Reframing AgriCULTURAL Experiences, Narratives, and Careers for African American Youth:
A Study of Community-based Programs Leaders' Motivations and Educational Space

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**Academic Abstract**

As America strives to supply a workforce for the projected 70% increase in agricultural production needed in 2050 (Holt-Giménez &amp; Altieri, 2013) and to increase its competitiveness in science, technology, engineering, and mathematics (STEM) (U.S. Department of Education, 2016), American institutions aim to recruit and retain more students within agriculture and related sciences (Association of Public Land-Grant Universities, 2009). However, an understanding of the racial gaps in agriculture and STEM is needed (Zhang, 2014) as Blacks are underrepresented the industry of agriculture (Brown & Segris, 2016), resulting in the missing skillsets and knowledge they bring to the disciplines. To understand why African Americans are missing from agriculture and STEM, Two studies were performed. A systematic literature of African Americans historical experiences in agriculture and an empirical study of African American community-based organization with emphasis in agriculture and STEM program leaders were interviewed. Literature on Social Cognitive Career Theory was used to frame the career interest development process of the individual learner to reference African American Youth, capturing African American's negative connotations of agricultural and STEM despite the knowledge and work African Americans have contributed to Agriculture and STEM since the formation of America. To address how to deter the negative connotations youth have, an empirical study was performed interviewing eight program leaders of community-based organizations that are engaging African American youth in agricultural and STEM education. Program leaders described their motivations and purpose as an act of service to the youth and the community as a way to provide youth with opportunities or capital as described by Bourdieu.

## General Abstract

To uncover experiences specific to African Americans youth in agricultural and STEM (science, technology, engineering, mathematics) career explorations and to understand why African Americans are missing from agriculture and STEM, a systematic literature review and empirical study were conducted. Literature covering the current and past African American perceptions of agriculture and STEM discipline, and narratives and experiences of African Americans in agriculture, were reviewed to explain their influences on African American youth perceptions and interest to pursue careers in agriculture and STEM. However, literature also explained the role of agricultural programs in STEM and agricultural literacy. In one paper, Social Cognitive Career Theory was used to frame the career interest development process of the individual learner to reference African American Youth. This review captured African American's negative connotations of agricultural and STEM despite the knowledge and work African Americans have contributed to Agriculture and STEM since the formation of America. In addition, to address how to deter the negative connotations youth have, an empirical study was performed interviewing eight program leaders of community-based organizations that are engaging African American youth in agricultural and STEM education. Program leaders described their motivations and purpose as an act of service to the youth and the community as a way to provide youth with opportunities or capital as described by Bourdieu.

**Dedication**

On the behalf of the ancestors, I would like to dedicate this study to the people of the African diaspora. With this research, I pay homage to the labor that they involuntary endured while losing a culture. I would also like to dedicate this thesis to the people that have supported me throughout this journey: my family, friends, peers, and advisors.

I would not have been able to get this far with the Lord watching over me and prayers from my beautiful elders and church family, Fellowship Missionary Baptist Church led under the late Pastor Richard L. Daniels. May all of the angels that are watching over me be at rest.

On behalf of the Black culture, I would like to give a shout out to my momma, Terrie Laney-Brown and my daddy, Roger Brown. I am so happy I was able to have you two to guide me 24/7 and beyond. I would like to shout out all of my aunts and uncles; sister/brother-cousins; Dasha, Ari, Lil Bit, Baby Cat, Resha, Stephanie, Rashenda, Muga, Oshae, Mia, Indy, Cambria TaTa, Que, Rog, Kwackie, Phil, Peechie, Darrell, Tanisha, Chris, Tay, Que, Berry, Drea, BJ, Squeak, Erica, Demetrius, Eric, Vonnie and all the others I didn't name you all know I love yall. And Last but not least my amazing Hokie friends who have been on this educational journey along my side Dr. Marurice Smith, Shannon, Rachelle, Racheal, Chantel, Lane, Crystal, Kayla, Courtney, Natalie, Danielle, and Dr. Lorien MacAuley. Last but not least, I want to thank all of my community and family mentors; Reverand Harris, Eric Payne, Dominique Brown, Gloria Pounce-Rodriquez, my VSU family.

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**CHAPTER 1 Introduction**

Students educated in STEM are needed as America strives to increase its competitiveness in the STEM industry (U.S. Department of Education, 2016) to supply food, shelter, and clothing to the global increasing population and to supply careers in agriculture and food (Hegerfeld-Baker, Anand, Droke, & Chang, 2015). To properly address America's lack of skillset in STEM, racial gaps in STEM industries must be addressed (Zhang & Barnett, 2014). Currently, African Americans are not entering the fields of agriculture and STEM at the same rate of other races, such as Whites and Asians (McGee, 2013, Riegle-Crumb & King, 2010). African Americans have had a long history of greatness and horror within science and agriculture that impacts African American courses to pursue agricultural and STEM careers.

McCray (1994) made it known that African Americans were not being reached by agricultural resources or governmental assistance due to the interpretation of governmental agencies collaborations with African Americans. African Americans viewed Cooperative Extension resources as opportunities for other people, "non-Black" people. He then recommended that African American experiences and knowledge be included into the Cooperative Extension System to truthfully serve its mission (McCray, 1994). A quarter of a century later, McCray's (1994) recommendation still stands today. Recommended by this thesis's research-driven results, African Americans' negative connotations towards agricultural and STEM careers should be combated by revamping the learning space and experiences for African American youth. Connecting African American youth with the land and their culture is what African Americans are missing within their learning experiences which is lost in some traditional schools (King, 2017), however classrooms outside the traditional space, community-based programs, are currently engaging African American students in such learning materials.

Ways to reframe the experiences, narratives, and careers of African Americans in agriculture and STEM are explored in this thesis to address how programs engaging African American youth in agricultural and STEM education are introducing African American youth to agricultural and STEM as a career option.

## Career Development and Capital Specific for African American Youth

Social Cognitive Career Theory, developed by Lent, Brown, and Hackett (1994) situates the development process of career interest for the individual learner. In this model, the individual learner's goals and actions to pursue a career be a direct result of personal characteristics that is defined by context such as race, and structural determinants such as America's slavery system, or one's actions and goals can be shaped by one's learning experiences that addresses one's personal characteristics and background. Although this model captures the development of career interest and what the learning brings to the educational space, it is limited to accounting for other factors influencing African American career interest, especially within the areas of agriculture, such as limited access to capital.

So, to fully understand what is happening within African American youth career explorations in agricultural and STEM, two theories are used as a frame of reference to understand the youth and the system they are developing in. Burke et al. (2009) found that social capital addresses many aspects of social context that is needed during the building of self-efficacy, and that such aspects should be implemented by scholar's and practitioners. In this research, SCCT is used to understand the individual learner and their self-efficacy development, along with a theory to understand what educators are doing and teaching in learning spaces to provide cultural and social capital, where the individual can gain knowledge and better expected outcomes within their careers and higher education in agricultural and STEM.

SCCT cognitive approach limits the model's ability to capture one's access to educational experiences and its quality. This is key to capture because behavioral choices of actions and goals in career interest development are highly influenced by historical and systematic institutional precedents (Bourdieu, 1990). Nevertheless, the model has the ability to outlines a person's characteristics and the background of the learner as a direct influence on career interest and demonstrates why African American youth are not pursuing careers in agriculture and STEM due to misinterpretations of agricultural resources, and historical and current events of oppression. However, the model also provides an area of focus, learning experiences, that could redirect and reframe careers in agriculture. Such patterns of careers being determined by historical context and characteristics within a racial system are represented in the low numbers of African Americans in STEM and agricultural higher education programs and careers today, and historically (Lancaster & Yonghong, 2017). The SCCT model displays learning experiences as another path to develop goals, actions, and interest to careers. Learning experiences' role in the model is to build outcome expectations and self-efficacy to then influence the goals and actions to pursue careers. Bandura (1997) situates self-efficacy as a characteristic that that can be developed through skills retained in learning experiences, which can be transferred into to the classroom or their careers. With such skills, the student will feel comfortable pursuing careers where the skills can be applied. However, it is important to consider factors other than self-efficacy and expected outcomes, that are barriers to African American youth. Such barriers and lack of resources are framed within the Bourdieu's (1997) social and cultural capital to capture the big picture of African Americans career development process and its various factors.

**Significance**

This research suggested programmatic changes to be made to existing programs that are designed to educate youth in agricultural and STEM education. Such changes are specific to uncovering history, engaging African Americans in agricultural and STEM practices, and providing them with capital that affords opportunities. Literature shows that skills in STEM and agriculture are built in agricultural education programs (Stubbs & Myers 2015). In addition, VanMeter, Frankenfeld, Bases, Espina, and Liotta (2014) determined that students can gain skills from their involvement in community-based projects where they are developing space where they reside. Currently, there is little to no research covering the work of African American community-based agricultural education programs with STEM components. With such literature, it was important to look at community-based programs where African American youth engage in agricultural and STEM education as a point of reference for agricultural program in existence and the upcoming programs in the future. Investigating the motivations of African American leaders will add new data to agricultural education, outreach, and recruitment research. This data will provide methods geared to engaging African American youth in effective agricultural and STEM education.

However, this study also brought out the work of community-based organizations with core emphasis in agricultural and STEM education that are changing African American youths' academic performance and overall perceptions of agriculture and STEM. Exploring beyond the cognitive approach, the findings clearly indicated that careers in agricultural and STEM was not the main focus of the programs. The programs wanted to expose the youth to more and different opportunities, teach them about themselves, and their communities. Due to the conditions of the African American community and the trajectory paths of African Americans as they develop into

adults, program leaders wanted to afford more positive outcomes to youth and spark awareness of social issues that are prominent in the Black community.  Opportunities and awareness ranges from swimming as opposed to the typical sports like basketball and football, or learning how to build irrigation systems as a form of skills that can be sold as a service for income. Essentially, program leaders described how they were building self-efficacy and expected outcomes by teaching them about behavior, trades, and other activities that  may not have been afforded to them due to the lack of capital. All of which are valuable and transferable skills for the workplace. Conversely, such skills are also framed as the foundation to self-worth, self-determination, and stewardship by program leaders. Such affordances from the community-based program are described as capital by Bourdieu (1977). Bourdieu (1986) frames capital as a reproduced form of resources that afford more opportunities for youth to excel in areas of their careers. In this research capital for careers in agriculture and STEM are  mentorship, education, experiences and networks. Although there are educational programs with STEM and agricultural education like Future Farmers of America and 4H, such programs do not include great representation of African Americans. Such lack of programs is a result of oppression of African Americans and their communies where there is a lack of capital. As a response, African American community leaders have formed programs to educate African American youth of agriculture, STEM, and social justice while affording youth activities and opportunities to expose them to ownership and power to change their reduction cycles of poverty, poor quality education, and poor infrastructure.

## Reflexivity

As a resident of Fresno, California, I felt it was important to capture the nature of such a unique place. You may be wondering what makes Fresno so unique, well simply because of the

people, its industry, and its central location in the golden state of California. Fresno is one of the largest cities in California by population trailing San Francisco but right before the state's capital, Sacramento. With a population of more than half a million people, the demographics amongst its citizens are distinctive. Fresno is a melting pot with diverse backgrounds and ethnicities of people. According to the California Agricultural Resource Directory 2010–2011 (2011), Fresno County has exported nearly 5.5 billion in agricultural production value. Despite California's productivity and profitable industry, Fresno faces food insecurity (Alkon & Agyeman, 2011) and high concentrations of poverty which also includes homelessness. Such demographics were unknown to me, or things I thought I had no control of so I never considered opportunities to change such characteristics of Fresno. However, through youth leadership councils, community-based programs in social justice, and grant-funded projects by the Environmental Protection Agency, my knowledge of community work and agriculture expanded. I became aware of new careers, new systems such as the food systems, and most importunately, new people with college degrees to help a first-generation college student like myself. As Campbell (2004) identified, learning about the local and regional food system should be a first step in educating one's self on what is going on within their area. After I became knowledgeable about what was happening or what was not present in my community, I knew I would go to college to enhance my community.

I can honestly say, I probably would not have received a full-ride academic scholarship to obtain a B.S. in Agribusiness without the capital provided by the various community-based programs I participated in throughout high school. Furthermore, I most certainly do not think I would have been able to be a part-time United States Department of Agriculture Rural Development employee, gaining experience at the national office in Washington DC, and also

working in my own community at Fresno, CA field office. I did not think any of these outcomes were possible because I never knew professionals in such fields nor did I know of community members that had received the USDA scholarship. In addition, there was little to no space for scholars that came from my community to reach back to students who might want to follow the same path as them in education. For example, athletic programs are prevalent in my community, starting at early ages up to college. Such camps are organized by retired and current professional athletes. However, the only camps for academics are limited and typically spaces that are not welcoming or spaces that do not recognize what I have to bring to the process from my personal experiences.

Fortunately, I found community programs that introduced me to my mentors and my network of social capitals (Bourdieu, 1986). Mentors shared with me the facts of education and the industries in relation to my socioeconomic situation and my local environment. They were able to share that agricultural studies have funding, scholarships, and there is an USDA scholarship that will pay for your college degree and provide you with internships every summer. In addition, I was told that such scholarships are only given to students who apply to Historical Black Colleges and Universities (HBCU). With such advice given to me that was not delivered to me by the traditional school system and its counselors, I became heavily active in the community through the community-based program in hopes of creating the perfect portfolio for scholarships and college applications. This process led me to an internship with Fresno City's Planning Department as a high school senior. My experience in councils and programs in Fresno has continued to support my educational career leading to my current assistantship for my Master's program in Agricultural, Leadership and Community Education. Without my experience and participation in community-based youth organizations, I probably would not have

known of the possible benefits of professional organizations like MANRRS while in my undergraduate career. At the MANRRS national conference I was able to network with professionals, which led me to Virginia Tech through the George Washington Carver Assistantship Program.

Non-profits in my community have had such a great impact on myself. I co-founded a non-profit "Building Youth Tomorrow Today". Since a child I knew I wanted to go to college. Specifically, I knew I wanted to attend a HBCU. I also knew that my parents didn't have a savings account for my college expenses, and in addition, I knew I was not going to pay for an education to be in debt. With this mindset, I knew I had to develop a scholarship package starting with my portfolio. My father, playing a critical role in my activism, molded me to be a voice for my community, Fresno, CA. With this voice, I developed skills in leadership and was afforded many opportunities to work with my local and national government.

Through such community and professional work, I was afforded copious opportunities to become a member of community-based programs and to be exposed to multiple career options within community work and more importantly, I was afforded navigations to colligate scholarships to study agriculture. In addition, I have been blessed to extend my experiences as capital and help four other inner city students under me to attend HBCU's from California debt free. Goals as such are possible because of community-based programs spreading knowledge of community-based issues. As we aim to have more African American youth in STEM, community-based programs provide capital for young inner city youth like myself.

**Definition of Terms**

AG-STEM: Area created with a goal and aims of preparing minds with a wide and open range of scientific and engineering abilities, with the technological and mathematical skills to manage the large scale programs (local food systems or industrial systems) that can assist and add knowledge to the agricultural industry meet their challenges. Programs as such could take place in the local food system.

Career Exploration: The course of development that includes the process of learning about yourself and work that you want to add to the world. This includes identifying and exploring possibly satisfying occupations, and creating an effective strategy to realize your goal. (Career Exploration Guide, 2015).

Agricultural Education: Agricultural education is the processes of teaching students about agriculture, food and natural resources. Through these subjects, agricultural educators teach students a wide variety of skills, including science, math, communications, leadership, management and technology. Agricultural education is delivered through three interconnected components: 1) Classroom or laboratory instruction, 2) Experiential learning — Learning experiences that usually take place outside of the classroom, supervised by the agriculture instructor and 3) Leadership education — delivered through student organizations such as the National FFA Organization and 4-H. (National Association of Agricultural Educators, 2016).

African American or Black: An ethnic group with ancestry from native populations of Africa (U. S. Census Bureau, 2011). Throughout the literature, other authors used both terms, African American and Black, to refer to the same group of people. These two terms will be used interchangeably. When speaking of the actual experiences that pertain to the history of Black Americans, African Americans will be used.

Community-based Education: This educational experience is way to enrich and expand classroom learning. Similar to place-based, environmental, or place conscious education, such approaches share the goal of formulating learning as more relevant and meaningful to the students by placing it in local and familiar issues, contexts, and challenges (Cole, 2010).

Minority: A group characterized by ethnicity or race, e. g., African American, Hispanic, or American Indian in the United States (National Science Foundation, 2012).

STEM: Refers to the college majors of science, technology, engineering, or mathematics disciplines which include agriculture, astronomy, biology, chemistry, computer and technological sciences, engineering, geology, mathematics, applied mathematics, physics, and statistics (National Science Foundation, 2012).

Social Justice: Actions that are towards identifying issues and attempting to address structural disadvantage, discrimination and inequality. Fraser (2009) summarizes approaches to social justice in two ways. The first approach has an emphasis on reorganization of resources and goods, whereas the second focuses on politics of recognition.

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**CHAPTER 2 The Development of African American Youth's Interest in Agricultural and STEM Careers and Social Cognitive Career Theory**

**Abstract**

In this philosophical study, social cognitive career theory (SCCT) literature is extended to specifically address how historical experiences and narratives of African Americans in agriculture and STEM have shaped and influenced Black youth perceptions of agricultural and STEM careers that were found in previous studies and have contributed to the underrepresentation of Blacks in agriculture and STEM careers. The SCCT model is used to help situate Black youth career explorations and academic interest within a wider context of history and narratives of the Black community. Throughout this paper, history and narratives as personal characteristics and structural determinants are identified as factors in Black youth career explorations and academic interest. This review suggests that learning environments with Black youth should focus on programming that attends to race, African American history, and provide mentors that Black youth can identify with to build self-efficacy and positive outcome expectations for overcoming barriers that are preventing youth from entering agriculture and STEM career trajectories.

Keywords: Social Cognitive Career Theory, Black/African American Youth, STEM, Perceptions

**Introduction**

The Bureau of Labor Statistics (2009) predicted that 2.7 million new job opportunities would be available in 2018. Today many of these jobs are in the areas of science and technology fields, which accounts for nearly a fourth of all new jobs (Bureau of Labor Statistics, 2009). A global projection of nine billion people by 2050 (Food and Agriculture Organization, 2009) demands more scientific and engineering disciplines (STEM Food and Agriculture Council, 2014) for food, shelter, and clothing.

As America strives to supply a workforce for the projected 70% increase in agricultural production by 2050 (Holt-Giménez & Altieri, 2013) and to increase its competitiveness in science, technology, engineering, and mathematics (STEM) (U.S. Department of Education, 2016), its institutions also aim to recruit and retain more students within agriculture and related sciences (Association of Public Land-Grant Universities, 2009). It is important that America prepare STEM-ready students to meet the need by developing STEM-interested youth to prepare youth to enter the steady stream of STEM innovative technologies and processes jobs (Tilinghanst, Petersen, Rizzuto, Dabiri, & Gonzalez, 2015). When analyzing the populations who are pursuing education or professional careers within the STEM fields, there are obvious missing populations such as people of color (PCAST, 2012). There is a need for students educated in STEM fields, requiring attention to the racial gaps in STEM education (Zhang & Barnett, 2014), which also includes many studies related to agriculture as well such as agricultural engineering and computer science. Data specified that the proportion of Blacks continued to be low in science and engineering occupations as compared to their proportion in the total population (Zhang & Barnett, 2014). According to the National Science Board's Science and Engineering Indicators (2018), sixty-six percent of science and engineering degrees were awarded to white

students, whereas Blacks only accounted for 4.8 percent. Increasing the representation of African American in these industries will increase the diverse set of skills available to provide solutions and to develop innovations. These missing populations represent an untapped opportunity to expand STEM employment in America, as the national agreement stands that the nation must do more to increase its competitiveness (Beede, Julian, Langdon, 2011) and African Americans have made great strides in STEM and agricultural in the past. So now we see that Blacks are underrepresented in the industry of agriculture and science (Brown & Segrist, 2016). African Americans make up 12% of the population however; only 3.9% makes up the U.S. science and engineering workforce and 2.8% of the biological and life science workforce (U.S. Census Bureau, 2011), resulting in the missing skillsets and knowledge they bring to the disciplines.

This study describes social constructs such as race and structural determinants as factors contributing to Black youth perceptions towards pursuing agriculture and STEM careers, supporting the American Association of Agricultural Education (AAAE) research agenda Priority 3: "Sufficient Scientific and Professional Workforce that Addresses the Challenges of the 21st Century" (Roberts, Harder, & Brashears, 2016). This research is needed to address the issue of underrepresentation of African Americans' in agricultural and STEM fields and why such gaps exist. The model of Social Cognitive Career Theory (SCCT) by Lent, Brown, and Hackett (1994) will be used to show the pathway of developing interests and goals to pursue careers specifically for agriculture and STEM and Bordieu's capital is used to provide context specific to the African American experience access and process to career development within a wider context of structural barriers. Although there are multiple factors in one's career development process, this study specifically looks at perceptions Black youth have towards agriculture and STEM and uncover the historical events and narratives of African Americans to

provide context of how to overcome the negative connotations Black youth have of agriculture and STEM (Jordan, 2011). This detailed review will illustrate that despite the various contributions and technology advancements African Americans have contributed to agriculture and STEM (Moon, 2007), African American youth continue to be absent from agricultural and STEM careers due to a lack of representation and education (Jordan, 2011).

## Social Cognitive Career Theory

The SCCT model explores how academic interests mature, how career choices are developed, and how these choices to pursue careers are made. Developed by Lent, Brown, and Hackett (1994), the model is based on Bandura's (1986) Social Cognitive Theory (SCT). Bandura's theory illustrated three factors to one's development as reciprocal determinants of human functioning: (1) personal actors in the form of cognitive, affective, and biological event, (2) behavior, and (3) environmental influences as major influences to one's outcomes in behavioral choices. SCCT emphasizes the role of self-efficacy and outcome expectations, as results from learning experiences, in the formation of career-related interests and choice goals and the attainment of career-related performance outcomes (Lent, Brown, & Hackett, 2000). Lent, Brown, & Hackett, (1994) advanced Bandura's (1986) theory by taking into account person inputs and background. Such factors then allow for African Americans as a sample in SCCT research. The SCCT model also illustrates the direct impact of race and background factors on one's interest, goals, and actions towards careers. However, the model also indicates that learning experiences are able to build and shape self-efficacy and expected outcomes.

SCCT asserts that race, social class, or the past system of American slavery, for example, adds to self-efficacy beliefs and outcome expectations through significant learning experiences (i.e., personal performance accomplishments, vicarious learning, verbal persuasion, and

physiological states) which are shaped by social constructs around these factors (see figure 1.).

Such social constructs of race and sex, both have shown correlations to one's experiences in

career explorations in areas such as STEM (Haynes, Jacobson & Wald, 2015; Dickinson,

Abrams, & Tokar, 2017). These learning experiences, in turn, influence one's level of self-

efficacy and expected outcomes toward a particular career and influence the development of

relevant choice goals. SCCT also suggests that one's interests, choices, and performance are

impacted (directly and/or indirectly) by environmental factors (Lent, Brown, Hackett; 1994)

throughout the academic and career development process (Lent, Brown, & Hackett, 2000).

Environmental factors are broken down into two areas, one being the proximal contextual

factors, such as known discriminatory practices in agriculture, which is shown in the upper right

portion of the model. The model basically represents that African Americans have a negative

history of discrimination which automatically negatively impacts African American youth choice

(and access) to pursue careers in agriculture. This is a major component during the career

decision making processes. This is why Bandura (1986) social cognitive theory is not enough to

explain how the career development process of African American youth in agricultural and

STEM. Bandura (1986) is not sufficient to account for all the factors that go into career choices

of African American youth. The second environmental factor (shown in the bottom left section

of figure 1.) holds structural determinants, such as role models, to which one is exposed.
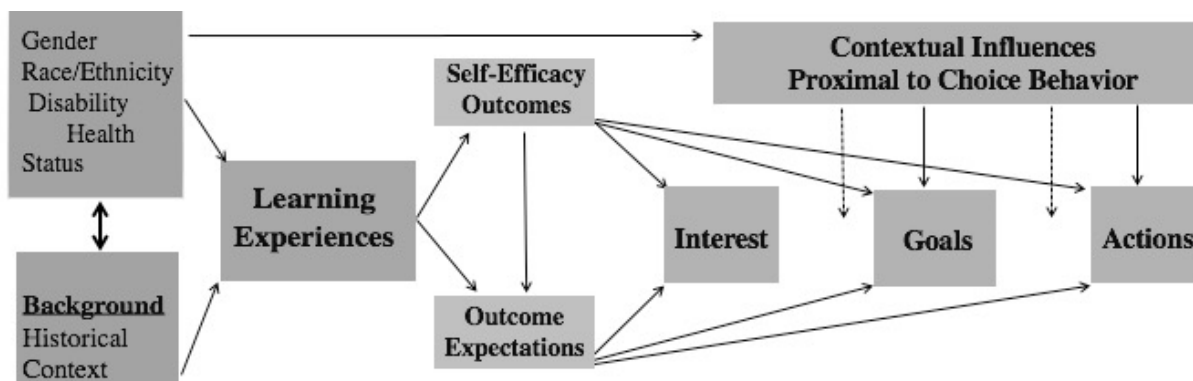
*Figure 1. Integrative model of career interest. Modified from Lent, Brown, & Hackett (1994).*

SCCT constructs have been used in previous studies to investigate minorities' career explorations (Brown & Lent, 2017) and empirical support for the SCCT model has been provided with meta-analyses (Brown et al., 2008). There is not much literature however, pertaining to racial and ethnic influences within the model (Flores & O'Brien, 2002; Spokane et al., 2003). Literature applying the SCCT model to understand influences unique to racial and ethnic groups is increasing (Lent et al., 2015), but there isn't any work referencing the historical, especially within the frame of context related to slavery's influence on African American youth career explorations in agriculture and its related sciences. Historical events will be reviewed in literature to bridge what youth have found as barrier to pursuing agricultural careers (Outley, 2008).

## Career Development of African American Youth

SCCT address such issues related to background and history, but one of the limitations with the model is that it fails to capture why African Americans do not have access to agricultural education and mentorship in agriculture and STEM. But the model does try to get at basics of why African Americans learning space needs to be addressed separately from other minority groups, as Brown and Lent (2017) continues to extend the model to reach new cultures and social justice themes within career development. Though the model is not sufficient to explain the African American experiences within agricultural and STEM career explorations and what has happened within the generational influence post slavery until today within the African American family, it does provide reasoning to why history and race must be addressed in agricultural education to then be a core educational in African American learning experiences. As the model does not account for the racial system where whiteness is dominance, such social

capital of community-based capital can introduce and reframe the image of agricultural and STEM disciplines for African American youth. Though there are other theories such as, Critical Race Theory (Stovall, 2005) that goes into more detail of race and neo-liberalism impacts on African American's education within a White dominate culture and society, a framework of capital is used to specifically look at the educational and career development process of career interest formation. Bourdieu and Passeron (1977)'s theories assume that youth who have access to capital, resources, will perform well in education. Although Bourdieu does not address race, he accounts for the opportunities given to people to improve their outcomes. Bourdieu and Passeron (1977) later introduced the term reproduction to explain the discrepancies in academic achievement among students from different socioeconomic classes. Low socioeconomic classes include African Americans. This perspective helps us understand what is happening to the learner.

Investigating the career development process is complex due to the various factors impacting one's choice, interest, and goals. In this study, we aim to understand the career development process for African Americans in reference to them making or considering agricultural and STEM careers as a choice. Studies looking at youth perceptions of agricultural and STEM careers (Outley, 2003; Jordan, 2011; Brown, 1993; and Luckey, 2012) have not directly addressed the impacts historical context and race on African American youth choices to pursue interest in agriculture and STEM. A previous study by Dickinson, Abrams, and Tokar (2017) applied SCCT to African American college students and found that aspects contributing to the learning experiences should be revisited in further research, especially for minority populations such as African Americans. In particular, this study did not capture characteristics or the background that one brings into the learning experience.

**Objectives**

Previous studies using the career theories like SCCT such as Holland (1997) have commonly missed background and characteristics as defined by society, that contribute to African Americans career development (Haynes, Jacobson & Wald, 2015). Instead they have focused more on influences such as parents, which applies to all race groups (Garriott et al., 2017). In addition, there is very little literature looking at the career development process of Blacks and how to address their career learning and growth (Owens, Lacey, Rawls, & Holbert-Quince, 2010). However, this study connects the past experiences and current narratives that youth have to influence their perception and interest in agricultural and STEM. This study highlights the need to address history and culture in learning spaces that are engaging African American youth in STEM and agricultural education.

The objectives of this study were to (1) explore the historical and current experiences and narratives of the African American experience in agriculture and STEM and (2) explore the career development process of African Americans. It is also important to discuss how these experiences shape and influence the perceptions African American youth have of agriculture and its related scientific careers within their career development process. Through this investigation, recommendations for restructuring educational experiences in agriculture to tailor to the needs of Black youth were identified. This approach suggests answers for AAAE research priority question of, "What strategies are effective in recruiting diverse populations into agriculture and natural resource careers?" (Roberts, Harder, & Brashears, 2016, p. 6).

**Methods**

In this article, an understanding of influences on career development is further advanced by applying the SCCT model to a specific population and career area and identifying factors that

are not explicitly addressed in the model. The process of Black youth's career development was investigated, specifically looking at career areas such as agriculture and STEM, adding to the growing literature of African American barriers within educational and career development (Grier-Reed & Ganuza, 2011; Rogers & Creed, 2011). The methods to this study were designed as a comprehensive literature review beginning with uncovering previous authors who have researched African American youth perceptions of agriculture and STEM and their overall presence in agricultural and STEM careers. Following such findings, a historical recap was done to bring out the various influences of African American youth perceptions of agriculture. Findings shaped recommendations for future research such as investigating agricultural programs and its effectiveness to teach life skills and introduce African American youth to STEM principles.

Historical context provides a perspective used to analyze past trends to uncover influences that are useful to our current situation and future endeavors. SCCT (Bounds, 2017) highlights the manner in which various contextual factors (e.g., gender, socio-economic status, and racial–ethnic background) may enhance or serve as a barrier to one's career development. For this philosophical piece, historical data, government reports, and findings from previous studies are used to further describe the lived experience and background that African American youth may bring into learning experiences in agriculture. This is done by researching previous and current perceptions that African American youth have towards agriculture in relation to historical context of African American history and resilience within a racist society. This approach analyzes historical and current factors, beginning with the onset of American slavery, that may affect Black youth's career interests in agricultural and STEM fields. Sources were identified by reviewing previous studies and literature that revealed and identified factors

influencing and forming Black youth perceptions of agriculture and its related sciences careers and studies.

Various naturally existing historical and current factors affecting the Black youth population were analyzed. Cultural influences have not been traditionally addressed as a factor in career self-efficacy (Brown & Lent, 2017). Research has been encouraged to consider specific variables pertaining to group such as African Americans like background (e.g., parental support, socioeconomic status) and proximal (e.g., educational climate) contextual factors, as barriers in African American career development. The theory frames Black youth career explorations and academic interest (i.e. expected outcomes and goals) to be influenced by a combination of uncontrollable components that are often defined by society such as race, and what Lent, Brown and Hackett (1994) describes as personal inputs and backgrounds such as stories of slavery which parents aren't the most supportive due to racial climates in the classroom and community, which may not be reflected in learning experiences (Ali & Menke, 2014) to develop positive actions, goals, and interest in agriculture and STEM. Investigating cultural experiences of African Americans is done to explain the formation of the perceptions of African American youth over the past years, in hopes to establish future studies and practices needed to solve the American issue of African Americans missing from agricultural and STEM careers and areas of study.

## Historical Context of African Americans in Agriculture

African Americans have been present in agriculture since the onset of the displacement of Africans as chattel throughout the Atlantic Slave Trade. Beginning in the early 1500's, people of African descent were brought into the Americas from modern day Dominican Republic as laborers within the gold mines (Rawley & Behrendt, 2005). As Africans were traded amongst the

new world, agricultural production simultaneously expanded in all forms of production and slaves as human capital to perform agricultural labor expanded as well. African slaves, unlike the native slaves in the West Indies in this "new world" known as the western world, were more skilled in agricultural crop productions (Hornsby, 2005). More importantly, they were resistant to many diseases Europeans carried and spread such as Malaria, which claimed many European and Native lives as the Europeans invaded the lands. In more detail, malaria was common in American rice swamps and tobacco fields causing African slaves to be the best-fit laborers in Virginia and the Carolinas (Hornsby, 2005), where American slavery began. In the early 1600's tobacco became a cash crop in Virginia, leading to the first commercial crop of tobacco in 1612. By 1619, enslaved Africans were imported into British America for agricultural crop production (Rawley & Behrendt, 2005) and forced into America's slavery system as laborers (Williams, 1883).

Not only were the slaves forced to perform agricultural duties as a labor task, gardening practices outside of slave labor was important for slaves' survival and health. As slaves on plantations, their diet was dependent on the master's rations. Food was scarce, forcing them to grow their own in small gardens, sometimes hidden or along the side of slave cabins or under their fireplaces to prevent their crops from freezing (McWilliams, 2005). Some slave gardens were also a source of money for slaves to purchase material items such as women's hair bows and children's toys. According to Williams (1883), many enslaved African American gardens and personal farming were key in providing a sense of independence, and empowered African Americans to learn the craft of economic bartering. McWilliams (2005) discusses evidence of West African crops such as yams and peanuts, grown within African American slave gardens, indicating slaves planted specialty foods to diversify their diet and preserve the culinary

traditions of home. He says, "Slaves at Monticello also appear to have kept a few domestic chickens" (McWilliams, 2005). Birthed from the slave experience and its labor were agriculture and scientific innovations and discoveries by African Americans such as the cotton gin and peanut butter. However such strides don't undermine the negative perception. Conversely, associations of slavery as slave-based agriculture dominates the knowledge of agricultural discoveries and technological inventions Blacks have contributed to agriculture, and connotes the current negative perceptions of agriculture formed by Black youth (Outley, 2008).

### African Americans Studying Agriculture and Related Sciences

Despite the conditions of slaves and their educational statuses, Blacks were knowledgeable in agriculture and STEM. The institution of slavery in America prohibited slaves from reading and writing (Butchart, 2006). They were either secretly taught or taught by their masters who trusted them, and this was rare. Although disobeying this law resulted in serious consequences such as whippings, starvation, and hangings, a few slaves became literate. Former slaves such as George Washington Carver and Frederick Douglass escaped slavery and became influential Black men in the realm of education. Frederick Douglass describes his education as a characteristic that makes him unfit to be a slave (Warnick, 2008). Historically Black Colleges and Universities (HBCUs) were specifically founded to provide college education to Blacks beginning in 1837, prior to the issuing of the Emancipation Proclamation in 1863 (Albritton, 2012). HBCUs had a sole purpose of providing Blacks with basic education, teacher education, and training to become tradesmen. For example, the Institute for Colored Youth opened a farm which became the first HBCU, Cheney University of Pennsylvania (Jackson & Nunn, 2003).

After the abolishment of slavery, the era of scientific agriculture evolved and produced knowledgeable Black farmers, technicians, engineers, machinists, and scientists. African

Americans in particular studied at the 1890 Land Grant Colleges and Universities, referred to as 1890's, which were also Historically Black Colleges and Universities (HBCUs). They were established by Congress to assist farms and rural populations (Finkelman, 2009). Vocational training was thought to be in the best interest of African Americans and was awarded to Blacks by Booker T. Washington. He "believed all Black southerners needed to know how to work on a farm. He idealized the skills of subsistence farming and urged people to use them to escape poverty" (Ownby, 2003, p. 34). Washington founded Tuskegee Institute (currently known as Tuskegee University) in 1881, serving as the model university for the 1890 land-grants (Stefon, 2015). The institute highlighted agricultural and industrial education. During the 1930's, Tuskegee then formed an African American male youth leadership organization, "New Farmers of America" (NFA). The organization was modeled from another male organization for youth at Virginia State University, an HBCU 1890 land-grant university. In 1963 NFA membership hit a peak of 58,000 plus members and shortly after NFA merged with Future Farmers of America (the White youth agricultural leadership organization) as the civil rights segregation act was passed lowering the amount of Blacks in the agricultural leadership organization.

Although the 1890 land-grants were established to assist farmers, according to Marbury (1979) within the late 1900's, they actually channeled much of their research efforts and students towards assisting the industry and big businesses (Gilbert, Sharp, & Felin, 2001). Meaning much of the knowledge learned at the universities did not directly help the local surround Black communities compared to 1862 land-grant universities assisting local farmers and individuals (Duemer, 2007). Merem (2006) found that many African American farmers didn't receive sufficient information to capitalize from government programs that afforded assistance to them. Instead of helping the community with agricultural education and skills, Blacks took their

education into the industry and used their knowledge to work in the factories. In addition to this, Blacks were constantly misinformed about resources, government programs and received less money than requested because of discriminatory practices within the USDA which were also hard to track (US House of Representatives Committee on Government Operations, 1990). This eventually contributed to Blacks farmers' loss of farmlands over the years and the decline in numbers of Black farmers (Marbury, 1979). The lack of assistance with farming in addition to discriminatory practices during this time period, hindered many Blacks from being successful farmers, resulting in a reason for migration to the north for new work.

## Black Farmers

Black farmers in particular have had a pivoting experience in history in the United States from owning almost no land after the Civil War in 1865, to owning at least 15 million acres by 1920 (Banks, 1976). The history of racism and discriminatory practices dating back to the 1900's is a direct result of what we see today of low representations of Blacks within agriculture due to discriminatory practices of the government. The increase in land ownership and farming that led up into the 1920s was a result of Black agents forming cooperative extension systems from the few HBCU land-grants that were established at Hampton University, Prairie View and Tuskegee (Hurt, 2011). Hurt (2011) explains that although this system of education benefited the Black farming community, it was hard to sustain due to the South's indebtedness which hindered Black's success in the farming industries. Within a span of about 80 years, African American farmland decreased from 15 million acres to 2 million acres (Browne, 2003). According to the 2012 United States Department of Agriculture National Agricultural Statistics Service report (2012), Black farmers as of the 2012 census, represent 1.4 percent of the farming population, which is two percent greater than in 2007. Although there has been a slight increase, this

discrepancy of Black farmers is reflected in lack of Black youth presence within agricultural and STEM industries related to agriculture.

## Why are Blacks Missing from Agriculture and STEM?

Review of the literature uncovered three primary areas that contribute to the lack of African Americans in agriculture and STEM careers: lack of mentorship and representation within the industry, negative perceptions held by youth, and limited access to educational experiences in agriculture.

## Mentorship and Representation in Agriculture and STEM Industry

Unlike their White counterparts, African Americans have a long history of discriminatory practices in America that have prevented previous generations from obtaining positions and roles to then pass on to their children (Gilbert, Sharp, & Felin, 2001). One of the factors that contributes to such a slow growth of Blacks in the agriculture and STEM is the lack of interest from the new generations that elders are unable to foster (Gilbert, Sharp, & Felin, 2001). In a study of Black youth, Townsend (1994) found that there was a lack of mentorship and a sense of belonging in the fields of agriculture and STEM due to lack of minority representation of faculty and staff. This resulted from historical but still relevant trends of Blacks not wanting to work in a racially hostile environment of agriculture (Darling, 1982). Although this was years ago, it is still relevant today. It is important to find solutions to build that gap between youth and elders to perhaps foster more interest of agriculture and STEM careers for Black youth. This mentorship is important to the formation of youth perceptions of agriculture and STEM.

## Youth Perceptions of Agriculture and STEM Careers

To better understand the relationship African American youth, have with agriculture and STEM education and careers, it is important to cover literature that has looked at African American

career development processes and key influences specifically in agriculture and STEM. Reasons why Blacks are entering into academic and career trajectories in STEM fields at low rates revolve around their lack of interest (Leggon, 2006) and this is true of agriculture as well. The agricultural industry is broad with various careers, but this is not always known to prospective students (Baker & Abrams, 2011). Luckey (2012) assessed the perceptions of participants in a majority Black fourth grade agricultural after-school program towards farming. He found that 90 percent believed youth like themselves should learn more (Luckey, 2012) and wanted to learn more about agriculture. This finding highlights the potential for educational programs to influence minority youth perceptions towards agriculture, but negative perceptions persist. Holz-Clause and Jost (1995) concluded youth aligned agriculture with farming, but made no connection to the technical or research-intensive aspects of agriculture. Urban youth, as defined by Kuperminc, Smith, Henrich, (2013), typically in areas where high populations of Blacks and at-risk Black youth reside, had little interest in agricultural careers but suggested early childhood education would have influenced their interest in agricultural careers and post-secondary studies (Holz-Clause & Jost, 1995).

Parmer (1993) analyzed African Americans students' career choices and found that a major influence came from their perceived cultural and economic barriers in society. He concluded that African American do not have many routes to careers, and many of them are athletic related professions (Parmer, 1993). Outley (2008) interviewed minority students involved in a society professional development conference, Minorities in Agriculture Natural Resources and Related Sciences (MANRRS), and concluded that a negative perception of careers in agriculture and natural resources is a major barrier to recruiting minorities into such fields that encompass many areas related to STEM. Other studies suggest Blacks aren't involved

in such agricultural programs because of their formed perception towards agriculture related to slavery or discrimination (Hunte, 1994). Such perceptions covered an overall historical context related to cheap labor (Brown, 1993; Hunte, 1994) and slavery (Brown, 1993) that hindered students from pursuing such careers in STEM and agriculture (Morgan, 2011) because stories of success in agriculture from elders are lacking (Barker, 2007). Many youths feel as if the agriculture and STEM fields are dominated with Whites inflicted racist views which do not favor people who look like them (McGee, 2013). This adds to the lack of mentorship roles and a sense of belonging (Townsend, 1994) that Black youth experience. As a solution, research has shown that mentorship and exposure to agriculture and STEM could be incorporated through agricultural programs with mentors and leaders African Americans can identify with during their learning experiences (Museus, Palmer, Davis, & Maramba, 2011).

## Educational Experiences in Agriculture

When considering why African Americans aren't represented within the industries of agriculture and STEM, it is important to look at educational experiences, inside and outside of the school. Agricultural education programs vary in their own curriculum designs, ranging from community-based learning to school-based agricultural education, with or without a STEM focus. School-based or community-based agricultural education programs are possible vehicles for teaching skills that can be developed in the classroom and transferred outside the classroom to influence youth to pursue AG-STEM careers (Stubbs & Myers, 2015). Agriculture and STEM education have both been seen as a great tool to connect content knowledge with real world issues (Ejiwale, 2012), overall helping students retain more knowledge of STEM and agriculture naturally.

Agricultural education programs serve an overall purpose of introducing STEM concepts along with the various careers and studies within the area of agriculture. Programs composed of these various disciplines are conducive to the efforts of recruiting minority students within the STEM workforce and agricultural industries. According to Krasny and Tidball (2009), agricultural education programs are possible tools to provide students with general knowledge, such as history, and mentorship to influence Black youth interest in STEM careers. Some agricultural education programs are placed within predominantly Black classrooms; however, literature reporting FFA and 4H racial demographics is limited. The few articles represent low representation of African American youth (Wooten, Rayfield, & Moore, 2013; Velez, Clement, & Mckim, 2018). Studies of structural inequalities within the education system have shown that African American students generally don't have evenhanded preparation to pursue math and science in high school (Martin, 2009, 2012) and minimum preparation for pursuing college majors in STEM disciplines (Leggon, 2006).

Leadership activities conducted within programs such as FFA are able to equip their students to learn about teamwork, public speaking and debates, writing for clear communication of ideas, and other skills identified as important for the worker of the future (Hains, Hansen, & Hustedde, 2017). Dailey, Conroy & Shelley-Tolbert (2001), found that participants saw that classroom themes such as teamwork, collaborative learning, economics, or management can easily transfer to life applications. Supervised Agriculture Experience program (SAEs) help educators assist their students in using classroom knowledge throughout daily encounters (National FFA Organization, 2015) and within the workforce, by providing students opportunities to apply what they have learned in the classroom and to transfer the knowledge and skills to a real-world situation (Hanagriff, Rayfield, Briers, & Murphy, 2014).

Agricultural education is one program within classrooms today which incorporates these valuable, transferable skills into the curriculum. The life experience gained within agricultural education programs has also become a profitable commodity in the workforce (Dailey, 2009). Many studies show that agricultural education improves the acquisition of basic science and mathematics process skills of high school (Hanagriff et al., 2014; Martin, Tummons, Ball, & Bird, 2014), and elementary students (Mabie, Irani, & Baker, 1996). Aquaculture lessons taught within agriculture programs can improve students' science and mathematics achievement scores as a result of their participation in agricultural education programs compared to their past performances in the exact same classes (Conroy & Walker, 1998). Programs such as FFA and 4-H allow students to gain hands-on experience with agricultural activities allowing engagement in leadership and educational development (Wooten, Rayfield, & Moore, 2013). Such experience and practical knowledge gained from such courses are also favored by employers and viewed as valuable experience.

Although these programs are influencing students to notice STEM and agricultural careers, such programs are not reaching the African American population (Velez, Clement, & Mckim, 2018). In all, these programs do not consider the knowledge African Americans could add to the class. Such structures are a representation of the system of racism that is endemic in America's society (Tate, 1995), and explains the structural inequalities that African American youth faces in the education system. Agricultural education programs serve an overall purpose of introducing STEM concepts along with the various careers and studies within the area of agriculture. Programs composed of these various disciplines could be a key component of the efforts of recruiting minority students within the STEM workforce and agricultural industries if these issues are attended to.

**Discussion**

Due to the lack of empirical studies exploring African American youth career development paths in agricultural and STEM, this philosophical paper compiles ideas and previous research of influences to one's career choices. This paper situates history as a factor in decision making for African American youth during their career development phases. This is necessary as past forms of racism and discrimination are part of the reality for African American youth today. To build expected outcomes, a reframing of education for African American history and their experiences in agriculture and STEM should be covered in learning experiences to reform perceptions of Black youth highlighted in studies within agriculture and STEM (Outley, 2008). This also adds room to address white supremacy within the agricultural educational experiences of not appreciating and covering Black culture in the traditional classroom space.

Other possible background variables include historical influences and family experiences that may affect one's ability to believe they have the ability to pursue a career in agriculture and STEM (i.e. self-efficacy), as well as one's belief about the consequences which may arise to given actions (i.e. outcome expectations). Within the literature, such background inputs include mentors or generational influences. However, connecting one's background or in this case barriers, such as discrimination of Blacks in agriculture and farming, there is a lack of mentorship for Black youth to identify with to influence their choice behaviors (Outley, 2008).

The perception of agriculture amongst African American youth was highly concentrated around slavery (Outley, 2008), which has given the agricultural industry a negative connection as far as careers and opportunities. This negative connotation is easily represented in the disparities of African Americans in STEM, although there were great contributions to agricultural advancements of African Americans. This is due to the harsh reality that is hidden and uncovered

in American history (Jordan, 2011). Narratives like, African American slaves being forced to perform agricultural duties as a labor task and to garden, because it was the only food source (McWilliams, 2005) not recognized as greatness or problem solving capabilities slaves obtained. Soon after the abolishment of slavery, the era of scientific agriculture evolved and produced knowledgeable Black farmers, technicians, engineers, machinists, and scientists. Even though HBCUs produced knowledgeable farmers and organizations such as NFA, such strides don't undermine the negative perceptions Black youth have towards agriculture today. Instead, as replicated by the SCCT model, background narratives of Blacks going through discrimination and used as labor directly impacts the goals and actions of African Americans youth to not pursue agricultural and STEM careers. Making it clear that African American youth are not making a simple choice to not pursue agriculture and STEM but, there are background factors and characteristics that are hindering successful expected outcomes in agricultural and STEM.

This historical narrative is part of the learning experience of African Americans, and does not build self-efficacy, minimizing their expected outcomes in the field of agriculture and its related sciences. This history must be addressed within the learning experiences to build expected outcomes and self-efficacy (Lent, Brown, Hackett, 1994) to engage African American youth in such studies. Racial identity and their relation to historical events of the United States heavily influence youth goals, interest, and outcomes (Lent et al., 1994). Racially inclined history of the mistreatment of African Americans creates the dominating associations of agriculture as sharecropping and slave work amongst Black youth (Outley, 2008), despite the progressive experiences Blacks have had within agriculture and STEM. Engaging students' entails consideration of generational influences (Wildman & Torres, 2001), which affect career interests and decisions (Twenge, 2014).

There is currently a lack of knowledge about the agricultural industry, contributing to the current negative perception of "farming" (Holz-Clause & Jost, 1995). The lack of mentorship and the sense of belonging for Black youth in agriculture and STEM, are due to a lack of minority representation of faculty and staff (Townsend, 1994). This outcome represents Black youth not feeling as if they have a place in science-related fields. This raises many questions along the line of: What does agriculture education look like today as far as demographics of race and income levels? What access does the average African American community have to agricultural and STEM education? Who (in the context of race and socioeconomic status) are agricultural programs such as, FFA and 4H, likely to serve? Such questions will lead to understanding how African Americans are missing from the educational experience of agriculture and STEM. Traditional programs such as 4-H and FFA are not providing the necessary cultural capital to influence and impact African American youth. There are many ways to shape the learning experience for African American youth.

To better assess the youth's experience and its impact on outcome expectations and self-efficacy expectations which shapes the interests, goals, and actions to pursue career trajectories (Bandura, Barbaranelli, Caprara, & Patorelli, 2001) into STEM and agriculture, the programs' learning experiences should be viewed as capital (Bourdieu, 1986). Ultimately leading to initiatives to provide or support programs that are delivering such educational experiences by addressing history and race. Therefore, a new model for career development should include factors of access and quality of educational programs for African American youth.

## Recommendations

To increase Blacks' representation in agriculture-related industries, existing and future programs designed to engage youth in agricultural explorations and education must address the

historical context influencing Black youths' attitudes towards agriculture today. This study has produced recommendations for programs that are currently in practice of educating African American youth in agriculture and STEM, along with recommendations for future programs and studies to address the issue of African Americans missing from agricultural and STEM careers and higher education to lead to STEM careers.

Beginning with recommendation number one, racial demographics of the program's staff should be considered, for mentorship was conducive to one's development of career interest (Outley, 2008). Agricultural programs must incorporate background context for Black students and address race to attack the negative perceptions Black youth have towards agriculture. Enhancing America's STEM workforce and agriculture production must start with investigation of the effectiveness of learning experiences for Black youth. Leading to recommendation number two, histories about the great scientists and agriculturists emerging from slavery, the Jim Crow South, and segregated America, should be incorporated into STEM and agriculture teachings. This could be done by having more mentors for African American youth to identify with in formal and non-formal agricultural and STEM learning spaces, to be able to share their experiences and counteract the narratives of slavery and sharecropping. Also, Black youth should be educated on reasons why they do not have access to programs of quality and substance. This form of oppression has to be known by youth to then escape traps of racial classrooms, where White supremacy do not allow room for Black greatness to be learned.

Future studies are needed to investigate existing STEM programs educating Black youth. The structure of agricultural programs, whether they are community-based or school-based, in predominantly Black classrooms, or outside of the classrooms should be examined. It has to be clear of whether or not Blacks are being reached by educational programs that are leading youth

to agricultural and STEM careers. Within this exploration and examination, areas of history and the reframing of agriculture should be the areas of focus for current and future agricultural and STEM education programs. In addition, uncovering the best pedagogical approaches to incorporating history within the learning of STEM and agriculture for African Americans. In this research, observing the youth outcomes can also add to the understanding of how agricultural programs impact on youth career explorations and higher education pursuits.

## Conclusion

The study focused on identifying the various factors influencing the perceptions formed by Black youth towards pursuing studies and careers related to agriculture and STEM from the literature. The factors derived from "personal inputs" and environmental conditions and events, labeled as "background contextual affordances" which cannot be chosen or controlled by individuals. They are outside factors that are defined by the society. Even though the model captures race, the model does not explain the capital associated with race. Therefore, the learning experience, as represented in the model, does not address quality. Instead the model suggests what should be included in the learning experience. SCCT does not grasp the society functions and how the student must operate within the system so that schooling can be seen as reproduction. However, Bourdieu (1997) situates capital as the key to reproduction and educational success. Using this model adds a better understanding to what is happening within the system where the learner is developing career actions and choices.

Characteristics, such as race/ethnicity, and backgrounds, such as family and community influences and education systems, were identified as factors and barriers to choices made by African American youth. However, all of these factors are hard to define within the model of SCCT. Background contextual affordances considered within a historical frame around slavery

and discrimination in agricultural and scientific industries help explain the challenges specific to the population of Black youth. According to SCCT, students need to develop self-efficacy and positive outcome expectations in order to develop an interest in the program of study. This cannot happen without learning experiences that take into account the personal characteristics and background contextual affordances described here. Ending with the bigger picture, do African American youth have access to STEM and agricultural education to make a choice or decide if they want to pursue that career? What do choices and opportunities look like for other nationality groups?

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**Based Programs Serving African American Youth from the Perspective of Program Leaders**

**Abstract**

African American's educational experiences differ from their White counterparts and other minority groups such as Asians in preoperational opportunities to pursue disciplines of STEM which also include agricultural education.  In addition, Agriculture has a negative connotation amongst African Americans. Community-based agricultural programs however, have engaged this specific population in agriculture and STEM. In this study eight agricultural and STEM focused African American operated community-based program leaders were interviewed to explore their motivations and the need for their programs. Program leaders expressed the need for agricultural education for cultural purposes but also as ways to afford opportunities for youth to grow professionally and to physically grow their own food. However, one major theme that came across all participants was the ability to have control of their circumstances and community through the teachings of hands-on agricultural practices.

Keywords: Community-based programs, Agricultural education, STEM, agriculture

*"We educated motivate energize organize and mobilize, and take our youth to a higher level. I feel that all those pieces that I mentioned right now are helping develop children and adults that may not have education and motivation.*

*Well we go into something that is not being taught as far as food and history. The children do to have the resources and opportunities to engage in, such activities to have a choice to choose a profession such as ag[agriculture]. So the school, we expose children to have leverage to another area that our ancestors started and some reason it has been lost over the years. And I think it is important that we bring that back to the table, to our community to let our children know that there is nothing wrong with being a farmer, and being involved in NBA. If that is what you want. But to understand you don't have to use your body to get your wealth, you can use your mind too." (Shavon)*

## Introduction

As the world's population continues to grow, agricultural output demands are following (Food & Agriculture Organization, 2009). Resulting in a need for knowledge in the production of agriculture within in the areas of science, technology, engineering, and mathematics (STEM) within the upcoming years (Langdon, McKittrick, Beede, Khan, & Doms, 2011). According to the United States Department of Agriculture Employment Opportunities for College Graduates Report (2015), job opportunities for food, agriculture, renewable natural resources, and environmental sciences in STEM areas are expected to grow, especially considering the retirement processes to take place amongst current STEM professionals (National Science and Technology Council, 2000). STEM careers are included in this broad field of agriculture where African Americans are unrepresented (Zhang & Barnett, 2014). As America strives to increase its competitiveness in STEM (U.S. Department of Education, 2016), it is important that the racial

gaps are observed (Zhang & Barnett, 2014). These racial gaps include African Americans. However, in order to increase the representation of African Americans in STEM and agriculture, educational preparation in early childhood development and learning space is needed for this specific population of African American youth.

## Current State of the STEM Industry

Although the 2016 STEM Index displays an increase in degrees within STEM and STEM hiring, Neuhauser (2016) found that America is underperforming in STEM. This is a major concern as we enter into a globalized and innovative world, resulting in the steady increase in demand for skilled STEM workers. Currently, America is not producing enough STEM workers to compete on a global scale (President's Council of Advisors on Science and Technology, 2012).

In addition, the Bureau of Labor Statistics (2009) predicted that 2.7 million new job opportunities will be available in 2018 within the science and technology fields, which accounts for nearly a fourth of all new jobs. The Association for Career and Technical Education (2009), found that there is a need to produce a stream of innovative young scholars within American secondary and post-secondary educational systems. As the demand for more American STEM professionals increases, it is important that we meet the need by developing youth interested in pursuing STEM studies as a way to sustain a steady stream of innovative technologies and processes (Tilllinghast, Petersen, Rizzuto, Dabiri & Gonzalez, 2015). This steady stream will then be future leaders to solve arising issues of agricultural and STEM. In order to accommodate the need for STEM workers, we must begin by educating students on the various aspects within the STEM fields; this can begin with community-based education for the missing "gap" of African American youth to be introduced to the possibilities of the STEM industry.

**Minorities in STEM**

When analyzing the populations whom are pursuing educational or professional careers within the STEM fields, there are obvious missing populations. These populations include women and people of color (PCAST, 2012). However, people of color do not include all minority groups. In 2009, White and Asian students had the highest percentage of undergraduate degrees in STEM fields (Aud, Fox, & KewalRamani, 2010). These populations include women and people of color (PCAST, 2012). Data indicates that the proportion of African Americans and Hispanics remained low in science and engineering occupations in comparison to their proportion in the total population (Zhang & Barnett, 2014). People of color have made major contributions to the STEM and agricultural industries throughout history (King, 2017). Yet, the workforce and education system currently lacks in representation within both fields. Such facts contribute to the lack of competitiveness America has within the global area of STEM. The missing knowledge and problem solving skills of African Americans are not present in the industries and research. These missing populations leave an untapped opportunity to expand America's STEM employment, even as there is a wide agreement that the nation must do more to improve its competitiveness (Beede, Julian, & Langdon, 2011).

Hispanic and African American's students lag behind white students in every measure of science and math proficiency (Association for Career and Technical Education, 2009). Such youths that are also minorities and are people of color, are not participating in agricultural and STEM programs because of specific factors shaping their perspective of STEM and agriculture (ACTE, 2009). Denson, Avery, & Shell (2010) researched African American high school students' perceptions of engineering, finding that students did feel as though they were prepared to pursue engineering. They concluded that one reason for the shortage of STEM workers begins

within the educational system not producing enough STEM-ready college students (Denson, Avery & Shell, 2010). The shortage of STEM workers is a concern because there should be equal representation of all races within such careers. Essentially, there should be more STEM works of color and specially African American STEM workers.

One way to provide youth with background knowledge of STEM and agricultural knowledge is through agricultural education and programs (Galbraith, McKenna, &Donovan, 2003). Agricultural education is a vehicle for agricultural and STEM education and a learning space that introduces youth to agricultural or STEM careers (Stubbs & Myers, 2015). AG-STEM, Agriculture and STEM education, has been seen as a great tool to connect content knowledge with real world issues (Ejiwale, 2012), overall helping students retain more knowledge of STEM and agriculture naturally. In addition, studies such as VanMeter, Frankenfeld, Bases, Espina, and Liotta (2014) found community-based programs with hands-on and experiential learning helped youth retain an interest for STEM, which can also be replicated in agricultural community-based learning. Youth-enrichment programs that include community-based learning with an AG-STEM focus, also add to the coursework of the formal curricula, allowing students to gain long-term engagements in learning about agriculture (National Research Council, 2009). The National Research Council (2009) also used two prominent programs, 4-H and Future Farmers of America (FFA), as examples of programs with major connections to governmental agencies that are providing opportunities for young people to be involved in leadership skills and to connect with scientist and other agriculture professionals. However, it is unclear if African Americans have access to these programs because literature fails to address these topics (Park, Fellow, & Dyer, 2005; Setterbo, et al., 2017). In fact, agricultural and STEM related programs have been created to specifically target minority groups

prior to college; one program is Junior Minorities in Agricultural Natural Resources and Related Sciences (MANRRS) (National Research Council, 2009). Although Junior MANRRS are introducing minorities to the industries and studies of agriculture and STEM, there are still many factors preventing African American youth from pursuing agricultural or STEM careers.

## African American Barriers in Agriculture and STEM

Another factor that contributes to such a slow growth of African Americans in the sciences is the lack of interest from the new generations that elders are unable to foster (Gilbert, Sharp, & Felin, 2001). Also, many scholars of color in education have established that histories and cultures of students of color have been undervalued, misinterpreted, or omitted from formal educational settings (Delgado Bernal, 2002). Community activists and educators are now providing spaces for African American youth to develop professional and career skills within their non-profit organizations and educational programs. This process has been noted by authors such as Christens and Dolan (2011) as community organizing groups that are leading youth into activities to provide social change and education (Kirshner, 2009). However, within community-based programs serving African American youth, it is imperative that the programs are addressing what the literature is describing as hindrances or opportunities that African American youth face inside the school and outside the school related to exploring agriculture and STEM concepts. This is especially important considering that traditional educational classrooms do not prepare underrepresented students to pursue sciences (Talbert & Larke, 1995).

The agricultural industry has various career options, which are unknown to students (Baker & Abrams, 2011). Agricultural education is one form of education that has been identified through various studies as a great way to help students frame their careers in agriculture (Bajema, Miller, &Williams, 2002; Case & Whitaker, 1998). Such studies were

conducted in public schools where African Americans, cultural and social capital is not valued to contribute to their learning and career aspiration development, in addition to their lack of preparation within traditional schooling to pursue science. This leads to the importance of providing space for African American youth to explore AG-STEM through community-based agricultural education programs with aims to develop African American youth success in STEM-related careers in agriculture (AG-STEM). As the agricultural industry sources new jobs into the economy, the success of African American youth from inner cities and rural areas could look different depending on one's goals to pursue agricultural and STEM careers. One student may be interested in changing agricultural industry production methods while another might be focused on developing local food systems with skills such as social entrepreneurship. Both trajectories include innovative ideas and science concepts, but to spark these ideas, youth must have the opportunity to engage in learning experiences that will broaden their perceptions and ideas of careers in agriculture and STEM.

Authors are concluding that an overall perception that only students involved in farming went into agricultural careers were prominent amongst groups like African American youth (Conroy, 2000; Outley, 2008; Jordan, 2011). Fraze, Rutherford, and Wolfskill (2011) concluded that such framing of agriculture from such backgrounds is attributed to the lack of FFA and 4-H programming in such communities. Agricultural programs have been found to serve as vehicle to teach professional and educational skills in STEM (Stubbs & Myers, 2015). To better understand this system where community-based programs serve as ways to engage youth in agriculture and possibly produce more African Americans interested in STEM, Bourdieu's (1986) views of social and cultural capital is used to explain what affordance such programs have for specific populations. More literature looks into the social capital in relation to educational development

(Dika & Singh, 2002), research using this theory have shown that student achievement is influenced by their possession or access to various forms as capital (Swartz, 1997). Bourdieu's lens of capital is used to indicate the urgency of community-based programs needed to tackle African American youth's need to become aware of agricultural and STEM career options by specifying that social capital, networks and groups of people with quality resources, and cultural capital, attitudes and knowledge that networks forms, are factors that lead youth into prosperous careers and outcomes. Research has shown that student achievement is subjective to their access to, or possession of, diverse forms of capital (Bennet, 2007; Lareau, 2017).

## Literature Review

As the world innovates, agricultural education is a tool to create the next generations of STEM workers. Currently, the fields of STEM and agriculture do not have high populations of African Americans, and African American youth are not pursuing such careers in rates that are filling the racial gap (Zhang & Barnett, 2014), essentially contributing to America's lost presence in the fields of science, technology, engineering, and mathematics, communally known as STEM (Wang, Moore, & Roehrig, 2011). As the field quickly expands, the need to prepare the next generation of STEM workers is urgent (National Academy of Sciences, 2007). The upcoming generations will address many of the upcoming social, economic, and environmental challenges (Stubbs & Myers, 2015), whether it is on a local, national, or an international level. This missing knowledge from underrepresented groups is needed. However, the means to provide this educational experience is not socially reproduced to reach African American youth within the inner cities, or African American youth who are "at-risk".  In general, African American history has been lost, hidden, undocumented, stolen, and not dispersed in the traditional public American school system (King, 2017) for all students to obtain. This is no

secret, for example, a recent Texas school district textbook referred to slaves as "workers" (Isensee, 2015) or an example of a Black influential scientist and innovators are not included in the textbooks period (Van, 1983; King, 2017). This lack of reference does not contribute to the success of African American youth and Black youth from all of Africa's diaspora (Chapman-Hilliard, & Adams-Bass, 2016). Great ancient nations of Africa that were created off the design and processes of agriculture (Hornsby, 2005) are not taught to students of color (King, 2017), instead they are taught bout Whites and Europeans in the recent sciences (King, 2017). Such polarized concentrations of knowledge in American school systems do not support the development of Black Youth (Chapman-Hilliard, & Adams-Bass, 2016), specifically in the areas of STEM and agriculture.

Bourdieu (1986) explains the needed capital to capture and influence youth besides the traditional classroom, which contributes to African Americans not being able to see themselves in the promising fields of agricultural and STEM. Programs provided by community-based organizations and programs are formed to create and provide the cultural capital for African Americans to gain exposure to such fields and learnings (King, 2017).

**Perceptions of Agriculture and STEM Careers**

*Minority youth perceptions of careers within the STEM areas influence the choices made to pursue careers in such areas. Parmer (1993), analyzed minority students' career choices. He found a major influence came from their perceived cultural and economic barriers in society. African American youth have limited occupational choices and many of them choose athletic-related professions (Parmer, 1993). However, such perceptions are rooted in the origins of America and its policies. Brown (1993) concluded that many African American youths are not interested in agriculture due to the misconception of the industry only having "farming" related*

*jobs. In addition to this research, he also found many high school students did not have access to education of the careers available in agricultural industry such as STEM. Overall, Tallbert and Larke (1995) concluded that Blacks had more negative perceptions of agriculture than White students.*

In a study conducted by Outley (2008), minority students involved in a national society for professional development and career readiness were interviewed. Outley (2008) found, students' personal interest for environmental conditions was an additional factor that influenced their choice of a career. In addition to their introduction into agriculture and natural resources careers at all stages of career development to encourage entry into the field. It was concluded that negative perceptions of careers in agriculture and natural resources are major barriers to recruiting minorities into such fields, which encompasses many areas that relate to STEM. Such perceptions included an overall historical context related to cheap labor, slavery, and discrimination in the fields of agriculture and STEM. These perceptions hinder students' pursuit of careers in STEM and agriculture. However, he also found that mentorship or having a relative in the field influences students to pursue careers in STEM-related areas, ultimately concluding to early childhood influence. Mentorship and exposure to such disciplines could be incorporated through agricultural programs. Examining the motivations and activities of out-of-school learning programs and community-based approaches that serves inner city Black youth in agricultural and STEM education may provide great insight on best approaches to encourage Black youth to pursue careers and studies in agriculture and STEM.

## Agricultural Educational Programs

As America lacks in the area of providing workers to enter the STEM industries, there is a major focus on school-based and out-of-school programs to promote and encourage more

students to consider such careers, essentially address the leaky pipeline. Many studies have shown that the curriculum of agricultural education has improved the achievement of basic science and mathematics process skills of students (Mabie & Baker, 1996). Bouillion and Gomez (2001) explained an arrangement of progressively more intricate learning experiences for primary students in Chicago, where students focused on riverbank restoration. This resulted in low learning outcomes, one for the participants and the other were improvements for the local community and ecosystem. Aquaculture lessons taught in agricultural programs reported that its students' science and mathematics achievement scores increased, as a result of their participation in agricultural education programs (Conroy & Walker, 1998).

Organizations geared to professional development and career readiness include various programs involving scientific research and services. These services also interest youth in career fields related to the STEM and agriculture. Professional organizations like MANRRS, provides an superb foundation not only for increasing students' perceptions of the field positively but also provides numerous opportunities for college students to gain entry into top graduate schools around the country or agriculture-related careers in government, private industry, or higher education (Outley, 2008). In addition, MANRRS includes community-based learning, like other leadership and agricultural focused programs such as FFA and 4H.

## Community-based Programs and Education

The classroom is not the only place of STEM learning. Dailey, Conroy, & Shelley-Tolbert (2001) conducted research to examine the pedagogical competencies and necessary content to teach agriculture with a science core focus. Within this study, participants indicated agricultural education should remain community-based to maintain its effectiveness. Such experiences and practical knowledge gained from these programs are also favored by employers and viewed as

valuable experience (Conroy & Walker, 1998). Science has also been a major part of the curriculum included within community garden projects, engaging students and the community in community development efforts.

Approaches for measuring mathematics, science influences, and accessible knowledge in a community-based educational (CBE) module is determined by the nature of the chosen community problem (Wendell, 2015). In addition, it has been argued by Nasir, Rosebery, Warren, and Lee (2006), that science learning is shaped by cultural and social backgrounds of the community. Illeris (2007) digs deeper and describes learning as an outcome of interactions with social and biophysical environments. A concept as such variously underlines learning as growing, where one begins as inexperienced and ends as a knowledgeable member of a community of practice (Lave & Wenger 1991). Wright (2001) investigated community-based practices consisting of high school African Americans and described their success in academic achievement which influenced their overall decisions to pursue studies and careers in STEM. CBE programs have included and developed youth within the field of agriculture and STEM fields (Wendell, 2015). It is important that agricultural educators are able to develop programs that will address the needs of the community to ensure the best learning experience for students.

Community-based learning processes produce positive outcomes which are embedded in agricultural programs, in combination with ensuring the perfect learning experience. As issues of food security and food deserts continue to gain attention in both the public policy arena and the academic literature, community gardens have been increasingly used as an integral part of local food production (Eanes & Ventura, 2015). As communities begin to engage in community planning and become more concerned about food insecurities, agricultural practices are currently being used as learning labs and ways to revitalize communities.

Research shows that students who are able to have hands on experiences are able to digest the information better (VanMeter et al., 2014). If science educators allow students to see how they can contribute to some of the problems they see every day, with what they are taught in community-based programs, students may also become more interested in the fields of science. The notable work of Garden Mosaics in the United States, Canada, and South Africa of implementing gardens, outside of traditional schooling, expanded from community gardens as sites for science learning and an emergent form of resource management in cities to sites of skill developed for youth in urban resource management (Tidball & Krasny, 2007).

## Social Movements in Community Development

The simple lack of rights to have quality and valuable education has led many social movements, and remains a key focus in a lot of reformations. Kane (2000) looks at the dominance of education and refers to it as "popular education". He goes into detail of how this "popular education" led to the people wanting to know more about how to increase their livability, which leads to social justice movements. Creative and passionate leaders in the community have made modern-day movement centered around rebuilding and building communities (Borrup, 2006). Borrup (2006), describes the process of community change as the gathering of people with the passion and similar cultural, beliefs, and aspirations, where does not have to give up their own identity and value to create change in the community.

The world is currently focused on profit, leading to unsustainable practices (Faber & McCarthy, 2003). Neoliberalism and globalization are two different paths moving in the same direction, with people traveling back in forth between roads to figure out which one is best. Some cannot decide so they take whichever road is convenient at the time, or the road with perfect pit stops is considered. I use this analogy to give a visual image of the changes that are

occurring and the responses we make. Development plays a crucial role in deterring the actions of human activity (Peet, 2009). As the world globalizes and forms new developments (technology), human actions are going to change. However, communities are finding ways to produce food, which is a major contribution to greenhouse gasses as food travels far, within their local communities, leading to social change. Agricultural programs have lead a community to knowledge about their community's capital such as, how to implement greenspace where it is needed (Ohmer et al., 2009). The community capitals framework was first established by Cornelia and Jan Flora (2008). The framework is currently being used across a wide range field of community work (Flora, Flora, and Fey, 2004). Although the framework mainly assesses assets of a community rather than the needs like performed in a needs-assessment, the framework looks at ways where capital can be turned into more assets making them capitals (Emery, Fey, and Flora, 2006). However, such relationships between the capitals are not linear, they are more complex (Speer & Christens, 2012), causing for a systematic approach of understanding the various barrier communities face.

As elaborated by Kane's (2000), the poor is typically always the portion of people who are being exploited (Kane, 2000), leading to social movements. Core issues are addressed such as environmental awareness to educate communities (Green & Haines, 2008) is used as a form of social justice. Communities forming associations to build and rebuild community's physical, economical, and social infrastructures are booming within the United States. In this book, the collaboration of culture, social change, and community developed is described as a relationship that doesn't require anyone to sacrifice their identity and values. Within this description it is clear that community development work takes efforts of a collaboration of people, such work is seen in community-based programs. Within Kenny's (2002) work, she states that one group

responds to the fused discourses in community development with innovative ways which include collaboration. Such joint forces are critical to development, but a self-reflection and realization of one's role is also important. Through a case study based research, Keefe (2009) highlighted that when forming relationships, communication and understanding must be transparent. If one is going under a process, they should have a full understanding of the system and their role in it. Community-based programs are currently doing this with youth (Christens & Dolan, 2011). Many frameworks have come out such great work such as the community capitals framework (Emery, Fey, and Flora, 2006). This framework looks at assets in a community that can be used to generate capital to be reproduced, creating new cycles of sustainable development.

### *African American Communities.*

Keefe (2002) explains how a strong sense of identity is needed, however historically when exploring the African American identify, this particular group has always experienced a community identity crisis. This makes it hard for members of the community to work collectively and to collaborate with one another to serve a greater purpose. As community-based development requires minds to be able to recognize an issue and strengthen the community identity (Keefe, 2002), the community has to be able to define their identity and be seen as one. Although African Americans struggle with indemnity, there is still some power in the people and opportunities to get organized, which have been formed. In this study in particular, such activities and cultural relevance will appear in the data of eight African-American led community-based programs.

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Although this group of African Americans struggles with indemnity along with an ethnically

diverse community of minorities, there is still some power in the people and opportunities to get

organized.

## STEM Pipeline

To address the big question within the agricultural science disciplines, "Why does the

STEM and agriculture have low representations of African Americans?" we must look at the

routes and access African American have to education and how they envision their career

aspirations. As agriculture is defined as an applied science that interrelates principles of the

physical, chemical, and biological sciences in the process and production of food and fiber

(Merriam Webster, 1988), the STEM pipeline will be explored. National education policy

priorities have framed achievement in STEM as a pipeline. In addition, due to the lack of

minorities and women in STEM, the pipeline has been referred to as the "leaky pipeline" (Oakes,

1990). This pipeline begins early in childhood development, through primary school, and leading

all the way to college and post educational achievements in careers. Metaphorically, it's

important to repair the leaks early in the pipeline as the water force is expected to increase

pushing more students out into the careers in agricultural and STEM. In order to seal the hole

where the leak appears, as opposed to a "Band-Aid" approach, community-based programs are

incorporating the knowledge and opportunities to broaden the career aspirations of youth.

Looking at the STEM pipeline, racial and ethnic stereotyping has been endemic in STEM

education and careers. This has been known to push competent Black students out of the STEM

pipeline prematurely (McGee, 2013). In all, the legacy of the United States racial oppression has

built obstacles that challenge the career development of African American youth (Blackmon & Thomas, 2013). Many scholars in the areas of career development have argued that African American youth career aspirations must be understood from a perceptive that accounts for sociocultural factors, such as racial or ethnic affiliation, which influences one's career development (Constantine, Wallace, & Kindaichi, 2005). As community-based programs are established to provide learning experiences to African Americans, they attempt to reach into the pipeline where students of color are generally weeded out early. However, this concept in the context of community-based programs has not been explored much.

## Social and Cultural Capital Assessments

Social and cultural capital have been introduced through Bourdieu and Passeron's (1977) work in sociology as factors in cultural signals, such as attitudes, tastes, and styles. In all, Bourdieu's observation focusses on a class system, and little to none concerning one's race and background as far as ethnicities. Despite this absence, scholars have begun to examine capitals in association to one's racial and ethnic identity. In general, cultural and social capital use has varied in literature, meaning it is applied to many different specific contexts. Its currency varies just as much as Bourdieu (1986) describes the value of social capital to vary once it is transformed into monetary goods or academic achievement credit such as a degree from a prestigious school. In the past and present, scholars have distinguished capital as dominant and non-dominant (Lamont & Lareau, 1988; Prudence, 2013). Lamont and Lareau (1988) used different terminology; the concept of the accrual and activation of (dominant) cultural capital were sought to be positive effects in school and serve as a mechanism for advancement for less privileged and underrepresented groups (Carter, 2003). To focus the quantity and quality of capital within low-income communities, Prudence (2013) shows how ethnic minority students

employ dominant and non-dominant cultural capital alternatively across settings to pursue different ends. In this study, she found that higher value capital was placed outside of their communities. This can be a possible explanation for the increase of community-based programs serving African American youth in educational and leadership skills.

In a study conducted by Stolle-McAlister (2011), a successful summer bridge program for high talented black students in STEM examined an effective approach of enhancing students' cultural and social capital. This study produced results that were useful to the program by informing them of impactful elements of the orientation program that were useful for the talented students and insight on other aspects to enhance in the summer bridge program. Although this study was conducted with students with high achievement in this program, it still provides a blueprint for community-based programs for urban African American youth. However, this is lacking in the literature. More studies should be done on community-based programs that are engaging students who do not make it far in the STEM pipeline. This can be directly related to the research of understanding what kind of social and cultural capital, such as mentors, networks, and education, community-based programs with focuses on agricultural and STEM education are providing to African American youth.

McGee's (2013) study of African American high school student's experiences in pursuing STEM studies or careers demonstrates the need for adequately established opportunities for African American youth to become interested in STEM. Focusing on this missing group of underrepresented minorities would contribute to America's goal of supplying more knowledge and workers to STEM areas of discipline (U.S. Department of Education, 2016). This focus requires providing adequate learning experiences to provide opportunities for youth to engage in STEM and agricultural discipline and practices. As agricultural programs have been found to

introduce students to STEM concepts (Krasny & Tidball, 2009), community-based programs serving urban African American youth should be studied. In addition, such programs could also address the many barriers African American youth face when wanting to pursue STEM post-secondary trajectories. Having this cultural capital provides knowledge to be valued and given to youth who typically do not have access to such knowledge.

Social and cultural capital have been described as influencers to a student's level of achievement. Glover (2004) describe community gardens as vehicles to deliver social capital, because it brings the people together. Using Bourdieu's theory as an analytical frame, we can view agricultural education, within community-based organizations with majority of their participant's African American youth, as an alternative learning experience to get African American youth involved in agriculture and STEM education. To understand how the programs are situation more analysis of the program motivations, goals, and background is needed to be explored.

## Theoretical Framework

To fully understand how community-based agricultural and STEM programs are assets to African American youth from inner cities, Pierre Bourdieu's (1986) work on social and cultural capital is used as a framework. With Bourdieu's background in European societies, the concept of social capital was centered around social class and other forms of inequality that are socially reproduced (Bourdieu, 1986). Bourdieu's perspective of social capital as a source of power that can transform inequalities and conclusions that cultural capital determines access to social capital, notes the power dynamics in capital (Stolle-McAllister, 2011). In all, community-based programs are opportunities for youth to afford social and cultural capital and engage in agricultural and STEM practices. The theoretical framework is centered around Bourdieu's

(1986) intersections between the two sources of capitals he identified: cultural and social. The association between capital and career (professional or educational) outcomes, has been heavily researched (Bourdieu & Passeron, 1977; Bourdieu, 1984), with independent studies showing that student achievement is influenced by access to, or possession of capitals (McDonough, 2005; Weinstein & Savitz-Romer, 2009; Wells, 2008).

Prudence (2003), uses the term "dominant cultural capital" to correspond to Bourdieu's conceptualization of high status cultural attributes, codes, and signals to perform (p. 138). Carter (2003) makes an argument that African American students lower their aspirations for school because they only believe that whites are capable of succeeding academically. In conjunction, Ogbu (1988) bases such differences in capital values as going beyond social, economic, and political conditions, and directly inserts racial and ethnical differences. For example, African American youth culture is not valued as "dominant" capital based on race; thus, gaining cultural capital for successful career explorations occurs in other spaces. Carter's (2003) research goes further to explain that for low-income, first-generation students of color, home cultural values or cultural capital, are not valued by higher educational systems to then afford opportunities for African American youth. However, Whites typically have access to or reproduce greater capital where capital is passed down from generation to generation (Bourdieu & Passeron, 1977). Meaning they have parents or networks that have navigated through the college or business industry, who can then provide feedback to have more positive outcomes (Roscigno & Ainsworth-Darnell, 1999). Therefore, to increase one's achievement in agriculture and STEM, youth need to be exposed to capital addressing such areas of disciplines and careers.

In the European sociologist's work, Bourdieu (1984) recognizes that dominant culture defines the legitimacy of cultural capital. Bourdieu suggests that social capital value is

determined by the size and volume of the networks of which one can then use to mobilize him or herself. Therefore, Bourdieu (1979) also explores the negative aspects of social and cultural capital, the non-dominant as Prudence (2003) uses to refer to African American youth skills learned from their background, community, and networks, also known as social and cultural capital in white spaces. Such capital is then seen as quality and quantity. Bourdieu (1986) points out that being able to have access to social capital builds cultural capital, concluding to one with little social capital will have less cultural capital. Thus, youth with little social capital, a majority of underrepresented populations in agriculture and STEM particularly looking at African American inner city youth, must be introduced to STEM and agricultural career possibilities academically, as if they were college seeking, adding legitimacy to the cultural capital, (McKenna & Lewis, 1986) to then build their capital.

Initially, Bourdieu and Passeron (1977)'s both assume that youth who have access to social capital will perform well in education. Bourdieu claims that knowledge is deemed by classes of one's wealth, resulting in capital being valued as something that can buy quality knowledge. However, he and others have built off this work and defined and interpreted capitals into new ideas. Social capital for example, had a role in creating human capital (Coleman, 1988), and Bourdieu (1986) conceptualizes social capital as access to institutional resources. Bourdieu (1986) also suggest that if one has prestigious and well-developed human capital, or networks, then one would also have more social capital. African American youth, however, from inner cities do not have such social networks, people that are professionals in AG-STEM, that is as easily assessable as their white counterparts in FFA. In addition, FFA creates space and areas of growth for youth whom share the same cultural capital to navigate as a unit through their educational and professional development. This results in African American youth from inner

cities needing to access dominant capitals to impact their career explorations in STEM and agriculture, such as community-based programs where students of the same background can create dense networks.

Christopher Emdin (2016) used Bourdieu's generalization of shared capital being based on one's background and experiences. He also includes James Coleman's (1988) definition of dense networks as tight knits and bonds of human beings that share the same social capital, to represent how youth bonds are strengthened by their shared frustrations of traditional schooling in the classrooms. Such networks are then turned into social capital, which can be dominant in certain spaces where it is valued, like community-based programs. Such programs are necessary for African American youth whom do not have high economic statuses to "buy" quality education. However, knowledge, leadership skills, and networks, all of which can be gained from community-based programs, can be transferred into cultural capital to then afford and rewarded opportunities for inner-city African American youth. As Prudence (2003) argued, however, this cultural capital is dominated by Whiteness and therefore inner-city African American youth's cultural capital is not valued, unlike their white counterparts. Ogbu (1988) goes into detail of this by stating that White cultural capital is valued by institutions and professionals in his work of oppositional culture theory. This theory, unlike Bourdieu's, highlights race and ethnicity differences in academic achievement. Community-based programs for inner city youth create space for youth cultural and social capital to be dominant and recognized as skills to be developed through the programs activities and structure. However, are stakeholders performing their work with the concept of building youths' capital?

If African American youth who are traditionally unrepresented in agriculture and STEM are expected to perform well in either field, they first must have access to social and cultural

capital. Essentially, community-based education with core emphases in agricultural and STEM can serve as the cultural and social capital needed to direct and introduce African American youth whom are underrepresented in such fields, to explore the possibilities of agriculture and STEM careers.

## Purpose and Research Questions

Studies of structural inequalities within the education system, it has been shown that African American students generally don't have an evenhanded preparation to pursue math and science in high school, unlike their white counterparts (Martin, 2009, 2012). Research has suggested that for urban students in particular, educational growth and development is affected by various outside of school dynamics (Anyon, 2005). Community-based agricultural education programs and approaches offer a potential avenue for addressing urban African American youth career choices. Little previous work has been done to understand the practices that these programs employ and how they might affect the awareness of African Americans about possible careers in AG-STEM. Additionally, it is important to know if these programs are defining agricultural and STEM careers in a way where youth see that they can contribute to the STEM and agricultural areas of work and studies.

## Purpose Statement

The purpose of this study is to investigate the structure of agricultural and STEM community-based programs through the lens of program leaders. This investigation centers around learning from key staff members and stakeholders' motivations, programs, and to gain more knowledge of the how and why their community-based programs are operating. Such research will help inform future programs in any context, outside of school, or in the classroom

on how to introduce and teach STEM and agriculture to African American youth, in ways where youth feel as if they have something to add to the fields.

## Research Questions

Overall, the objective for this study is to identify and explore community-based program leader's motivations to have a learning space with core emphasis of agricultural and STEM education, and to understand how capital is being provided to youth through these programs from the program leader's prospective. By learning from the program leaders, an understanding of their delivery of social and cultural capital was explored, and suggestions on how to intersect the pipeline of minority student outcomes of becoming engaged in STEM and agricultural studies were identified. Research questions framing this study are:

1. What are the program leaders' motivations to create a space for African American Youth to learn and engage in agricultural and STEM practices and professional opportunities?

2. How do program leaders of agricultural and STEM educational community-based programs view their activities in relation to the traditional classroom experience of African American youth?

3. From the perspective of program leaders, how are agricultural and STEM educational community-based programs and their activities providing forms of social and cultural capital to steer youth participants' interests in agricultural and STEM studies and careers?

## Methods

### Project Overview

To grasp a greater understanding of what is happening in programs and how it is executed, a qualitative approach and a multi-case design method are used to go in-depth of the social phenomenon (Yin, 2014) of CBPs introducing STEM and Agriculture African American youth. The researcher "approaches the world with a set of ideas, a framework (theory, ontology) that specifies a set of questions (epistemology), which are then examined (methodology,

analysis) in specific ways" (Denzin & Lincoln, 2011, p. 11). A qualitative approach requires the researcher to search for the meaning of a phenomenon from people who actually experience the phenomenon (Hesse-Biber & Leavy, 2011). This approach allows a holistic point of view of the stakeholders interviewed (Stake, 1995). An epistemological philosophical explanation is used due to the qualitative approach to explore the nature of learner (the stakeholder) (Schunks, 2012) and an ontological lens of what is known about the social experiences of the stakeholder's motivations in connection with the aims and goals of the community-based program (Hesse-Biber & Leavy, 2011).

In this research, the nature of how one views their work in relation to the purpose of the organization or program they are serving was explored through a critical theory paradigm by performing qualitative research (Denzin & Lincoln, 2011). This epistemological approach with a critical theory paradigm was used to shape the reality by ethnic, cultural, gender, social, and political values (Denzin & Lincoln 2011). Critical theorists emphasize the realities that are mediated by power affairs that are typically socially and historically constituted. This is why the aims of this study are to look at the motivations of the stakeholders in serving African American youth in agriculture and STEM, fields they are underrepresented in due to the historical and current societal influences, which are also historically embedded in social constructs such as segregation and racism.

Multiple sources of data are used to address the findings of the community-based program components and stakeholder's motivations. An interview will explore the view of the "experienced knower" the stakeholder and the actual program, in addition to information found on the website and online resources. The design is grounded with several data collection methods which are broken down into stages. Interviews and information collected (see Appendix C) are

used to address the findings of the community-based program components and motivations. Materials collected from Appendix C were resourceful in prompting interview questions and providing context while writing results.

## Basic Assumptions

After reviewing literature, it is assumed that agricultural education programs create positive change in the perceptions formed around agriculture (Outley, 2008). It is assumed that the literature findings of hindrances of African American youth to have interest in agriculture and STEM careers are addressed by the programs motivations and confronted with the program's activities. Stakeholders of the non-profit programs are strategically designing their programs to address African American self-determination and to provide various learning opportunities to support and introduce youth to STEM and agricultural practices. Their involvement will also introduce them to new fields that they never would have explored prior to being in the program. This is significant due to the fact that literature describes African American youth as a population that is not prepared and equipped by the traditional classroom to pursue careers in agriculture and STEM. Knowing the motivations and the structures of these programs can add to or recommend more spaces for African American youth engagement in agricultural and STEM education.

## Participants

To gain insights into how community-based agricultural and STEM programs are providing the necessary capital to influence African American youth to see themselves in the fields of agriculture and STEM, a multi-site approach is taken for the study. In this study participants were interviewed to capture a full narrative of their program and their motivations. A demographic focus on African American youth and a program with agriculture and STEM

focuses will limit the selection pool. Because of literature stated by Carter (2003), spaces where African American social and cultural capital is recognized as dominant that is idea sites for this research. However, within the paper, pseudonyms are given to the program leaders and to their program/ or organization names. The sites were chosen through a purposeful sampling, including word of mouth referrals that the researcher will ask, similar to a snowball sampling approach, where the stakeholder refers a similar program doing similar work. The targets are community-based programs which do not limit the study to organizations that have filed and obtained a 501(c)3 status. Selecting a case is crucial (Stake, 1995, p. 243), and should be chosen through a formal case study screening procedure. This screening was conducted by reviewing the program online resources which may include documents and phones calls to the program to gather information and field notes (see Appendix C), guided by set criteria (Stake, 1995). The criteria will focus on finding a program that is community-based serving underserved African American youth with agricultural and its sciences education. All programs must:

- Engage youth in agriculture and STEM

- Majority of participants African Americas youths that are considered "underserved, at-risk, low-income"

- Community-based

Selection was guided by a data collection instrument used to screen potential programs (see Appendix B). The first stage of collecting information to perform the screening. Information was gathered from public information provided on their websites, news articles, and other similar online sources. If information pertaining to all criteria were not found in the first stage, a second stage was conducted by contacting the organization or asking the stakeholder that has been identified (see Appendix D).

Established is defined by having a program with African American youth who have been introduced to agricultural and STEM disciplines and practices within the past year. Within each case, authority figures were interviewed to interrogate the program's motivations. Stakeholders of the program were identified by talking to program staffs listed on the website, who were the initial point of contact. They were asked to refer me to the best representative to conduct the interview. Study participants were identified by using Greene's (2005) clusters of four groups of:

''(a) people who have decision authority over the program, including other policy makers, funders, and advisory boards; (b) people who have direct responsibility for the program, including program developers, administrators in the organization implementing the program, program managers, and direct service staff; (c) people who are the intended beneficiaries of the program, their families, and their communities; and (d) people disadvantaged by the program, as in lost funding opportunities'' (pp. 397–398)."

Stakeholders in groups "a" and "b" were targeted because they hold a lot of stake in the structure of the program and the programs or activities. Resulting in majority of participants being founders of the programs or current directors.

Having this consistency will allow me to target programs serving African Americans with similar motivations of wanting to accelerate African Americans educational achievement. As these studies of individual programs will have the aim to help programs in the future and to know what is working, word of mouth of specific practices is a key factor in communication efforts in such spaces. Instrumentation

Multiple sources of evidence enhance studies that include individual cases within a sample (Yin, 2014). Resources that were available such as interviews, handouts, and information available on the website were all collected and used as data or reference points. The interview

data was the main source of data, whereas other material served as references and information to prompt interview questions. The interview was a standardized open-ended interview (Patton, 2015), led with an interview guide (see Appendix D), and served as the main source of data. Follow up questions were generated and tailored based on the information from other data sources (e.g., websites) that will provide a richer description. To determine what documents should be requested, a data collection form was used to collect this information in a standardized manner. Such documents included: the demographics of the students, programs itineraries, and activities. The documents will serve as supplementary information and not the main data source; they will provide more context for the interview protocol by specifying programs in relation to forms of capital. I also used such data to see if the stakeholders' interview responses are consistent with the information collected through the screening process (see Appendix D).

## Data Collection

Material on the design of the program was collected from websites and/ or from program staff to help structure the interview questions for the stakeholders as the primary source of data. These materials are items such as the syllabus and program objectives. All data sources were used to form triangulation and documents. The interview was a standardized open-ended interview (Patton, 2015), led with an interview guide. Interviews were conducted in person or via telephone and audio-recorded and transcribed by the researcher. To ensure the quality of the transcription, they were sent to the interviewee prior to analysis to ensure clarity. Multiple sources of data collection were used to address the various findings of the community-based program (see Appendix C) with the use of triangulation and detailed descriptions of what is happening in the programs.

**Data Analysis**

A line by line coding process was used for data analysis of interview transcripts (see appendix E). The documents and material found online did not have a full textual analysis, instead they were supporting material to provide more thorough descriptions of the program activities identified by interviewees, as well as providing background information to prompt questions during the interview. The analysis was guided by social and cultural aspects included in the program's activities, the programs' structure, and program leader's motivations, along with the research questions and material outlined in the a priori table (see Appendix A). The concepts of social and cultural capital from the interviews and documents was transformed into the coding scheme for coding analysis after each individual transcript is developed. In addition, themes were generated based on open codes created within the excerpts (Miles & Huberman, 1994), essentially grouping codes into categories, "focused codes". Cross-case analyses were performed within a computer program, Atlas.Ti for clarity and validity. Figure 2 shows a brief snapshot of the groupings and overlaps of the codes, subthemes, themes, and research questions, with a quote as a synopsis of the program leaders' responses to all three research questions. After all the codes were developed they were placed into a codebook (see Appendix F). Evidence of credibility was conducted in a form of double checking themes and making sure that the results reflect the data and not my personal interpretations during sessions of peer debriefing interactions (Lincoln & Guba, 1985). Peer debriefing sessions of the initial codes helped form concrete themes directly from the data collected. This investigator triangulation (Stake, 1995) was established by having a research group session with peers. A group of five researchers was able to form a triangulation process by validating and adding multiple perspectives to enrich the

proposed themes (Atkinson and Delamont, 2005; Creswell, 1998). During this session, codes of

the data and themes were grouped and explained as categories and later developed into themes.

The data that was collected in this study describes structures within community-based

educational programs and briefly touch on barriers that are supporting or preventing youth in

developing interest and actions to pursue agricultural and STEM education and careers. This data

was collected by gathering material from multiple sources of data that were combined by taking

the details found to address the various research questions. For example, documents were used as

more description and supplementary information of the programs activities and context to add to

the findings within the researcher's write-ups (see Appendix C). Using the A Priori table, the

documents and information collected was used to situate the information in forms as capital that

is provided to youth that are in one or multiple programs that the organizations may have

available. As a researcher, the interpretations of text, documents, and transcriptions were made to

make sense of the whole organization's motivations and structure. This does not ensure great

validity, however, biases may enter into the natural design of a case study (Yin, 1994; Norris,

1997). As I gradually analyzed data that addressed the research questions, analysis was written

and presented (Yin, 2004).

*Figure 2. Snapshot of data analysis*

"Time and time we (Blacks) are told that we aren't great thinker or contributors to society and civilization. But in fact, we have built the first universities and text, scriptures, and communities. We have to lace our kids with game that they took from us and that culture so we begin here with the agronomy of life. The importance of black soil and black knowledge and contribution to how we live to today." (Taron)

| RQs | Research Question 1: Program leaders' Motivations | | | Research Question 2: Relationship to Traditional Schooling | | Research Question 3: Program Elements as Capital | |
|---|---|---|---|---|---|---|---|
| Themes | Generational Guidance | Changing Condition of African American Communities | Black Culture | Experiential Learning and Educational Delivery | | Economic and Community Development | Industry Exposure and Knowledge |
| Sub-themes | Leaders received guidance and education from elders in their family | Reframing Blacks in AgriCULTURE<br>Solving Community Issues<br>Reframing Nature<br>Nurturing environment<br>Leaders serve as an elder influence for the youth<br>Avenues for Economic Development | | Discipline and Personal Development<br>Community engagement, Community development<br>Natural and Authentic Teachings<br>Space for Creativity<br>Solving Community Issues | Career Development<br>Role Models in Agriculture<br>STEM and Agricultural Education<br>Avenues for Economic Development<br>Community Education and Stewardship | | |
| Open Codes | Early childhood exposure  Teach youth resistance<br>Elderly gudiance  Passion to help youth  reframing the image of black youth for the community  Family atmosphere  Develop children  Health  Ending poverty  exposrue<br>need for better school and food systems  reframing the image of agriculture  Teach life skills  Poverty  Youth activist<br>need for black mentorship  culture for black communities  Nurturing environment  teaching history of African people  Career fairs<br>Grandparent influence  Education on food  space for youth to become inspired by nature  Infrastructure  Increase food selection<br>provide alternative promising life styles for youth  moral and values of African descent  connecting with soil and history  College trips  Hands-on experience<br>Build personal relationships  making sure culture is centered in community engagement  alternative strategies for relaxation  Narratives of blacks in ag | | | | | | |

**Trustworthiness**

Within this study, validity is relied on the interpretation of the findings and actively incorporated during the study (Creswell, 2014). Following the steps of analysis and documenting any changes to the analysis process assured reliability (Yin, 2009). In addition to double-checking transcripts (Creswell, 2014), the approach was reliable by documenting all the steps in the data collection and analysis process (Yin, 2009). The interpretation begins with one's background and the assumptions they may bring to the study (Creswell, 2014). As someone who has experienced being involved in a community, my experiences along with the literature findings, the data was collected and analyzed accordingly. This clarity of bias was incorporated into the research by including self-reflection within the introduction.

## Results

The purpose of this qualitative study was to explore the motivations of community-based program leaders with STEM and agriculture emphasis. A semi-structured interview also asked questions targeting the resources and capital that the program supplies, and how what they are doing differs from the traditional classroom. Here we present a short snapshot of the programs and the roles of the participants and results and themes from analysis of the interview data.

## Study Participants

With the assistance of social media and program websites, a purposive sample of eight program leaders of community-based programs with majority of its participants that are Black youth within the eastern region of America, rural or urban, were selected to be interviewed. Table 1 provides a summary of the program leaders role, and a brief description of the program.

*Table 1 Demographics of Community-based programs and programs' leaders*

| Participants | Pseudonym | Roles | Program Description |
|:---:|:---|:---|:---|
| 1 | Arionne | Founder/ CEO | LLC farm, now an afterschool, during, school, and during the summer educational experience to learn about agricultural and STEM careers and practices. There are specific entrepreneurship and business emphasis in urban communities and schools. |
| 2 | Roger | Executive Director | A non-profit program with programs on a farm for summer camps and inner city gardening and tutoring programs after school. |
| 3 | Shavon | Founder | An afterschool, and summer program that engages youth in agricultural practices within a community garden. |
| 4 | Que | Farmer | A farming experience geared to providing education of agricultural practices as a way to gain community service for court orders. |
| 5 | Tanisha | Program coordinator and a co-founder of the program | This program that takes place within a private academy during school, after school, and during the summers. The program operates within community gardens and |

| | | | within farms with livestock outside of the city and urban areas. |
|---|---|---|---|
| 6 | Taron | Founder of program and is soon to file for a non-profit status. | After school and summer program for the youth to engage in planting and gardening around the city. |
| 7 | AJ | New employee, taking to role of Farm director. | Summer and after-school programs for the youth to be involved in community development and health. |
| 8 | Jamaal | Founder/CEO | The academy program stems from a farm (LLC) to engage youth in agricultural education. The programs are offered in the summer and after school. |

## Participant Descriptions

Below is a more detailed description of the program leader and their community-based program. The synopsis is a brief snapshot covering the operating times of the program, where it is located, and a description of the students in their program. All programs highlight their services as exposure to agricultural, STEM, career readiness, businesses and economic values, and discipline for the youth and their families.

### *Arionne*

Arionne is a business owner of many hats, as she describes "I am a community organizer, public relations practitioner and community development practitioner, as well as a master gardener, and urban farmer". With all these roles, she serves as a multiple role models for youth in her youth programs that are located at two schools within urban communities. Arionne has one program located within the area that most of her students reside in, whereas the other program is situated within the community where the youth participants attend school but do not live. Both programs engage African American youth in urban gardening activities which are now developed into small networks of gardens and local farmers to form markets and alternative revenue streams. The programs operate throughout the year, afterschool and during the summer.

### *Roger*

Roger is the son of the founder of the 30-year-old program FruitPicks. Farmpicks originally started as a farm, located outside the urban community, but Roger's father wanted to expand the farm operations to teaching, so he founded a non-profit for youth. This non-profit is currently directed by Roger who runs the student after-school tutoring programs, educational field trips/ tourism, and their biggest program, the summer academy. Within all the programs of FruitPicks, Roger serves a wide range of youth from different backgrounds, but there are specific routes and funding set to engage youth from low-income areas and low performing schools. At the farm, the youth are engaged with various activities such as swimming and hiking right outside of their urban community. Although the farm is the main program space, there are small facilities where the program operates out of within the city where urban gardening is currently being implemented by the youth. FruitPicks includes an annual career field and college tours to engage students in post-secondary career options.

### *Shavon*

Shavon is the Founder of JustFree School in an urban community that has been identified as a food desert, low-income, and underserved. The program has been in existence for two and a half years, increasing student's performances in school and sending students home with agricultural prizes from the state fair. JustFree School takes place during the summer and after school for all young people within the community to attend. The program takes place at a community church where a small plot of land is granted to the youth to garden and the church's halls and kitchen are used as classroom space. Within this program, youth are also prepped for college and leadership roles through JustFree's partnership with a local non-profit organization with a mission to direct youth to college careers through community engagement and social

justice awareness. Throughout the year the program involves youth in educational practices of gardening and farming, such as installing drip and cover crop systems. The school host three annual farmer's market programs where the students are able to sale their produce and value-added products.

### Que

Que is a farmer that has decided to afford gardening skills to youth that have to serve court orders of community service. With this targeted population, Que does not only serve African Americans but also do to his location, predominantly of the youth in his program are Black. Que allows the students to shadow him on the farm, which is located outside the city to plant and harvest. He also allows the youth to follow him to sale what is harvested. Que makes it point to teach the youth skills, so he teaches them about adding value to the crops like making black ginger. Que teaches the youth about the unique topography of the land and sustainable practices to grow in such climates. Que also make it a point to allow the students to engage in historical lessons behind food and its production

### Tanisha

Tanisha, one of the co-founders of a learning institute (private charter school) and is also the program coordinator of their FoodFighter program within the urban communities of Blacks, that have been around for about 10 years. This gardening program was created to engage the youth in community development activities and to help provide food for the community. The program is located in the city serving youth from low-income and underdeveloped communities, however there is another location, a 70-acre farm that is located outside the community. The program operates at various locations; the church, schools, and community centers throughout the city. Throughout the year the students grow, deliver, take orders, and build gardens

throughout the city. Students are heavily engaged with African principals as a form of discipline and order, such as the Kwanza principles; and African American history as a motivator, such as studying George Washington Carver in agriculture and STEM.

### *Taron*

Taron is expecting to file for his own 501c3 soon as he wishes to gain more funding to implement more community gardens in underserved and low-income communities. Taron started his work by taking advantage of the capital he saw in the community such as abandoned sidewalks and turned them into gardens. Through this work he recruited young men from the streets. Eventually, Taron made such efforts "cool" and more youth became involved. As a leader in the community, Taron gained access to teaching material to educated the youth with hands-on and outdoor lesson plans. His program has been running for about five years. He partners with local non-profits in the area for knowledge exchanges and guidance. The program operates during the day, after school, and during the summer. Although the gardens are in the city, Taron has resources to land outside of the city for further educational opportunities I farming, such as beekeeping.

### *AJ*

AJ, originally involved in social justice and restorative justice activism, decided to work with youth because of the need to empower communities where Blacks live. AJ is a new employee to a Farm that has been in operation for 5 plus years. AJ's youth program operates during the school year and the summer. Throughout the year students maintain urban gardens that are throughout the city and then return to the farm, located in the suburbs of the city, to grow and harvest mass crops for sale. Students engage in agricultural and STEM education through the work they perform such as building raised beds and planting seeds. AJ serves African American

and Brown youths that are underserved and labeled "at-risk". However, youths that are passionate about community development and social change are also involved in the agricultural and gardening program.

### *Jamaal*

Jamaal purchased an operating farm that he turned into an afterschool and summer program that has been running for three years. As an agricultural teacher, he wanted to expand learning outside the classroom and deliver practical skills to young Black males. As he got into the work he realized he would have to include all Black, specifically Black, youth, boys and, girls. Jamaal's school, "Back to Your Roots" is grounded in African and African American principles and history. Jamaal's farm and students he serves are not located in urban areas but, they are located in smaller but modern rural areas. The youth that Jamaal serves are underserved within the community and the school system. Meaning there are limited and poor quality resources available for the community. At Jamaal's farm the youth are raising livestock and growing crops for the community to eat but to also be educated on sustainable practices and living.

### Themes

### Research Question 1: Program leaders' Motivations

Addressing the first research question, "What are the program leaders' motivations to create a space for African American Youth to learn and engage in agricultural and STEM practices and professional opportunities?" Program leaders were asked to speak about their motivation and reasons behind their work. Program leaders expressed that their experiences with elders and seeing youth today without that elderly guidance, along with their passion for

community development were their reasons for being involved in the community-based

agricultural and STEM educational work for African American.

### Theme 1: Generational Guidance

The motivations of participants in this study stemmed from the influences of an elder

from their family or the community and their teachings of agricultural resources. Having this

experience influenced program leaders to also serve in the role of elders, similar to their

experiences, for youths that are participating in their program(s). As Taron describes "we are that

sergeant parental, substitute for youths that are missing that". Taron feels like this is a role he has

to take because of the conditions and family structure in the black family. He continues with ".

Especially if two working parents, they come home and want to relax and not spend too much

time with the kids". Such conditions are common in the Black communities and families.

*Leaders received guidance and education from elders in their family*. In this data, we

found elders to be major influences along with the solving the issues that are rampant in the

Black community. Roger describe his father as the foundation to his role today in his father's

organization "What led me to this work in particular is that my father started the farm". Early

childhood influences introduced agriculture as a source that can generate resources for the

community and to also sustain the land. For example, Tanisha described this motivation and

influence as exposure to agriculture at an early age and the practice of learning while doing

alongside of experts, their elders.

> "I always spent my time with my grandparents and great-grandmother, they weren't
> farmers but my grandparents grew everything that they primarily ate. They had chicken,
> big gardens, no cows, but occasionally there was a hog. But just those experiences from
> maybe 5 years to 13 years had a deep impact on my life. Just being in that rural
> environment and always being out in nature helping the great-grandmother and
> grandmother with any harvesting and planting that had to be done, and always
> remembering that the foods we ate were fresh from the garden and the chicken. And

sitting and talking with the great and grandmother and learning how to can. And all the things I do now with my granddaughter" (Tanisha)

***Leaders serve as an elder influence for the youth***. In addition to leaders having elders from their family be huge influences, program leaders articulated that they were also helping guide youth like their elders had once done, by introducing them to agricultural practices and community development. Two participants described their contributions as a necessary role for youth today, but approached it differently in their programs. In the first quote below Roger frames his role in the program as way to offer his skills to work with the youth but to also provide opportunities for youth

> "So I been working in the community for about 16-17 years. Related to food justice, food access, but mainly my focus has been on youth education and development.... What led me to this work in particular is my father started the farm... It was never my goal to pursue this career but when I saw the need and that I had some skill and temperament for the kids, and working with the kids, and a desire to help them achieve their goals that is what kind of led me to this field and to take over the non-profit once I was hired."
>
> (Roger)

However, this participant made it clear that the students needed elderly guidance and the program was there to provide that with its space and services.

> "Our oldest elder at the freedom school will be 100 this year and she was able to hang out with us during our harvest and farmers market festival. I know the value of our elders and I teach our young people the importance of elders and I grew up with my grandmother so I know it." (Shavon)

### Theme 2: Changing Condition of African American Communities.

Many of the program leader's motivations revolved around the idea of community activism and empowerment to create change in underserved communities. Whether the

conditions of the community require health, spiritual, educational, or life skills development of the people, elders helped foster and motivate program leaders to do the work to help develop communities where Blacks convene. Program leaders also expressed that their parents' influence of reassuring stewardship as the greatest reward one can give, was a personal motivation that also developed into a passion to educate the youth and serve the community. Jamaal describes his motivation as a duty, stating "my parents gave me the foundation that I need to be a steward of your people". For instance, some participants made it clear that their work was to change the conditions of Black communities.

> "I started doing what I do 'cause I was involved in a lot of political activism and Black lives matter and like police stuff. And I thought it "has to be a better way than marching in the streets".  Which isn't bad but it's like I needed a better strategy and I felt like growing food could really empower people. If you start looking around, you'll see that there is no nutritional value in neighborhoods, no fruit trees. All your food ships thousands of miles away from you… You have no connection to it. So you know, also just knowing local people systems where everyone has access to natural green spaces and so it's a lot of things that go into it." (AJ)

AJ had a background in community advocacy and saw agriculture as a way to provide one with power and control of their community and environment. These factors are why they are educating youth who have been seen as powerless or worse in the Black community, they are seen as criminals. It is known that at the stage of fourth grade, African American males in particular, destiny's of prison or school is determined based on reading scores. To prevent or change such trajectories, community-based programs are critically analyzing the pipelines that have been set by white supremacy and in places where agricultural is demised.

> "So as a Black American that came here from the diaspora I wanted to reach a particular folk. I feel that being in touch with the land is healing and I always wanted my work to be concentrated in a community that I am a part of, aligned with, and culturally adjacent to." (Arionne)

Overall, the motivations were cultured around guidance from elders or parents to be one with the land, to share this experience with newer generations, and their personal motivations to take care of the community.

## Research Question 2: Relationship to Traditional Schooling

Addressing research question two, "How do program leaders of agricultural and STEM educational community-based programs view their activities in relation to the traditional classroom experience of African American youth?", data showed that representation of Blacks in the learning material, a nurturing environment, a great discipline system, and reframing nature were all subthemes created defining the culture within these community-based programs serving Black youth. Program leaders made it point to create a new culture of agriculture in the community as leaders and elders. For example, Taron states "If this [urban agriculture] is trending with the kids then they all will be doing it soon, so it's family that is important, a positive adult and family influence is the key component in the betterment of Blacks as a whole". The programs are making sure culture and community are at the center of all work and career ideas. Giving back is part of the duty, culture, and educational process for the young people in the program.

## Theme 3: Black Culture

Black culture can comprise of anything that is related to African American norms, however, in this paper Black cultural is related to historical events and narratives that have kept African Americans out of agriculture and STEM. Reframing the image of agricultural, science, and nature are done through cultural teachings and historical lessons of Blacks in agriculture and the science. Taron describes his mission of the program as "to change the narrative of agriculture for our people, the adults, and especially for the younger people." The community-based programs are

providing education that includes historical reference of Black greatness for children to model, and as a way to reframe African Americans' agriculture.

*Reframing Blacks in AgriCULTURE*. Program leaders expressed that the culture and history of Africans and people of visual African descent is at the center of the teachings at the farm and in their programs. This cultural identity is even taught as a source of discipline from proverbs and principles rooted in the African traditions such as the seven principles of Kwanza used by one of the participants.

"Our program is grounded in the 7 principles of Kwanza...So teaching our children who and what they are, and teaching them the greatness of who we were will only allow them to have the vision of the greatness of who they can become. Using that as a frame to help them understanding of who we are and food" (Tanisha)

All participants spoke of slavery being the core reference of agriculture by youth. All program leaders concluded that agriculture itself had to be reframed in all aspects such as environmental justice, food systems, and STEM education as a tool for solutions. It is clear that the program spaces encourage culture in the education process by addressing history and what the future can look like around agricultural practices.

"We wouldn't be who we are today without cotton that was the whole money system. It is from cotton, it came from agriculture, it came from sugar cane and tobacco, so it's kind of my goal to re-narrate how people feel about agriculture especially in the black community." (Que)

Participants spoke on how they were reframing agriculture for youth in a way that was not demanding but natural in learning about history.

"They don't even think food, that's my plan is to kind of help change that narrative, also to make it fun for them so they can start to see that this is not associated only with slavery and that it has its history." (Que)

*Nurturing*. Program leaders expressed and repeated the importance of having a bond and true relationship with the student that is focused on the student's success and community education. The program leaders made it clear that this is space created specifically for the students to learn

and engage in learning within a caring environment. This is not what children are exposed to at

school. Instead they are faced with harsh disciplinary methods. In addition, the environment

encourages students to support each other learning process. As Que describes his student's

curiosity process within their learning environment:

"We have little questions that we all the time like "what would you eat for dinner"? A lot of
the kids will be like fast food restaurants, McDonald's and stuff like that. But just those little
things and everyone laughs and it's good. In a class, the kids are embarrassed if they are laughed
at. But when we are outside and they see we are having fun and someone can be like "aw that's
not funny" but everyone understands that it isn't funny, and that's why we ask questions."

The environment is nurturing and as the program leader Roger describes his program from

youth perspective "It is a place where once you come you don't want to leave". Such nurturing

desires and structure are implemented in the program by having small talk with the student as

shown below:

> "Well we sit down and talk. They want to talk and grow food. I talk with the parents and
> we talk about respect between all parties. The parents say their child's demeanor totally
> changed, talking back not talking back. This is all credited to how our leadership team
> and elders in the school engage with the youth. We build relationships with them and
> their families so we can nurture the kids." (Shavon)

***Discipline and Personal Development***. Program leaders expressed that the major key in

their work is centered around culture and discipline for the young people which they view as

totally different from the traditional school system where Black students are constantly penalized

and disciplined with harsh consequences. The penalty in these program spaces is an honest and

genuine talk about making better choices and taking ownership of their lives. Such talks build

skills and better expected outcomes for the youth career choices. Such outcomes break cycles of

bad behavior and poor decisions such as career choices and educational pursuits. Participants

made it clear that students were held at a level where they were held accountable for their actions

without a penalizing record of behavior. This work is done collectively as a community as

Tanisha describes it as: "this includes holding everyone responsible for their actions in different forms of discipline and a sense of community".

> "What I could say is when the students walk into the program with me, we have specific norms we attend to. When I first begun the program, students would throw their bag around on the floor. But now we have a very strict policy that all bags must go on top of the counter and be placed properly. That is a part of urban ag class, and if you eat, and cook, you wash your dishes, and we have reusable dishes. We don't throw any of our dishes away, spoons, cups, and we all share responsibility that is not something that they have learned in school at all. There is no such thing as washing a plate at school or cleaning collectively. So it is a clear difference that we have in the urban ag school." (Arionne)

> "Before we begin each session we circle up and the children repeat the program's pledge, and then we repeat the seven principles of Kwanza. Throughout our session and whatever lesson we are engaged in, we extract the principle(s) that is being practiced in that particular lesson. And even sometimes when children might not behave correctly, the principle is reflected within our ending discussion to bring all back and centered' (Tanisha)

In addition, program leaders make it a point to note that this is simply what the youth needs to be successful in any area of life.

> "Well first they need discipline, and I'm noticing some trends now and I don't want to speak too prematurely about them but, the discipline aspect is what needed to be taught to them first, and then that is what two of my older students have gotten. We've seen grade point averages increase." (Jamaal)

Program leaders also made it a point for the youth to respect them as elders and caretakers. Such processes, as reported by program leaders, are not difficult because of the relationship of trust that is established early on, which the program leaders have found easy for the students to receive. The students receive discipline that allows them to build character by having them center lessons around traditional principles that are agreed upon and accepted by the group as a whole. This allows the student to be accountable for their actions and for the students to be accountable to their peers. There is ownership on everyone's behalf in the programs. In addition, all efforts of their hard work and character building are going into building their

community. Savon stated, "So my motivation is for them [black youth] to get great and to teach

them discipline".

      ***Subtheme 3d. Reframing Nature***. Connecting back to the roots and the culture of

African people was the core of the program leader's goals. As AJ described,

> "They brought a number of us here through the institution of slavery, so we were still
> able to hold some of our values but our values often times were closer to ways of how we adopt
> to our environments, so once you separate us from the land you separate us from our culture."

      This component of the program is what builds the passion for the youth and set the

foundation for them to explore all areas of life, for the development of humankind. As stewards

of the land, respecting nature is a piece of the program that connects the students to

responsibility and ownership of their natural resources that they have in their environment.

However, program leaders made it clear that youth and African Americans in general have been

separated from these principles that were core to the African culture through the institution of

slavery.

> "But basically you have to understand that we have a disconnection from the soil and the
> land, so slavery and sharecropping, a lot of African Americans have a disconnection with
> the soil every time we look at it we think of slavery" (AJ)

## Theme 4: Experiential Learning and Educational Delivery

      The programs are providing hands-on and a natural learning approach through activities

such as growing and building for agricultural production. They provide the youth with a natural

learning environment and that encourages them to want to learn, according to the participants.

Taron describes youth response to being in a learning environment that is supportive of their

interest and curiosity, "the kids want to be here to learn and ask questions, no one is ever

embarrassed when they have questions, it [learning space] just sparks more questions to be asked

by the students".

*Solving Community Issues*. Community-based programs center their efforts on the community. The community is the space for the students to learn and develop. Seven participants tied a lot of their project work to teaching ownership of the community. One participant describes their work as a response to what they were seeing in their community:

> "Young white suburbanites were moving into the city and establishing community gardens. And starting a garden is really a great thing, but what was disturbing to us was that we had these young white coming into the community and establishing gardens but they were not engaging with the people of the community, so we saw it as disrespectful ...Whenever they [youth] see something nice, and given to us [the Black community], and fancy it didn't take on the reflection of them, but it was from the Whites" (Tanisha)

Another participant describes the difference between two programs she operated. One program is not located in the area the youth went to school and gardened whereas the program in the following quote is located within the neighborhood the youth live.

> "But we are trying to sustain the parts of community that are positive and adding to the ecosystem, while also trying to give a different perspective on community and how we engage. So it's not trying to change it but it is expanding the idea of what civic engagement looks like and seeing that we are eco-friendly and how we contribute to the environment, so I think that is the big difference between the programs" (Arionne)

*Natural and Authentic Teachings*. A major component that the leaders expressed about their program was the hands-on teaching style that keeps the youth engaged. In addition to this approach, the youth are also using nature as a classroom and lab to test. Tests for crops, test for community development, and even test of education in friendly environments to help retain information from peers to peers. All program leaders expressed how the traditional classroom has a form of book and lecture with sparingly some group activities. Whereas in the community-based programs, teaching is done by doing and during the process of solving real-life issues that the youth are facing.

> "One of the things is the hands-on activities and outdoor learning areas" (Roger)

"I wouldn't say we dive in the chemistry books but we teach them that nothing has waste, everything is renewable to energy to resources, and to being sustainable and being one with the land" (AJ)

By connecting the material that is being taught to the youth to their actual living conditions, youth are more passionate about learning and making a difference. Youth are then introduced to new careers in this process as well. Youth are engaging with politicians, college volunteers, and elderly mentors to help guide them in making a difference. This also connects to the idea of having ownership of how your community looks.

*Space for Creativity.* Youth are able to be in a space where they can be creative with their peers and leadership teams. Everyone is able to bounce ideas and learn. The data shows that youth are able to explore their interest by learning about other's interests as well. Program leaders encourage to youth to be creative about solving issues that are on the farm and issues with homework. Such creativity is possible because of the space that the youth are in, where there are built relationships of trust and honesty. Shavon and Taron mention the importance of providing the opportunity of creativity they provide to the youth, "I created the school so children can pick what they want to do and when they want to do it. And so they are creative" (Shavon) and "A lot of these kids have not had the chance to be creative." (Taron).

### Research Question 3: Program Elements as Capital

The programs did not specifically refer to the opportunities they were providing to the youth as capital, instead they saw it as a way to teach youth how to be sustainable and healthy within their communities. Arionne describes her program as a resource to provide capital "I came in and said I need to get them into building social capital, and specifically around the students of color".  Only two of the eight program leaders describe their programs as sources of capital for the community. As young people, the need for mentorship to be tomorrow's leaders is

needed heavily, from the program leaders point of view. The following themes highlight the work that is being done to include more African Americans in agriculture and STEM-related disciplines.

### Theme 5: Industry Exposure and Knowledge

The programs are situated to provide multiple avenues for children to explore careers related to agriculture and STEM. All the programs afforded youth to interact with professionals in agriculture and to gain hands-on experience. But most importantly, they urged the youth to participate in being contributors to the society. Jamaal explains, "These other concepts [STEM] are important because it is what society is moving towards. So if we can push our kids, from my perspective, our kids will have a voice in making effective change in our society". This urgency describes how Blacks have been left out and underrepresented in STEM and agriculture. Jamaal even specifies this by stating "My focus is on creating a space for black youth to grown, because we don't have that in society".

*Role Models in Agriculture. Examples of mentors, within agriculture and STEM, that youth are able to form relationships with comes from the agricultural program activities and leadership teams. As program leaders, they all serve as farmers and gardeners role models, in addition to the outside network of professionals that are brought into the program through their activities.*

> "We had a few presenters and visits to the farms, which is an organic farm, and a female farmer and majority of mentorship is done with me, the program leader, so I am mentoring the class and the seven students I am close with and I have brought them to vegan businesses which are potential customers that are open enterprises around plants and plant-based diets so there is this the cultural lens of seeing people who look like them. As a master gardener female facilitating this class, I think that their perspective on what a teacher looks like, what a farmer looks like, an educator, an organizer just by facilitating and mentoring has been eye-opening." (Arionne)

Role models are key influencers for development of young people (Denise, 2015). However, role models do not have to set the best example. In this case, program leaders are setting the best example that they can for young people to develop careers, passion, and knowledge of the environment and its sciences. The role that the programs play is to provide the foundation for youth to explore with positive imagery and guides. One participant describes a characteristic that makes it easier to connect to the youth as a role model.

> "I think I have been able to pull ag concepts and help and relate them to STEM but I think what is the most effective thing in relating to these kids, is that I [the program leader] have youth." (Jamaal)

*Career Development.* Program leaders express the goals of educating the youth about what agriculture and science are about and how they can feed, shelter, clothe, and heal people. Such exploration is taught through farm work, guest speakers, and even nature alone. One major career aspect was being owners of their skills and work. Taron describes career development in a form of self-reliance "We are raising them to create careers with ownership. Ownership is the most important thing". Education on health and natural elements exposes youth to new disciplines such a holistic health and meditation, whereas career fairs introduce professions in such careers. All activities are conducive to one's career explorations, which aren't afforded in traditional learning spaces for Black youth. For example, one participant describes a specific aspect of career development as:

> "And I think it is important that we bring that back to the table, to our community to let our children know there is nothing wrong with being a farmer, and being involved in NBA if that is what you want. But to understand you don't have to use your body to get your wealth, you can use your mind too.... We are raising them to create careers with ownership. Ownership is the most important thing." (Taron)

Whereas another program leader made it clear that the work they're doing physically in agricultural and STEM is conducive to their career exploration phase.

"And of course we want our young people to look at the various careers in ag, and to meaningful careers to them and of course they learn of the different careers that are available to them through agriculture." (Tanisha)

<div align="center">Theme 6: Economic and Community Development</div>

All program leaders expressed their passion to create ownership in agricultural production and form new streams of revenue. As noted by Arionne "I thought it was necessary to teach the community about other sources of income through farming year round and not only during harvesting seasons". There is a need for collaborative economics within African American communities, which also relates to community development.

*STEM and Agricultural Education*. Leader's expressed the goal of educating the youth in skills that they can use to develop their community and to end generational poverty with multiple career options. Furthermore, the youth are educated on the wonders of nature and what the earth has to provide. They are also taught about the problems that are created that arise from nature, such as pest and disease, and men such as pollution, which requires solutions from people like themselves. However, in order for the youth to know about the issues to solve them, they have to be equipped with knowledge about practices and disciplines. This introduction to agriculture and STEM is done through the programs structure of non-formal agricultural education. Jamaal describes his teaching method as the key to teaching STEM, "I think I have been able to pull ag concepts and help and relate them to STEM". Whereas other participants such as Roger mentioned how they farm careers.

> "And around the different career opportunities around agriculture it's not just putting your hands in the dirt, it is a part of it but there is soil science, there is distribution, marketing, economics, customer services, technologies, and the growing process and how to get your food snap, how to use them at local markets, landscape. on and on." (Roger)

*Avenues for Economic Development*. Program leaders express the need to self-sustain and

to be self-reliant through agriculture. Agriculture is taught as providing the necessities to survive,

food, shelter, and clothing. Such principles are taught to the youth as entrepreneurship skills or as

skills that are necessary to have to survive. Either way, economic stability is needed to create

generational wealth and to afford opportunities that have not been afforded to Black youth in

particular.

> "We are linking afterschool activities to a career that would end the cycle of generational
> poverty because if they go to school then the degree would necessitate a job or career to
> make income and we are pushing our kids to go to college, prepared "(Roger)

*Community Education and Stewardship*. Through this work, students learn about the

importance of community work. They learn that they can have control of their environment and

what the community looks like as far as development and beautification. This component is

important because skills are able to be retained because they are seen as useful. Students are then

challenged to come up with solutions through food, again sparking creativity. Such concepts

teach a variety of life skills that may lead to greater opportunities. For example, one program

leader changed the program to an employment opportunity through the city and state grants.

Through such programming, students are able to build network and gain status by participating

in programs which contain and hold valuable capital.

> "I think it is important for the youth to know where the food comes from and how they can
> control different aspects of that or to know about it. Having more control of what is going
> on in their life." (Que)

The programs were wanting to involve youth in food justice and insecurity issues as it also

relates to the health of the community as well. This social justice piece contributes to the

learning experience as well where students are developing skills through hands-on experiential

learning. Such outcomes situate agricultural programs in communities a tool to engage minority

and underrepresented populations in agricultural education. Although this is not the focus, it is an attempt to direct students into a pipeline that offers multiple career options in community activism and community development. However, careers in STEM are not unnoticed either. The program allows the students to explore solutions to community issues with their knowledge of agriculture and STEM that is provided through the programs' activities. Such activities also include entrepreneurial components

> "The program in its second year I had a different approach to tie in an enterprise for black farms to say "hey, we have to have another way to make money besides going to the markets," so the second year program I incorporated jelly and jam that was made from local farmers that were growing products and creating value added products, and um folks who were scientist and using local ag to formulate body butter and beauty products and I was just really plugging in a lot of local farmers in a way that set review streams for them and informed curriculum for the class the way it was taught about black farmers so that they see and didn't have this romantic idea of what farmers are" (Arionne)

Arionne makes it a point to operate her business and programs year round as a sustainable stream of economic wealth and educational pursuits for the youth to provide to the community. Over the years, she was able to expand her program to address various barriers or characteristics of the African American communities and businesses within agriculture and STEM.

## Discussion

The purpose of this research was to capture the essence of what program leaders were delivering to African American youth as it related to youth development and career interest in STEM and Agriculture. It was also key to capture the motivations of the program leaders. Overall, the main driven key of the program leaders was to better the conditions of the Black community, starting with teaching the young people about culture and nature. For example, Hoff (1998) discusses countries' abroad troubles with addressing economic development due to the

social factors embedded in the history of colonialism. Such context can also be explored here in America, for this is the main purpose of community-based programs, to change the overall conditions of African American communities. But, no one wants to talk about African Americans bad eating habits in relation to slavery and how that impacts the diet today, in addition to the lack of healthy choices that are not invested into African American communities. Although the conversation is happening, to say the least, the conversation is not backed by new policies, findings, and research dollars to prove such racism exists and that it is thriving. Dominate social values must change in order to see a change (Hoff 1998) in the way underserved communities of color are lacking capital and resources.

In this research, it was evident that African American leaders of the community knew that there was a disconnect between the land and African Americans that needed to be addressed and bridged. This disconnect was heavily embedded in the influence of slavery and sharecropping systems that have deterred African Americans interest in such fields (Outley, 2008). To capture and discuss the findings, this portion is structured by answering the research questions. This is best as the qualitative data composed of narratives with multiple ideas and answers to the three research questions. Such crosses are shown in figure 2.

As Black American communities are typically underdeveloped and with less capital in all (Yosso, 2005), the community-based program is situated as a tool used to build the community by starting with the inhabitants, the youth. The community youth members of the program are situated as community representatives for community development projects. Such projects feed the community, educate the community, and most importantly, build a relationship with the community and its members and their resources.

**Research Question One**

Getting into the stakeholders' motivations and reasons to have the program, program leaders expressed their role in the program was not only to be the director of the programs but to also serve as a role model for the young people. Program leaders made it clear that African American youth today are misguided by negative influences and role models (Le & Stockdale, 2011), which is why they chose to work in community-based programs. Playing the role as an elder, just like the program leaders had experienced in their childhood, program leaders wanted to guide youth in the right direction. As literature stated, there is currently a generational course of poverty (Desmond, 2012) being reproduced in Black communities in particular. This idea has been framed as "poverty culture" (Greenbaum, 2015). Unlike the participants in the study, many Black young people do not have a support system to help them in their personal and professional life (Desmond, 2012). Greenbaum (2015) explains that such culture of poverty can be broken with mentorship and community development, that is however programs that are not based on governmental reports of false observations of the poor, such as the "Mohynihan Report".

The program leaders that were included in this study are actual members of the community that have a clear understanding of what is missing in the youths' development stages of career interest. Program leaders made sure that the young people had someone to look up to and an advocate that can speak positively on their behalf, especially within educational spaces. The program leaders naturally take a role as a parent and set guidelines and expectations for the students to adhere and strive by. As a parent they also afford the youth social capital (Lin, 200). This allows the students to be challenged in an academic, civic, and nurturing environment. Such environments encourage the students to be great learners and thinkers. Paulo Friere (1990) describes this relationship as an equal playing field where knowledge is shared between both

parties. This is a concept that program leaders expressed as a factor in students feeling comfortable to make mistakes but still learn, which is a concept that has been explored by Friedmann (1987) to help one gain valuable knowledge due to the nonauthoritarian manner of exchange.

The leaders of the programs also made it clear that they are a community-based program so many of their teachings are core to community development and engagement to ultimately create social change (Christens and Dolan, 2011). Program leaders are aware of the multiple skills youth can build by being part of the participatory process (Sanoff, 2000) of forming urban gardens or farmers' markets

## Research Question Two

In similarity to the other differences that are seen in the school system while looking at racial lines and the resources in them, Black youth are tolerated in traditional classrooms (Leonardo, 2013). In addition, Black history teachings are limited in the traditional school textbooks (King 2017). This dynamic is totally different at the programs. The youth are invited to the space to learn and grow through agricultural and STEM practices (Ejiwale, 2012). Such agricultural practices are also hands-on, allowing more STEM skills to be developed through experiential learning (Kolb & Kolb, 2009). Their personal development and educational experiences are all centered around African and African American teachings and principals within agricultural education. Even when it comes to agricultural history, Black figures of glorified. It is a place where, as Prudence Carter (2003) describes, the capital is recognizable and rewarding, Black capital. Initially, the program leaders are prepared to help youth grow and aren't expecting perfect behavior. Unlike the community-based program settings, traditional schools can be viewed as not a place where the kids want to be nor is it a place where teachers

feel like parents. This discipline aspect was also a major theme that appeared to be present in the community-based learning experience versus the traditional classroom learning space. In the space of these programs, the atmosphere is filled with love, care, and positivity, according to the program leaders. It is a space where education is shared between the student and teacher. Everyone in the space is there to grow and become more knowledgeable about what is going on about them. This family style support builds a bond that is honest and genuine between all community partners, the youth, their parents, and their teachers from the traditional school. Unlike the traditional classroom, youth are not punished for their behavior, instead they are taught to be held accountable for actions and to correct such behavior. Personal relationships are built in these spaces that the program leaders provide and support. Relationships with the community, schools, churches, families, and the youth themselves. Many of the program leaders identified a knowledge of "knowing thyself" is taught to the youth. This is the idea of Black cultural capital (Carter, 2003). This nurture and care are life skills that will build self-efficacy and reproduce capital such as culture, that is centered in Black identity. Program leaders are providing a nurturing environment that allows the students to see themselves as contributors of society. In this, students are held to a certain level of expectations.

In traditional learning spaces like public school, African American youth in general are nurtured and are often disciplined harshly. This natural space of learning doesn't require memorization but it requires knowing how to implement ideas and how to be creative enough to solve issues with the resources one may have available for their access. This environment creates a network of creativity for the youth in an educational and nurturing environment. Students are given the opportunity to literally reimage and reframe what a farm or community garden looks like in their community (Cole, 2010).

**Research Question Three**

African Americans, unlike whites, have been associated with having less dominant culture (Carter, 2003). However, this capital is valuable to youth in learning spaces, because they are comfortable to learn and grow. Although there is not a direct path to certain careers, the programs want to provide youth with other options that are promising and positive. In addition, some forms of capital are obviously missing from areas with the highest concentrations of Blacks (Yosso, 2005). Furthermore, Bourdieu describes cultural capital as networks that can afford opportunities to students from family members, however in the case of African Americans in agriculture this network does not have a positive influence of youth perceptions of agriculture.

Within the program, capital was not necessarily situated as access to careers or mentors in the industry of agriculture. However social capital and creating family-like networks to reproduce greatness such as farmers, are the goals of these programs. The program provides access to other opportunities to the children within their personal and educational development. Within the study leaders were not concerned about sending students into agricultural and STEM careers. Instead, leaders wanted to introduce careers to youth and to provide them the ownership and skills to make the best career decisions and choices in life. Though choice is known to be influenced by the environment, the program leaders see their educational practices as capital that is reproduced to generate better influences on career decisions. As mentioned, there is a generational gap that youth are experiencing with their elders. In fact, some elders also discourage agriculture because of their negative experiences with agriculture such as sharecropping (Outley, 2008). Such factors demanded a review and reframing of what agriculture is and what it can provide. Many of the participants made it clear that agriculture was

the foundation of liberation and self-sustainable practices. Such principles are key in letting youth know that they have control over their futures and what they want to be in life.

As Bourdieu (1977) situates capital as resources and opportunities that is afforded and generated through connections or networks, it is clear that minority groups do not have the same leverage points to gain such "dominant" capital. But as community-based programs enter underdeveloped communities to teach skills, a new cycle of wealth and education is created. This new cycle is needed to afford African American youth opportunities in agriculture and STEM.

## Limitations to the Study

Some of the limitations to this study consist of not being able to mention or include all factors inhibiting or contributing to youth's development. In addition, all components in a program may not be gathered by the data collection processes. This limitation hinders the study to capture all great work that is impacting African American youth self-determination to pursue agriculture or STEM-related trajectories. Another limitation to the study is the lack of visits to the sites where the program takes place.

## Conclusion

While the students are benefiting from the STEM and agricultural education, the goals and purpose of the programs are not to lead them into agricultural industry careers, however it does introduce the careers to them in a space that encourages their learning and creativity. Ohmer, Meadowcroft, Freed, and Lewis (2009) concluded that community agricultural practices mobilizing community members are within majority White areas. As Tanisha summarized, Whites are always appearing as a "savior". Especially in the context of looking at urban inner-city communities. In Ohmer, Meadowcroft, Freed, and Lewis's (2009) study, majority of their participants were white, as majority of data was focused around white communities, when

referring to community development and agricultural programs. However, this study explored projects and communities of color that are taking ownership in their community through agricultural practices implementations, such as community-based programs. In all, it was clear the directing African American youth into STEM or agricultural careers was not the main focus of program leaders. However, community development and social change is core at involving youth in activities to build their skills and capital to pursue better career options.

Although I was learning about the motivations of the stakeholders to have informal educational experiences for youth, I believe social movements are key to create long-lasting change for the community and its members. The social justice and self-determination of Black youth were important to the leaders more than their actual career goals in agriculture. This is addressed because of the oppression African Americans gets within the STEM pipeline. African Americans are marginalized and therefore have to create their own spaces to do what they want. Such doings are funded where others are framed to perform certain activities to gain funding. Although the organization's purpose is not directly aligned with the funding requirements, organizations are applying themselves and tailoring their activities to specific guidelines. This is done to provide youth with education and power to change their neighborhood and food systems, which was important in the programs' delivery. Quotes such as "knowledge is key" or "a mind is a terrible thing to waste" are all good quotes but they do not specify what knowledge is delivered, to who it is delivered to, and its purpose. This is why there is a need to know what is happening within community organizations and following the paths of youth that are coming from these organizations.

**Recommendations**

In the future, I would like to continue my research in two barriers within two different populations. The finding from both pieces' frames both history and generational gaps core to the miseducation (Delgado Bernal, 2002), and specifically in agricultural and STEM careers (Outley, 2008). Understanding these two barriers within the communities of African Americans and communities from the African diaspora abroad would be great area to expand my studies. Findings in this research such as, history dating back to the enslavements of Africans for agricultural labor and capital gain in modern-day Haiti, situates a need to undercover African history and the enslavement of its people. Particularly, in agricultural and its advancements in technology, research should address slavery, colonialism, racism, and their current effects on people of color globally.

Understanding, this history of oppression and introducing people of color to human advancement disciplines such as STEM and agriculture provides accessibility for opportunities to have people of color contribute to the innovations and future technologies for societies across the world. For example, to be the best competitor in global trade your nation has to be educated. But my question is, who is receiving this education? Are African and African decent countries receiving this education? In America and other countries, it is known for the best education to be given to those whom are wealthy. These wealthy people have seen the benefits of neoliberalism and monopolies, and are now trained to build its future development, using the same logic that benefits them. However, such information has to be delivered and educated to all classes of people within the African and African descent communities. As stated in the article by Stephenson and Zanotti (2017), Haiti's economic, environmental challenges, and opportunities are heavily determined by the demographic characteristics of the people. One's, Haitians, who

are afforded job opportunities which are limited, are only given to the selected few who has education (Sephenson & Zanotti, 2017). Providing such background and knowledge of agricultural and STEM opportunities can change the conditions of such communities.

## Research

In the future, I would recommend evaluations for the various programs that are in existence to see what can be done to enhance the programs and to possibly incorporate them into school environments and afterschool programs in ways that FFA and 4H are situated in the traditional school systems. Sanoff (2000) describes the organization's role as being the sources to partnerships, to strengthen relationships the programs should present results and outcomes of their program. He then recommends that the organization also partake in participatory methods and reflect over their mission and vision with their current status and activities (Sanoff, 2000). In addition to this investigation, performing qualitative and quantitative research to track African American youth pathways would also add to the literature of community-based education. Such research would look at the long-term impacts the programs have on youth performances academically and socially. Such approaches may also allow the programs to expand through grant writings and supportive material to showcase their impacts on the community and youth. Addressing one of the areas of limitations, it would also be great for future research to perform case studies of programs that may have the "ideal" structure.

## Practice

As for program leaders and community-based programs, leaders and stakeholders should begin to think of their program systematically with the use of mapping tools in the future. This could better help frame the organization's goals, mission, and activities in relation to community development. Program leaders should also look into evaluation tools such as logic models, as a

way to keep track of the program's success. And in all, to capture the great work that is happening in underserved communities and with "at-risk" youth, there should be a common directory or council to arrange communication between programs doing similar work. This network could lead to funding, knowledge exchanges, and even financial and economic adventures such as trading produce.

As programs begin to partner with federal agencies for community-based programs that go beyond technical assistance to include networking and extends to building social capital to improve access to opportunities (Diop & Fraser 2009, Christian et al. 2013), community-based programs like the few that were included in this study, should prepare to have material as evidence of the great work they're doing for future funding opportunities.

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**Appendix A**
**A Priori Table: RQ's and Theory**

| Proposition | Supporting Literature | Research Questions | Interview Protocol Questions |
|---|---|---|---|
| Community-based programs with core emphases of programs surrounding agricultural and STEM education, are spaces for African American youth to explore AG-STEM possibilities and practices. | Outley (2008) found several strategies to be considered to provide African American youth with experience, entry level skills and education on a collegiate level and as professional in agriculture and STEM. One of the strategies stated that minority community-based programs should connect with universities and/or professionals.<br><br>Bourdieu and Passeron (1977)'s theories assume that youth who have access to social capital will perform well in education. | What are the program leaders' motivations to create a space for African American Youth to learn and engage in agricultural and STEM practices and professional opportunities? | A1, A2, B1, B3, |
| Community-based programs with core emphases of programs surrounding agricultural and STEM education, are spaces to address the tension of traditional school not providing adequate resources equip African American youth to pursue careers and trajectories in AG-STEM. | Traditional educational classrooms do not prepare underrepresented students to pursue science (Talbert & Larke, 1995).<br><br>Wright (2011) investigated community-based practices for 11th- and 12th-grade African American students and described the ways | 2)How do program leaders of agricultural and STEM educational community-based programs view their activities in relation to the traditional classroom experience of African American youth? | A2, B1, B5, C1, C2, C3 |

| | academically successful African American male adolescents interpret their social and academic lives so they are able to be successful in school while maintaining a healthy racial identity. | | |
|---|---|---|---|
| To best address the impact of out-of-school educational programs, stakeholders should map their program's activites to recognize one's capitals as dominant or valuable and strive to build one's social or cultural capital for underrepresented populations. | Whites typically have access to or reproduced greater capital, meaning they have parents or networks that have navigated through the college or business industry, who can then provide feedback to have more positive outcomes (Roscigno & Ainsworth-Darnell, 1999). Therefore, to increase one's achievement in agricultural and STEM, youth needs to be exposed to capital addressing such areas of disciplines and careers.<br><br>Forms and sources of cultural capital are<br>  -Academic jargon (Carter, 2003)<br>  -HBCUs for they bridge the gap between underserved communities and economic development (Albritton, 2012)<br>  -A formal organizational position or service such as becoming a state or national FFA office | 3) From the perspective of program leaders, how are agricultural and STEM educational community-based programs and their activities providing forms of social and cultural capital to steer youth participants' interests in agricultural and STEM studies and careers? | B2, B4, B5, C1, C2, C3 |

| | (Hains, Hansen, and Hustedde, 2017) -Acceleration in mathematics and in negotiating White STEM spaces for African American youth (McGee, 2013) Forms and sources of social capital -Forming relationships that build skills from opportunities to out-of-school youth (underserved) activities, including arts, journalism, leadership, and civic engagement (Kuperminc, Smith, and Henrich, 2012) -Community-based programs and their partnerships which serve the community (Schelhas et al., 2017) -Community gardening activities where youth and adults form trustworthy relationships (Krasny& Tidball, 2009) -"Features of social organization, such as networks, norms, and trust, that facilitate coordination and cooperation for mutual benefit" (Putnam, 1993) -Access to institutional resources (Bourdieu, 1986) | | |
|---|---|---|---|

**Appendix B**

This guide was used to make sure all areas of inquiry were covered within each interview. This tool was altered for each individual interview with specifics of each program (provided through material that collected). All questions below were used to prompt questions to cover and explore areas as stated in the research questions.

**Interview Guide for Program Staff**

**Information of Interviewee**

Hello, we're going to being the interview with some questions regarding to your positon in the program and reasoning for working with the program

1. Please describe your role in the organization/ program and why you choose to do this work?
    a. What brought you to this position?
    b. What are your personal motivations to stay engaged in this program?
2. What are some personal skills or experience you bring to the organization/program which serves the mission of organization/program?

Now we're going to move into the bigger picture of the programs existence, services, and activities.

**Program Questions**

3. Can you please give a brief description of the organization/program's history and founder's vision of the program?
    a. Why is agriculture a component to include in the program?
4. Can you please describe the motivations, aims, goals, and/or mission of the organization/program?
    a. Describe the population of youth the organization/program is serving?
        i. It's mentioned that you serve _____youth, why this population?
        ii. How are they recruited to participate in the program?
    b. How would you define the overall structure of the program in relation to the programs purpose?
    c. Why are you serving this population?
5. Are there any partnership or relationship that are brought to the program? For example, elders, outside community service events, etc?
6. What programs, activities, and resources are available through this program/organization for African American youth?
    a. How is the program relative to the formal classrooms that your participants experience?
7. How are careers and educational pursuits explored through the programs activities?
8. In relation to the STEM and agricultural activities and structure, please describe the organization/program's desired outcomes pertaining the youth?

Next I am going to ask about ways you're supporting youth and providing them with resources
    a. What networks are being built for the youth participants?
    b. How are you helping youth form and build relationships?
    c. Are youth building relationships with mentors in agriculture or/and STEM?
    d. Please describe any partnerships (community members, programs, government)
        i. What does that look like, or how do you do that, and why.

**Appendix C**

**Document Record Form**
**Organization Name:**
**Stakeholder:**

Components

Programs

Program's Lesson Plans

Daily, Monthly, Seasonal, Activities

Youth Participation/ demographics/enrollment

Guest Speakers/Activites

Documentation

Applications

Agendas

Itinerary

Ads/ Flyers

**Appendix D**
**Checklist for Community-based Program Screening**
**Stage 1: Looking through Public Information**
> Public information will be obtained by looking at sources such as; news articles, online
> website, and videos (see appendix C).

**Stage 2: Asking the stakeholder with screening questions.**
> If all information needed for the screening is not collected, a contact with the program or
> an identified stakeholder will be made via email or phone to ask if the program has the
> missing criteria that the research could not have obtained.

**Use of Documents found online and through screening interviews (3 Mechanism)**
1. The information collected will determine if the program is the right fit and meets the
   criteria for the study.
2. All the information collected will also be used to add clarity to the interview protocol
   to gain more insight into the programs' activities and structures.
3. They will also serve as text to add veracity to the context of which the program is
   situated in.

**Community-based Program Criteria**
**Organization:** _____
**Date:** _____

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**Community-based Program**

**Criteria and Stipulations**
- Established, meaning running a program for at least a year and is now within or entering their
  second year.
  - **Leading questions to ask programs:** I was wondering how long your program
    has been operating
- Learning space outside of the traditional classroom curriculum
  - This excludes programs that are performed during classroom hours but includes
    programs that are happening school campus during breaks, lunches, or after school
  - A non-formal learning environment, where knowledge is delivered to meet the local
    needs (Norqvist & Leffler, 2017)
    - **Leading questions to ask programs:** Where and when does this program for the
      youth take place?
- Provided by an external local educational government source (not provided by the school
  district)
  - **Leading questions to ask programs:** Who operates this program?

**Evidence**


**Sources**

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**Underserved African American Youth Participants**

**Criteria and Stipulations**

- Youth must come from a background where the value of education is poor and have a lack of resources (capitals). This criterion must be established by the program in terms such as "at-risk", "troubled", low-income", and "underserved". The descriptions of youth are not limited to the given terminology
- Must serve youth
  - o Participants between the ages of 2-20
  - o Can include adults as well.
- A majority of the participants must be of African American. Expecting at least half to 3 quarters of the demographics should represent African American youth.
    - ▪ **Leading questions to ask programs:** What are the demographics of the youth participants in the program, and how would describe their backgrounds?

**Evidence**

**Sources**

**Agriculture and STEM**

**Criteria and Stipulations**

- All programs must have a focus on agriculture and its practices
- STEM concepts should be learned, this includes the science and technologies used in agricultural productions
- The organization should be centered around the subject of agriculture and its sciences but doesn't not have to be limited to these developments and skills.
    - ▪ **Leading questions to ask programs:** Is the program focused on agricultural concepts and learning activities? Are there any emphasis on the science, technology, engineering, and mathematical concepts?

**Evidence**

**Sources**

**Appendix E**

**Analysis Steps (individual and cross case analysis)**

Look for main ideas to be coded (outline in 1 -6 steps)
1. Review raw data
   a. All data sources individually to check for complete data (full audio recordings)
2. Transcribe data (verbatim)

3. Edit transcripts to legible text and content

4. Perform open coding aligning with themes and research questions of the study and taking note of new arising themes
   a. Review data for various interpretations

5. Gather focused codes to match with quotes

6. Group focused codes with themes and research questions

Search for patterns in the multiple data sources
   a. Convergence and non-convergence chart

7. Look for linkages between transcript, program documents, activites

8. Draw tentative conclusions, and include them into the focused codes and themes

9. A second round of coding with focused codes and quotes will be inserted into a program for qualitative research tools.

| Appendix F | | | | |
|---|---|---|---|---|
| Research Question | Themes | Focused Codes | Open Codes | Quotes |
| **1: Program leaders' Motivations** What are the program leaders' motivations to create a space for African American Youth to learn and engage in agricultural and STEM practices and professional opportunities? | **Theme 1:** Generational Guidance. | **1a:** Leaders received guidance and education from elders in their family | Background: elderly guidance Background: quality time with elders Early childhood exposure Family establishment Family structure Father influence Grandparent influence parent influence for personal motivation of program leader | "What led me to this work in particular is that my father started the farm..." **Roger** |
| | | **1b:** Leaders serve as an elder influence for the youth. | real life experiences with soil | "The parents are barely home to spend quality time with the kids. They come home and want to relax. So we try to provide that, not like we are the adopted parents but we are that sergeant parental, substitute for youth that are missing that." **Taron** |
| | | | Teaching them proper service to the community Personal Motivation : show black youth that they can have ownership of their community Build personal skills Build personal relationships with youth and families Passion to help youth parent influence for personal motivation of program leader ownership organic approaches to teaching from elders need to develop innovation black thinkers along with the world innovations need to change the image of blacks in education and their roles in history Need to advance black youth mentorship in all aspects of life Education of food for black communities across all class lines | |

| | | | connecting culture through crops<br>connecting back to African roots<br>Connecting back historical roots<br>community empowerment through food production<br>BG (background): quality time with elders<br>BG( background): elderly guidance<br>allowing student's input to be valuable | |
|---|---|---|---|---|
| | **Theme 2:** Program leaders are lead to change the conditions of the Black community. | Program leaders also expressed that their parents influence of reassuring stewardship as the greatest reward one can give, was a personal motivation that also developed into a passion to educate the youth and serve the community. | Teach youth resistance<br>Reassurance of their circumstances<br>provide care and support<br>provide alternative promising life styles for youth<br>previous work with underserved communities<br>political background<br>need to change white agenda on how to educate black youth<br>need for better school and food systems<br>Need for education of health and wellness<br>To motivate the youth<br>Provide an introduction to self-worth practices<br>changing extra curriculum activities<br>Ownership | "So as a Black American that came here from the diaspora I wanted to reach a particular folk. I feel that being in touch with the land is healing and I always wanted my work to be concentrated in a community that I am a part of, aligned with, and culturally adjacent to." **Arionne** |
| **2: Traditional Classroom VS CBP Classroom** | **Theme 3: Black Culture** Program leaders expressed that the culture and history of Africans and people of | **3a:** Reframing *Blacks in AgriCULTURE* (*Black Greatness*) | teaching ownership<br>Teaching moral values core<br>teaching history of African people<br>teaching food is culture<br>teaching about growing your own food<br>resistance<br>reintroducing agricultural practices<br>reintroduce agriculture<br>reframing the image of women Black women<br>reframing the image of black youth for the community | "My mission is to change the narrative of agriculture for our people, the adults, and especially for the younger people. But old too. The young ones because they just look at ag, the history of America and |

| | visual African descent is at the center of the teachings at the farm and in their programs. | | reframing the image of agriculture<br>reframing the history of African descent people<br>reframing nature<br>reframing history<br>reframing community work<br>reframing black youth narratives<br>reframing agriculture with historical frames<br>reframing agriculture for African descent people<br>reframing agriculture<br>reframe nature<br>reconstruct the idea of agriculture<br>rebuild blacks relationship with agriculture<br>real life problems they're solving in the community<br>Provide a different educational experience<br>paying homage to ancestors<br>Older voice to connect today with the past<br>Nurturing environment<br>not prepared (education)<br>need to change the image of blacks in education and their roles in history<br>Need to advance black youth<br>Need for blacks to reframe and rewrite the histories of their people<br>Need for black space<br>need for black mentorship<br>need for better school and food systems<br>Need for education of health and wellness<br>narratives of agriculture<br>moral and values of African descent<br>moral and values<br>making sure culture is centered in community engagement | slavery involved in agriculture. SO, it is kind of.., it's not disheartening, but it's sad when I talk to the youth that's the first thing." **Taron** |

| | | | making a change in their environments (school and home)<br>defining farming<br>culture is explored for blacks<br>culture for black communities<br>cultural crops<br>culture is provided as a form on discipline<br>culture in food<br>culture in ag is developed over time<br>culture in ag<br>crop culture<br>connecting the past perceptions with today's actions and involvement in ag<br>connecting soil with history<br>connecting culture through crops<br>connecting back to African roots<br>Connecting back historical roots<br>Changing the image of agriculture education for urban students<br>build relationships<br>breaking the cycles<br>Blacks are at the center of science<br>Black youth only<br>black history reframed<br>Black are at the center of America<br>Black are at the center of agriculture<br>agriculture is used for culture awareness<br>African theme farm to reframe agriculture<br>a process to reframe agriculture to spark youth interest in such careers | |
|---|---|---|---|---|
| | | **3b Nurturing.** Program leaders expressed and repeated the importance of having a bond and true relationship with the student that is focused on student success and community education. | | So it's a place where when once you come |

| | | | | |
|---|---|---|---|---|
| | | | time to plan future<br>the youth wants to be there<br>the youth are building themselves with educational practices<br>teaching youth about nature<br>teaching ownership<br>Teaching moral values core<br>teaching history of African people<br>space for youth to explore personal interest<br>space for youth to become inspired by nature<br>pm: teaching students that were in a food crisis<br>personal skills<br>personal relationships with youth and families<br>Passion to help youth<br>parents involvement<br>ownership<br>Nurturing environment<br>moral and values of African descent<br>moral and values<br>mentorship in all aspects of life<br>mentorship and guidance for educational and career pursuits<br>life lessons<br>Life<br>lack parental guidance<br>knowledge is shared<br>know thyself<br>know about their community<br>Family structure<br>family environments<br>families are educated<br>families<br>Discipline | you don't want to leave. And there are times where I'm like it's time to go home and the children are having so much fun they ask me "Why do we have to go to school? Why can't this be our school?"<br>**Shavon** |

| | | | | |
|---|---|---|---|---|
| | | **3c Discipline.** Program leaders expressed that the major key in their work is centered around culture and discipline for the young people | college volunteers<br>built relationships based on leaders in the program<br>building families<br>build relationships with youth<br>build relationships<br>breaking the cycles that are in low-income black communities<br>breaking the cycles<br>bonding youth with elders to generate wealth<br>allowing student's input to be valuable<br>agricultural practices core of learning principles and values | This includes holding everyone responsible for their action in different forms of discipline and a sense of community"<br>**Tanisha** |
| | | **3d**. **Reframing Nature**. Connecting back to the roots and the culture of African people was the core of the program leader's goals. | teaching responsibility<br>Teaching characteristics<br>Teach life skills<br>Family atmosphere<br>Nurturing environment<br>Natural learning<br>Moral and values of African descent moral and values<br>Family<br>Mentorship in all aspects of life<br>Need to advance black youth<br>Black self-worth | "They brought a number of us here through the institution of slavery so we were still able to hold some |
| | | | Teach nature is rewarding | |

| | | | | |
|---|---|---|---|---|
| | **Theme 4: Experiential Learning and Educational delivery** | **4a. Solving Community Issues.** Community-based programs center their efforts on the community. | nature importance is lost<br>nature importance<br>natural learning<br>mental health<br>life in food<br>Life<br>engage black youth in nature<br>disconnection with soil<br>defining farming<br>culture in food<br>connecting out roots<br>connection with nature is fostered for youth growth<br>connection with nature<br>connecting with soil<br>connecting soil with history<br>connect youth with nature<br>connect with soil<br>connect with fresh produce<br>changing extra curriculum activities<br>alternative strategies for relaxation<br>agriculture is used for culture awareness<br>a process to reframe agriculture to spark youth interest in such careers<br>placing black youth in nature | of our values but our values often times where closer to ways of how we adopt tot our environments, so once you separate us form the land you separate us from our culture. **AJ** |
| | | **4b. Natural and Authentic Teachings.** The teaching styles of | Health<br>Capital<br>space for youth to explore personal interest<br>space for youth to become inspired by nature<br>Infrastructure | "Young white suburbanites were moving into the city and establishing community gardens. And starting a garden is really a great thing, but what was disturbing to us was that we had these young white coming into the community |

| | | the programs allow students gain knowledge through hands-on learning activities and outdoor learning labs. | Food access<br>Poverty<br>Gang violence<br>Education<br>Communication<br>Unity and structure<br>Culture competence | and establishing gardens but they were not engaging with the people of the community, So we saw it as disrespectful" **Tanisha** |
| | | | | "One of the things is the hands on activities and outdoor learning areas" **Roger** |
| | | | pm: develop children<br>placing black youth back in nature<br>place for creativity<br>personal skills<br>personal relationships with youth and families<br>outside learning<br>organic approaches to learning about farm production<br>organic approaches to community work and engagement<br>Nurturing environment<br>natural learning<br>moral and values of African descent<br>moral and values<br>model to grow food and connect to community work<br>learning is fun and natural<br>learning from the past | |

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| | | **4c. Space for Creativity.** Youth are able to be in a space where they can be creative with their peers and leadership teams. | learning from real life practices<br>learning by doing<br>Learning about being one with nature<br>learn skills at the program<br>learn by doing<br>learn about various aspects of the food system<br>Learn about sustainable practices<br>learn about preparation to cook<br>learn about food sciences<br>learn about food labels<br>Learn about environmental factors<br>leading by example<br>knowledge is shared<br>know thyself<br>Kids wants to learn<br>keep interest<br>introduce community designs to youth<br>feeding the community<br>farming production<br>farmer<br>farm production is a learning process<br>farm is a place learning<br>farm is a classroom<br>Farm controls the learning<br>explore learning<br>explore career ideas<br>encouraged to ask questions<br>Empowerment for the people<br>education is spread through the learning experience<br>educate youth to have control over their food systems<br>Creating ownership<br>connecting our roots<br>connection with nature is fostered for youth growth | |

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| | | | connection with nature<br>connecting the past perceptions with todays actions and involvement in ag<br>community engagement<br>bonding youth to motivate them<br>Blacks do not have spaces to grow and share culture<br>bad community culture<br>approaching youth with resources<br>Active engagement with the students<br>accepting students' knowledge that they bring<br>bonding youth to motivate them | I created the school so children can pick what they want to do and when they want to do it. And so they are creative. **Shavon**<br><br>A lot of these kids have not had the chance to be creative. **Taron** |
| | | | space where youth are welcomed<br>space to talk about the environment<br>space to begin family conversation<br>space for youth to explore personal interest<br>space for youth to become inspired by nature<br>space for black youth grown through conversations<br>farming production<br>farmer<br>farm production is a learning process<br>farm is a place learning<br>farm is a classroom<br>Farm controls the learning<br>creativity is key<br>community space to engage<br>After school programs to engage youth | |
| **Research Question 3: Program Elements as Capital.** | **Theme 5: Industry Exposure** | **5a) Role Models in Agriculture.** Examples of mentors, within agriculture and STEM, | a process to reframe agriculture to spark youth interest in such careers<br>After school programs to engage youth<br>agriculture career | "I think I have been able to pull ag concepts and help and relate them to STEM |

| From the perspective of program leaders, how are agricultural and STEM educational community-based programs and their activities providing forms of social and cultural capital to steer youth participants' interests in agricultural and STEM studies and careers? | and Knowledge | that youth are able to form relationships with comes from the agricultural program activities and leadership teams. | agriculture is STEM<br>black identity is lost<br>black male lead<br>black women in agriculture<br>Black women mentorship<br>career exploration<br>Careers are explored through learning<br>college and career readiness<br>college volunteers<br>reintroduce agriculture<br>respect for the past trials of our ancestors<br>role model influences<br>students are teaching<br>volunteers from college | but I think what is the most effective thing in relating to these kids, is that I [the program leader] have youth." **Jamaal** |
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| | | **5b. Career Development**. Program leaders express the goals of educating the youth about what agriculture and science is about and how it can feed, shelter, clothe, and heal people. | they are motivated to pursue careers in agriculture and stem teach them skills for various careers<br>teach life skills<br>Spark interest in career<br>space where youth are welcomed<br>soft skills development<br>Relationship building<br>Skills<br>reconstruct the idea of agriculture<br>rebuild blacks' relationship with agriculture<br>providing role models<br>providing foundation for youth who seek change<br>providing foundation for youth to explore careers<br>provide safe place to explore interest<br>Provide foundation of educational introductions to careers | "We are raising them to create careers with ownership. Ownership is the most important thing." **Taron**<br><br>"So if they are interested in technology we are connecting them with the career options related to that field of technology and connecting them to people that are professionals in those |

| | | | | provide career exploration<br>provide alternative promising life styles for youth<br>Provide a different educational experience<br>Project based learning<br>production happens with learning<br>producing high demand crops<br>prepare food<br>preparation to harvest to sales are learning spaces for youth<br>practical skills<br>poor food system<br>pm: develop children<br>personal skills<br>personal relationships with youth and families<br>ownership<br>own food<br>own community<br>opportunities for Black youth besides entertainment<br>not prepared (education)<br>networks are built<br>need to education for blacks<br>need to develop innovation black thinker along with the world innovations<br>need to change white agenda on how to educate black youth<br>Need for black space<br>need for black mentorship<br>need for better school and food systems<br>Need for education of health and wellness<br>natural space for urban communities<br>natural learning<br>narratives of agriculture | career fields and also giving them the educational background to achieving that career goal." **Roger** |

| | | | mentorship and guidance for educational and career pursuits | |
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| | | | mental health | |
| | | | men in agriculture | |
| | | | life lessons | |
| | | | learning sparks passion | |
| | | | learning is fun and natural | |
| | | | learn by doing | |
| | | | knowledge is shared | |
| | | | know thyself | |
| | | | jobs | |
| | | | innovative ideas | |
| | | | Exposure to multiple careers in ag and stem | |
| | | | exposure to agriculture industries | |
| | | | explore many aspects of agriculture production | |
| | | | explore learning | |
| | | | explore career ideas | |
| | | | Entrepreneur | |
| | | | Early childhood exposure | |
| | | | connecting ag with learning and career | |
| | | | college and career readiness | |
| | | | built career connections | |
| | | | Building transferable skills for black boys | |
| | | | Building pathways to success | |
| | | | build youth leadership skills | |
| | | | build youth capitals | |
| | | | build work experience | |
| | | | build relationships with youth | |
| | | | build relationships | |
| | | **6a. STEM and Agricultural Education**. Leader's expressed the goal of | Blacks aren't developed in white spaces | "Because we look at it in a holistic point. |
| | | | allowing student's input to be valuable | Because yes we need |
| | | | All children dont want to farm | farmers, but farmers |
| | | | agriculture is STEM | |

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| | **Theme 6: Economic and Community Development**. | educating the youth in skills that they can used to develop their community and to end generational poverty with multiple career options. | agriculture career<br>After school programs to engage youth<br>a process to reframe agriculture to spark youth interest in such careers | can't farm unless we have people that are knowledgeable about healthy soil, and GWC was the first sustainable farmer, and he was many other things and we are looking at that."<br>**Tanisha** |
| | | **6b. Avenues for Economic Development.** Program leaders express the need to self-sustain and to be self-reliant through agriculture. | Teaching business operations<br>space to talk about the environment<br>resistance<br>Relationship building<br>reframing community work<br>reassurance of their circumstances<br>provide resources through community and nature<br>provide food for underserved communities<br>provide education for underserved and served communities for blacks<br>production of value added<br>producing high demand crops<br>learning sparks passion<br>lack of resources in the community<br>lack of resources from the city requires planning and certifications<br>lack of food<br>economics of agriculture<br>economical strategies<br>control over life skills<br>control of food<br>community supported economics and education<br>community empowerment through food production<br>agricultural practices to save money | "We are linking afterschool activities to a career that would end the cycle of generational poverty because if they go to school then the degree would necessitate a job or career to make |

| | | | agricultural practices core of learning principles and values<br>agricultural practices | income and we are pushing our kids to go to college, prepared."<br>**Roger** |
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| | | **6c. Community Education and Stewardship**. Through this work, students learn about the importance of community work. | Teaching business operations<br>space to talk about the environment<br>resistance<br>Relationship building<br>reframing community work<br>reassurance of their circumstances<br>provide resources through community and nature<br>provide food for underserved communities<br>provide education for underserved and served communities for blacks<br>production of value added<br>producing high demand crops<br>learning sparks passion<br>lack of resources in the community<br>lack of resources from the city requires planning and certifications<br>lack of food<br>economics of agriculture<br>economical strategies<br>control over life skills<br>control of food<br>community supported economics and education<br>community empowerment through food production<br>agricultural practices to save money<br>agricultural practices core of learning principles and values<br>agricultural practices | "I think people get is misconstrued that if you put black people in traditionally white spaces that it is a step towards fixing the problem of equity and equality but it is not. What has to happen is that there has to be people of African descent with certain perspectives and experiences to further help and develop that issue." **AJ** |

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| | | | community activism<br>building culture through the land<br>black youth are without access to healthy food<br>black youth and communities are in need<br>blacks are involved in agriculture and community work<br>allowing student's input to be valuable<br>Black youth deserve to change their community<br>Changing the cycle of underserved communities<br>bringing opportunities for black people<br>bad community culture<br>changing food access<br>bring the community together with food<br>breaking the cycles that are in poor communities<br>better the people<br>build relationships<br>providing the foundation<br>respect for the community and its members<br>providing space for students to engage with different communities<br>teach small lessons to apply<br>teach life skills<br>providing foundation for youth who seek change<br>Poor access to quality and affordable food<br>misinformed about food nutrition<br>Farm controls the learning<br>education about food and crops<br>education about food<br>personal skills<br>reframing agriculture with historical frames | |

| | | | introduce food to youth<br>teach them skills for various careers<br>opportunities for Black youth<br>teaching vocational skills<br>education about the community's food<br>farmer<br>teaching youth about environmental systems<br>personal relationships with youth and families<br>education about food systems | |
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