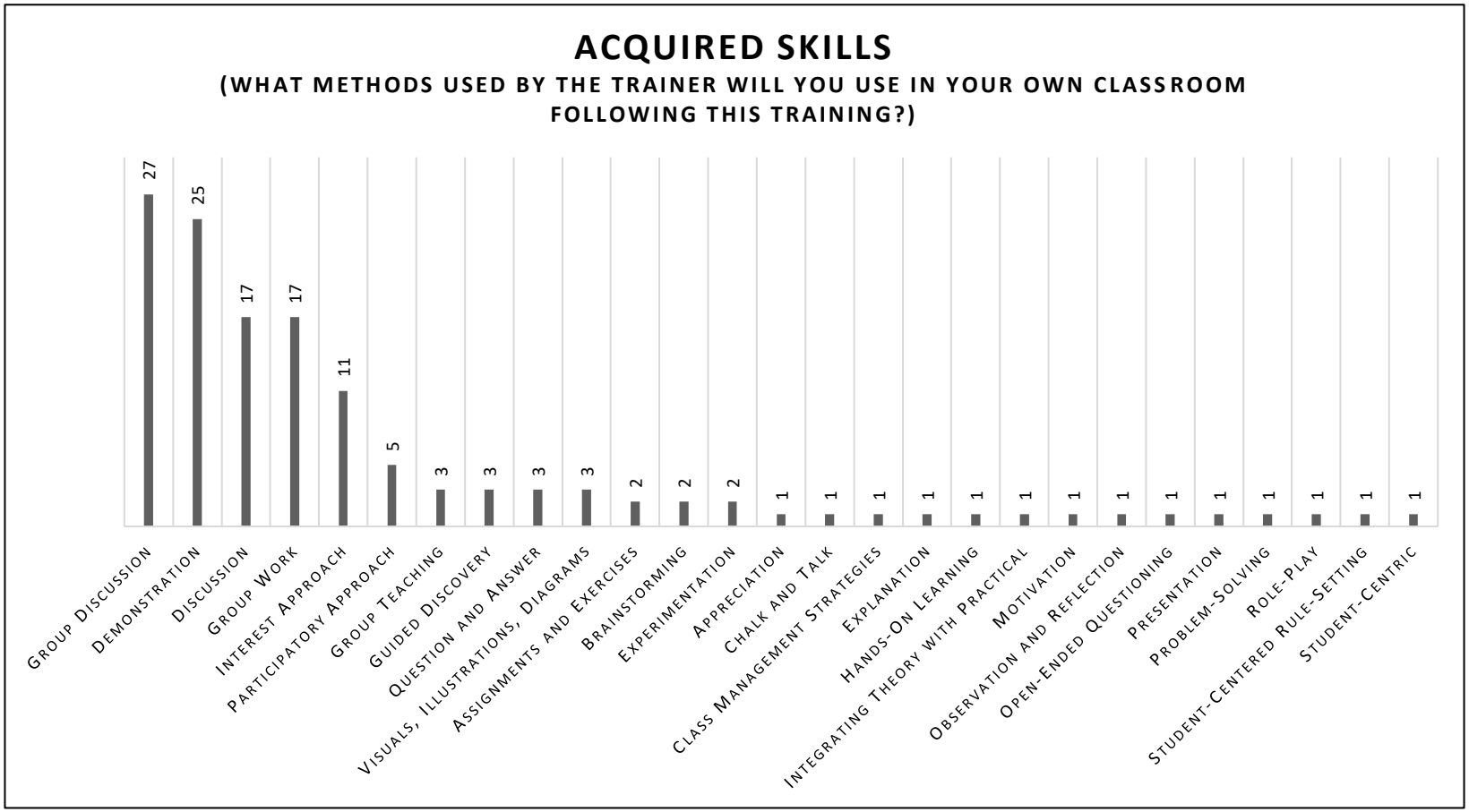
Theme 6: *Centering the Student*

Findings of this study implied the distillation of theory-based but practical learning experiences by the teachers who would thereafter construct and teach corresponding learning experiences for their students. The constructivism embedded in FoH's professional development approach provided agricultural instructors a space to cultivate and reconceptualize the curriculum and its content in ways that they saw fit for their students and aligned with national sociocultural values as described by Rogan's and Grayson's (2003) profile of curriculum implementation in developing nations. The skills that teachers perceived best to use in their classrooms were interpreted as ways to optimize the participation, interest, motivation, and learning of their students.

The survey question that addressed this research question and from which Theme 6 emerged was "What methods used by the trainer will you use in your own classroom following this training?" Such was operationalized as the pedagogical skills and methods that teachers derived from the training which they intended to use when teaching their students (see Figure 20).

Figure 20

Acquired Pedagogical Skills and Methods Teachers Intended to Use in their Classrooms in the Future (n=56)



Group Participatory Methods

Group Discussion was an emergent subtheme accounting for 48% of the teachers' responses and ranking first (see Figure 20). A word search for the term *group* within the paired components of the FoH curriculum illuminated its recurring presence in the Teacher's Guide, i.e., discussions held in groups of three and four accompanied the lesson activities and objectives for each day. I distinguished the different methods within Group Discussions and Discussions, as described by teachers. In the Teacher's Guides for levels S1 through S3, group discussions were action-oriented, participatory, and interactive strategies that placed students in the center of their learning experience. In this method, the teachers were expected to guide their students when necessary and bring the lesson full-circle with a rejoining discussion, or a trip to the school garden at the end to support the students' understanding.

Generalized responses, such as "Discussion" or "Discussion methods" were interpreted as theoretical presentations of agricultural concepts by the teacher to be followed by an applied demonstration or practical activity, as warranted by the design of the FoH curriculum. Group Work served as an overarching subtheme that accounted for 30% of the teachers' responses (see Figure 20). This subtheme was characterized by teachers to include group learning, group methods, grouping and demonstration, and small group activity.

Teachers' responses that tied this concept to related teaching strategies included: "Group methods mostly for large class"; "I intend to group my learners and giving them an activity and allowing them to brainstorm"; and "Giving assignments, [f]orming groups." These short and descriptive answers provided a lens to envision students'

learning experiences that build critical thinking skills through brainstorming and problem solving (Cannon, 2019; Thurmond et al., 2018), effectively managing classes with large student numbers, and that centered the students in engaging, communal participation through group interactions. This was contested through teachers' responses regarding group arrangements in classrooms with large student numbers, which appeared in a subtheme as a concern of some teachers in implementing the FoH curriculum (see Figure 13).

Demonstrations

Cannon (2019) affirmed the indispensability of demonstration methods to building students' practical agricultural skills: "Teachers recognized their students were acquiring the skills through the practical demonstrations students performed in the garden or when caring for animals" (p. 117). The term *demonstration* appeared in 45% of teachers' responses, ranking second in code frequency (see Figure 20). Due to the close-ended design of the related question, "What methods used by the trainer will you use in your own classroom following this training," teachers' responses appeared in list form. This provided limited insight into *how* or *why* incorporating demonstration methods into their future teaching practices was intended, or a desirable skill to acquire. I inferred that the practical application of agricultural theory through demonstration methods characterized the perceptions of teachers who expressed intentions to incorporate these strategies in their future teaching practices. In terms of school-based, agricultural education, other researchers conceptualized this as projects, farm visits, school gardens, and laboratory experiences (Baker et al., 2012; Mukembo, 2017).

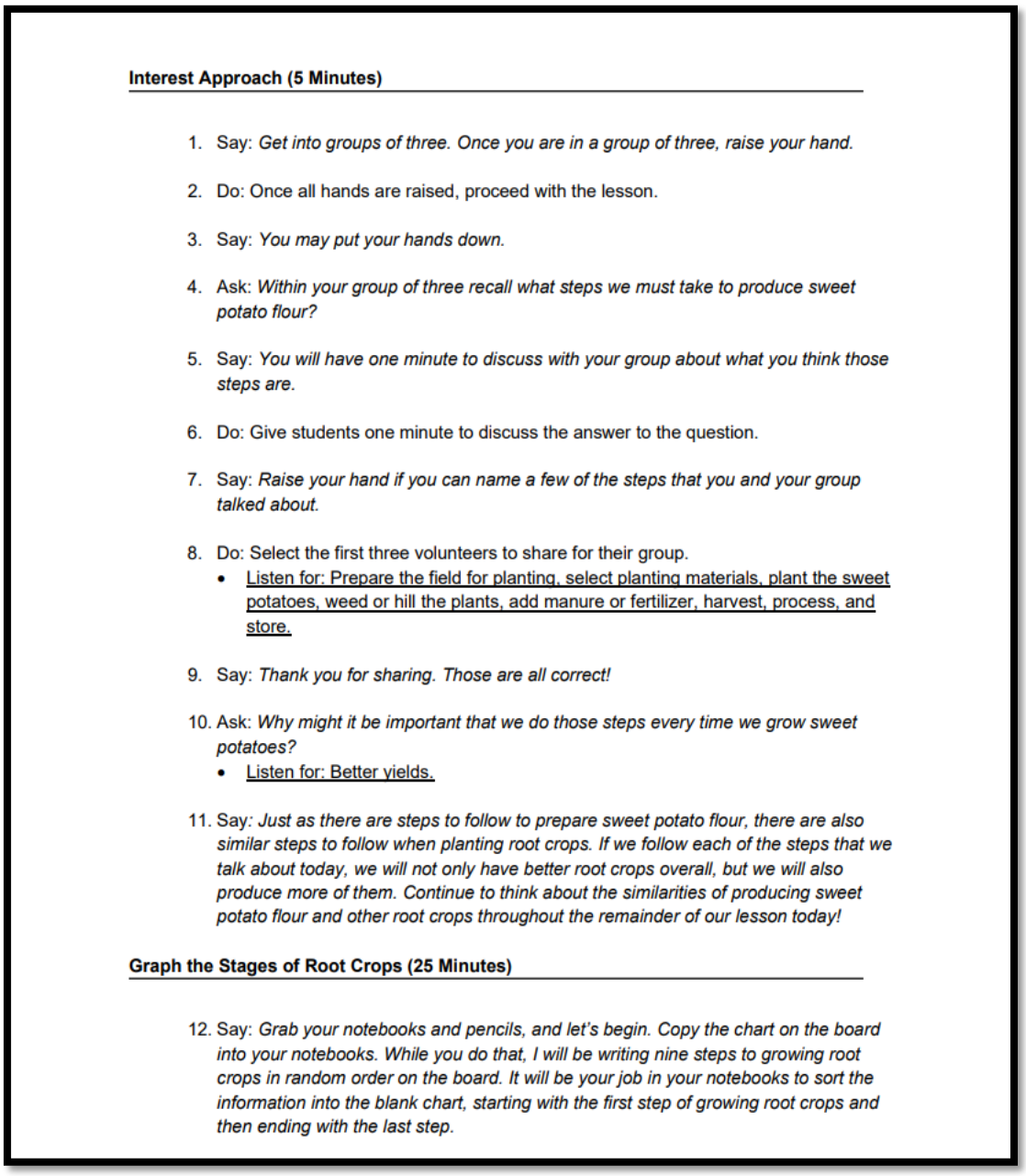
Interest Approach Methods

Interest approaches are often introductory attention-getters for the beginning of a lesson that serve the purpose of stimulating student engagement and enthusiasm for agriculture (Baker et al., 2012) [see Figure 21]. Its emergence as a subtheme from teachers' responses to what and why their favorite parts of the FoH curriculum were such (see Appendix D) affirmed it as an appropriate and valued student-centered approach to teaching agriculture under Theme 6.

To supplement the limited details in teachers' responses to the close-ended question, "What methods used by the trainer will you use in your own classroom following this training?" I explicated their responses from the question, "What is your favorite part of the FoH curriculum and why" to understand their preferences regarding interest approaches (see Appendix D).

Figure 21

Example of an Interest Approach, Field of Hope Teacher's Guide for Senior 3 Agriculture Curriculum (p. 177)



Interest Approach (5 Minutes)

1. Say: *Get into groups of three. Once you are in a group of three, raise your hand.*
2. Do: Once all hands are raised, proceed with the lesson.
3. Say: *You may put your hands down.*
4. Ask: *Within your group of three recall what steps we must take to produce sweet potato flour?*
5. Say: *You will have one minute to discuss with your group about what you think those steps are.*
6. Do: Give students one minute to discuss the answer to the question.
7. Say: *Raise your hand if you can name a few of the steps that you and your group talked about.*
8. Do: Select the first three volunteers to share for their group.
   - Listen for: Prepare the field for planting, select planting materials, plant the sweet potatoes, weed or hill the plants, add manure or fertilizer, harvest, process, and store.
9. Say: *Thank you for sharing. Those are all correct!*
10. Ask: *Why might it be important that we do those steps every time we grow sweet potatoes?*
    - Listen for: Better yields.
11. Say*: Just as there are steps to follow to prepare sweet potato flour, there are also similar steps to follow when planting root crops. If we follow each of the steps that we talk about today, we will not only have better root crops overall, but we will also produce more of them. Continue to think about the similarities of producing sweet potato flour and other root crops throughout the remainder of our lesson today!*

Graph the Stages of Root Crops (25 Minutes)

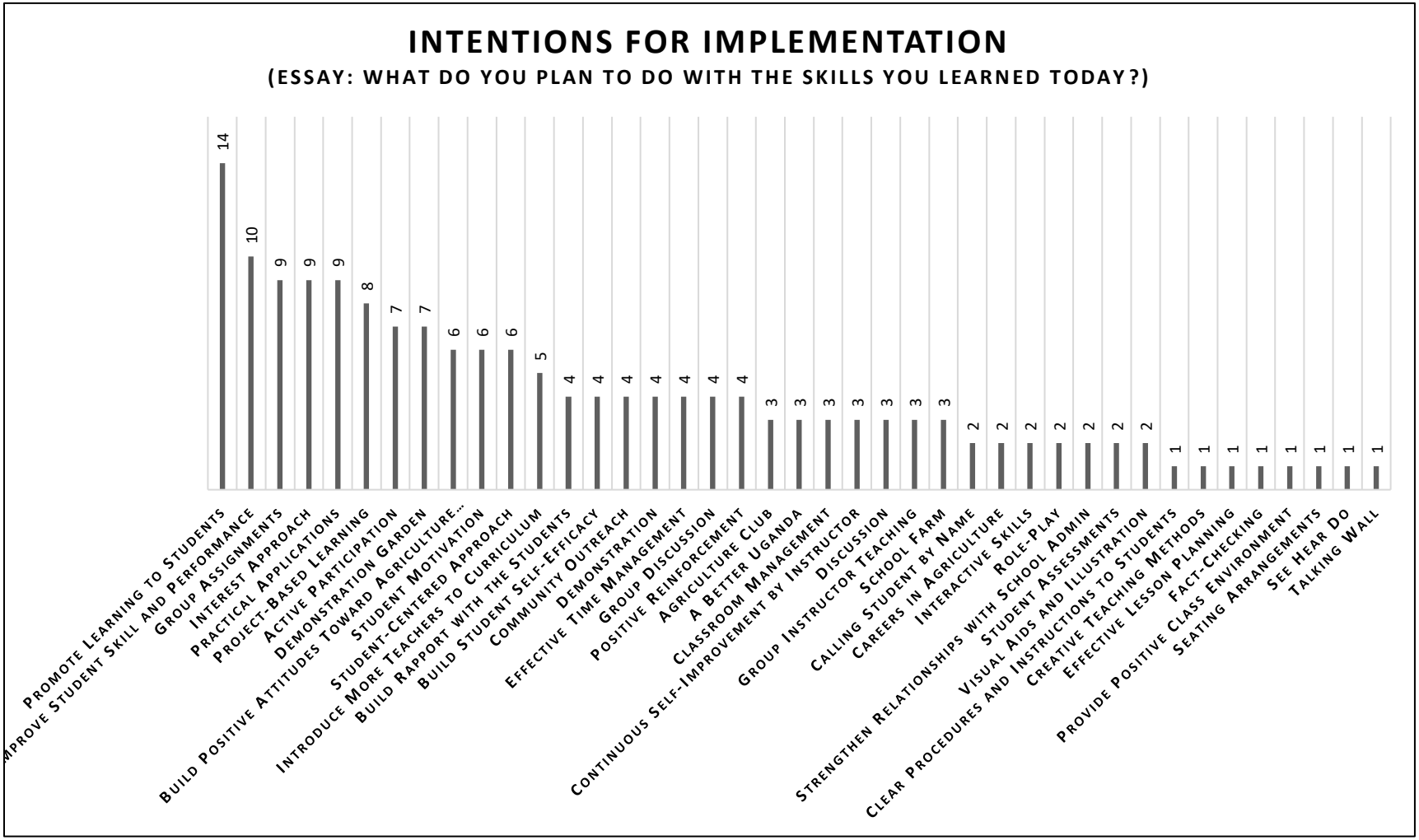
12. Say: *Grab your notebooks and pencils, and let's begin. Copy the chart on the board into your notebooks. While you do that, I will be writing nine steps to growing root crops in random order on the board. It will be your job in your notebooks to sort the information into the blank chart, starting with the first step of growing root crops and then ending with the last step.*

By asking the teachers *why*, this questionnaire item expanded on and characterized the teachers' perceived utility of FoH's interest approaches: "Interest approach; it engages learners by checking on their competencies in critical thinking"; "[t]he interest approach of conducting lessons. It helps to develop learners' competence"; "[f]avorite part with the FoH curriculum - Interest approach. Amasing in attracting learners' attention"; and "[i]nterest approach, it motivates learners for the lesson."

The values assigned to the curriculum's interest approach methodology by the educators portrayed it as a dynamic strategy for engaging the learners, motivating them to learn, cultivating critical thinking skills, building student competence, and attracting their attention toward the day's lesson in exciting and memorable ways. The interest approaches made an impression on the teachers that reminded I of the limitations of secondary analysis due to its detachment from the experiences of fieldwork. Without direct knowledge to how the interest approach was presented to the teachers during the professional development workshops by the FoH trainers, I was left to conceptualize through analytic imagination (James, 2013), for the purpose of extracting meaning from the teachers' responses

Figure 22

Teachers' Distilled Responses to an Essay Question regarding their Intentions to use the Skills they Learned as related to the FoH Curriculum (n = 56)



Theme 7: *"A Better Uganda": Community and Teacher Outreach*

In accordance with a story form narrative, this theme emerged through the analysis of the survey questionnaire's final post-training question: "Essay: What do you plan to do with the skills you learned today (After this training, I plan to use… in my classroom to promote learning, etc.)?" Teachers were encouraged to amplify their intentions in descriptive prose, generating more codes and subthemes than the other items as a result (see Figure 22). The theme's title was inspired by one educator's reply to the essay question, which stated:

> I plan to use all the methods learned here in order to impart knowledge and skills to my students in order to motivate them to take the subject, pass the subject, [and] build their practical skills for a better Uganda.

I recognized the teacher's appreciation for agriculture as an important part of education and of the livelihoods of many Ugandans. For a deeper understanding of the teacher's intentions on using "all the methods" presented during the FoH teacher training, I explored this teacher's responses to other questions: "What methods used by the trainer will you use in your own classroom following this training?" and "What is your favorite part of the FoH curriculum?" and "why?"

To the former, the teacher replied: "Group discussion, Interest approach, Guided discovery." As the first two methods had emerged as subthemes in other research objectives (see Figures 15 & 20), this finding affirmed the prevalence of desire for concise methods that center the students and stimulate their interests in the lessons and in agriculture. Guided discovery, a code that emerged in another post-training question (see Figure 20), was not found in either the curriculum's Guide or Supplement during a search

through each senior level, so I imagined (James, 2013) this concept to have been introduced to teachers during the training workshops. Cannon (2019) recalled one teacher from her study with FoH, who referred to *discovery methods* as "student-lead" "research" in providing the narrative: "Isha described this concept: 'Students benefit such that the syllabus is covered faster as they do research which is under the discovery method. You may find they have discovered something. Your work is just to supplement now'" (p. 130).

Njura et al. (2020) conjoined the method with PBL and attributed to it that:

> [t]he discovery method has been found to improve student motivation and interest. Students also indicate more satisfaction with PBL than with traditional methods of instruction. However, controversy on the use of this approach is the existence of little empirical evidence as to what students are learning and how. (p. 4)

Constrained by context and data, I envisaged guided discovery as a research strategy or scientific method that aids in building students' critical thinking skills and undergirds lesson activities that are project- or problem-based (Cannon, 2019; Njura et al, 2020). Gerver and Sgroi (2003) affirmed this inference by framing guided discovery as a systematic eight-step approach to PBL.

Regarding the questions "What is your favorite part of the FoH curriculum?' and "Why?" th teacher replied: "Weeds control because they are in our daily practice." This supported the relevance of the curriculum to daily norms and existing agricultural practices in Uganda. I imagined this educator discerning from the FoH curriculum the

most effective ways to garner students' interests and harness their motivations, as well as building students' skills for the practice of agriculture in the future.

Although the code "promote learning to students" ranked first among code frequencies from this essay question at 25% (see Figure 22), it was not considered to be justified as a subtheme for Theme 7 due to the prevalence of teachers describing it as an outcome related to other codes. However, it was noteworthy and a testament to the passion and dedication of the teachers to propel students to success in agricultural education and their performance in real-life.

To further explicate, one teacher's response that characterized this reflection was "I plan to use discussion, role play, demonstration, interest approach, and motivating the learners in my classroom to promote learning." Another teacher's answer, "[a]fter this training, I plan to use interest approach, set up demonstration gardens/farm, encourage learners to participate to promote learning," described the acquired skills they intended to use for the purpose of encouraging participation and promoting learning to their students. These findings reaffirmed the teachers' perceived self-efficacy and value for FoH's practical, project-based agricultural education curriculum.

Improving Student Skill and Performance

This subtheme ranked second in code frequency owing to its presence in 18% of the responses to the essay question, and, similar to the "promote learning to students" code, was sometimes attached to an associated teaching strategy that teachers perceived would facilitate achieving such. This is a subtheme congruent with Theme 7, as supportive of "a better Uganda" by enhancing the nation's youth population for livelihood development through agricultural education. One teacher said: "I plan to use

the skills that I have learned to implement the FoH curriculum and help learners acquire skills in relation to the subject to enable them to be self-reliant people in this world." As such, the educator's desire to see their students flourish as independent individuals through the skills they themselves acquired from the FoH curriculum and professional development training, especially by integrating agricultural theory and practice, was visualized.

Another teacher's response echoed and extended this view:

> I plan to use the skills, knowledge, and experience I have gained from the training in my classroom to promote learning and to equip the learners with better skills which is more of practical, such that when they get out they apply it to the community and also to make them earn a living because they will have their own projects.

This teacher provided depth by elaborating on a) how the training supplied them with skills, knowledge, and experience, which were leading code frequencies from teachers' responses supporting Theme 1 (see Figure 7), and b) how the skills they acquired would better prepare their students for community outreach, sustaining livable incomes, and girding students with the competence to be independent by conducting their own enterprises. The intentions embedded in this response reflected FoH's intervention regarding its applicability, relevance, and compatibility (Rogers, 2003) with the teachers' and the students' communities, economies, and their own beliefs of self-efficacy to learn, teach, and practice agriculture.

Building Positive Attitudes Toward Agriculture within Students

Self-efficacy comprises an individual's attitudes regarding their abilities to perform steps necessary to complete certain objectives (Bandura, 2001). I imagined students' self-efficacy being linked to their teachers' levels of confidence regarding their own abilities as agricultural instructors, including their knowledge and skills for connecting agricultural theory to the applications of agricultural practices. Teachers' responses underpinned this by providing clarity, for example: "I plan to apply the knowledge [I] have got to make the students also love the FOH curriculum, especially to carry it practically." The link between the teacher's "love" for the FOH curriculum and the implied students' "love" for it, as conveyed by the use of the word *also*, supported this assertion. In a similar way, so did this teacher's response:

> I plan to use all the methods taught to motivate the learners to embrace agriculture as [the] best subject by letting them know all the careers related to agriculture. I shall also try with all my best to [emphasize] practical lesson[s] in my classroom.

This provided another lens to understand how teachers perceived the ability that the skills and knowledge they acquired from the FOH professional development would improve their students' understanding of and related perspectives on the importance agriculture. It was also concluded that research describing students' perceptions on the FOH curriculum could greatly contribute to further understanding the effectiveness of its use.

Before the workshop, teachers voiced hopes to change their students' unfavorable perceptions toward agriculture. For instance, an instructor replied: "Techniques on how to attract learners to actively participate in practical agriculture without looking at it as a

punishment and waste of time" to the question "What do you hope to learn from this professional development training?"

In a similar way, another instructor answered: "Bring hopes back from the students as they consider agriculture is a punishment at school" to the question "If you have not seen the curriculum yet, what are you hoping it includes?" From the teachers' responses, I envisioned their desires and anticipation for behavior and attitude changes, first within themselves, and followed by their students. Further, teachers expected these behavior and attitude changes to be ignited by the FoH curriculum as well as from their experiences during professional development workshop.

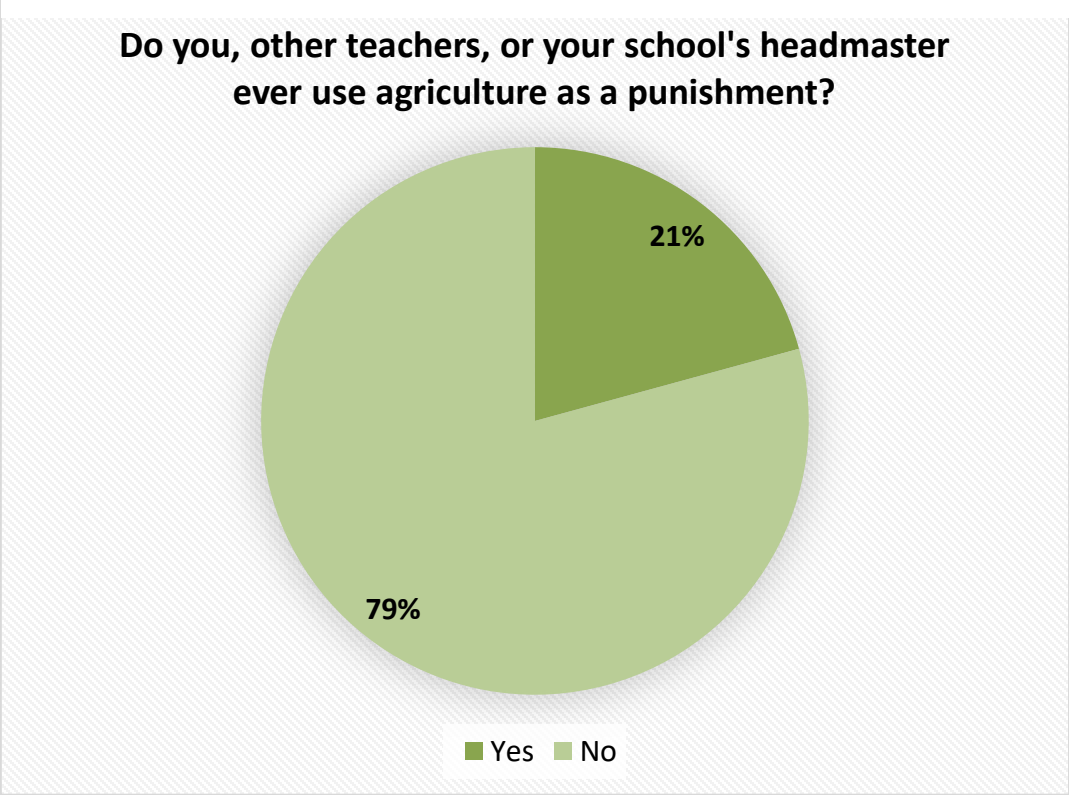
In practice, students have been sent to the school gardens or grounds as a form of punishment, as confirmed by teachers' responses to the question, "Do you, other teachers, or your school's headmaster ever use agriculture as a punishment?" This revealed that 21% of the responding teachers had either used agriculture as punishment, or knew someone who had, although 79% reported having done neither (see Figure 22). This number was still alarming, as studies done in SSA have linked the use of school garden activities for the punishment of students, to discouraging youth participation in the subject (MIJARC, IFAD, & FAO, 2012).

To this questionnaire item, one teacher responded: "Personally, I don't. Much [of] the school administrators used it before as a tool of administrative punishment. But I talked to them [,] and they are currently changing their attitude[s] gradually." This practice may be more common than the findings revealed, due to the teacher's use of the word *much* in reference to the number who did or had used agriculture, e.g., weeding, as a punishment.

Some teachers reported intentions toward a change of behavior and perception regarding this practice due to their participation in FoH's professional development. A teacher who said that: "[a]fter attending the training, I [will] no longer use agriculture as a punishment, but sometimes other teachers still use" conveyed to I a positive persuasion toward a change of attitude and behavior, i.e., Rogers' (2003) related stage of the innovation-decision process.

Figure 23

Use of Agriculture as Punishment (n = 53)



Introduce More Teachers to the FoH Curriculum

The extension of FoH professional development services to head teachers, school administrators, and other teachers, remerged as a subtheme with a code frequency of 9%

and is presented as a subtheme for Theme 7 (see Figure 9). Teachers expressed desires to share the FoH intervention with others in their school network while also assigning a beneficial outcome to doing that. One teacher's detailed response:

> My plan is to first of all go back to school and give feedback to the school administration about what transpired in the training and thereafter interesting them to adopt this curriculum. Thereafter, [I] will try this gradually in S1, S2, and S3 classes. Otherwise, it's been a very fruitful training on my part and I am very positive it's going to work for me because honestly speaking it's the way to go.

This statement provided insight into the interpersonal channels of communication through which the teachers intended to introduce the FoH curriculum and professional development workshop to their school leaders and teacher peers. The benefit assigned through this intended course of action was present in the teacher's appraisal of the training as being a "fruitful" experience for them that, in its adoption and diffusion, was "the way to go." This supported Rogers' (2003) position on how to successfully persuade potential adopters regarding an innovation's compatibility by using interpersonal channels of communication.

Community Engagement

Regarding community engagement, a teacher responded:

> I am planning to go and train my learners, community members and also to open agricultural clubs in churches and to train them on the practical aspects in agriculture and also to set my demonstration lessons with community members, [and] students can come and attain skills.

Such echoed a shift along the innovation-decision process and the implementation stage of the FoH curricula. As described by Rogers (2003), the *confirmation stage* of the innovation-decision process is the last of the five stages within that framework during which one of three actions confirming the adoption of an innovation may occur: "14) recognition of the benefits of using the innovation; 15) integration of the innovation into one's ongoing routine; and 16) promotion of the innovation to others" (p. 199). This teacher's response reflected an intention to promote and share the skills acquired from the FoH curricula and in-service training to community members outside of the school setting. Rogers (2003) contended that the completion of this and other stages does not affirm the completion of all previous stages, and that depending on the innovation, it is subject to its own course or path and time period to navigate the innovation-decision process. Further affirmation of the desire among teachers to diffuse the innovative curriculum and professional development services to their communities was described by another teacher:

> I plan to use the skill I have learned here to improve on my teaching methods knowledge. In my classroom, I will use interest approach to promote learning and encourage more learners to offer agriculture, not simply to pass exams but to change the training of agriculture in Uganda.

The phrase "encourage more learners to offer agriculture" was interpreted as synonymous to encouraging learners to *attempt* or *endeavor* to take agriculture as a course. The teacher also conceptualized students' competence to expand beyond high test scores on assessments and examinations, to their participation in agriculture nationwide. The teacher's aspiration to transform the teaching of agriculture in Uganda was

reiterative of Cannon's (2019) subtheme *Country-Wide Adoption of the Curriculum* in her study's findings, in which teachers from FoH's 2019 professional development workshop traveled from remote regions in Uganda to attend the training. This impressed the participants and the trainers that the agricultural curriculum had substantial potential for country-wide adoption as designed and delivered by FoH.

Chapter Summary

Seven themes and 21 subthemes were derived from analyzing the experiences of newly attending teachers who participated in FoH's January 2020 professional development workshop through their pre-training and post-training survey responses. These themes were derived from the experiences, meanings, and values that the teachers perceived regarding the agricultural education curriculum and its related professional development training. The study's findings related to the research objectives and additional research questions follow.

Research Question 1: What expectations did teachers have of the FoH curriculum and teacher training?

Additional aims of discovery that emerged through data analysis after formation of the study's objectives were as further points of investigation, i.e., research questions that helped to undergird the investigation's overall design in a narrative story form. This question preceded the study's first objective as an introductory placemark or prologue for the beginning of the research story.

Before the workshop began, the teachers participated in a pre-training survey, by which they expressed hopes and expectations to *build practical agricultural skills* (see Figure 7). Teachers imagined practical application of agricultural concepts as hands-on

activities that would facilitate the concretization of agricultural science theories and abstractions. I considered the previous experiences of the teachers who voiced these desires to have potentially fallen short at providing learning schema constructive in developing skills or preparing their students adequately for careers in on- and off-farm agriculture. It was also made apparent by the teachers that the disinterest of many students during their lessons further incentivized their participation in FoH's training.

The underlying motive in teachers' participation in the FoH teacher training was to *increase their knowledge* regarding pedagogy and subject matter content. Teachers wanted to learn new teaching methods *and* new ideas. Their hunger for information was reaffirming of their passion and purpose as agricultural instructors, farmers, and other agriculturists.

Research Objective 1: Describe the factors that would support teachers' intentions to implement the FoH curriculum.

When asked how FoH could support their implementation of the curriculum, teachers voiced limitations in funding, learning resources, and confidence in their abilities to effectively apply the agricultural concepts presented during training. Although a majority of the participants answered yes to whether they felt that their school directors and administrators understood their roles as agricultural instructors, a powerful undercurrent of will existed for the FoH trainers and officers to *persuade* school administrations to further understand agriculture, its importance to the nation, and its importance in educational spaces. The prevalence of teachers eager to forge *FoH relationships with school administrators* suggested a strong interest in what had been provided to them by the workshop and the curriculum (see Figures 9 & 10). Relationship-

building activities were depicted as school visits, orientations, workshops, training, and seminars for the purpose of *sensitizing*, in the words of many teachers, the headteachers and school administrators to agriculture and their integral roles in the sustainability and prosperity in Uganda's schools and communities.

By FoH forming these relationships, the easing of access to the *continuous training* for which teachers voiced desires would more likely occur (see Figure 10). The depth with which the curriculum addressed agricultural content requires more than one four-week training course, as expressed by teachers who mentioned wanting to further improve in areas of weakness regarding both subject matter content and teaching methods. Forming relationships was also visualized to extend to workshops and *training for school administrators.* It was emphasized by the teachers, as well as reinforced by Nzarirwehi and Atuhumuze (2019) and Ward et al. (2006), that extending training to the headteachers, neighboring teachers, and other school administrators can support and sustain adoption of an innovative curriculum.

Funding was a leading unit of support in curriculum implementation, as attested by teachers who also expressed intentions on investing such in agricultural projects, practicals, general school supplies, and stationery. Instructors who confirmed having school gardens and/or animal farms, as well as those who said they did not, conveyed being limited by material and nonmaterial resources. The availability of resources was often at the discretion of the school administration, who sometimes did not comprehend the scope to which agriculture required materials to conduct practicals and projects or concluded that such were too expensive to implement. Relationships were reconceptualized through this void to suggest a thorough needs-based assessment for

individual schools so as not to overly generalize their supply and demand environments when providing extension and outreach services.

Research Objective 2: Identify ways to improve the FoH curriculum based on teachers' perceptions.

With the upcoming release of the Ugandan syllabus and curriculum for lower secondary schools in February 2020, teachers expressed an eagerness to maintain as close an *alignment with the NCDC* and to its curricular framework as possible, to support student performance on national examinations. When teachers were asked about their perceived concerns or challenges with the FoH curriculum or with implementing it in their classrooms, they expressed limitations in *time and resources*. Although some teachers assigned value to the extent of information and vast subject matter content in FoH's Teacher's Supplements and Guides, the fear of being constrained by the 40-minute time allotted for electives by the MoES suggested an incongruity between agriculture's scientific nature, which warrants practical laboratory experiences, and the time given it by Uganda's national educational framework.

Furthermore, some teachers voiced a need for student textbooks that reflected the FoH curriculum material, perhaps due to their large class sizes. Some teachers also voiced a desire for handouts to give to their students instead. Because many teachers in Uganda are subject to extraordinary student-teacher ratios, class sizes were a concern regarding the group participatory teaching methods in the FoH Teacher's Guide of several teachers (see Figure 13).

Concerns with *preparing for national examinations* appeared in several teachers' responses, which further suggested aligning the FoH curriculum to standards set by the

UNEB. Through the lens of Rogers' (2003) model for the diffusion of innovations, teachers' perceived compatibility of the FoH curriculum with the standards of the UNEB could have potential to decrease the likelihood of intentions to adopt the curriculum and new teaching methods, or to discontinue adoption, by the teachers who expressed these views.

Research Objective 3: Describe the teachers' perceived value of the FoH curriculum to their teaching practice.

Despite citing limitations due to deficit time and resources, teachers were encouraged and motivated by the multidimensionality of the professional services provided by FoH and the agricultural content of its curriculum. Teachers were excited by the practical components and the innovative concepts it contained. Intentions to *integrate theory and practice* represented by teachers who assigned high value to these components of the Teacher's Guide and Supplement (Appendix D). The instructors' positive appraisal of the curriculum for applying theoretical concepts through *practical teaching methods*, such as hands-on activities and demonstrations, conveyed the pedagogical shift from agricultural theory to agricultural practice that underpinned FoH's curriculum and in-service approach. It was expressed by one teacher that this shift was superior to prior behaviorist pedagogy that was teacher-centered, lecture-oriented, and often too theoretical to impact student learning in meaningful ways.

The *comprehensibility* of the curriculum served as a motivating factor for understanding agricultural concepts and theories that may have been difficult to grasp otherwise. Teachers found that the curriculum's design, layout, and content were simplified yet detailed, easy to teach and on which to elaborate, well-arranged, logically

organized, sequentially organized, systematic, orderly, easy to follow, well-described, understandable, and precise (see Figures 15 & 16). Some teachers assigned high value to the comprehensibility of the curriculum as well as to the practicality of its recommended teaching methods.

Although many instructors expressed concerns regarding time and too much content to teach in the allocated time period, others assigned high value to the curriculum's content for it being *relevant to daily life in Uganda*. This subtheme was characterized by teachers' responses, which were conceptualized through the lens of Rogers' (2003) model. As such, the subtheme connected relevance to compatibility with preestablished socioeconomic values, as well as to existing cultural norms and routines. All of these factors increase the likelihood of an innovation's adoption.

Research Objective 4: Identify teachers' perceived needs for additional professional development.

After the workshop, teachers perceived to need further training in mostly animal sciences, crop sciences, and mechanization (see Figure 17). Perceptions of *areas of need* trended toward subject matter content, rather than more professional development on practical teaching methods. Nzarirwehi and Atuhumuze (2019) noted that in-service teacher training and extension outreach services should work at the capacity of the instructors and their schools to provide training and related concepts, ideas, and agricultural innovations for both professional teaching practice development and subject matter knowledge development.

Teacher confidence was measured by two Likert-type questions regarding the instructors' attitudes on leading, or teaching in their classrooms and outside the

classroom (see Figures 18 and 19). Teacher confidence was higher for teaching in the classroom than in the garden and laboratories, however a greater difference (Δ), i.e., a greater increase existed in the latter after the training. A teacher who indicated not being comfortable teaching their students in the garden contributed the perception to a lack in related skills, and teachers who expressed confidence in teaching their students were intrinsically motivated by factors that included engaging their students enthusiastically, assessing and testing their students for high achievement, and through successful lesson planning. Through this objective, I conceptualized how the continuous training and education of the instructors could further build their competence and confidence for teaching their students in all learning environments.

Research Question 2: What acquired skills did teachers plan to utilize?

This research question informed the study's two final themes. Teachers left the workshop equipped with new knowledge and inspired by ways to effect change through practical agricultural education, as provided by FoH's curriculum and related teacher training. Teachers' responses to the question of what skills acquired from the training they planned to implement in their lessons *centered the student* in ways that would facilitate participation, stimulate interest, and disperse the learning experience among them equally.

A large percentage of the responding teachers characterized these intentions by citing *group participatory methods* as a strategy worth incorporating into their daily class routines (see Figure 20). Group work, as a general theme to describe similar techniques, i.e., group learning, group methods, grouping and demonstration, and small group activity, was described by teachers as a way to facilitate critical thinking and problem

solving skills by empowering the students as constructors of meaning to their own learning experiences. Though six participants mentioned a limitation in this method due to robust class sizes, the number of teachers who esteemed this teaching method for future practice outweighed the former by three-fold (see Figure 19).

The new attendees of the FoH professional development workshop were trained to incorporate theoretical concepts and ideas regarding agriculture into activities such as garden demonstrations, PBL and other hands-on learning experiences (see Figures 15, 16, & 20). *Demonstration methods* were perceived by the teachers to build practical agricultural skills in their students that would create independent, proficient young people who would be competent in their examinations and in future careers, including the agricultural sector.

Teachers were inspired to use *interest approach methods* to energize and motivate their students to engage in the day's lesson. Two examples of the interest approach method, as provided in the FoH Teacher's Guide are presented (see Figures 15 & 21). The instructors perceived the use of interest approaches to garner student interest in agriculture, as well as to build their technical skills and competence in the subject.

The final theme, "A Better Uganda": Community and Teacher Outreach, served as a conclusive title that I deemed appropriate in reverence to the passion and drive the study's teachers embodied to optimize the livelihoods of their students and their communities by teaching agriculture. In their words, the future of Uganda was underpinned by an overarching objective to *improve their students' skills and performance.* The faith teachers had in the curriculum to supply the nation with prepared, competent young people with related and relevant technical skills suitable for the

agriculture sector, was rooted in their own lived experiences during the FoH professional development workshops and grounded in their perceived positive value for its potential to foment educational change.

Teachers expressed intentions to use the FoH curriculum and the skills they acquired from the workshops to facilitate *building positive attitudes toward agriculture within their students.* The interest approach was mentioned in staking students' attention to the lessons and attraction to agriculture as a subject. The self-efficacy of the teachers and potentially their students were connected by analyzing responses that framed this as integral to improving students' perceptions of agricultural livelihood opportunities. It was inferred that the potential existed for sustained curriculum implementation and use of its recommended teaching methods.

Only through its recommended successful adoption of FoH's curriculum by the participating teachers, can school-wide adoption be attempted through interpersonal channels of communication (Rogers, 2003), i.e., by the headteachers, school directors, and other administrators. Teachers expressed intentions to *introduce more teachers to the curriculum,* as associated with a call for FoH forging relationships with their school's administrators. In this regard, adoption of FoH's curriculum and recommended teaching methods by the study's teachers seemed avouched. I considered it possible that at least some teachers had their confirmed adoption decision (Rogers, 2003), but follow-up studies are needed to verify such.

Some instructors took knowledge skill-sharing further by expressing their desires for *community engagement* through promoting, training, and involving community members in practical, agricultural applications as designed and instructed by FoH's

curriculum and training. Country-wide adoption through the teachers' willingness for community outreach and to travel great distances for teacher training affirmed other research regarding the FoH agricultural education intervention in Uganda (Cannon, 2019).

CHAPTER V

SUMMARY OF THE STUDY, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

This chapter is a comprehensive summary of the study, including its problem statement, purpose, research objectives, supporting literature, participants, theoretical perspective, and data analysis procedures. Further, the chapter details conclusions and implications derived from study's findings, as well as related recommendations for research and practice going forward.

Summary of the Study

Problem Statement

Agriculture is the largest employer of rural youth in Africa (Yeboah & Jane, 2020), and competence in the sector is essential for socioeconomic development of individuals, societies, and nations (FAO, 2014; Ministry of Agriculture [MoA], 2013). A study conducted with 272 children by Bandura et al. (2001) showed that youth perceptions regarding occupational efficacy (career choice) were more determined by their personal self-efficacy than by academic performance (test-taking). As education continues to shift to more project-based methodologies that enhance student capacity for real-world problem solving (Mukembo, 2017), teachers must be equipped with the knowledge, the resources, and the professional development support to successfully prepare their students, including teachers of agriculture. In rural settings, however, teaching capacity is often limited because supplies, support, and relevant curriculum

content are in short supply (Cannon, 2019). In addition, government policy that focuses on Western economic models of development may be removed from the reality of rural communities that rely on subsistence agriculture and smallholder farming, rather than on cash crops and large-scale, industrial models of agriculture and related economic development schemes (Özerdem & Roberts, 2012).

Uganda has long-recognized the power of building coalitions with NGOs and INGOs to facilitate academic learning and context-specific vocational training (African Union, 2007; MoA, 2013). The nation's Ministry of Education and Sports' (MoES) success in educational reform could be further propelled and implemented with the help of community outreach that seeks to meet its needs and objectives. These local and international groups offer support that includes general education and vocational training, and financial inputs corresponding with the demand environment of a nation and/or its specific regions. Some evidence exists on the effectiveness of such education outreach intervention programs, but research on how impactful such are, is scarce (Cannon, 2019). More work is needed to inform future initiatives in agricultural education and outreach in developing countries. It is this need that inspired the purpose and design of the current study regarding such work in northern Uganda.

Purpose of Study

This purpose of this study was to explore the perceptions of Ugandan secondary school teachers regarding FoH's agricultural education curricula (see Figure 2), including the teaching methods supported by its design that they found most important to implement, the overall influence the related professional development had on their attitudes about teaching agriculture, and on their teaching practices altogether. Project-

based learning was the primary methodology designed into the curriculum for the agricultural education of school-aged youth in northern Uganda. This framework described the recommended lessons comprising the curriculum to be taught by secondary school teachers of agriculture. Secondary data analysis informed the four objectives that guided this study:

Objectives

1. Describe the factors that would support teachers' intentions to implement the FoH curriculum.
2. Identify ways to improve the FoH curriculum as perceived by teachers who participated in the FoH training workshop.
3. Describe the teachers' perceived value of the FoH curriculum to their teaching practices.
4. Identify teachers' perceived needs for additional professional development.

Review of Literature

I studied relevant literature to gain understanding of the topics that comprised this mixed methods inquiry. The major sections included in the literature review were agriculture for development in Uganda (Barungi et al., 2016; FAO, 2013; Major, 2018; Mangheni et al., 2003; Mukembo et al., 2014; Mukembo & Edwards, 2015; Thurmond, 2019; Wilcox et al., 2021; World Bank, 2008); Uganda's education system (Bazalio, 2020; Cannon, 2019; Craig et al., 1998; Mahmood, 1999; Major, 2018; Mbiti, 1990; Namukasa et al., 2007; NCDC, 2019; Nzarirwehi & Atuhumuze, 2019; Outreach Uganda, 2007; Ssekamwa, 1997; Ward et al., 2006; World Bank, 2020); educational change and curriculum reform in Uganda (Alberto et al., 1995; Almendarez, 2010; Bazilio, 2019;

Craig et al., 1998; Lynch, 2016; Mubangizi, 2020; Mukembo, 2017; Noel, 2009; O'Sullivan, 2002; Rogan & Aldous, 2005; Serbessa, 2006; Ssekamwa, 1997; Tabulawa, 1998; Tedla, 1992); agricultural education in Uganda (Bazilio, 2020; Cannon, 2019; MoES, 2020; Mubangizi, 2020; Mukembo, 2017; Namukasa et al., 2007; Ssekama, 1997); select educational schools of thought and related teaching methods (Cannon, 2019; Ebert, 2012; Jumaat et al., 2017; Kolb, 1984; Laur, 2013; Rothfield, 2007; Skinner, 1974; Thorne & Henley, 2005; Weegar & Pacis, 2012); project-based agricultural education (Croom, 2008; Edelstein, 2020; Jumaat et al., 2017; Mubangizi, 2020); Field of Hope (Cannon, 2019; Field of Hope Organization, n.d.; Shizha, 2013; Thurmond et al., 2018), conceptual framework for curriculum reform and implementation (Rogan & Grayson, 2003); and the theoretical framework for teachers' adoption and implementation of FoH's agricultural education curriculum (Rogers, 2003).

Theoretical Perspective

This study was underpinned theoretically and conceptually. Diffusion of innovations theory by Rogers (2003) served as its theoretical foundation. The theory was operationalized as the lens through which to understand potential adopters' perceptions of FoH's agricultural education curriculum (see Table 1), to interpret teachers' perceptions of the utility of such and its recommended teaching practices, and their likelihood to adopt and implement the curriculum in sustainable ways.

The likelihood of adoption is dependent on five attributes under this framework: relative advantage, compatibility, complexity, observability, and trialability of the innovation (Rogers, 2003). These variables impact the probability of the new idea, or agricultural education curriculum and related pedagogy in this case, being utilized and

implemented by an individual or a community of practitioners, i.e., the group of agricultural instructors reported on in this study.

Rogers (2003) described relative advantage as the extent to which an innovation is perceived as superior to the idea it supersedes. This perception considers aspects such as convenience, satisfaction, and social values which inform potential adopters about the relative advantage of the innovation as compared to similar ideas or innovations (Rogers, 2003).

Compatibility was described as the extent to which an innovation is perceived to align with the experiences, cultural values, and needs of the potential adopters (Rogers, 2003). Past experiences provide a point of reference to interpret and evaluate an innovation. The perceived compatibility of an innovation is related to its rate of adoption (Rogers, 2003).

The complexity of an innovation is the perceived level of difficulty regarding its utility (Rogers, 2003). Some innovations are easier to understand and use than others, often increasing the likelihood of adoption.

The observability of an innovation refers to the extent to which individuals can see the results of an innovation before adopting it (Rogers, 2003). Observability is often operationalized through demonstrations and can facilitate peer discussions and shared evaluations of the innovation before deciding to adopt (Rogers, 2003).

Trialability is the degree to which an innovation can be tried prior to its adoption (Rogers, 2003). Change agents can increase the likelihood of adoption through product samples or test-runs, because this helps reduce uncertainty and strengthens potential adopters' knowledge and understanding of the innovation (Rogers, 2003).

The Framework for Curriculum Implementation in Developing Countries, by Rogan and Grayson (2003), guided the study's conceptual foundation. They constructed their framework on three main principles: profile of implementation, capacity to support innovation, and support from outside agencies (Rogan & Grayson, 2003). Three commonalities that these constructs all share include: a) can be measured by indicators; b) broad enough to comprise a number of variables; and c) sufficiently narrow to contain a specific idea (Rogan & Grayson, 2003).

The profile of implementation is operationalized through the condition or mental set of the main actors, i.e., adopters, to reconceptualize the intended changes within their own contexts (Rogan & Grayson, 2003). In this way, the framework serves as a template or map to guide an individual's implementation process to render any number of possible outcomes.

The capacity to support innovation is measured by various factors that can facilitate or hinder the implementation of a new curriculum and related instructional practices. This construct anticipates the complexity of supply and demand factors that inform a community's capacity to support innovation and is governed by four indicators: 1) physical resources; 2) teacher factors; 3) student factors; and 4) school ethos and management (Rogan & Grayson, 2003).

Outside agencies constitute entities not found within an existing school organization which help facilitate the implementation of innovative reforms by creating interactive relationships with the schools and their actors (Rogan & Grayson, 2003). Support from outside agencies usually occurs through four types of sources: unions, donors, educational departments, and NGOs/INGOs (Rogan & Grayson, 2003). The

support from INGOs can help ease the implementation process and usually has two forms: material support and non-material. I studied the INGO Field of Hope, its agricultural education curriculum, and related professional development services, and perspectives of the new teacher participants who experienced its training program in Uganda during January 2020.

Sample Size

I employed the critical case sampling method (Patton, 1990), which included the teacher participants who identified themselves as having no prior experience with the FoH curriculum before attending the INGO's teacher training in January of 2020. This responding sample included 56 teachers of the 91 who participated in the four-week-long professional development workshops in Lira, Uganda. The teachers' identities were anonymized into codified markers to ensure confidentiality of their participation in the study.

Data Analysis

Two Excel data sheets were created from the paper survey questionnaires during my virtual internship with FoH during the Summer of 2020 and imported into the QDAS NVIVO. Because the survey had been already conducted and the data collected prior to my involvement as a researcher, the teachers' responses were archival and preliminary analysis of such informed the creation of the study's questions and objectives. With these questions as overarching pillars for analysis, this process facilitated initial distillation as well as omittance of select survey items determined to be uninformative to the investigation's research questions and objectives.

The teachers' responses were analyzed using in vivo, concept, descriptive, simultaneous, and axial coding, throughout the first and second cycles of data analysis. The coding processes were operationalized and informed by Saldaña's (2009) coding handbook and interpreted through a reflexive framework for qualitative secondary data analysis described by Tate and Happ (2018).

Conclusions and Implications

From the analysis of the survey questionnaire responses of 56 teachers new to FoH's professional development workshop, several themes and numerous subthemes emerged (see Table 4). The seven themes were pedagogical shift: from agricultural theory to agricultural practice; material and nonmaterial support; alignment with NCDC; pedagogical shift: integrating theory and practice; professional development and subject matter knowledge; centering the student; and "a better Uganda": teacher and community outreach. The first theme, pedagogical shift: from agricultural theory to agricultural practice, included three subthemes: *building practical skills; new teaching methods;* and *increasing teacher knowledge*. The second theme, material and nonmaterial support, comprised four subthemes*: FoH relationship with school administrators; training for school administrators; continuous training;* and *resources*.

The third theme, alignment with NCDC, contained two subthemes*: time and resource factors*; and *preparation for national examinations.* The fourth theme, pedagogical shift: integrating theory and practice, contained three subthemes*: practical methodologies; comprehensibility of curriculum;* and *relevant to daily life*. The fifth theme, professional development and subject matter knowledge, included two subthemes: *areas of need;* and *teacher confidence*.

Theme six, centering the student, consisted of three subthemes: *group participatory methods, demonstration methods,* and *interest approach methods*. The final theme, "a better Uganda": community and teacher outreach, contained four subthemes: *improving student skill and performance; building positive attitudes toward agriculture within students; introducing more teachers to the curriculum;* and *community engagement.*

The teachers' perceived value of the practical aspects of FoH's curriculum was revealed in three themes: pedagogical shift: from agricultural theory to agricultural practice; pedagogical shift: integrating theory and practice; and centering the student. The first theme, pedagogical shift: from agricultural theory to agricultural practice, emerged in answers to the research question regarding expectations the teachers had of the curriculum and the professional development workshop. It was concluded that instructors who were new to FoH well-anticipated the shift that was taking place through the multidimensionality and innovativeness of its extension education and outreach services. Teachers reported that they were ready to learn new information and concepts pertaining to agriculture and the ways to teach such to their students. A comparative relationship between traditional lecture-based strategies and practical hands-on methods was revealed by several responses. The use of the word *more* when expressing expectations of learning new ideas related to agriculture, such as *more practical and demonstrative*, indicated that these new teaching methods were contrary to previous, traditional approaches which were teacher-centered and mostly theoretical.

The subtheme *building practical agricultural skills* shared the responsibility of learning agriculture to not only students, but to also include the instructors. Responses

indicated that the teachers were expecting to enrich their technical skills to effectively transfer the acquired agricultural knowledge and innovative concepts to their learners in practical, demonstrative ways. Craig et al. (1998) affirmed that through INSET's hands-on experiences which first flow to the instructor, both teachers' and students' competencies are cultivated.

The second subtheme, *new teaching methods*, indicated that teachers were keen to learn new and innovative ways to operationalize their teaching strategies in practical ways. A high number of responses voiced that they needed more practical techniques and experiences, and that these methods would be superior to previous teaching practices (see Figure 6). I envisaged that favorable sentiments expressed toward acquiring new teaching skills viewed as more practical, demonstrative, and student-centric, over the traditional, lecture-based methods, constituted as a *relative advantage* to FoH's agricultural education curriculum and its related teaching methods (Rogers, 2003). However, more research should be conducted to measure teachers' attitudes, and perhaps their students' perceptions as well, after the curriculum's implementation.

The third subtheme, *increasing teacher knowledge*, derived that the participating teachers anticipated learning innovative, practical pedagogies that conceptualized the learning theories and practices within the FoH curriculum, especially from the Teacher's Supplement to the curriculum. The teachers' perceptions embedded in the second subtheme affirmed the need to further their understanding of the curriculum, especially its concepts, subject matter content, and intended objectives. This related to Rogers' (2003) principle of optimizing potential adopters' how-to knowledge when learning about an innovation to increase their likelihood of adoption.

The second theme material and nonmaterial support emerged through the study's conceptual lens of Rogan and Grayson (2003) regarding the facilitation of curriculum implementation in developing countries. This theme met the research objective to describe the factors that would support teachers' intentions to implement the FoH curriculum in their teaching of agriculture.

From the subtheme *FoH relationship with school administrators*, a call to establish relationships between FoH and the teachers' school networks materialized. Teachers' responses supported this subtheme with an intentional aim to garner the support and understanding of their headteachers, directors, and administrators regarding the importance of agriculture in their schools and communities. The teachers described interactions along the lines of talks, discussions, orientations, seminars, workshops, presentations, assistance in budget planning, and student demonstrations (see Figure 8). I conceptualized Rogers' (2003) innovation-decision process encapsulating these anticipated relationships as interpersonal channels of communication by which persuasion, e.g., orientations with a comprehensive overview of awareness-knowledge regarding the importance of agriculture for the school administrators and headteachers, is conducted by FoH's trainers and other officials.

Another dynamic by which relationships between FoH and the school administrators could be considered was the emergence of the subtheme *training for school administrators*. Many teachers expressed that effective implementation of the curriculum and its related practices was contingent on extending training and workshop services to their fellow teachers, headteachers, and administrators. Although some teachers conveyed desires for the training of school administrators to be a repeat of their

teacher training experience, others indicated a workshop that would be more introductory, or suitable for school officials whose professional training was unrelated to agriculture. As affirmed by Craig et al. (1998), in-service professional development should "have the support and participation of the headteacher and other school leaders" (p. 118). The potential for school-wide adoption of the FoH curriculum, as explained by some teachers to support its implementation as well as to promote understanding by their directors regarding the importance of agriculture to the nation and as a course, is highlighted by this subtheme.

The subtheme *continuous training* revealed that the teachers supported ongoing professional development through FoH's trainings as essential to prolonged implementation of the curriculum (see Figure 10). These sentiments were similar to the participants' in Cannon's (2019) study on earlier teacher workshops provided by FoH and reflect Rogers' (2003) attribute of trialability. In similar proportions, the teachers indicated preferences for biannual training sessions in January and August, or in January and May at 37% and 31% response rates, respectively (see Figure 11).

The subtheme *resources* called to attention the shortage of basic technical and instructional supplies necessary for practical application to support students' learning as recommended by FoH's curriculum. Funding was the leading concern of the teachers, in that materials for demonstration gardens and animal projects were described by the teachers as either outdated or nonexistent (see Figure 10). Although three-fourths of the responding participants affirmed having gardens or access to animals for demonstrations at varying levels (see Figure 12), the teachers expressed needing material support in the form of grants and related funding for stationery, curriculum worksheets, textbooks,

agricultural tools, and inputs. It was explained that access to learning materials is overseen by their school directors, who must approve of any requests for such. Uganda's MoES governs national educational expenditures but reported a lack of funds necessary to implement the new curriculum for lower secondary levels, which was released in February of 2020 (Mutesi, 2020). Considering the economic factors that put a strain on education at a national level and FoH's capacity to provide individual support to each teacher and their school, an opportunity exists to expand relationships with other agricultural extension education and outreach providers in Uganda, as well as other international donors.

Theme three, alignment with NCDC, provided foundational insight to research objective two, which aimed to identify ways to improve the FoH curriculum based on teachers' perceptions. This theme encompasses aspects of the curriculum's design that the teachers perceived could be improved, as well as their concerns regarding its implementation in their classrooms.

The subtheme *time and resources* emerged because almost one-half of the teachers voiced concerns with the allotted time to teach the course content within the existing school terms and schedules. Other forms of resources also appeared from teachers' responses, such as class sizes and learning materials for incorporating more practical teaching methods. Consideration regarding the relevance of subject matter content to the teachers' and students' daily lives, and the capacity for agriculture as an elective in the national curricular framework was made evident by this subtheme, which complemented Rogers' (2003) attribute of compatibility and increasing the likelihood of an innovation's adoption.

Preparation for national examinations as the second subtheme was another indicator of the compatibility of FoH's agricultural education curriculum to the teachers' existing values and norms. Student competency in Uganda is measured by their performance on national examinations, as designed by the UACE and distributed by the NCDC's UNEB (NCDC, 2020). Although measuring students' competency based on their examination performance may be contrary to their acquisition of practical knowledge and skills due to its focus on rote-memorization and lower-order thinking (Mukembo, 2017), perceptions of its importance can impact instructors' intentions to implement a new curriculum, especially if examination performance may be negatively impacted. In this regard, understanding students' perceptions of the curriculum as well as conducting explorations into their performance on national examinations could better assess the FoH curriculum's *real* relative advantage and compatibility.

Theme four, pedagogical shift: integrating theory and practice, describes the teachers' perceived value of the FoH curriculum to their teaching practice, in fulfillment of research objective three. This theme also served to reinforce and suggest partial satisfaction of teachers' expectations of the FoH intervention, as per Theme one. Here, teachers assigned high value and positive appraisals of the FoH agricultural education curriculum through a multifocal lens. Their responses included references to the Teacher's Supplement and the Teacher's Guidebook. The highest values the teachers had regarding such were that the materials' content was practical, comprehensive, and relevant to daily life.

The first subtheme, *practical methodologies*, emerged as a trend in teachers' responses favoring the practical components of the curriculum. Teachers explained that

the practical nature of the curriculum was constructive and appropriate due to its participatory activities, its student-centric design, and its ease of use. These attributes align with the initiatives of the NCDC to integrate agricultural theory and its related practices (NCDC, 2020). A longitudinal assessment of the teachers' perceptions of the curriculum after future trainings could build on these findings and better inform how curriculum implementation progressed or regressed over time.

The subtheme *comprehensibility of curriculum* represented teachers' characterization of how they found the practical nature of FoH curriculum and its structural organization to be detailed, easy to teach, elaborative, well-arranged, logically organized, sequentially organized, systematic, orderly, easy to follow, well-described, and understandable. I connected these findings to a perceived lack of complexity favoring an increased likelihood of adoption, as interpreted through the lens of Rogers' (2003) model. The teachers' hypothesized low complexity due to the curriculum's comprehensive and useful design, warrants testing and further research to access its true utility and efficacy by the teachers who implement it.

The subtheme relevant to daily life reinforced FoH's alignment with the social values and daily norms of the participating teachers and their students. Through responses that expressed a close connection between the curriculum's subject matter content and daily farming practices as well as with related livelihood opportunities supported Rogers' (2003) assertion that a compatible innovation is complementary to the adopters' needs and preexisting values and such increases the likelihood of adoption. Via this subtheme and the third theme a link between the compatibility of the curriculum and its relevance to the teachers' and their students' daily lives was illustrated.

The fifth theme, professional development and subject matter knowledge, identified teachers' perceived needs for additional professional development per the study's fourth research objective. This theme delineated areas in which the teachers perceived needing further training. Here, teachers expressed more of a desire for additional training in subject matter content, especially in animal science content, and a lesser trend toward acquiring more practical teaching methods, which supported Cannon's (2019) findings. Considering this conclusion could inform FoH of the teachers' levels of knowledge about select agricultural concepts and theories prior to future teacher training workshops.

This theme was characterized by the subtheme *areas of need*, which revealed that more than one-third of the responding teachers expressed wanting more training in animal and crop sciences after FoH's workshop (see Figure 19). Subtopics of such content were listed by the teachers included nutrition, production, improvement through breeding, castration, apiculture (beekeeping), and aquaculture (fish-farming), vegetable propagation, and pest management (see Figure 19). Mechanization was next in the ranking of topics for areas of need. Practical teaching methods was ranked eleventh, implying that the teachers perceived a greater need for the development of subject matter knowledge and related agricultural concepts. This subtheme suggested the need to assess the teachers' how-to knowledge and principles knowledge of agricultural content (Rogers, 2003) to understand their preparedness to effectively teaching FoH's curriculum.

The subtheme *teacher confidence* provided support in conceptualizing the teachers' learning experiences through their attitudes and related perceptions of self-

efficacy for instructing their students (Bandura, 2001; Cannon, 2019). This subtheme concluded that, overall, the FoH workshop increased teachers' confidence levels in educating their students inside and outside the classroom (see Figures 18 & 19). However, the teachers were generally more confident in the classroom than in the garden, owing to their perceptions of not having the necessary experiences to teach students the skills needed in such a practical setting.

Further, as also found by Cannon (2019), high confidence levels were described by some educators to be connected to internal motivations, such as teaching a class of enthusiastic students who love agriculture, effective lesson planning, and high test scores. Future interventions that accommodate for teachers' perceptions of self-doubt and that fortify their individual strengths could contribute to increased confidence for teaching the FoH curriculum (Craig, et al., 1998; Rogan & Grayson, 2003).

Theme six, centering the student, addressed the second research question regarding what skills the teachers planned to utilize that they acquired from the professional development workshop. This theme served the purpose of illustrating how the curriculum provided opportunities to reconceptualize their teaching approaches, center the student in the learning experience, and why it was valuable to do such.

The subtheme *group participatory methods* exemplified that nearly one-half of the instructors assigned high value to the design of the Teacher's Guide, which provided activities arranged in four to five groups of students for the purpose of problem solving, research, and discussions. This subtheme was supported by teachers' responses indicating their support for group learning, group methods, grouping and demonstration, and small group activities (see Figure 19), which replaced them as the sole director of the learning

process and focused on the students as the main actors in their learning experiences. These findings reinforced previous studies on student-centric pedagogy in effectively cultivating critical thinking and problem solving skills by students (Cannon, 2019; Mukembo, 2017; Thurmond et al., 2018).

Through group participatory methods, the learning experiences associated with the subtheme *demonstrations* were consolidated to accommodate resource limitations and operationalized as group projects and practical learning experiences that would allow equal participation and skillset cultivation by the students (Baker et al., 2012; Mukembo, 2017). This theme was reinforced by Cannon's (2019) findings which provided evidence that students were building agricultural skills through the practical demonstrations included in the FoH curriculum, but the need for more resources still existed.

Insight into the way FoH trainers conducted their workshops and how *interest approaches* were presented to the teachers was inferred to have supported the emergence of this subtheme, but its understanding was somewhat limited due to the analysis of archival data and my distance from the training experience. This notwithstanding, I perceived the interest approaches noteworthy due to their reoccurrence throughout data analysis as a valuable aspect of the FoH curriculum, as well as a teaching practice for future implementation, as perceived by the teachers (see Figure 20). Through their voices, the attractive qualities of the interest approach methods found in FoH's Teacher's Guide were described as motivational, participatory, attention-grabbing, and the building of critical thinking skills by students. The interest approaches were concluded to have been tailored into the lessons' designs with an aim to center and stimulate student interest

and build positive student attitudes toward agriculture, as also supported by the findings of Cannon (2019).

Theme seven, "a better Uganda": community and teacher outreach, combined with the sixth theme to inform the second research question regarding which skills the teachers planned to use in their future lessons as acquired from the professional development workshop. Through this theme, the appreciation the teachers had for agriculture as constructive to their students' futures and to the wellbeing of the nation was transparent.

The subtheme *improving student skill and performance* revealed that teachers perceived the effective transference of their acquired agricultural skills and practical knowledge to their students, was essential to the foundation of "a better Uganda." Teachers' responses expressed beliefs that in building their students' practical agricultural skills, they were providing the nation and the world with self-reliant, independent, and competent young people who would be suitable for the workforce and prepared to sustain their communities. This was in alignment with previous research which stressed the importance of strengthening the capacity of youth by enhancing their agricultural knowledge and skills (Major, 2018; Mukembo et al, 2014; Thurmond, 2019; Wilcox et al., 2021) while boosting agricultural employment and improving the livelihoods of those involved in the sector (World Bank, 2020)

To this end, the subtheme *building positive attitudes toward agriculture within students* provided positive feedback for the FoH intervention's potential for freeing students from the mundanity of mostly lecture-based pedagogy and exposure to more engaging, challenging, and practical approaches to learning agriculture. Moreover, due to

the somewhat prevalent practice of using agriculture as punishment by sending students to weed and dig around school grounds as a disciplinary technique, teachers were aware that their changed attitudes, behaviors, and related teaching practices were essential in building positive attitudes toward agriculture within their students. This process was visualized in two ways and portrayed through the teachers' intentions to 1) discontinue punishment through agriculture and encourage other teachers to as well, and to 2) build practical and technical agricultural knowledge and skills within themselves and in their students.

The teachers also expressed desires to spread awareness regarding the FoH intervention and to *introduce more teachers to the curriculum*. Teachers perceived that extending the agricultural curriculum and training to those within their networks was beneficial to their own sustained growth and development as agricultural instructors. From these responses, the ease with which participating teachers could utilize interpersonal channels (Rogers, 2003) to communicate the curriculum's relative advantage, its compatibility with existing personal and social norms, and its high trialability was inferred. Further, by establishing teacher networks of FoH adopters within the same school, the potential to acquire and share teaching resources likely increases, such as equipment and tools for practicals and demonstrations. Cannon's (2019) findings also encouraged resource sharing as a common theme among the participants in her study.

The subtheme *community engagement* suggested that after the professional development workshop, teachers were inspired to share the FoH curriculum and its recommended practices with members of their communities. While some teachers

discussed plans to do this by starting agriculture clubs in their churches and localities, others expressed introducing the curriculum to members of their families, and to the nation at large. The confirmation stage of Rogers' (2003) innovation-decision process was exemplified by this subtheme, because, per this stage, the innovation is promoted to others by the adopter. However, the teachers were viewed as still undergoing the other steps of Rogers' (2003) confirmation stage, i.e., recognizing the benefits of implementing the curriculum, and incorporating the curriculum and related teaching methods into their daily routines. Considering such, further investigation into FoH's future professional development workshops and how implementation had followed the January 2020 training could be informative to enhancing the INGO's ongoing work in Uganda and elsewhere.

Table 5

Summary of Recommendations based on Themes and Subthemes

Themes	Theme and Subthemes	Recommendations	
		Research	**Practice**
Theme 1	**Pedagogical Shift: from Agricultural Theory to Agricultural Practice** Building Practical Agricultural Skills New Teaching Methods Increasing Teacher Knowledge	• Incorporate a needs assessment to evaluate new teachers' knowledge of subject matter content into a pre-training survey questionnaire.	
Theme 2	**Material and Nonmaterial Support** FoH Relationship with School Administrators Training for School Administrators Continuous Training Resources	• Investigate teachers who discontinued the implementation of the FoH curriculum and participation in the teacher training to explore factors leading to discontinuance.	• INGOs should include school administrators in curriculum reform and implementation initiatives. • FoH should design an awareness campaign for school administrators.
Theme 3	**Alignment with NCDC** Time and Resource Factors Preparation for National Examinations	• Conduct a needs assessment on teachers' perceptions of relevant subject matter for future curriculum development. • Conduct a needs assessment for teachers and students to analyze possible barriers to curriculum implementation. • Measure student performance shifts on national examinations.	• FoH should encourage teacher networks, i.e., communities of learners, and related resource sharing initatives.

Theme 4	**Pedagogical Shift: Integrating Theory and Practice** Practical Methodologies Comprehensibility of the Curriculum Relevant to Daily Life	• Investigate teachers' confidence attitude shifts regarding curriculum designs following implementation of FoH intervention.	• FoH should develop additional S1-S4 curriculum supporting the teaching of agriculture in Uganda.
Theme 5	**Professional Development and Subject Matter Knowledge** Areas of Need Teacher Confidence		• INGOs should operationalize partnerships with national research centers to train teachers and local curriculum developers. • FoH should incorporate supplemental learning for teachers into the training program to address related subject material.
Theme 6	**Centering the Student** Group Participatory Methods Demonstration Methods Interest Approach Methods	• Investigate in-school monitoring and evaluation protocols mid-implementation of the curriculum for students S1-S4.	
Theme 7	**"A Better Uganda": Community and Teacher Outreach** Improving Student Skill and Performance Building Positive Attitudes Toward Agriculture within Students Introduce More Teachers to Curriculum Community Engagement	• Research S1-S4 student competency shifts in practical agricultural skills. • Investigate students' attitudes regarding agriculture as a livelihood and career.	• FoH should extend invitations to headteachers and other school officials for professional development.

Recommendations for Future Research

Nine recommendations are offered for future research. Refer to Table 5 for a related summary by relevant themes and subthemes.

1. To harness a better understanding of teachers' knowledge capacity prior to the beginning of the FoH professional development workshops, incorporate a needs assessment to evaluate the new teachers' knowledge of subject matter content into the pre-training survey questionnaire.
2. Explore the perceptions of teachers who discontinued implementation of FoH curriculum and teacher training to identify variables related to their discontinuance (Rogers, 2003).
3. For quality assurance of FoH's commitment to the alignment of their curriculum to agriculture in Uganda, conduct a needs assessment on teachers' perceptions of relevant subject matter for future curriculum development.
4. For further insight into the needs of the students and teachers utilizing the FoH curriculum, conduct a needs assessment to analyze possible barriers to full and sustained curriculum implementation.
5. To study the impact of FoH's curriculum on students' learning achievements as measured by standardized tests, investigate students' performance on their national examinations.
6. For further insight into FoH's impact on teachers' perception of self-efficacy after their professional develop workshops, follow-up with an investigation into teacher confidence shifts regarding their use of the curriculum and its related teaching methods after its implementation.
7. A formal evaluation of the implementation process of the study's teachers should be conducted, in accord with Rogan and Grayson's (2003) theory for curriculum implementation for developing countries, to construct an in-school monitoring and evaluation protocol mid-implementation of the FoH curriculum.
8. To measure the impact FoH's professional development and agricultural education curriculum has on developing students' technical skills, an instrument should be designed to measure their competency and improvements in demonstrating practical agricultural knowledge and skills.

9. Investigate students' attitudes regarding agriculture as a career (Mukembo 2014, 2015) after experiencing the FoH curriculum.

Recommendations for Future Practice

Seven recommendations are offered for future practice. Refer to Table 5 for a related summary by relevant themes and subthemes.

1. INGOs should include school administrators and other school officials in curriculum implementation initiatives (Rogan & Grayson, 2003).
2. FoH should design an effective advocacy campaign and orientation for school administrators to create awareness of the importance of teaching agriculture in secondary schools and to Uganda overall.
3. FoH should encourage teacher networking and resource sharing to accommodate for shortages in instructional supplies, tools, and materials (Cannon, 2019).
4. To ensure relevant and current knowledge and skills, FoH should revise and update its curriculum as needed to account for technological, economic, and environmental changes that correspond to the workforce development needs of Uganda's agriculture sector.
5. To optimize the practical training of agriculture teachers, national research centers should assist FoH in cultivating their skills through laboratory and field demonstrations. The National Agricultural Research Organization (NARO) includes nine Zonal Agricultural Research and Development Institutes that conduct adaptive research in nine of Uganda's farming zones (NARO, 2021) and should be encouraged to collaborate with the NCDC.
6. FoH should incorporate needs-based, supplemental learning for teachers into its training program to address related subject matter learning needs.
7. FoH should invite headteachers and other school officials for professional development, supporting the implementation of its curriculum and to improve their understanding of the agriculture sector in Uganda and its importance to the vibrancy of the nation (Craig et al., 1998).

REFERENCES

African Union (AU). (2007). Strategy to revitalize technical and vocational education and training (TVET) in Africa. *Department of Human Resource Science and Technology*. http://www.africa-union.org

Ahaibwe, G., Mbowa, S., & Lwanga, M. M. (2013). Youth engagement in agriculture in Uganda: Challenges and prospects. *Environmental Policy Research Center*, 106. https://ageconsearch.umn.edu/bitstream/159673/2/series106.pdf

Ahmed, S., & Potter, David M. (2006). NGOs in international politics. *Kumarian Press*. ISBN 9781565493469. OCLC 732955747

Alberto Torres, C., & Puiggrós, A. (1995). The state and public education in Latin America. *Comparative Education Review, 39*,(1). https://www.journals.uchicago.edu/doi/pdf/10.1086/447287?casa_token=uQkso0Osf80AAAAA%3AEdChO32akOwbKNrVBtrv34tVAr7-s5Z0JTJ0Ns2i8WKuvGzHQvHQEwxr0uus-MnWdlKDOqJCac9P&

Ansari, F. K. (2020). Perception and its importance. *Organizational Behavior, 201*, 1-8. https://mmhapu.ac.in/doc/eContent/Management/FaryasKausarAnsari/May2020/Perception%20and%20its%20Importance.pdf

Application. (2021*). In Oxford Learner's Dictionaries. Oxford University Press.* https://www.oxfordlearnersdictionaries.com/us/definition/american_english/application

Baguma, G. (2020*). Amended circular NCDC 1/2020*. National Curriculum Development Centre (NCDC). https://www.ncdc.go.ug/sites/default/files/Amended.pdf

Baker, A., Robinson S., & Kolb, A. (2012). Aligning Kolb's experiential learning theory with a comprehensive agricultural education model. *Journal of Agricultural Education, 53*(4), 1–16. doi: 10.5032/jae.2012.04001 https://www.jae-online.org/attachments/article/1694/53.4.1%20Baker.pdf

Bandura, A., Barbaranelli, C. Caprara, G., & Pastorelli, C. (2001). Self-efficacy beliefs as shapers of children's aspirations and career trajectories. *Society for Research in Child Development, 72*(1), 187- 206. https://www.jstor.org/stable/1132479

Barr, A., Fafchamps, M., & Owens, T. (2005). The governance of non-governmental organizations in Uganda. *World Development, Elsevier*, *33*(4), 657-679. https://reader.elsevier.com/reader/sd/pii/S0305750X05000082?token=802938E58D67921FA64AAD069279068822500CE4348AB8F5A98FDE54C5AF99AA651A46350D6D5FA03F14B1CAC9B3D2AA&originRegion=us-east-1&originCreation=20210421183046.

Barungi, M., Guloba, M., & Adong, A. (2016). Uganda's agricultural extension systems: how appropriate is the single spine structure? (2016). *Economic Policy Research Centre (EPRC), 16.* https://ageconsearch.umn.edu/record/253558/files/16%20Uganda_s%20Agricultural%20Extension%20Systems.pdf

Bazilio, K. (2019). Analysis of the different education policy reforms in Uganda (1922 – 2000). *Research Association for Interdisciplinary Studies*, 311-318.

doi:10.5281/zenodo.3550053. http://rais.education/wp-content/uploads/2019/11/044KB.pdf

Boyatzis, R. E., & Kolb, D. A. (1995). From learning styles to learning skills: The executive skills profile. *Journal of Managerial Psychology*, *11*(1), 3–17. doi:10.1108/02683949510085938

Brown, S. (2010). Likert scale examples for surveys. ANR Program Evaluation. *Iowa State University Extension.* https://www.extension.iastate.edu/Documents/ANR/LikertScaleExamplesforSurveys.pdf

Cannon, E. (2019). Agriculture education curriculum adoption by Ugandan secondary school teachers fostered by the INGO Field of Hope. ProQuest LLC, 27529097. Ann Arbor, MI. https://repository.lib.ncsu.edu/bitstream/handle/1840.20/36844/etd.pdf?sequence=1

Cervantes, B., Hemmer, L., & Kouzekanani, K. (2015). The impact of project-based learning on minority student achievement: implications for school redesign. *NCPEA Education Leadership Review of Doctoral Research, 2*(2). https://files.eric.ed.gov/fulltext/EJ1105713.pdf

Clark, A.M. and Clark, M.T.G. (2016). Pokémon go and research: qualitative, mixed methods research, and the supercomplexity of interventions. *International Journal of Qualitative Methods, 15*(1). https://journals.sagepub.com/doi/pdf/10.1177/1609406916667765

Cohen, B. (2015). Urbanization, city growth, and the new United Nations development agenda. *The Official Journal of the World Coal Industry, 3* (2), 4–7. https://web.archive.org/web/20150627045821/http://cornerstonemag.net/urbanization-city-growth

Crabtree, B. F., & Miller, W. (1999). *Doing qualitative research*. Sage Publications.

Craig, H., Kraft, R., & du Plessis, J. (1998). *Teacher development: making an impact. Report to USAID.* Advancing Basic Education and Literacy Project, World Bank, Human Development Network, Effective School and Teachers. https://www.researchgate.net/publication/44824196_Teacher_development_Making_an_impact

Creswell, J. & Poth, C. (1998). *Qualitative inquiry & research design: Choosing among the five approaches (4th ed.).* Thousand Oaks, CA: Sage.

Creswell, J. & Plano C. (2017). *Designing and conducting mixed methods research (3rd ed.)*. SAGE Publications.

Croom, D. B. (2008). The development of the integrated three-component model of agricultural education. *Journal of Agricultural Education*, *49*(1), 110 - 120 https://www.jae-online.org/attachments/article/140/Croom_49_1_110-120.pdf

Davison, C., & Dustova, G. (2017). A quantitative assessment of student performance and examination format. *Journal of Instructional Pedagogies, 18*. https://files.eric.ed.gov/fulltext/EJ1151723.pdf

Deininger, K. (2003). Does cost of schooling affect enrollment by the poor? Universal primary education in Uganda. *Economics of Education Review, 22,* 291–305.

http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.629.4081&rep=rep1&type=pdf

Ebert, A. K. (2012). Behaviorism vs. constructivism in the technological secondary education classroom. Theories of educational technology. Boise State University. https://sites.google.com/a/boisestate.edu/edtechtheories/behaviorism-vs-constructivism-in-the-technological-secondary-education-classroom-1

Eck, C., Robinson, J. S., Cole, K., Terry, R., & Ramsey, J. (2020). The validation of the effective teaching instrument for school-based agricultural education teachers. *Journal of Agricultural Education, 61*(4), 229-248. https://doi.org/10.5032/jae.2020.04229

Emmanuel, A. (2012*). Modernisation of smallholder agriculture and policy making in Uganda. Building an Effective Advocacy Movement for Sustainable and Equitable Agricultural Development in Africa.* TrustAfrica. https://media.africaportal.org/documents/uganda1.pdf

Field of Hope Organization. (n.d). *Mission – About us*. https://fieldoFoHope.org/content/mission

Food and Agriculture Organization (FAO). (2004). *School gardens concept note: Improving child nutrition and education through the promotion of school garden programs.* [Government publication]. http://www.fao.org/3/af080e/af080e00.htm.

Food and Agriculture Organization. (FAO). (2009). *Education for rural people.* [Government publication]. http://www.fao.org/3/a-i0760e.pdf

Food and Agriculture Organization (FAO). (2010). *A new deal for school gardens.* [Government publication]. http://www.fao.org/3/i1689e/i1689e00.pdf

Food and Agriculture Organization (FAO). (2014). *Youth and agriculture: Key challenges and concrete solutions*. [Government publication]. http://www.fao.org/3/a-i3947e.pdf

Food and Agriculture Organization (FAO). (2015). *Responding to the challenges of poverty, food insecurity and climate change.* [Government publication]. http://www.fao.org/3/a-bp628e.pdf

Food and Agriculture Organization (FAO). (2017). *Sustainable development goals: Sustainable Development Goal 4 ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.* [Government Publication]. http://www.fao.org/sustainable-development-goals/goals/goal-4/en/

Gillham, Bill. (2000). *Case study research methods.* Bloomsbury Publishing Plc, ProQuest Ebook Central. https://ebookcentral.proquest.com/lib/oks-ebooks/detail.action?docID=564247

Glatthorn, A., Boschee, F., Whitehead, B., & Boschee, B. (2011). *Curriculum leadership: strategies for development and implementation*. 3rd edition. Sage Publications.

Govender, S. (2018). South African teachers' perspectives on support received in implementing curriculum changes. *South African Journal of Education, 38*(2). https://files.eric.ed.gov/fulltext/EJ1204396.pdf

Government of Uganda. (2020). *Ministries*. https://www.gou.go.ug/content/ministries

Harris, D., & Fuller, D. (2014). Agriculture: definition and overview, 104-113. https://doi.org/10.1007/978-1-4419-0465-2_64.

Hussain, M. (2004). A comparative study of the performance of trained primary school

teachers with and without in-service training in Hazara division and development strategy for future. (Unpublished master's thesis). Islamabad, Pakistan: Allama Iqbal Open University. https://www.aiou.edu.pk/downloads/COMPARATIVE-STUDY-FINAL.pdf

International Movement for Catholic Agricultural and Rural Youth, International Fund for Agricultural Development, & Food and Agriculture Organization. (2012). *Summary of the findings of the project implemented by MIJARC in collaboration with FAO and IFAD: 'Facilitating Access of Rural Youth to Agricultural Activities.'* https://www.ifad.org/documents/38714170/39135645/Facilitating+access+of+rural+yout%20h+to+agricultural+activities.pdf/325bda30-ac08-494f-a37d-3201780a5dff

James, A. (2013). Seeking the analytic imagination: reflections on the process of interpreting qualitative data. *Qualitative Research, 13*(5), 562-577. https://doi.org/10.1177/1468794112446108

Jumaat, N. F., Tasir, Z., Halim, N., & Ashari, Z. (2017). Project-based learning from constructivism point of view. *Advanced Science Letters, 23*(8), 7904-7906. https://www.researchgate.net/publication/320558653_Project-Based_Learning_from_Constructivism_Point_of_View/link/5a012a014585159634c2623e/download

Kakande, A. (2019). Are president Museveni's claims on Ugandan school enrollment true? *PesaCheck: A Code for Africa (CFA).* https://pesacheck.org/fact-checking-president-musevenis-claims-on-school-enrollment-in-uganda-bf8fce1ecc86

Kolb, David. (1984). Experiential learning: experience as the source of learning and development. Prentice-Hall.

Lynch, M. (2016). Comprehending how the Great Depression influenced American education. *The Edvocate.* https://www.theedadvocate.org/comprehending-great-depression-influenced-american-education/.

Macdonald, A., & Pálsdóttir, A. (2008). *Moving into the zone of feasible innovation – towards meaningful science teaching*. University of Iceland, School of Education. https://www.academia.edu/33212634/Moving_into_the_Zone_of_Feasible_Innovation_towards_meaningful_science_teaching

Mahmood, K. (1999). Effectiveness of in-service training imparted through teacher training project. Unpublished master's dissertation submitted to Allama Iqbal Open University, Islamabad, Pakistan.

Major, A. M. (2018*). The phenomenon of women's empowerment projects fostered by the INGO Field of Hope in northern Uganda*. (Master's thesis). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 10815462).

Malterud, K. (2001). Qualitative research: standards, challenges, and guidelines. *The Lancet, 358* (9280), 483-488. https://doi.org/10.1016/S0140-6736(01)05627-6.

Mangheni, M., Mutimba, J., & Biryabaho, F. M. (2003). Responding to the shift from public to private contractual agricultural extension service delivery: educational implications of policy reforms in Uganda. *Association for International Agriculture and Extension Education (AIAEE)*. https://www.aiaee.org/attachments/article/1199/Mangheni412.pdf

Maxwell, J. (2010). Using numbers in qualitative research. Qualitative Inquiry. 16, 475-482. http://dx.doi.org/10.1177/1077800410364740

Mcleod, S. (2019). Likert scale definition, examples and analysis. *Simply Psychology*. https://www.simplypsychology.org/likert-scale.html

Merriam, S., & Tisdell, E. (2015). *Qualitative research: a guide to design and implementation.* John Wiley & Sons, Inc. https://ebookcentral.proquest.com/lib/oks-ebooks/reader.action?docID=2089475.

Mhango, C. (n.d.). How to teach practical skills. FRCOG. College of Medicine, University of Warwick. https://warwick.ac.uk/fac/sci/med/about/global/etatmba/training/malawi/module6/how_to_teach_practical_skills.pptx

Ministry of Agriculture, Animal Industry and Fisheries (MAAIF). (2013). National agriculture policy. *The Republic of Uganda*. https://www.agriculture.go.ug/wp-content/uploads/2019/04/National-Agriculture-Policy.pdf#pdfjs.action=download

Ministry of Agriculture, Animal Industry and Fisheries (MAAIF). (2020). *National agriculture policy: Mandates and Functions.* https://www.agriculture.go.ug/the-ministry/

Ministry of Education and Sports. (2008). *Agriculture teaching syllabus. Kampala, Uganda: National Curriculum Development Center.* https://www.ncdc.go.ug/content/agriculture-textbook

Ministry of Education and Sports. (2016). *Fact booklet. The Republic of Uganda*. http://www.education.go.ug/fact-booklet/

Ministry of Education and Sports. (2020). *Uganda secondary education expansion project: environmental and social management framework.* http://www.education.go.ug/wp-content/uploads/2020/05/Final-ESMF-for-USEEP-qa-05-05-2020.pdf

Molyneaux, K. (2011). Uganda's universal secondary education policy and its effect on 'empowered' women: how reduced income and moonlighting activities differentially impact male and female teachers. *Department of Educational Policy Studies-Comparative International Education, University of Wisconsin-Madison, 6*(1). https://doi-org.argo.library.okstate.edu/10.2304%2Frcie.2011.6.1.62

Moodie, G. (2002). Identifying vocational education and training. *Journal of Vocational Education and Training, 54*(2), 249-266. https://doi.org/10.1080/13636820200200197

Mpanza, M. (2013). *A case study of teachers' implementation of the Grade Four Natural Sciences curriculum*. School of Education, University of KwaZulu-Nata. https://researchspace.ukzn.ac.za/bitstream/handle/10413/11441/Mpanza_Mavis_Nokuthula_2013.pdf?sequence=1&isAllowed=y

Mukembo, S. C. (2017). *Equipping youth with agripreneurship and other valuable skills by linking secondary agricultural education to communities for improved livelihoods: A comparative analysis of project-based learning in Uganda*, (Doctoral dissertation). https://shareok.org/handle/11244/299532

Mukembo, S. C., Edwards, M. C., Ramsey, J. W., & Henneberry, S. R. (2014). *Attracting youth to agriculture: The career interests of young farmer club members in Uganda*. *Journal of Agricultural Education,* 55(5), 155–172. https://www.jae-

online.org/vol-55-no-5-2014/1870-attracting-youth-to-agriculture-the-career-interests-of-young-farmers-club-members-in-uganda.html

Mukembo, S. C., Edwards, M. C., Ramsey, J. W., & Henneberry, S. R. (2015). Intentions of young farmers club (YFC) members to pursue career preparation in agriculture: The case of Uganda. *Journal of Agricultural Education, 56*(3), 16–34. https://www.jae-online.org/index.php/back-issues/192-volume-56-number-3-2015/1914-intentions-of-young-farmers-club-yfc-members-to-pursue-career-preparation-in-agriculture-the-case-of-uganda.

Mutesi, A. (2020) Uganda's new curriculum for lower secondary: will it meet learners' skill needs? *Parliament Watch Uganda. Centre for Policy Analysis.* https://parliamentwatch.ug/ugandas-new-curriculum-for-lower-secondary-will-it-meet-learners-skill-needs/

Namukasa, I., & Buye, R. (2007). Decentralization and education in Uganda. *Comparative and International Education / Éducation Comparée et Internationale, 36*(7), 92-116. http://ir.lib.uwo.ca/cie-eci/vol36/iss1/7

National FFA. (2021). *About FFA*. https://www.ffa.org/about/

Njura, H. J., Kubai, K., Taaliu, S., & Khakame, K. (2020). The relationship between agricultural teaching approaches and food security in Kenya. *Hindawi Education Research International, 2020* (8847864) 1-18. https://doi.org/10.1155/2020/8847864

Noel, B. (2009). Education reform in Latin America: equal educational opportunity? *Gist: Education and Learning Research Journal, 3*, 134-157. https://files.eric.ed.gov/fulltext/EJ1062558.pdf

Okiror, J., Geoff, H. & Winterbottom, M.. (2017). Towards in-service training needs of secondary school agriculture teachers in a paradigm shift to outcome-based education in Uganda. *The Journal of Agricultural Education and Extension, 23*(5), 415-426. https://doi.org/10.1080/1389224X.2017.1338593

Orr, Andrea. (2020). *How electricity is transforming a farming community in Uganda*. Feed the Future: U.S. Government's Global Hunger & Food Security Initiative. https://www.feedthefuture.gov/article/the-power-of-light-and-a-loan-transforming-a-farming-community-in-uganda/

Outreach Uganda. (2007). *How schools operate in Uganda*. Outreach Uganda. https://outreachuganda.org/how-schools-operate-in-uganda/

Özerdem, A., & Roberts, R. (2012). Challenging post-conflict environments: sustainable agriculture (1st ed.). MPG Books Group, UK

Patton, M. (1990). *Qualitative evaluation and research methods.* Sage, 169-186. https://legacy.oise.utoronto.ca/research/field-centres/ross/ctl1014/Patton1990.pdf

Perception: Definition, Importance, Factors, Perceptual Process, Errors. (2021). *iEduNote.* https://www.iedunote.com/perception

Rayfield, J., Croom, D .B., Stair, K., & Murray, K. (2011). Differentiating instruction in high school agricultural education courses: a baseline study. *Career and Technical Education Research, 3*, 171-185. https://doi.org/10.5328/cter36.3.171

Riyad, M., Pramana, C., & Munakib, A. M. (2020). Theoretical education vs practical education. *Test Engineering and Management, 82*, 5074 – 5081. https://www.researchgate.net/publication/338831615_Theoretical_Education_vs_Practical_Education

Rogers, E. (2003). *Diffusion of innovations.* 5th edition. Free Press.

Rogan, J. M. (2007). How much curriculum change is appropriate? Defining a zone of feasible innovation. *Science Education, 91*(3), 439 – 460. https://doi.org/10.1002/sce.20192

Rogan, J. M., & Grayson, D. J. (2003). Towards a theory of curriculum implementation with particular reference to science education in developing countries. *Journal of Science Education, 25*(10), 1171-1204. https://doi.org/10.1080/09500690210145819

Ryan, G. & Russell B. H. (2003). Techniques to identify themes. *Field Methods, 15*(1). https://doi.org/10.1177%2F1525822X02239569

Saldaña, J. (2009). The coding manual for qualitative researchers. Los Angeles, CA: Sage Publications.

Shah, S., Kiani, K., Mahmood, Z., & Hussain, I. (2011). In-service training of secondary level teachers: a follow-up of teachers' performance in comparative perspective. *Journal of Education and Practice, 2* (11-12). https://core.ac.uk/download/pdf/234633267.pdf

Shizha, E. (2013). Reclaiming our indigenous voices: the problem with postcolonial sub-Saharan African school curriculum. *Journal of Indigenous Social Development, 2*(1), 1-18. https://scholarspace.manoa.hawaii.edu/bitstream/10125/29818/1/v2i1_06shizha.pdf

Smith, K., & Rayfield, J. (2016). An early historical examination of the educational intent of supervised agricultural experiences (SAEs) and project-based learning in

agricultural education. *Journal of Agricultural Education. 57*(2), 146-160. https://www.jae-online.org/index.php/back-issues/389-volume-57-number-2-2016/1977-an-early-historical-examination-of-the-educational-intent-of-supervised-agricultural-experiences-saes-and-project-based-learning-in-agricultural-education

Ssekamwa, J.C. (1997). *History and development of education in Uganda.* Fountain Publishers. http://www.nzdl.org/cgi-bin/library?e=d-00000-00---off-0unescoen--00-0----0-10-0---0---0direct-10---4-------0-1l--11-en-50---20-about---00-0-1-00-0-0-11----0-0-&a=d&c=unescoen&cl=CL1.4&d=HASH5a996944f627034add15bf.6

Sumberg, J., Anyidoho, N., Leavy, J., te Lintelo, D., & Wellard, K. (2012). Introduction: the young people and agriculture 'problem' in Africa. *IDS Bulletin, 43*(6). https://doi.org/10.1111/j.1759-5436.2012.00374.x

Tabulawa, R. (1997). Pedagogical classroom practice and the social context: the case of Botswana. *International Journal for Educational Development, 17*(2), 189-204. https://doi.org/10.1016/S0738-0593(96)00049-1

Tabulawa, R. (2003). International aid agencies, learner-centred pedagogy and political democratisation: a critique. *Comparative Education, 39*(1), 7-26. https://doi.org/10.1080/03050060302559

Tate, J. A., & Happ, M. B. (2018). Qualitative secondary analysis: a case exemplar. *Journal of pediatric healthcare: official publication of National Association of Pediatric Nurse Associates & Practitioners, 32*(3), 308-312. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5911239/

Tedla, E. (1992). Indigenous African education as a means for understanding the fullness of life: Amara traditional education. *Journal of Black Studies, 23*(1), 7-26. https://www.jstor.org/stable/2784670

The World Bank. (2007). *Curricula, Examinations, and Assessment in Secondary Education in Sub-Saharan Africa*. World Bank Publications.ProQuest Ebook Central. https://ebookcentral.proquest.com/lib/oks-ebooks/detail.action?docID=459870

The World Bank. (2020). *Arable Land.* The World Bank Group. https://data.worldbank.org/indicator/AG.LND.ARBL.HA?locations=UG

Thurmond, W. (2019*). Field of Hope: The curriculum cycle.* Vivayic, LLC. https://www.vivayic.com/insights/field-of-hope-the-curriculum-cycle

Thurmond, W., Denney, A., & Kueker, D. (2018). *Vivayic & Field of Hope: Designing project-based learning agricultural curriculum for secondary Ugandan classrooms.* Paper presented at the annual conference of the Association of International Agricultural and Extension Education. Abstract retrieved from https://www.aiaee.org/attachments/category/181/AIAEE_Proceedings_2018.pdf

Trading Economics. (2020). Uganda: employment in agriculture. https://tradingeconomics.com/uganda/employment-in-agriculture-percent-of-total-employment-wb-data.html

Uganda Regions Map. (2021). *Mapsopensource.* http://www.mapsopensource.com/uganda-regions-map.html

United Nations (UN). (2016). *Why are rural youth leaving farming?* https://www.un.org/youthenvoy/2016/04/why-are-rural-youth-leaving-farming/

United Nations Educational, Scientific, and Cultural Organization (UNESCO, n.d.). Institute for Statistics. *Glossary: In-service training*. UNESCO Institute of Statistics. Retrieved from http://uis.unesco.org/en/glossary-term/service-training

United Nations Educational, Scientific and Cultural Organization (UNESCO, n.d.). *SDG 4 Uganda: country profile*. https://www.un.org/sustainabledevelopment/education/

United Nations Educational, Scientific, and Cultural Organization (UNESCO) Institute for Statistics. (2016). *Strategy for technical and vocational education and training (TVET).* https://en.unesco.org/sites/default/files/tvet.pdf

United Nations General Assembly. (2015). *Transforming our world: the 2030 agenda for sustainable development.* https://www.refworld.org/docid/57b6e3e44.html.

van Harmelen, U. (1998). Is learner-centred education child centred*? Journal for Educational Reform in Namibia*, *8*, 1–10. https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.737.1548&rep=rep1&type=pdf

Ward, M., Penny, A., & Read, T. (2006*). Education reform in Uganda – 1997 to 2004. Reflections on Policy, Partnership, Strategy and Implementation.* Department for International Development (DFID). https://www.semanticscholar.org/paper/Education-Reform-in-Uganda-1997-to-

2004.-on-Policy%2C-Ward-Penny/fdc933710abca41351a401b7c86a09b46558c843

Weegar, M., & Pacis, D. (2012). A comparison of two theories of learning - behaviorism and constructivism as applied to face-to-face and online learning. *E-Leader Manila,* 1-9. http://www.g-casa.com/conferences/manila/papers/Weegar.pdf

Wilcox, A. M., Edwards, M. C., Henneberry, S., & Ringer, J. J. (2021). The voices of women empowered by the INGO Field of Hope in Northern Uganda. *Journal of International Agricultural and Extension Education, 28*(3), 120-134. https://doi.org/10.5191/jiaee.2021.283120

Wisdom, J., & Creswell, J. W. (2013). Mixed methods: integrating quantitative and qualitative data collection and analysis while studying patient-centered medical home models. *PCMH Research Methods, 13*(1-5). https://pcmh.ahrq.gov/page/mixed-methods-integrating-quantitative-and-qualitative-data-collection-and-analysis-while

World Development Report. (2008). *Agriculture for Development.* The World Bank. https://openknowledge.worldbank.org/bitstream/handle/10986/5990/WDR%202008%20-%20English.pdf?sequence=3&isAllowed=y

World Population Review. (2020). World population review: Uganda population. https://worldpopulationreview.com/countries/uganda-population

Worth, S. (2006). Agriflection: a learning model for agricultural extension in south Africa. *Journal for Agricultural Education and Extension, 12*(3), 179-193. https://doi.org/10.1080/13892240600915488

Worth, S. (2008). Developing curriculum markers for agricultural extension education in South Africa. *Journal of Agricultural Education and Extension*, *14*(1), 2134. https://doi.org/10.1080/13892240701820215

Yeboah, F. K., & Jane, T. (2020). African farmers are younger than you think. Here is why. *The Conversation US*. https://theconversation.com/african-farmers-are-younger-than-you-think-here-is-why-141076

APPENDICES

APPENDIX A: New Attendees Teacher Survey Questionnaire: Pre and Post Items

Jan 2020 FOH Teacher Training Evaluation Survey Questions

1. **(PRE ONLY/QUANT)** Have you had FOH curriculum before today?
2. **(PRE ONLY/QUANT)** What two months do you prefer FOH to have teacher trainings?
3. **(QUANT)** On a scale of 1 (not) to 10 (very), how confident are you in your classroom and leading your students?
4. **(QUANT)** On a scale of 1 (not) to 10 (very), how confident are you in an external setting (like the garden) and leading your students?
5. **(PRE ONLY/QUANT)** What other teacher trainings or workshops have you participated in before now?
6. **(POST ONLY/QUANT)** As an instructor, what areas do you feel you need more training in?
7. **(POST ONLY/QUAL)** Do you think your school director and administrators understand your role as an agriculture instructor? How can we help them understand your role/job?
8. **(PRE ONLY/QUANT)** Do you, other teachers, or your school's headmaster ever use agriculture as a punishment?
9. **(PRE ONLY/QUANT)** How did you hear about FOH's curriculum and this training?
10. **(PRE ONLY/QUANT)** If you have not seen the curriculum yet, what are you hoping it includes?
11. **(PRE ONLY/QUANT)** Does your school currently have a garden and/or animals that could be used for learning?
12. **(PRE ONLY/QUANT)** What do you hope to learn from this professional development training?
13. **(POST ONLY/QUAL)** Regarding FOH's curriculum, do you think it is helpful to teach agriculture?
14. **(POST ONLY/QUANT)** What is your favorite part of the FOH curriculum? Why?

15. **(POST ONLY/QUANT)** What part of the FOH curriculum needs the most improvement? Why? How can it be better?
16. **(POST ONLY/QUANT)** What are your concerns with using the curriculum in your classroom?
17. **(POST ONLY/QUANT)** How can FOH better support you using the curriculum in your school?
18. **(POST ONLY/QUANT)** What methods used by the trainer will you use in your own classroom following this training?
19. **(POST ONLY/QUAL)** Essay: What do you plan to do with the skills you learned today? (After this training, I plan to use… in my classroom to promote learning, etc.)

Appendix B: Personal Communication with Whitney Thurmond of Vivayic, LLC.

Questions for Whitney Thurmond, Learning Designer at Vivayic, Inc.

1. What does sustainable agriculture mean to you?
2. What type of agriculture does the Vivayic teaching curriculum specialize in?
3. Can you describe your research approach prior to the curriculum development for Field of Hope?
4. What pedagogical methodologies are most prevalent in Field of Hope's curriculum design?
5. What knowledge of your clients/audience did you have prior to developing Field of Hope's curriculum?
6. Can you describe your experience in Agricultural Education? How many years of curriculum development did you have prior to its conception with Field of Hope?
7. What are you most proud of in your work with Vivayic and in working with Field of Hope?
8. Are there any challenges or considerations you wish to address in the curriculum development project with Field of Hope?
9. Are there any current projects you are working on with Field of Hope?

Appendix C: Personal Communication: Response Transcript from Whitney Thurmond of Vivayic, LLC via WebVTT.

Sunday, December 06, 2020

Hey Robin, it's nine o'clock on Sunday and my husband and I have just sold our house. And we have less than a week to pack up and get out. So it's just been a little crazy. Please Excuse My tardiness. And for getting these answers back to you. I opened up my computer, open up the word document to start typing to you, and this is the third time that it's frozen on me. I'm just going to talk, which I think you'll probably get more information out of me if I talk, rather than type. And then I'm recording. Stop. Delete. And then I'm going to send you the recording of this. And when you get it. And you're watching it. So hopefully, watching obviously now you can look over to the right side of the screen. And there should be a transcript of what I'm saying. So you'll have, you'll still have a transcript that you can copy and paste if you need to. So hopefully this works. If not, I'm glad to take another stab and talk through it. I said some of the questions as I was looking at them and thought, I just thought, oh man, these are some good loaded questions and I want to make sure I get you all of your information. And like I said, the document was also freezing so I'm taking a screenshot of the document. Since it was freezing and I'm just going to start talking through these So your question number one. What does sustainable agriculture mean to you. Really to me, that means I'm using practices that sustain the future of agriculture, meaning that the next generation is inheriting land that is productive if not more productive than what it was. When you yourself. Were farming it. I don't know if that's a research question but that's just my definition when I hear that term being used or tossed around to me. It means not depleting your soil. It means using practices that you know are safe and would allow the next person to grow food on the same piece of property without fear of depleting or depleting resources or having food that is in any way, and harmful to eat, so your second question what type of agriculture does the Vedic teaching curriculum specialize in. So if you're talking specifically about builds of hope curriculum. We were very conscious of balancing modern agricultural practices with a subsequent practice. We spend a lot of time thinking about the current state of where you've gone to is, and focusing on, you know what is currently happening, and the resources that they have available in the mechanization that they have available right now. But we also wanted to teach mechanization specifically in a way, and technology rather that, whether that be like a typical IoT technology or see technology that's huge too. We wanted to teach those things. And so, that there's at least an awareness around it. And you know, 2030, years from now, we hope that it is, you know, as a part of Ugandan agriculture. We also had a lot of people at Vivek who are very very passionate about sustainable agricultural practices, specifically, the person who helped us draft what we call the ED post. So the ad posts are the very very very first step after we cross walk to the Ugandan syllabus. So the garden syllabus lays out the objectives for us. And then from there we go and find

content that supports that objective. And so you can think of n. Ek p, or ekpo, essential knowledge profile as literally just that the essential knowledge or the essential content that has to be taught. It's not how we're going to teach it. It has no activities in it. It's literally just a content bulleted list of content, the bulleted list of content, the person who led that effort was the same person. Over the course of all four years that the curriculum, and she's not in Vivek employee. She's a sister of vibe of the Vivek employee. And she taught in Kenya for years. Taught agriculture in Kenya for years. So, She's very passionate about sustainable agriculture. So I know that all of our content was rooted in that. And if you want to know her background or if you want to see what kind of content she was likely pulling in or, or the training background that she has in sustainable agriculture. You can look at an organization called ecco down in Florida and Philip has a pretty good partnership with them at this point so if you want to reach out to them by by they obviously has relationship with them. There they are a client of ours so they focus a lot on using resources, already available in the country. And then what's cool about echo actually when we were kicking off this curriculum. I mean my Alexa wasn't on board at the time. In fact, they just decided that Alexa was going to be the first intern to go over to Uganda for the summer, but she wasn't on this trip me Mike Cathy Dan was there. Audrey who is the Vivek employee sister I was just talking about. And then a few other people went down to echo and got to see, this is like where we started the design process of the curriculum, like what it's going to look like and what's going to be important. and work carpet. Pet competences. Are we going to develop besides just agricultural knowledge, and it was so cool because they set up. It's like in like tropical portion of Florida. So you know, they have weather similar to like a lot of Asian countries like developing Asian countries and a lot of countries in Africa, and they take these plots, and they build the plot, and like, try to amend the soil in a way that is very similar to whatever country or whatever geographic region, they're trying to do research on. And then to garden to grow. The only use resources that are available in that part of the world have resources that will be abundant in that part of the world so certain types of grass is or certain types of trees or leaves or certain types of animal manure, that kind of thing is put on fields that are specific to like Eastern Africa, or, you know, certain plots will be designed and developed with terraces that look a lot like Asian countries. So it's really cool like, that's where we started the whole process and we're we did our very first brainstorm about around what this could look like and we've got to go kind of go out and see a lot specific to that part of Africa and just kind of get some of our toes dipped in the water. Alright, that was question number two. I told you I'd share a lot more if I didn't have to type, it's all out. Question number three. Can you describe your research approach prior to the curriculum, the curriculum development for field of hope. I'm not quite sure what you mean by research approach and if you're talking to me specifically, or if you're talking about the field of hopes research approach or if you're talking about my big research approach. Honestly, I'm not sure I could speak too much of any of that. This

may be what you're getting at we did an exploratory trip very early on in 2015 me my husband and another very big employee, and her husband as well. My husband has done a lot of Ag research in Africa. He spent time months in Liberia doing agricultural research there and interviewing, I think, I don't remember how many people that I think they had an interview guide of like 600 questions of or something like that so we pulled together. Um research questions, if you will, which ended up being like two or three pages long about the culture and about the type of learning and you know, is that a question. Are they a country that is very individualistic or are they a country that likes collaboration, and would enjoy group work. I mean things like that you know you just, you can't even imagine the number of questions that we thought about and went into. And some of these questions were filled of hope. Wait, and some of those questions we asked of fields of hope staff and some of those wealth staff, there wasn't really a staff at the time but build up hope, board members board volunteers, and some of those like we asked directly to teachers or directly to administrators, about their schools or about how you know do these gardens and do they have any kind of livestock facility that could then support me designed into the curriculum. And I want to be very upfront that when we were first designing this and we took that exploratory trip just to see like can we do this. Our main area of focus in geographical region was Northern Uganda, so we focused a lot on the rural areas of Uganda, to see what was available. We had a materials list, like we walked away with, like, what can be used and what is trash. You know when you gone to what gets tossed and trash that could be used as planters or it could be used as you know, have a little seed and watch it germinate and do they have protractors. And do they have notepads and do they have you know just the whole, like that. You know what materials are available. What, what materials are available to teachers, how do teachers teach. We did a lot of observation of teachers in the classroom, just observing both like, I would say low low quality teachers and really, really high quality teachers in Uganda. So we got to see kind of the spectrum. We literally walked into a classroom one day where the teacher had copied notes onto the board and was gone like the students were literally just looking at their notebooks. I'm copying from a blackboard and there was no adult in the room and we were there for maybe 30 or 40 minutes, and no adult ever came in, all the way to like we saw a lot of how I can't think of what the word is right now. Where you ask questions of your audience of your students. I can't think of the term for that at the moment so we use a lot of that too and we designed the curriculum. Alright so that hopefully that gives you a little bit of background on the research approach. Yeah, it does. We gather a lot of context and a lot of like textbooks and things like that while we were there. And then when we got back to wherever the wait and then when we got back before we ever made the decision to move forward with it. Question for what methodologies are most prevalent and filled of hope curriculum design. Hmm, well it's branchial learning is at the heart of it. Um, if you want to talk about that coke model cold. Hold experiential model is the hardest difficulty of hope, curriculum design, but there's a lot of others project based

learning was definitely something we strove toward. We hit it really heavy and you're one, and then in the one and during the pilot of SR one. When I went back over to see how it was going, we could tell that it was, it was almost so intense that the teachers were a little afraid of it and we were afraid that if we kept that going. It was too big of a change initiative, so it was too big of a hurdle we needed to start with some baby steps because otherwise, if it felt too difficult than our curriculum was just going to get put on a shelf and never used because it was too complicated for the teacher to understand. So we slowed back down a little bit and we said, you know, let's start with s one at a crawl. And then let's move to a walk in s two and s three and then let's run in s four. And so, almost built into this, the curriculum was this change management piece of helping the teachers move from just a rote learning and memorization rote memorization and just for regurgitation regurgitating information onto a board to let's start incorporating a garden like what would it look like, just to have a group garden. And how could we take the classroom out there and show what the, what that looks like and all the way to what you see an S for, which is like students have their own plots small groups of students that they get to test and research and run with their own small little plot inside of the larger group garden. And so yeah, those are the main two experiential learning. Just Kolb's model and then problem ppl. Problem Based Learning are the main two and then of course we've wrapped all of that in competency modeling development. So there's a competency framework, so that students weren't just learning agricultural knowledge but they were also learning the problem solving skills so that's an underlying competency, that's developed through the curriculum, they are learning critical thinking skills, communication skills group work collaboration. Those types of competencies as well. What knowledge of your clients. Your audience, did you have prior to develop the development of the host curriculum. So this is question five. I had never been to Uganda, until our exploratory trip. So I had 10 to 12 days in Uganda, and a lot a lot of interviews with subject matter experts, before we delve into the first development. But like I said, I didn't draft the content the content was drafted by someone who spent years teaching in East Africa, and then for us one. And I can't tell a lot of the contents came from Liana, who was a teacher that was sponsored by Philip, open, had been teaching in Uganda on time. I think she may be lived there three or four years and had been teaching. 343. It could be longer than that, you have to ask Mike or brandy that Liana really gave us the foundation for us one and getting us started, which was huge because it came from someone who had been there, and had lived have lived experience teaching, and had live experience teaching that Ugandan syllabus, had some gaps in it, and provided that to us so that was huge. Six. Can you describe your experience in agriculture education how many years of curriculum development, did you have prior to conception with fields of hope. My whole life. Agricultural Education. Oh man. My dad was an agriculture education instructor I grew up in his classroom from day one. I mean literally we had my first birthday. Wait, my mom had to drive me to take me to see him while he was doing

his student teaching. And then from there on, I never left I was in everything I was at every FFA function. And I took five years of formal agriculture education in Oklahoma, and was a state officer in Oklahoma. So Ambassador Ascension culture education for two years and then I worked at the National FFA Organization for four years, four and a half years. I trained National FFA officers. I've developed a lot of national state curriculum, national, state curriculum, wrote a lot of curriculum in the four and a half years I was there and did a lot of trainings for like the Department of State. When they would bring folks in sometimes US Department of Agriculture would do some tours. The US agriculture so it's pretty deep prior to even joining Vivek. And so how many years of curriculum development, did you have prior to conception. Okay. I want to say this, we started that in 2016. So anywhere between 10 and 12 years of curriculum development experience before we started the field of hope curriculum. Seven What was your most proud of what are you most proud of, with your work with build of hope and Robin I wrote an email to my staff that my staff. The to all work on this project in some way shape or form. We live in the final set of curriculum and to fill the Pope, I hit send on that, and Amelie typed out the words that this is likely the most significant word work, I will ever do. Because of this curriculum. It does his job, it truly can change the food security of a nation I believe that wholeheartedly. I mean there's a lot of barriers that stand in its way potential barriers, but if it really does what it's supposed to do it really could be the most influential work I've ever done. Yeah I'm proud of how we are teaching teachers to teach. And it doesn't matter if it's sad or not ag. I'm proud of how I'm proud of how the entire team feels connected to this mission and connected to people that they've never met. And I'm really, really proud of the students who take this and have a mindset switch and have a paradigm shift of agriculture, being like this backbreaking I'm not profitable work to recognizing its potential and recognizing that like they can make a profit and not only that they can provide for their families, and they can market and they. There's so much more brilliant than they ever imagined that they could be or are. And I think that this opens. I think that when they get a small glimpse of that in the garden and they get to practice it and I get to see like, Oh wow, I can do this. I grew this, like, and I can sell it for XYZ amount and make a profit. I just like think there's so much power in that. And that's what I'm proud of. Are there any challenges or considerations you wish to address in the curriculum development project with fields of hope. We have talked about a few of them the main challenge was just getting the teachers. So, you know like, you got to sit down, you got to think about your students and where students are as you write the curriculum, and what knowledge they have but you got to think about where the teachers are, because there's your first audience like if you can't get a teacher to use this then it never reaches the students so you know the problem based learning. I've already talked about yes just getting the teachers to drink transition from this rote memorization Just let me lecture you to let me think about how to create an experience that is powerful enough to anchor a concept that improves retention and that you don't just regurgitate for

it for a test but you've lived it and you know it and you can go out and do it again because to me. I mean, it matters that they pass the test at the end of the day, of course, so they go to college, they want to study agriculture, but I cared that they go back and they do it and they have a successful crop. I think one of our challenges is you've seen the curriculum is like 490 some pages. And we wouldn't normally draft 90 lesson plans that are 490 pages, because that's just this. That's just his way. It's like way too much, because that's just way too much like we're doing a Teacher's Guide in the US. I feel like they would throw it out the door. But one of the things like what I'm not picking this up for 90 pages. I can't read this to my classroom. I think one of the challenges we had and why became such a long piece is because on my first trip we were at a training on one day where we were telling these farmers to plant their corn in rows and a farmer came up to us who had been at the training previously and he was so excited to show us that he had planted his corn in rows. So we had to hike forever like Robin. I don't even know. Forever felt like miles out to this guy's farm where he's got his corn planted and we get there and he's planted it and mounds, and those mounds are in rows. And he was so excited to show us and it was so heartbreaking because when you plant, I mean you know this when you plant corn and in mounds for that close to each other and spacing the one single plant doesn't get enough nutrients to produce any corn stalks, and so he had planted four or five seeds so tightly together in his mound, that he wasn't going to have any produce, and so we had to tell him that it was past a certain vegetative state, where if he were to pull them up the routes were too entangled and he would kill all of them so that he needed to go through and he had to break the stocks of four of the five plants in each of his mounds. And that's when it hit me like that. you can't afford to get it wrong, because that is four out of five of his seeds. And honestly, it's probably not even that because who knows what the germination rate actually was for that seed. And so he lost four out of five of his crop that day. And then you kind of like you know I mean, that may mean that his family. Didn't you know they need a few months later I don't know I don't know what it meant for him but I know that we can afford to get it wrong. And this is pretty unprofessional but we used to literally say to each other. We can't get back this up. We can't back this up like that was the same. On this curriculum for four years, there was a meeting where someone said that in through tears, we can't afford to, and she said it at this up, and we're all like Yeah right. We can't, and that's why it's 490 pages so that's another challenge is just like, you know, when we're not there to demonstrate we've got to make sure that it is so clearly articulated. And sometimes it takes extra pages to do that and diagrams, you can't just say go plant in rows and think they know what that means, if you've never seen it, you don't. I mean how can you know so alright there's probably hundreds of other challenges and hundreds of other considerations. But those are two. Number nine, are there any current projects you are working on with fields of hope. Yeah. Gosh, what am I working on, um, well, the six k was something I was trying to push pretty hard fundraising is also something that we work on pretty well throughout the year, bringing in new donors and

just sharing the message of field of hope. I'm working on a few board projects one is a board training is online eight week or nine weeks I can't remember how many weeks is ended up being eight or nine weeks training that kind of takes you through it takes a new board member through the field of hope story, all the way down to their role as a board member that fiduciary responsibilities of the board member legal responsibilities of a board member, how to fund raise our communication platform that kind of stuff. I recently worked on the year end mailer with Alexa, and do a little bit of the communication stuff. Tobin takes total exit, take the lead, but I'd hop in when I can. I'm also working on just a few like really high strategy type things like succession planning and board succession planning staff succession planning. The other one that we got just got done. I don't even know if you want an alcoholic and get a list together. If you want to talk through it. Wait. I don't even know if you want, and together if you want to talk through but lots of different filter, the old of hope initiatives, hope this is helpful, again I would gladly hop on a call with you, that is more efficient for you. If you have any questions what I've shared or if you want to talk to Archer your Audrey's sister. Robin who had taught in East Africa or if you want to ask Miko brandy. If you can get in touch with Leanna I don't know if they're still in touch with her or not but there are lots of people on the initial part of this project and they did a lot of work, a lot more work than I did and I don't even know about. So hope all as well and again if you need a transcript just let me know if it doesn't work, I can definitely copy that out for you if you need it. Thanks, bye.

Appendix D: Excerpts from FoH's Agricultural Education Curriculum: Teacher's Guide and Teacher's Supplement

Teacher's Guide for Senior 1: Term 1: Table of Contents

TERM 1: Table of Contents

FIELD OF HOPE

How to Use the Curriculum

Lessons Objectives
By the time you have finished teaching this lesson, the objectives are what your students will have accomplished.

Syllabus Connection
How does this lesson align with the Ministry of Education and Sports' Agriculture Teaching Syllabus? Look here to find the topic, sub-topic, and general objective this lesson covers.

Materials
All students will need their pencils and notebooks during these lessons. The materials listed in this section will help make the most of the lesson.

Content
This section is split into three parts:

- "Interest Approach" captures students' attention and get them excited for the lesson.
- "Instruction" has been given specific titles corresponding to the activities and objectives. This section includes the bulk of the content that will be shared to educate the students.
- "Review" ensures students understand what was taught in the lesson.

Each day of content is about 50 minutes in length.

What teachers say or ask is in *italics*.
What teachers write on the board is **bolded.**
Answers teachers are listening for students to say is <u>underlined</u>.

Future Career Opportunities
Here you will find example future careers students can explore that pertain to this lesson.

Assignments
Here you will find examples of assignments that students could complete to help them further understand the content. It is your decision whether or not to assign them to students.

Instructor Notes, Ideas & Additions
As you prepare to teach this lesson, use this section to write any additional information to help you achieve success.

Teacher's Guide for Senior 1: Lesson Objectives Syllabus Connection, Materials, and Interest Approach

General Introduction to Agriculture

FIELD OF HOPE

Lesson 1: Importance of Agriculture

Lesson Objectives:

- Explain the term agriculture
- Explain the importance of agriculture

Syllabus Connection:

- Sub-Topic 1.1: Importance of agriculture
- General Objective: Explain the term "agriculture;" Explain the importance of agriculture in the economy of Uganda

Materials:

- Student notebooks
- Pencils/Pens

Content:

Interest Approach (5 minutes)

1. Ask: *When you think about what farming looks like within our community, what comes to mind?* (Pose as a rhetorical question.)

2. Do: Ask students to draw a picture of what farming looks like within their community. Invite a few volunteers to share their picture with the group by describing what they have drawn. Call attention to any patterns or recurring ideas that are shared.
    a. Say: *There are certain things that commonly come to mind when we think about farming. Depending on how much you've explored the term "agriculture," the word might bring to mind some of the same things. Agriculture is the industry farming fits within. Today, we'll be defining what agriculture is and learning about its importance in our communities and the world. It's important to realise that agriculture is a profitable industry that can help Uganda to thrive economically. If we seek out opportunities within agriculture, we can be a part of the solution to many problems our country faces.*

6

Teacher's Guide for Senior 1: Lesson 1 Objective: Syllabus Connection, Materials, and Interest Approach (cont.)

What is Agriculture? (40 minutes)

3. Ask: *Tell me about your morning, before coming to school. What are some of the things you did from the time you woke up to the time you arrived at your first class of the day?*
    a. Listen for: getting dressed, eating, drinking, etc.

4. Say: *Agriculture is the science or practice of farming including the cultivation of soil for growing crops and raising livestock to provide food, fibre, shelter, and fuel. Those who cultivate the soil or raise livestock are engaged in agriculture which is a world-wide industry. Farming is just one of the practices that falls within agriculture.*
    a. Do: Write the words below on the board, instructing students to take notes.
        - **Agriculture is the science or practice of farming.**
            - **Includes:**
                - **Cultivation of soil for crops**
                - **Raising livestock**
            - **Provides:**
                - **Food**
                - **Fibre**
                - **Shelter**
                - **Fuel**
    b. Ask: *As you look at the list of what agriculture provides, and as you consider some of the things you did this morning, how has agriculture already impacted your day?*
        - Listen for: Food eaten was a product of agriculture. Clothing put on was a product of agriculture. Shelter was built using agricultural products.

5. Say: *Every person in the world consumes agricultural products to survive – from the clothing we wear to the food we eat. Farming and contributing to agriculture is an honourable and noble profession. The agricultural industry encompasses everything involved with the growing of crops and raising of animals to processing those raw goods into products that are sold.*

6. Do: Write Psalm 24:1 and Genesis 2:15 on the board. **The earth is the Lord's and everything in it, the world and all who live in it. (Psalm 24:1) The Lord God took the man and put him in the Garden of Eden to work it and take care of it. (Genesis 2:15)** Invite one student to read the scripture aloud.
    a. Ask: *What does this scripture mean to you?*
        - Listen for: We do not own the land, we are merely its tenants, and God is the owner. God has entrusted the work of caring for the land to us. Our houses, our fields, our trash pile/dump, all belong to God.
    b. Ask: *What might you do differently if you lived your life in awareness that everything belongs to God?*

7

COMMUNITY AGRICULTURE SUSTAINABILITY ASSESSMENT
ASPECT OF SUSTAINABILITY
Production goal: Satisfy human food, feed, and fibre, and contribute to biofuel needs
Productivity of farming practice or system ○ *Is the average farm productivity increasing or declining in the community?*
Quality and safety of food output ○ *How much of the food in the community is safe to eat (are you able to eat without getting sick)?*
Affordability of farm output ○ *Can most people in your community afford to buy the food?*
Availability of farm output ○ *Is there enough food grown in your community to feed everyone?*
Environmental goal: Enhance environmental quality and quality of resource base
Soil quality and health ○ *What percentage of the soil in your community is healthy enough to grow strong, healthy plants?*
Water quality ○ *Is there enough access to clean drinking water? Do people drink only the safe water?*
Air quality ○ *Is the air in your community clean and healthy to breathe?*
Biodiversity ○ *Are there many types of plants planted and growing wildly? Or just a few?*
Animal health and welfare ○ *Are most of the animals that live in your community healthy and strong?*
Economic goal: Sustain the economic viability of agriculture
Farm business profitability and viability ○ *How often do farmers make a profit selling their crops in the market? What kind of farmers make a profit?*
Farm and household viability ○ *How many of the families of farmers in your community make enough money to pay school fees and buy what they need?*
Farm labour economic security ○ *Are the people who work on farms in your community making enough money to buy what they need?*
Community economic security ○ *Does your community have the money it needs to build the things it needs like schools and clinics?*
Social goal: Enhance the quality of life for farmers, farm workers, and society as a whole
Ensure farm operators and their households are able to maintain an acceptable quality of life ○ *Are people that live on farms living well and content with their needs being met?*
Protect the health and welfare of farmers, farm workers, and society ○ *Are people in the community mostly healthy? Or are many of them sick?*
Enhance community or social well-being from the surrounding agriculture ○ *Does agriculture in your community make life better for the people who live there?*

General Introduction to Agriculture

FIELD OF HOPE

Test Question Bank

Thirty multiple-choice questions are provided to test student knowledge on the content delivered in this topic. Write the questions on the board or ask the questions orally. Have students number a piece of paper, write their response on the paper and turn it in for grading. The correct response for each question is **bolded.**

1. Which of the following are products of agriculture? Select all that apply.
    a. **Food**
    b. **Fibre**
    c. **Shelter**
    d. **Fuel**

2. Which of the following careers can be related to agriculture? Select all that apply.
    a. **Farmer**
    b. **Biologist**
    c. **Conservation officer**
    d. **Mechanic**

3. Which of the following best describes the term agriculture?
    a. **The science or practice of farming.**
    b. The creation of garments.
    c. The preparation of food using fresh ingredients.
    d. The engineering of mechanical equipment.

4. What value can a building provide on a farm? Select all that apply.
    a. **Store machinery**
    b. Grow crops
    c. **Store produce**
    d. **Shelter animals**

5. A _____ is a living plant grown for a purpose.
    a. Animal
    b. **Crop**
    c. Building
    d. Road

6. Which of the following would help a farmer to work the land *and* manage the farm?
    a. Animal
    b. Crop
    c. **Worker**
    d. Building

Teacher's Supplement for Senior 1: Lesson 10: Subject Matter Lecture Points

Lesson 10 - #2

West Nile System
▪ Modification of the northern system due to climate and differing customs ▪ Districts of north-western UG ▪ One long rainy season due to its nearness to the Congo Basin ▪ Food crops: Finger millet, cassava, sim-sim, sorghum and cowpeas ▪ Cash crops: Arabica coffee (at high altitudes), cotton and tobacco (at low altitudes)

Montane System
▪ Mountainous regions of Rwenzori, Kigezi, Sebei, Mbale and (mountainous areas of western, southwestern and eastern UG). ▪ Low temperatures due to high altitude, fertile and deep soils some of which is volcanic. Rainfall is high and bimodal in distribution. ▪ Food crops: Plantains, Irish potatoes, wheat, sorghum, sweet potatoes, cassava, vegetables and legumes ▪ Cash crops: Arabica coffee ▪ Contour ploughing and terracing are common methods of soil and water conservation ▪ Livestock keeping is also carried out, although limited by topography

Pastoral System
▪ Regions of Karimojong (northeast UG) and Bahima of Ankole (southwest UG) – land often owned communally ▪ Large number of cattle and goats of low quality are kept. Can lead to overgrazing, bush burning, and random mating of livestock. Animals are moved from place to place in search of water and pasture ▪ Small-scale farming of annual crops such as millet, sorghum and maize is done

Lesson 21: #6

NOTE: Have three sheets of paper ready to hand to groups for activity

Group 1: Crops grown for earning money

Specialty crops, fuel crops, timber crops, fibre crops, Industrial crops, Many cereals, roots and tuber crops are staple crops but are also grown extensively for processing into industrial products such as vegetable oil and biofuel. This can create competition for the product's use and affect prices.

Group 2: Crops grown for livestock

Plant material eaten by grazing livestock. Grasses, silage, hay

Group 3: Crops grown for raising food for the population

Specialty Crops, Vegetable crops, Fruit crops, and Staple crops: Used as staple food. A staple food is one that is regularly consumed in large quantities as to form the basis of a traditional diet and which serves as a major source of energy and nutrients.

VITA

Robin Melissa Shuffett

Candidate for the Degree of

Master of Science in International Agriculture

TEACHERS' PERCEPTIONS OF PEDAGOGICAL CHANGE THROUGH THE INGO FIELD OF HOPE'S AGRICULTURAL EDUCATION CURRICULUM IN UGANDA – A MIXED-METHODS CASE STUDY

Ms. Shuffett is from Atlanta, Georgia. She enjoys traveling, learning new languages, cooking, and running. She has one daughter and over 20 different houseplants.

Ms. Shuffett completed the requirements for the Bachelor of Arts in Spanish with a concentration in International Business in December of 2018. She completed the requirements for the Master of Science in International Agriculture at Oklahoma State University, Stillwater, Oklahoma in December, of 2021.

Ms. Shuffett worked in customer service and hospitality during her undergraduate studies. While in school, she briefly worked as an urban community garden coordinator and instructor for children ages 11-15, which sparked her interest to study international agriculture and education. She acquired two years of qualitative and mixed-methods research experience as a graduate student in Oklahoma and is currently a new hire and trainee as a food broker at Interra International, a food brokerage and logistics company in Atlanta, Georgia.