Urban Agricultural Education: Exploring Good Practices for Recruiting and Retaining Underrepresented Youth into the Agricultural Industry

Quintin O. Robinson

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Rick Rudd - Chair

John C. Ricketts

Curtis Friedel

Tiffany A. Drape

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ABSTRACT

The agricultural industry continues to face a shortage of qualified workers in high-skill, high-wage positions, while underrepresented youth remain largely excluded from agricultural education and careers. This study examines successful urban School-Based Agricultural Education (SBAE) programs that have effectively recruited, retained, and prepared underrepresented youth for agricultural professions. Guided by the Theory of Planned Behavior (TPB), this qualitative multiple-case study explores how external factors, school practices, and teacher influences shape students' attitudes, perceived behavioral control, and subjective norms toward agricultural careers. Data were collected through interviews with teachers, administrators, and alumni from four urban high school SBAE programs recognized for engaging diverse student populations.

Findings indicate that family perceptions, financial constraints, program accessibility, and exposure significantly influence students' intentions to pursue agricultural careers. Self-efficacy, mentorship, inclusive curricula, and strong community-school partnerships were identified as critical to student persistence and engagement. Early exposure and culturally relevant learning experiences were key in transforming negative perceptions of agriculture into sustained career interest.

Recommendations include expanding urban agricultural programs, strengthening mentorship and community partnerships, and developing inclusive curricula that reflect the cultural and historical

contributions of underrepresented groups in agriculture. These findings can guide educators, policymakers, and community leaders in creating equitable and sustainable pathways that increase the participation of underrepresented youth in the agricultural workforce.

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GENERAL AUDIENCE ABSTRACT

The agricultural industry continues to face a shortage of skilled workers, yet many young people from underrepresented backgrounds do not view agriculture as a viable or appealing career path. This study examines how high school agricultural programs in urban settings are changing that perception. By exploring four successful programs, the research highlights how teachers, schools, and communities collaborate to attract and support diverse students who ultimately pursue careers in agriculture.

Many students overlook agricultural studies because they lack access to programs, encounter financial barriers, or associate the field only with traditional farming. However, when students are introduced to agriculture early—through engaging lessons, hands-on experiences, and strong mentorship—they begin to see it as a field rich with opportunity, technology, and innovation. Partnerships with local businesses and universities further connect students to real-world career possibilities.

The findings show that expanding urban agricultural programs and providing culturally relevant instruction can open doors for students of color and others historically excluded from agricultural education. By investing in these programs, schools and communities can help cultivate a more diverse, inclusive, and sustainable agricultural workforce for the future.

DEDICATION

This dissertation is dedicated to my loving wife, Mon-Cheri A. Robinson, and my children, Quintin Orlando Robinson II, Nyla Rhea Robinson, and Amoura Cheri Robinson.

To Mon-Cheri:

Mon-Cheri, I want you to know how deeply grateful I am for you. Thank you for standing with me through my PhD and dissertation journey. Packing up our family and moving to another state showed me how much you trust and believe in me. I'm so thankful and appreciative of your motivation, the long talks, late nights, and early mornings, and the sacrifices you made to see my goals and dreams come true. For the way you kept pushing me forward when I felt like there was nothing else in me—I say thank you.

Thank you for challenging me, believing in me, praying for me, and reminding me that I was capable, even when I doubted myself. You have been my anchor, my motivation, my biggest fan, and my partner in every sense of the word. I am truly blessed to share life with you. This work belongs to us. I dedicate this dissertation to you and honor everything you pour into our family. I Love You!

To my children — Deuce, Nyla, and Amoura

You three are the greatest blessings of my life. Finishing this dissertation is proof that with God first, there is nothing you cannot accomplish with hard work, focus, and faith. Every page was written with you in mind. I want you to always know that Daddy did this for you, and that you can do even greater.

In loving memory of

Father Michael D. Dismukes

Grandmother Nell C. Byrd,

Grandmother Minnie L. Dismukes

Grandfather Onie L. Robinson Sr.

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You are a fighter, a warrior, and one of my heroes. I love you deeply.

I will never forget graduating with my master's degree—the moment when the gentleman in front of you had a seizure, and you missed seeing me walk across the stage. I told you then that I would earn my PhD so you could watch me walk again. And today, you should be proud: you have your first PhD in the family.

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CRT	Critical Race Theory
CTE	Career Technical Education
DEI	Diversity, Equity, and Inclusion
FFA	Future Farmers of America
GDP	Gross Domestic Product
IRB	Institutional Review Board
NFA	New Farmers of America
TPB	Theory of Planned Behavior
SAE	Supervised Agricultural Experience
SBAE	School-Based Agricultural Education
STEAM	Science, Technology, Engineering, and Mathematics
USDA	U.S. Department of Agriculture

Chapter 1: INTRODUCTION

American agriculture is an essential industry that feeds the world and increases global food security. Within the United States, minority workers remain significantly underrepresented in skilled and higher-wage agriculture careers. The lack of underrepresented youth who pursue agriculture careers may be explained by social norms, personal and family perceptions of agriculture, a lack of knowledge about careers in agriculture, and a belief that they are not able to pursue a career in agriculture.

According to the U.S. Department of Agriculture (USDA), the agriculture, food, and related industries contributed $1.109 trillion to the U.S. gross domestic product (GDP) in 2019, accounting for a 5.2% share. Based on this data, it is vital to continue developing agricultural technology and practices to boost food production for an ever-growing world population. Consequently, the industry needs to, now more than ever, harness the knowledge, skill, and passion of a diverse workforce.

Attracting underrepresented youth to high-skill, high-wage careers in food production, research, food security, food justice, and beyond will bring an underused pool of potential employees to the agriculture industry.

The lack of qualified applicants for agricultural career openings poses a threat to the industry by not having people to fill key roles in production, research, processing, promotion, and management. One potential source of new employees in agriculture is the relatively untapped resources of underrepresented youth.

While the solution to this problem may appear simple—bringing more underrepresented youth to agricultural careers—it is indeed a very complicated issue based on a negative historical context. Underrepresented youth have been overlooked, discouraged, and outright excluded from

high-skill, high-wage jobs in agriculture throughout our nation's history. Educating underrepresented youth in and about agriculture is only one step toward increasing minority participation in agricultural careers. Using SBAE programs in communities with underrepresented youth populations may contribute to creating an inclusive and welcoming environment where social norms, perceived behavioral control, and minority youth and community attitudes toward agriculture and agricultural careers can be addressed through effective urban SBAE programs.

Background to the Problem

A diversity gap exists in SBAE programs based on the number of students enrolled compared to the national secondary school student population. For example, in 2013, "40% of students enrolled in public schools were from a minority group, while only 24% of them were enrolled in school-based agricultural education" (Swinehart, 2013, p. 15). This data, alongside the projected increase in enrollment of students from minority groups, indicates an opportunity for school-based agricultural teachers to be more inclusive in program development, recruitment, and instruction. While some SBAE programs, particularly in urban areas, are effective in recruiting, retaining, and placing underrepresented youth in high-skill, high-wage agricultural careers, there has been limited written documentation on effective practices to facilitate this process.

No recent significant increase has been noted in the diversity of SBAE programs nationally. For example, whereas Texas agricultural educators tend to demonstrate favorable attitudes toward having diverse classrooms, a review of the research by LaVergne et al. (2011) does not show progress in diversifying secondary SBAE programs. While Texas school-based agriculture teachers, like teachers in many states, say they welcome underrepresented youth to

their agricultural education program, little progress has been made to increase minority participation.

Teachers also play a crucial role in creating an inclusive, diverse, and equitable environment in their classrooms. They create this environment by regularly voicing their perceptions of inclusion, diversity, and equity. LaVergne et al. (2011) indicate that a study on teachers' perceptions of inclusion in their classes revealed that a majority favored extra lessons to effectively work with students from diverse backgrounds. In supporting inclusion, respondents also noted that positive strategies should be based on the context and nature of the instruction delivered. Therefore, educators' readiness to receive training on additional educational strategies for diverse students shows that diversity is a priority for SBAE teachers.

Although some steps have been made toward enhancing inclusion, diversity, and equity in agriculture, minority groups are still underrepresented in high-skill, high-wage jobs across the entire industry. According to Heim (2019), "of the 3.4 million landowner/farmers nationwide, just 240,000 — or roughly 7% — are minorities, a ratio that has remained relatively flat for many years. The persistently low numbers beg the question: Are minorities uninterested or unexposed to agriculture?" Thought leaders and researchers need to address this issue to understand the phenomenon and work toward solutions for increasing minority participation in U.S. agriculture.

Although the agricultural industry in the United States has transformed over time from a small-holder agrarian economy to larger farms and plantations that used slave labor, to landowner-driven production into the largest industry in the United States and indeed the world, the interest in agricultural careers in minority groups has been considerably low compared to other professions.

Underrepresented groups have continually shown disinterest in agricultural activities and pursued other high-skill, high-wage professions. Their decisions are potentially based on unfounded opinions that agriculture is a low-level profession for the uneducated in society (Swinehart, 2013). Such beliefs have directed them toward more office-design jobs, research and development careers, and other professions they consider more challenging and fulfilling, never considering agricultural-related work. Accordingly, they do not access agricultural positions since forces outside their control often negatively influence many who wish to pursue a career in agriculture.

For instance, the career choices of students in the MANRRS society are strongly affected by their frequent interactions with people already in the agriculture sector. The study by McGovney-Ingram et al. (2011) discovered that many members of MANRRS chose agricultural majors and career paths because they failed in their previous majors. Since no direct intellectual connection exists between their preference for agriculture and the discipline itself, it is essential to expose underrepresented youth to career opportunities and motivate them to pursue careers in agriculture. Academic agendas that sway marginalized children into food production deepen the meaning of their entire learning experiences.

Theoretical Framework

The study will be guided by the Theory of Planned Behavior (TPB). According to Bosnjak et al. (2020), TPB is a cognitive model that suggests that people's decisions to take part in particular behaviors, like consuming unhealthy foods or smoking, can be predicted by their intent to participate in that behavior. TPB emphasizes the role of plans in achieving the motivational aspects that impact behavior. Bosnjak et al. (2020) defined intentions as indicators

of an individual's willingness to engage in a behavior and the amount of effort they plan to invest in doing so. TPB focuses on aspects such as external factors, background information and knowledge, social norms, perceived behavioral control, and personal attitudes. TPB suggests that behavioral intention and perceived behavioral control can be applied directly to predict behavior (Bosnjak et al., 2020). In this sense, the theory can be used to understand why underserved populations do or do not pursue agriculture careers and potentially what can be done to increase their participation.

Purpose of Study

The purpose of this study is to examine the practices of successful teachers in urban SBAE programs that have led to success for underrepresented youth in agricultural careers. This complex set of practices begins with attracting underrepresented students to urban SBAE programs and ends with youth engaged in a successful agricultural career.

Research Questions

The agriculture industry needs to attract underrepresented people to careers in agriculture. Urban SBAE programs can influence underrepresented students' attitudes, perceived control, and subjective norms about agriculture and agricultural careers. This study was guided by the following research questions:

1. How do external factors of underrepresented youth influence their intention to pursue an agricultural career?
2. What practices of the school and/or teacher increased underrepresented youths' sense of behavioral control in pursuing agricultural careers?

3. What practices of the school and/or teacher improved underrepresented youths' attitudes toward pursuing an agricultural career?
4. What practices of the school and/or teacher positively changed underrepresented youths' subjective norm beliefs about agricultural careers?

Significance of Study

Education offers one of the key avenues to enhance diversity in the agricultural sector. For example, many SBAE programs exist in urban regions of the United States where students interested in agriculture can pursue related careers after completing the program, either as entrants into the job market or by undertaking postsecondary education. The present study focuses on creating a blueprint for recruiting, retaining, and preparing students in urban agricultural education programs for entry and advancement in high-skill, high-wage agricultural careers. Talbert et al. (1997) established that teaching in an urban classroom can be a barrier for even the most skilled agricultural education professional. Accordingly, the current study aims to identify the inner workings of successful urban agriculture programs and the limitations and barriers of unsuccessful programs. Programs like Supervised Agricultural Experiences (SAEs), Future Farmers of America (FFA), or comparable leadership programs usually excel. The researcher intends to use the findings of this study to equip teachers and school administrators with effective models to recruit, retain, and place students in agricultural careers.

Urban agricultural education shows promising results in steering underserved students toward agricultural professions. This research proposes to identify and disseminate good practices of successful urban agriculture programs that serve underrepresented students and place them in agricultural careers. The overall assumption driving this study is that increasing the good

practices for student recruitment, retention, and placement in urban agricultural programs will lead to more underrepresented youth being employed in the agricultural industry. It is essential to understand the delivery of urban agricultural education in the country, the factors shaping it, the barriers affecting access to learning, and what can be done to ensure that more underrepresented youth choose to enroll in urban SBAE programs.

This study will explore how successful agricultural education programs are structured and the features or limitations of urban SBAE programs. The study also seeks to identify barriers to engaging underrepresented youth, particularly those from urban communities. Finally, the study aspires to explore ways to equip educators and school administrators with models that can be used to build and reform urban SBAE programs.

Definition of Terms

Urban - The Office of Management and Budget defines "urban" as a geographic area that contains at least one urbanized area of 50,000 or more people, plus an adjacent territory that is economically connected to the central urban area. According to the Census Bureau, an urbanized area contains a population of 50,000 or above. Population density is 1,000 persons per square mile, with the adjacent territory of at least 500 persons per square mile.

Urban Agriculture - The USDA website describes urban agriculture as "City and suburban agriculture [that] takes the form of backyard, roof-top and balcony gardening, community gardening in vacant lots and parks, roadside urban fringe agriculture and livestock grazing in open space."

Urban Agriculture Education - The application of agriculture education in an urban context.

Underrepresented - Inadequately represented and, according to the Census Bureau as well as other federal measuring tools, includes African Americans, Asian Americans, Hispanics or Chicanos/Latinos, and Native Americans.

Minority - Smaller in number of two groups constituting a whole.

School-Based Agricultural Education (SBAE) - Teaches students about agriculture, food, and natural resources. Through these subjects, agricultural educators teach students a variety of skills, including science, math, communications, leadership, management, and technology in a secondary education setting (National Association of Agricultural Educators, 2022).

Theory of Planned Behavior (TPB) - Explains the reasons behind an individual's decision in specific circumstances and times. It was based on the premise that people have self-control and can make decisions based on the expected outcome, especially the possible risks and benefits.

Case Study - Methodology that allows researchers to investigate complex phenomena in particular contexts in-depth (Rashid et al., 2019). With this design, the researcher can explore the phenomenon in real time within their naturally occurring environment.

Summary

The agriculture industry in the United States has a chronic need for qualified employees, particularly in high-skill, high-wage jobs. There is an untapped population of underserved youth who can help fill that need. Some SBAE programs in urban settings have been successful in recruiting, retaining, and placing underrepresented youth in these careers. Successful SBAE programs in urban communities can change social norms, attitudes, and perceived behavioral control of underrepresented students and provide a model for teaching and other good practices that lead to their success. Using these good practices as a tool in other minority-serving SBAE

programs may attract more youth to the program and, eventually, the industry.

Using the TPB, the researcher hopes to explore the why behind students' decisions to study agriculture and pursue agriculture careers. TPB is a cognitive theory that can help predict behavior. The fundamentals of a TPB inquiry are understanding social norms, attitudes, and perceived control. If the researcher can help predict students' behaviors, programs can better prepare recruiting and retention efforts of minority students. Through a series of interviews, the researcher will speak with teachers, recent graduates, and administrators. Teachers will offer insight into what is working regarding attracting and keeping students excited about agriculture. Administrators will give their perspectives on school culture and expectations around the agriculture program. Students will provide vital information on how their attitudes start toward agriculture, when they change, and what causes the shift. Both teachers and administrators will also be able to refer to what has been a hindrance in recruiting and retaining minority students in the program.

Chapter 2: LITERATURE REVIEW OVERVIEW

Urban agricultural education is an initiative developed to increase the interest of high school students in urban areas in higher education and careers in the agriculture sector. This initiative advances learning efforts that generate a greater understanding and appreciation of the community's critical role in agriculture, natural resources, and food systems. Besides enhancing personal welfare and boosting civic involvement, urban agricultural education improves national and international well-being by increasing the participation of urban community members in agricultural-related courses in higher education and careers. Urban agricultural education is critical for underrepresented youth in the United States today to improve their involvement in agricultural-related education and employment.

Urban agricultural education is one strategy for involving underrepresented youth in agriculture. Since agriculture is a central contributor to the U.S. economy, increasing the participation of urban residents can strengthen both the sector's productivity and its long-term sustainability. The historical underrepresentation of minorities in agricultural ownership and decision-making can be traced to the period following slavery. During slavery, African Americans were the agricultural labor force, yet they were denied access to land ownership, education, and equitable participation in profit-based agriculture. Following emancipation, systemic racism, discriminatory lending practices, and land dispossession further restricted their opportunities to engage in agriculture as independent producers or leaders (Daniel, 2013). These historical barriers continue to shape attitudes toward agriculture today. The TPB helps explain why negative perceptions persist, as attitudes are often influenced by collective memory, societal norms, and perceived barriers. Expanding secondary agricultural education for underrepresented populations provides a powerful opportunity to combat poverty by increasing agricultural

competency and reframing agriculture as a viable, respected, and lucrative career pathway. Successfully placing underrepresented populations in agriculture would also be achieved through microloans, pursuing agriculture careers, and embracing digital technologies in agriculture. This research is guided by the TPB as a theoretical framework. It also adopts the descriptive case study research design in determining effective SBAE programs for underrepresented populations in educational institutions.

Virginia in 1935 with a few members and chapters, but it expanded significantly. The organization focused on Black people studying vocational agriculture in public learning institutions across the United States.

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4. What practices of the school and/or teacher positively changed underrepresented youths' subjective norms about agricultural careers?

History of Underrepresented Groups in Agricultural Careers

Overview of the New Farmers of America (NFA) and FFA Merger

Agriculture is one of the many industries that experienced segregation in the United States. The formation of FFA exempted people of color, compelling them to form the NFA. NFA was an agricultural association of African American youths. School desegregation pushed NFA and FFA to reunite and focus on similar goals. Although desegregation had occurred, cases of discrimination remained common. NFA members felt that the merger had no positive benefits; they felt they had been absorbed rather than being merged. Additionally, their voices were suppressed by members of the FFA.

The FFA was formed in 1928, and most black students were not allowed to participate due to segregation. Consequently, this led to the NFA's formation. The organization began in The primary purpose of the NFA was to promote and encourage the leadership of black students in different areas, including citizenship and scholarship (Holbert, 2021). Moreover, it focused on the development of its members in social, recreational, and vocational life via established chapters.

The NFA was an exceptional youth organization supporting African American students in secondary agricultural education programs. Specifically, the organization increased the members' chances of becoming successful farmers. NFA was formed during segregation to allow African American male youth to study agriculture. The organization led to an increased number of African Americans in agricultural education. However, as the civil rights movement

spread in the United States, many NFA chapters merged with local FFA chapters due to school desegregation. The passage of the Civil Rights Act in 1964 aroused discussion on the merger between the two organizations, leading to a single unified entity. The act prohibited segregation in public schools, forcing NFA and FFA to merge in 1965, with all African American students becoming FFA members (Hartmann & Martin, 2021). The two organizations were separate entities before the merger but had similar goals. The merger was supposed to create new opportunities for the students and teachers of both organizations. NFA members were affected the most since they felt that their organization had been absorbed into the FFA instead of merging. Besides, many NFA members perceived the merger as detrimental, given racial prejudice. After the merger, former NFA teachers and members were forced to learn the traditions of a new entity while also facing competition from FFA members for leadership positions and awards.

The Role of the NFA-FFA Merger in Disrupting the Participation of Black People in Agriculture

NFA members believed that its merger with FFA had damaging effects on its operations. The formation of NFA was intended to allow African Americans to articulate the grievances that they experienced in the agricultural sector. However, the merger led to a decline in the number of African Americans in the agriculture industry. FFA acquired the constitution, assets, money, and resources that NFA owned. Studies also showed that minority communities were left behind while most whites occupied the largest agricultural sector. Agriculture became predominantly White, while African Americans were excluded. Black people were cultivated using rented facilities and loans, which dragged them behind in economic progress.

Before the merger, NFA served its members by providing experiences in education and leadership in the agricultural sector. However, its merger with the FFA negatively affected Black

teachers and students. Before the merger, the NFA was a thriving organization for Black males, especially those interested in leadership and agriculture. However, following the merger, African American participation significantly declined, and the group became underrepresented in FFA membership (Gilman, 2013). In other words, since the merger, African American involvement has deteriorated to the point that this group is underrepresented in FFA membership. Whereas the FFA was open to all students from different racial backgrounds, widespread segregation prevented Black people from participating in critical activities.

Other factors led to a significant decline in the number of Black people in agriculture. Their roles were weakened, and their membership in the agricultural sector was reduced. Additionally, Black teachers had to undergo other training to improve their knowledge about the FFA. The merger led to the erosion of the infrastructure that maintained the roles of Black students and teachers in leadership positions (Hartmann & Martin, 2021). The gradual decline of Black people in the agricultural and education fields was a significant outcome of the merger. Some of the former members of the NFA cited the union's frustration as they were underrepresented in leadership positions, had limited access to resources, and had minimized agricultural activities. The racial intolerance demoralized many Blacks, especially the former members of the NFA, leading to a significant decline in their participation in agricultural education and activities.

As one of the major industries in the United States, agriculture plays a vital role in the country's role as a food exporter. In the United States, this industry extends beyond farm practices to include related sectors like food manufacturing and food services. In 2020 alone, U.S. agriculture and food-related industries contributed about $1.055 trillion to the GDP (Kassel & Martin, 2022). This translates to about 5% of the overall GDP (Kassel & Martin, 2022).

Despite the sector's significance to the U.S. economy, empirical evidence suggests inadequate representation of minority groups and people of color. While people from these communities actively participate in agriculture, their involvement tends to be limited to lower-ranking jobs in labor and support roles. Only a tiny number of minority groups participate in higher-level management and business ownership.

Based on the 2017 agricultural census, the U.S. has approximately 260,000 producers of color. This number represents about 8% of all U.S. farmers, a figure that suggests vast inequality in the participation of minority communities in agriculture (Benson et al., 2022). These statistics apply to Black, Asian, Latino, Native American, multiracial, and other minority producers in the United States. According to Benson et al. (2022), minority producers operate around 193,000 farms, which translates to about 10% of all total farmland. Based on these statistics, the participation of minority groups in high-wage and high-income agriculture careers is relatively low compared to the rest of the population. Oddly, minorities and people of color are more likely to participate in labor, support, and other low-ranking roles in the agricultural industry.

Minority communities lag their White counterparts in terms of their participation in agriculture due to multiple factors. Specifically, structural racism, environmental injustice, and uneven capital accumulation compromise these communities' involvement in agriculture despite their critical role in the country's agricultural history (London et al., 2021). For instance, Native Americans are known for being the original agriculturalists in the U.S. by domesticating the many crops recognized today as corn, potatoes, beans, squash, and various types of berries. Due to their extensive knowledge of soil and land health, Native Americans were the first community to practice sustainable agriculture. However, regardless of their crucial role in jumpstarting the country's agriculture sector, the participation of Native Americans in modern-day agriculture

practices remains extremely low. Today, Native Americans account for the most inadequate involvement in agriculture, with producers in this community owning only about 4,000 farms (Benson et al., 2022). The declining participation of this group in agriculture raises significant questions about the real reasons behind the recent statistics.

Among communities of color, Hispanic and Latino producers accounted for the highest percentage of participation in the country's agricultural sector. Specifically, this group had the most farms, translating to about 86,000 (Benson et al., 2022). This group also received the most significant percentage of government payments, translating to about $15,492, compared to their African American counterparts, who earned the lowest amount of about $7,108 (Benson et al., 2022). Despite accounting for the highest agricultural income earners in the country, the Hispanic-Latino community also has the highest number of agricultural laborers who work long hours for low compensation. However, Zahniser et al. (2018) assert that U.S. growers have been raising farm wages for migrant Hispanic workers in response to growing demands for labor in both U.S. and Mexican farms. Cheaper agricultural labor increases access to more affordable agricultural products.

Federal and state farm support programs—such as direct commodity payments, disaster relief, and conservation funding—are typically administered on an annual basis. However, the average amount of support received per farm varies significantly across racial groups. In 2022, for example, non-Hispanic Black or African American farms that received government payments averaged just $7,774 per farm, compared to $16,417 for White-operated farms (USDA ERS, 2024). The historical development of agriculture in the U.S. coincides with the nation's broader history. While modern curricula often reference the majority population, they give little attention to the diverse perspectives, contributions, and hardships of underrepresented groups (Vommi &

LaVergne, 2016). This omission is especially evident for Native American tribes, who were the original practitioners of agriculture in North America. Agricultural education curricula mirror the broader patterns found in U.S. textbooks, with a disproportionate emphasis on White, non-Hispanic experiences while minimizing or excluding minority contributions (Vommi & LaVergne, 2016).

Arends's (2017) study highlights how agricultural education and related literature often rely on monolithic language when referring to Indigenous communities. In addition to omitting meaningful discussions of slavery, many texts use outdated terminology to describe Hawaiians and Native American tribes, diminishing their agricultural knowledge and contributions. This pattern reflects a broader whitewashing of the agricultural curriculum, where minority voices and histories are marginalized or erased. Recognizing positive allusions to underrepresented groups is critical to counteracting this neglect and ensuring their rightful place in agricultural history (Arends, 2017). Despite the occasional token reference to minority figures, the overwhelming emphasis on White accomplishments—particularly those tied to British agriculturalists—illustrates a long-standing imbalance in representation within agricultural education (Arends, 2017).

The narrative of white accomplishments in this field stains the history of U.S. agriculture in the agricultural curriculum. Furthermore, the narrative shapes today's agricultural educators, suggesting that individuals in the agricultural sector do not perceive a pressing or actionable need to expand their students' knowledge of diversity in agriculture and the contributions of Native, Black, and Hispanic agriculturalists (Hazen, 2017). There is a lack of documentation, reference, and recognition of underrepresented groups in agriculture.

Moreover, instances whereby white agriculturalists received credit for work done by underrepresented groups raise significant concerns (Hazen, 2017). The level of discrimination in society back then may have accounted for the inaccurate representation and misrepresentation of agricultural accomplishments by minority groups. Incorrect representation of minority groups in agricultural history initiates the impression that individual members from these communities do not own life experiences, achievements, and opinions (Hazen, 2017).

The experiences of the Black community help demonstrate the adverse impact of the inaccurate representation of minority groups in agricultural history. Most literature on this community focuses on its exploitation through violence, slavery, and discrimination for generations, even after slavery's termination (Hazen, 2017). The re-enslavement of Black people by the discriminatory system is apparent through the sharecropping system. Sharecroppers leased land in exchange for a share of the crops produced, such as cotton, rice, and tobacco. African Americans found it hard to own land due to the discriminatory laws imposed at the time. The Equal Justice Initiative (2018) indicates that only 7% of Black farmers owned land during this period, compared to 40% of their white counterparts. The sharecropping technique bound more than 50% of practicing Black farmers. Those who could not afford leased land were forced to work as laborers (Equal Justice Initiative, 2018). These practices made wages inaccessible to Black farmers, leaving their families in debt and poverty for generations.

According to the Public Broadcasting System (2018), the number of farms using sharecropping labor rose from 24% to 48% between 1880 and 1940 as landowners needed sufficient work to maintain the productivity of their farms. The Black men who participated in the sharecropping system were not only experiencing discrimination but also faced widespread violence and were even murdered if they tried to fight the system. White landowners worked

hard to ensure this system remained in place to boost their profits. The Black farmers continued being oppressed while the political and legal protection systems ignored the Black workers' plight, leaving them under inhuman oppression.

Less than one-third of sharecroppers were black, while whites made up about two-thirds of sharecroppers (Public Broadcasting System, 2018). Sharecropping became more exploitative, and farmers were denied the right to elect official leaders representing their interests. By working in the sharecropping system, farmers soon were heavily indebted. High interest rates for the use of land, unscrupulous landlords, and unpredictable harvests placed insurmountable odds on farmers and their families (Public Broadcasting System, 2018).

Black people would have to cultivate using borrowed or rented equipment and mules year-round, and at harvest, the landowner could count all they had loaned until they had a tiny return for their efforts (Equal Justice Initiative, 2018). Black people specifically were affected by the crop lien system used when lending money, where most sharecroppers used their farm harvest as collateral for loans given by white landowners. This system ensured that Black people could never get ahead and were always in debt. According to the Public Broadcasting System (2018), sharecropping made Black families more economically dependent than when enslaved.

To understand why black and brown minorities continue to be underrepresented in agricultural careers, we can turn to Critical Race Theory (CRT). CRT is a novel approach to contextualizing these persisting issues. The theory can help explain power dynamics within careers, illuminate the voices of black and brown minorities, and question their career experience. CRT emphasizes the equitable treatment of people from all races and the recognition of overt and obvious racist practices and systematic racism built into systems over time (Gillborn, 2015). As an academic concept, CRT has been around for more than four decades, and

it underscores the premise that race is a socially constructed or culturally invented aspect used to exploit and oppress people of color.

This theory emphasizes that racism is inherent in the regulation and legal institutions of the United States as they work to create and maintain economic, political, and social inequalities between white people and minority communities, particularly African Americans (Crewe, 2021). In understanding the underrepresentation of minority groups in urban agriculture education, CRT can help expose legal systems and policies that inform the obstructed representation of minority groups in the country's agricultural history. The theory asserts that U.S. social institutions like the education system, healthcare, labor, housing market, and criminal justice system are not only laced with racism but also embedded in regulations, procedures, laws, and rules that instigate differential outcomes by race (Crewe, 2021).

The Theory of Planned Behavior (TPB)

To explain and predict human behavior, Ajzen (1991) proposed the TPB as an approach social scientists can employ, examining not the behavior itself but the intentions to engage in a specific behavior. The theory postulates that individual intentions are a reliable predictor of behavior and can be used to explain human behavior. This theory has been widely used in social sciences, including agricultural education.

In addition to background and demographic variables, Ajzen's TPB relies on the three constructs of **attitude** toward the behavior, perceived **behavioral control**, and social **norms**. The TPB was used as a theoretical frame to guide this research. Below, please see how the background, demographics, and theoretical constructs were used, along with practices in urban agriculture schools, to answer the following research questions:

Research question 1. *How do external factors of underrepresented youth influence their intention to pursue an agriculture career?*

External factors impacting underrepresented youth in the four urban agricultural education program graduates pursuing agricultural careers, as well as teacher interviews and administrator interviews were examined and analyzed. These factors were considered in determining student attitudes toward agricultural careers, their perceived behavioral control to pursue agricultural careers, and their perception of social norms for underrepresented populations pursuing and succeeding in agricultural careers.

Research question 2. *What practices of the school and/or teacher increased underrepresented youths' sense of behavioral control in pursuing agricultural careers?*

Teacher and school practices that increased students' sense of behavioral control about pursuing an agricultural career were determined through interviews with teachers, administrators, and graduates pursuing agricultural careers.

Research question 3. *What practices of the school and/or teacher improved underrepresented youth's attitudes toward pursuing an agricultural career?*

Teacher and school practices that increased student attitudes toward agricultural careers were determined through interviews with teachers, administrators, and program graduates pursuing agricultural careers.

Research question 4. *What practices of the school and/or teacher positively changed underrepresented youths' subjective norms about agricultural careers?*

Teacher and school practices that increased student attitudes toward agricultural careers were determined through interviews with teachers, administrators, and program graduates pursuing agricultural careers.

Figure 1 represents a conceptual model for this study built on the TPB. This research used this framework to understand external factors facing underrepresented youth in urban agricultural

education programs and identify good practices utilized by teachers and schools to positively influence underrepresented youths' perceived behavioral control, attitude, and view of norms for entering and succeeding in agricultural careers.

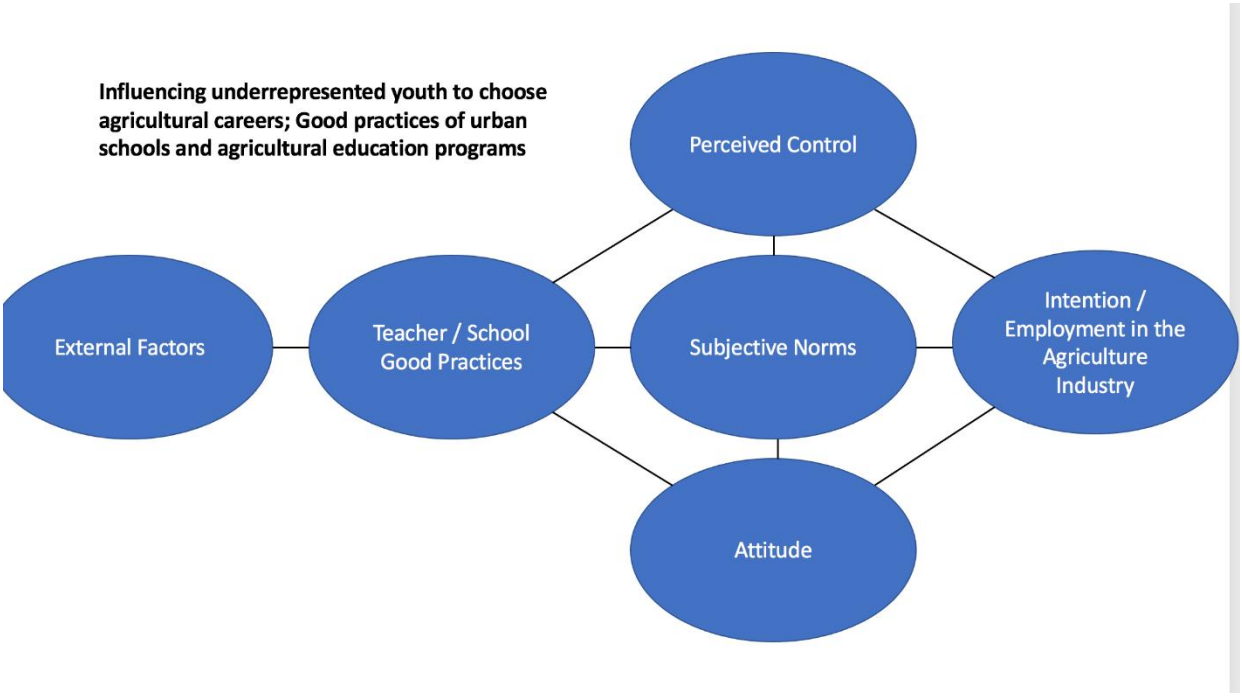

Figure 1: Conceptual Model Built on TPB

The TPB explains the reasons behind an individual's decision in specific circumstances and times. It is based on the premise that people have self-control and can make decisions based on the expected outcome, especially the possible risks and benefits. TPB has explained diverse human behaviors for several years, including smoking, drinking, and substance use. Behavioral achievements depend on intentions and behavioral controls. It proposes three beliefs, including control, normative, and behavioral beliefs. Besides, the six constructs influencing an individual's actual behavior control include perceived power, perceived behavioral control, attitudes, social norms, subjective norms, and behavioral intentions (Bosnjak et al., 2020). The addition of perceived behavioral control changed the theory from reasoned actions to planned behavior. This theory can explain how different ethnic groups perceive agriculture.

TPB provides a useful framework for examining the complex reasons and attitudes that shape minority participation in agriculture and related careers. These reasons often include perceptions of agriculture as a low-status profession, limited early exposure to agricultural opportunities, and societal or familial pressures that discourage agricultural engagement. TPB suggests that individuals' plans and intentions serve as critical motivators that influence their ultimate behaviors. According to Bosnjak et al. (2020), an individual's intentions are a significant predictor of their enthusiasm and willingness to engage in specific activities or behaviors. The theory emphasizes internal variables—such as behavioral regulations, subjective norms, and personal preferences—that interact to shape intentions. Bosnjak et al. (2020) further explain that in TPB, both intentions toward a particular behavior and one's perception of control over it directly predict the likelihood of engaging in that behavior. Applied to agriculture, TPB helps explain the persistent underrepresentation of minorities in agricultural careers and provides insights into strategies for improving their participation in this sector.

Given historical events and the current racial makeup of leadership in the agriculture industry, underrepresented youth may feel less confident that they have the opportunity to be successful in an agricultural career. The TPB could help understand students' decisions to enter or avoid agricultural professions.

The students' cultural and social backgrounds also influence their sense of control in decision-making and their academic progress within agriculture. For many underrepresented students, the decision not to pursue agricultural courses can stem from a history of cultural exclusion, where their communities have been systematically left out of professional agriculture pathways. As a result, students may not see examples of family members or peers succeeding in agriculture, which limits the parental and peer encouragement that often persuades young people

to explore specific careers. This lack of support reinforces the perception that agricultural careers are unattainable or beyond their reach. In some cases, students may not have the necessary resources, role models, or institutional support to pursue higher education in agriculture with confidence.

Within the framework of TPB, these barriers reflect the influence of subjective norms—how individuals' intentions are shaped by the expectations and examples of those around them. If students do not see others from their cultural or social backgrounds succeeding in agriculture, they may assume the profession is "not for them." This absence of representation fosters negative perceptions and discourages persistence. By contrast, when students encounter role models or examples of success from their own communities, they are more likely to develop positive attitudes and believe that agricultural careers are attainable.

Additionally, the TPB might have been influenced by external factors such as family life, career path, peers, and teachers' influence. Students will select courses based on how their families depend on or view the professions, and the people surrounding the students will affect their opinions. Understanding the attitude of participants toward agriculture would depend on the recognized external factors.

Interviews

Semi-structured Interviews

Semi-structured interviews blend the features of structured and unstructured interviews. According to Silverman and Patterson (2014), the difference between a semi-structured and an unstructured interview is that the researcher has a list of questions to present to the interviewee. Additionally, the difference between structured and semi-structured interviews is that the order of questions is not set before the interview. The researcher has the liberty to be flexible in questioning. Using a semi-structured interview allows the researcher to create questioning

patterns during the interview. Interviews are vital for data collection because they allow participants to develop leads for subsequent questions. Conducting semi-structured interviews follows specific procedures that include setting objectives, designing the questions, assembling participants, deciding the medium of the interview, and conducting the interview. Its main goal is to retrieve authentic information from the participants. Additionally, it is designed based on the principles of sensitivity and word choices that are sensitive to cultures and beliefs. Since semi-structured interviews lack structured questions, hypothesizing the possible participant answers helps identify the discussion themes (Silverman & Patterson, 2014). Participating in a semi-structured interview requires personal commitment and consent. Most importantly, participants should fill out the consent form as ethical and legal evidence that they are not forced to participate in the study.

The Need for Underrepresented People in Agricultural Careers

Agriculture was one of the main sources of income in the 20th century; the underrepresentation of specific social groups placed these groups in poverty. Agricultural practice is closely tied to cultural practices that promote or demote economic capabilities. Ancient race-based policies still promote non-inclusiveness and inequality in this sector, such that the minority either actively avoids it or is passively disregarded. Subsequently, such ethnicities engage in behaviors that reinforce beliefs that make them opposed to agriculture. Therefore, CRT and the TPB help to explore patterns, trends, and behaviors concerning the minority group's involvement in the agriculture sector in the United States.

The production of agricultural products is critical to the world economy. Besides presenting one of the most powerful tools to eliminate extreme poverty, agriculture enhances shared prosperity and is projected to feed up to 9.7 million people by 2050 (World Bank, 2022). Growth in the agriculture sector could lead to the growth of the global GDP and help many

families who rely on agriculture jobs and wages. Sixty-five percent of poor working adults globally made a living through agriculture in 2016 (World Bank, 2022).

Apart from direct production, farming creates second-order employment opportunities and helps boost GDP in rural regions through transportation, food processing, veterinary services, and marketing support services (Agovino et al., 2019). Minority-owned agricultural businesses are typically smaller and produce lower sales and earnings per acre than their majority-owned counterparts. It is possible to generate billions of dollars in additional economic value by bringing these agricultural entrepreneurs symmetric on a per-farm/agribusiness income and profit basis. Encouraging these farmers and agribusiness people to become more involved in their communities could provide more possibilities for potential minority employees working in low-wage jobs in the agricultural industry and other sectors (Dedrick et al., 2020).

Many factors have led to the low numbers of Black-owned farms in the United States. For instance, federal practices and initiatives to exempt Black people from land purchases, the Homestead Act of 1862 (passed before the Fourteenth Amendment, which acknowledged formerly enslaved Africans as citizens), and the lack of procedural safeguards, such as wills to facilitate the transfer of assets to heirs, led to a missed opportunity for generational wealth for Black families. CRT can help explain these factors and their contribution to discrimination against African Americans through legal practices, regulations, and laws that compromised their access to land and other assets that would have boosted their participation in the agriculture sector. Similar to how a farmer knows the need to diversify their harvests, initiatives to increase the representation of women and minorities in management roles and ownership positively impact the agricultural sector.

The USDA's Economic Research Service (2017) found that groups facing racial and gender prejudices made up 41% of food producers in the United States, with 88% being women of any ethnicity, 8% (Hispanic), 4.2% (American Indian), 3.3% (Blacks), and 1.6% (Asian) (Key & Todd, 2021). This data reveals that women fall under another category of underrepresented groups within the agricultural industry, apart from racial disparity. Patriarchal relationships, paperwork, bureaucratic challenges, and a lack of knowledge are all possible causes of women's underrepresentation in agriculture. Further, the industry should increase work opportunities for women by backing capacity-building schemes for strengthening education and simplifying job application processes.

Further, the interest in sustainable farming is influenced by dynamics in farmers' lives. For instance, a farmer's age, level of education, and understanding of sustainable techniques determine whether more individuals participate in food production, especially within minority groups (Whittinghill & Sarr, 2021). In addition, minority groups often own small farms. They must constantly deal with access to resources, tools, and credible strategic marketing data. The lack of sufficient land for agricultural purposes determines the financial resources that farmers can access. In turn, barriers to other resources exist. In some instances, the minority groups conducting farming contend with soil contamination due to heavy metals and chemicals (Whittinghill & Sarr, 2021). This development impedes long-term participation in agriculture.

Agriculture degrees are also lagging among underrepresented groups. Minorities account for only 8% of all the degrees awarded in the Science, Technology, Engineering, and Mathematics (STEM) and agricultural fields in the U.S. (Fry et al., 2021). Several universities have initiated programs for underrepresented students to become leaders in agriculture. USDA agencies such as the Animal and Plant Health Inspection Services, Natural Resources

Conservation Services, Agricultural Research Services, and Agricultural Marketing Services provide intensive hands-on training and internships for minority students to prepare for agricultural career success (Fry et al., 2021). Many underrepresented students participate in these initiatives and are exposed to many agricultural disciplines outside of farming. During the internships and short courses in these programs, students gain hands-on experience in plant science, animal science, soil science, entomology, and other diverse career fields in agriculture.

Sharecropping, slavery, segregation laws, and the Homestead Act led to discrimination against Black people and other minorities and resulted in great mistrust. White people have dominated agricultural history. Underrepresented people have not been recognized in agriculture education, and this lack of inclusiveness hinders them from receiving a comprehensive education. The underrepresentation of minority communities in the country's agricultural history also impedes the provision of a complete narrative to all students regarding the contributions of various communities to agricultural practices in the U.S.

Due to a lack of diversity, the agricultural industry lacks accurate information to influence education. There is bias in contributions where achievements are attributed to whites, even when people from minority groups accomplish these achievements. The agricultural curriculum gives incomplete information by ignoring stories like slavery and failing to provide them with full disclosure in the curriculum. People of color find it challenging to make positive contributions, given that there are few positive historical or modern references to represent them.

Lack of Diversity in Careers and Secondary School Programs

Black, indigenous, and people of color have been historically underrepresented in agriculture and agricultural education. This underrepresentation is seen at all educational levels, from high school to college, where fewer students from racial and ethnic minorities enroll in agricultural-related classes, join agricultural-related clubs, and study agriculture as a major.

Agricultural programs in the United States should reflect the changing demographics of the country. Due to shifting demographics in the United States, underrepresented groups must have access to agricultural programs in secondary schools. White people make up the great majority of those enrolled in agricultural courses at the secondary school level (Jayaratne, Park & Davis, 2019).

Students are first recruited into the agricultural professional pipeline via their high school's agriculture education program. Agricultural education programs in secondary schools are also an essential way to attract future students to the field of agriculture at the tertiary level. Therefore, agricultural education specialists should pay close attention to the problem of the underrepresentation of minorities in SBAE programs in secondary schools. The most successful strategies for recruiting students from underrepresented groups into SBAE programs may be gleaned from an examination of the obstacles experienced by agricultural educators (Jayaratne et al., 2019). There were 26-300 students enrolled in the various agricultural education programs that were recorded, with 128 being the mean. The minority enrollment in these ag-ed programs varied widely, from 7% to 90%, with the mean enrollment being 46%. The SBAE programs in these communities reflected the demographic of the area. Reviewing the demographics of the responding agricultural education instructors and their programs reveals a diversified set of teachers with a range of experience levels and a curriculum that serves a large and varied student body (Jayaratne et al., 2019).

In their analysis of students enrolled in agriculture classes, Velez, Clement, and McKim (2018) considered factors such as race, gender, and family income. Due to a lack of extensive, longitudinal research addressing the implications of student engagement in SBAE, a well-researched grasp of the value SBAE gives has been restricted. Using the idea of involvement as a

framework, researchers evaluated data from a nationwide longitudinal study to look at the relationship between students' ethnicity and their participation in vocational clubs and SBAE. According to the findings, Black males participated more heavily in vocational clubs that did not focus on SBAE but less actively in SBAE-vocational groups.

Although Black and Hispanic women account for a significant portion of SBAE's student body, they were underrepresented in leadership positions within the program's occupational clubs. On the other hand, white women were disproportionately represented among SBAE vocational club officers. The data also shows that women who participated in SBAE and served as officers earned $10,507 more per year than women who did not participate in SBAE and served in a similar capacity. The majority of SBAE members have been White men in the past (Gordon, 2014).

The National FFA Organization is the biggest agriculture-based vocational club. In 2016, it had 649,355 student members, 41% of whom were male, 32% were female, and 27% did not indicate their sex. Forty-one percent identified as White, 13% as Hispanic, 3% as Black, 1% as American Indian, 1% as Asian, Native Hawaiian, or Pacific Islander, 1% as two or more races, and for 41%, no ethnicity was given (National FFA Organization, 2016). Further research reflects the disproportionate number of White men, although recent years show a rise in female participation in SBAE (Lawrence, Rayfield, Moore, & Outley, 2013; Retallick & Martin, 2005). A study conducted on students enrolling in Career Technical Education (CTE) programs in 2014 found that males made up 53.7% of the total and females made up 46.7%. The majority of the population was white (51.9%), then Hispanic or Latino (23.7%), Black (16.2%), and Asian (4%). (U.S. Department of Education, 2016).

Adding an agricultural module to an urban charter high school syllabus ends the stereotypes that youth typically associate with agricultural jobs. Increasing familiarity with and insight into agribusiness offsets students" disconnect with agriculture. For example, the University of Tennessee's High School Agricultural Education Initiative helped many tenth graders to begin long-term partnerships with Title I urban high schools to apply and join agricultural programs in the future (Jean-Philippe et al., 2017). Therefore, the early introduction of agriculture in urban schools enriches underrepresented students' advanced knowledge in the subject and their employment opportunities. Teaching the subject to this demographic in more remote settings also yields positive intellectual and practical outcomes in conventional disciplines, such as math and science.

Secondary Agricultural Education

Agricultural education is critical in enhancing the sector's productivity. Agricultural education intends to equip students with the necessary skills that are fundamental to careers. Classroom competency often translates to fieldwork operations, making training crucial. Besides, agricultural education shapes students into leadership positions in the industry (Faulkner et al., 2018). This basic understanding is why agricultural education is essential at all learning levels, especially in secondary institutions. Adding career and technical elements to the curricula places the nation on the trajectory for attaining sustainable agricultural practices and a workforce.

Additionally, these efforts determine the practices farmers adopt and use, as well as their overall impact on production and business aspects. Ultimately, relevance in secondary agricultural education is imperative for attracting potential leaders and farmers. Therefore, attracting and convincing minorities in secondary schools that agriculture is a favorable field they can venture into requires a customized approach to ensure they have the right attitude toward the subject (Faulkner et al., 2018).

Millions of students per year receive technical education in agricultural programs in every state. Agricultural education aims to equip students with the individual, academic, and career knowledge and skills necessary for career success in agriculture. Agricultural education is divided into three categories: agricultural science, business, and technology. As per Kim (2017), three components make up high school agribusiness education programs, namely, classroom and laboratory teaching, SAE, and FFA. Students can gain knowledge in agricultural competency through classroom instruction and laboratory activities, preparing them for professions in the food, textile, and natural resources sectors. Student-SAEs allow them to learn firsthand what it is like to operate their own agricultural business or work in the farming industry. The FFA provides a "laboratory" of leadership, personal growth, and career success.

The FFA is a national organization that cultivates youths' potential for exceptional leadership, personal development, and professional success (Tummons et al., 2017). Individual and leadership development occur via participation in career development events, degree courses, community service initiatives, and in regional, state, and national leadership conferences. Members of FFA learn self-confidence and interpersonal skills that will aid them in attaining success in their academic, professional, and personal endeavors for many years after program completion. Students who complete agricultural education programs develop pride and are well-rounded people who can become leaders in the agriculture sector (Bostic et al., 2021).

SAE denotes a work-centered learning experience led by students and supervised by instructors that instigates measurable outcomes within agriculture education. For example, cultivating crops, rearing animals, or working in an agriculture-related company would be considered SAE projects for agricultural education students. Students get valuable "real-world" experience via these projects, which allow them to practice the principles they have studied in

the classroom and laboratory. SAEs also enable students to gain skills in agricultural-related job fields.

SAE is a necessary component of a comprehensive agriculture education program for all students. Students participating in the SAE program can examine various jobs and occupations, learn acceptable professional conduct, gain specialized industry skills, and apply academic and vocational skills in the workplace or a simulated working setting (Russ & Gaus, 2021). Students learn how to use what they learn in the classroom through these tactics as they prepare to enter the world of college and job options. Entrepreneurship, placement, research, exploration, school-based enterprise, and service-learning are some of the SAE programs available and suited for students in school-based agriculture education.

Urban agricultural education is increasingly used to encourage civic engagement. A study examining civic engagement among youth in the United States noted that agriculture education programs contribute to youths' preparedness for the future, especially in civic involvement. Such programs improve the youths' understanding of social justice (Russ & Gaus, 2021). The programs provide a platform where youth engage in ongoing civic activities, such as tending community gardens, community development, and providing food to the needy. A similar study by Dunlap et al. (2019) presented comparable findings by demonstrating that people in urban areas participate in agriculture as a form of leisure practice oriented toward civic issues. Conducted in Austin, Texas, the study offers valuable insights into how municipalities might cultivate the civic impulses of their residents, especially concerning urban agriculture.

Urban agriculture is critical to meeting the world's future demands, whether in terms of food supply, health, or environmental preservation. On the other hand, agricultural education programs have recognized the value of variety in student growth. Educators are making the

necessary efforts to provide the essential experience as part of their curricula. Classroom instruction, leadership skills, and active experimentation are examples of these. The working of these components results in a good program that produces well-rounded individuals who are ready to lead in agriculture, corporate, and industry. Agricultural education enables us to learn fundamental farming skills and knowledge, occupational training and retraining, and professional growth (Russ & Gaus, 2021). Agriculture education programs are formalized in secondary schools, state schools, and academic institutions.

There are a variety of options for recruiting minorities, as well as for overcoming hurdles and resolving the issues of attracting minorities into agricultural programs. Agricultural educators should investigate existing communication channels between schools and minority communities to inform potential students and their parents about agriculture's career opportunities and prospects and dispel misconceptions about agriculture to attract minorities to agriculture education. It is vital to engage excellent minority agricultural career specialists as guest speakers to help minority students understand the prospective possibilities in agriculture. With sufficient mentoring, minority students are more likely to change their stereotypes about agriculture's limited options (Russ & Gaus, 2021). Recruiting displays, websites, and handouts should be produced to educate potential minority students and their parents, emphasizing the good experiences of minorities who are successful in agriculture-related jobs.

Career counselors and administrators should be given promotional materials to distribute to potential students and their parents. This is critical to helping minority students succeed, enjoy a positive learning experience, and develop enthusiasm for agriculture and related careers while they are enrolled in the program. In turn, current minority students can serve as ambassadors to engage their communities and encourage new students to enroll. Given this reality, agricultural

educators should seek out diverse students from agricultural backgrounds to inspire underrepresented groups to participate in farming education courses (Russ & Gaus, 2021). Agricultural teachers should encourage students of color and students with disabilities to participate in secondary agricultural education programs by exhibiting evidence of a collaborative, trustworthy, and respectful connection with possible role models from minority populations.

Programs for urban agricultural education in the United States will likely grow in scale and breadth soon (Warren et al., 2015). Therefore, metropolitan regions are one of the most promising development areas for the agricultural education profession, and, as a result, they should get more emphasis in this regard. Adults' role in fostering a generation of civic-conscious youths is critical. People who have the most influence on youths, for example, those who show enthusiasm for civic courses like participation in urban agriculture education programs, are identified as parents and guardians. Females have a more significant influence. Most civic-conscious youths reported their female guardians or mothers as the primary force behind their enthusiasm for civic engagements. Even more clearly, activities and experiences focused on various topics impacted their choice to join an urban agriculture education program. Student mentoring was critical in assisting urban agriculture educators to feel they were making a significant contribution to society via their profession (Brown et al., 2015). They also found significance in their differences by accepting them as they are. To achieve this, urban agriculture educators must build a culture that recognizes them for their individuality.

Urban Agricultural Study programs are intended to pique the interest of urban high school students in agricultural, consumer, and environmental sciences and prepare them for post-secondary education and professions in these fields. Urban agriculture will play a significant part

in meeting the requirements of the world in the future, whether related to food production, health, or the protection of nature. Recent developments, in part, in community garden projects, have provided an alternate means of distributing beneficial resources. In cities around the United States, several community groups and non-profits run agricultural-based educational programs after college and during the summer months, frequently with adolescents from low-income communities employed as paid interns (Salazar, 2015).

Most of these programs may be found in metropolitan regions with disadvantaged populations. Most of them are run by youth groups dedicated to providing developmental chances for at-risk adolescents. Community agriculture in a neighborhood context may positively impact the development of underprivileged adolescents by allowing them to nurture resources of constructive activity with various advantages. Long-term manifestations of compassion, independence, mastery, and inclusion in young people have been seen, and these effects may be felt at a more general community level.

Recruitment and Retention of Underrepresented People

Agriculture is a broad field with roots and branches in politics, the economy, and social interactions. This sector interacts with numerous aspects of daily living that most students fail to understand or have minimal information about. Cases of racial prejudice have excluded minority groups from actively participating in agricultural activities. As the American community is diverse, such changes should be reflected in all sectors. Therefore, there is a need for the agricultural sector to recruit and retain an underrepresented population.

Few minorities are pursuing jobs in agriculture because of educational limitations and negative attitudes about the field. Traditional perceptions of agriculture among underrepresented groups have been that it comprises only farming, ranching, and other associated occupations.

Model retention programs may be made up of a variety of different components. To achieve academic achievement and to remain enrolled at the institution, formal mentorship by peers is essential. The elimination of prejudice among academics, staff, and students should be a priority for universities and schools (Jayaratne et al., 2019). As a result, adding and including apprenticeships to the subject will ensure that students are exposed to the subject without limitations within the educational system.

Several students have expressed concern that racially prejudiced attitudes, unfavorable impressions, and assumptions held by particular instructors, staff members, and students at the school were to blame for some of the unpleasant interactions they had while at school (Jayaratne et al., 2019). Insensitivity to cultures other than their own, as well as covert racist acts, are shown in such actions as a refusal to give "additional" mentorship or aid to people from specific backgrounds. Also, bias may manifest itself in various ways on any campus. These biases have varying degrees of impact on multiple people. Disparities influence student performance in teacher-student interactions that may be attributed to race/ethnicity and gender.

The instructors' actions toward people are also affected by their assumptions about the students' skills. Students value the cost of on-campus housing and its closeness to courses and campus activities as significant factors in their decision to live on campus. Field visits help students to learn about the many farm-related occupations and would have been beneficial in assisting students in deciding to focus on agriculture. Administrators at higher education institutions must ensure that deeds follow their words to be effective. In the opinion of the students, agricultural career fairs offered positive reinforcement and encouragement for the industry's image (Lee et al., 2019).

Exposure to various agricultural jobs and meeting agricultural experts increased their likelihood of pursuing a career in agriculture. The social milieu on campus and weekend activities must be conducive to making students from underrepresented groups feel like they are a part of the student body. These students were dissatisfied with their sense of isolation and believed that there was nothing to do on campus or in the surrounding town. Because of financial concerns, students must be informed of financial assistance programs that are accessible to them and part-time work options in agriculture inside the institution or other occupations in the surrounding area.

The population of the United States is growing more varied, and agricultural education should reflect that variety. Agricultural education programs are essential recruitment tools for students interested in further education in agriculture. As a result, the underrepresentation of minorities in agricultural education programs is a national issue that must be addressed. Due to various challenges, preconceptions, broadened viewpoints, and sharpened critical thinking abilities, diversity research has proven to favor students' cognitive and personal development.

Diversity and inclusion reflect a realistic human development approach to educational and social well-being. That entails more than just removing barriers or worries in a culturally responsive classroom. Due to shifting demographics in the United States, minorities must enroll in high school agriculture education programs (Jayaratne et al., 2019). White youth make up the majority of students enrolled in high school agriculture education programs. The agriculture education curriculum in high school is the first step in attracting students to the agriculture professional preparation pipeline.

Student enrollment in SBAE programs is hampered by several impediments between students and agricultural education programs. Student opinions on agricultural education

programs, unfavorable attitudes, and scheduling issues are just a few of the obstacles (Jayaratne et al., 2019). Another hurdle to their participation is a lack of marketing related to minorities. Minority youth had less of a rural and farm background than White students, according to research done with secondary school students in Texas.

It seems the best ways to attract minorities are to make personal contact with potential students and to have students recruit their minority friends. Another strategy is to assist minority students in succeeding in their current classes by exploring their interests and introducing fun activities such as travel and competitions. Also, this extends to selecting a diverse group of people when discussing agricultural leaders as part of the class, treating minorities as other students, and taking them to non-competitive FFA events (Jayaratne et al., 2019). When recruiting minority students into agricultural education programs, agriculture teachers should be aware of potential hurdles and problems to overcome barriers and tackle challenges genuinely.

Minorities' lack of information about agricultural-related employment options and misunderstandings about agriculture are the most common hurdles (Jayaratne et al., 2019). As a result, it's critical to use all available communication channels and public relations opportunities to inform potential minority students, their parents, and the community about career options in agricultural fields and dispel misunderstandings about agriculture (Jayaratne et al., 2019). It is vital to strengthen school-home connections and build a clear communication link with minority students and their parents to overcome the challenges of recruiting minorities into agriculture education programs.

Successfully Placing Underrepresented People in Agricultural Careers and Post-secondary Education

In a world where technology, engineering, and social media are perceived as fulfilling, monetarily and emotionally, agriculture is not as glamorous. Photographs of people hard at work

on large farms or in grim weather with little income to show for it do not appease the younger generations. Additionally, there is a lack of prominence in the field through money or social standing that further discourages minorities. Therefore, agriculture must be given a new face and aggressively championed on numerous platforms to stimulate a new attitude among minority students.

A rising number of high school students choose not to pursue professions in agricultural education, despite the sector having more prospects for graduates in the field. Agriculture is associated with farming, viewed as uninteresting, demanding, and requiring much physical effort for a poor wage by young people (Kunstadter et al., 2019). It is critical to extend their view on agriculture and, eventually, encourage them to do so to attract more young people to jobs in the food and agriculture sciences. Young people do not often see agriculture as having a long-term future.

There are several avenues for young people to become economically engaged in agriculture, although not all of them include getting their hands filthy. Among service providers and businesspeople, youth actively invest in initiatives that help agricultural production, capacity development, products and services, logistics, value addition, and other areas of interest. And, of course, youngsters are also involved in farming. What also separates this younger generation of agricultural youth is their use of technology, which includes the use of digital banking services, among other things.

As a result, digital technologies should be used in the agricultural sector. Additionally, increased outreach initiatives may be beneficial. Valuable resources should be available, including leadership development possibilities, learning programs, job readiness coaching, internship placement, and long-term employment to maximize membership benefits. A particular

focus should be given to agriculture, environmental assets, and related sciences to ensure members benefit most from their membership. Various efforts, such as the operational and ownership microloan programs, should be established to support historically disadvantaged populations.

A study by Alston et al. (2019) notes that these tactics should also include giving microloans to farmers to help them acquire farmland, develop an existing farm, apply sustainable water management methods, and pay startup costs. They may also be eligible for financial assistance. Black Americans, American Indians, Asian Americans, and Hispanics will benefit from these programs, as would other socially disadvantaged farmers (Horst & Marion, 2019). It is possible to successfully eliminate historical prejudice by providing funds for minority landowners to own and run farms, aid with farm administration and financial management, and assistance with application and bidding processes.

Summary

The participation of minority groups like African Americans, Hispanics, Latinos, Native Americans, and Asians in agriculture in the United States is relatively low, especially at high-ranking leadership, entrepreneurial, and managerial levels. A substantial percentage of people from these communities tend to be limited to low-ranking labor and manual jobs. Such underrepresentation helps explain the low participation of students from minority communities in high school agricultural programs like classroom and laboratory teaching, SAE, and FFA. Inadequate participation in agriculture education during high school implies that students from communities of color do not pursue agricultural careers in higher education, which can improve their prospects of participating in high-ranking and managerial positions in the farming industry. Enhancing the participation of minority students in urban agricultural education can help address

this challenge. These students are likely to participate in agricultural education with sufficient access to mentoring programs. Moreover, adequate representation of their communities in the agricultural history of the United States will motivate minority students to pursue careers in this sector.

Chapter 3: METHODOLOGY

Overview

Through a qualitative methodology, the study defines good practices in urban secondary SBAE programs. It uses TPB theoretical perspectives to execute a collective case study approach to derive emergent themes. The theories will enable an understanding of why underrepresented populations do not pursue agriculture careers and what can be done to increase their participation in this critical profession.

Purpose of Study

The purpose of this study was to examine the practices of successful teachers in urban secondary SBAE programs that have led to success for underrepresented youth in agricultural careers. This complex set of practices begins with attracting underrepresented students to urban SBAE programs and ends with youth engaged in a successful agricultural career.

Research Question

The agriculture industry needs to attract underrepresented people to careers in agriculture. Urban school-based secondary agricultural education SBAE programs can influence underrepresented students' attitudes, perceived control, and subjective norms held about agriculture and agricultural careers. This study will be guided by the following research questions:

1. How do external factors of underrepresented youth influence their intention to pursue agriculture as a career?
2. What practices of the school and/or teacher increased underrepresented youths' sense of control in pursuing agricultural careers?
3. What practices of the school and/or teacher improved underrepresented youths' attitude

toward pursuing an agricultural career?

4. What practices of the school and/or teacher positively changed underrepresented youths' subjective norms about agricultural careers?

Theoretical Framework

The study will be guided by the TPB. According to Bosnjak et al. (2020), TPB is a cognitive model that suggests that people's decisions to engage in particular behaviors, like consuming unhealthy foods or smoking, can be predicted by their intent to participate in that behavior. TPB emphasizes the role of plans in achieving the motivational aspects that impact behavior. Bosnjak et al. (2020) identify intentions as signals of the degree to which people are enthusiastic to try and the quantity of work they intend to apply to participate in a specific behavior. TPB focuses on aspects such as subjective outlooks, professed behavioral regulation, and personal customs variables, and how they define intentions. TPB suggests that behavioral intention and perceived behavioral control can be applied directly to predict behavioral engagement (Bosnjak et al., 2020). In this sense, the theory can be used to understand why underserved populations do not pursue agricultural careers and what can be done to increase their participation in this critical profession.

Reflexivity

Explaining researcher biases and experiences about cultural competencies and data is necessary to ensure an accurate representation of the research findings. In this study, the researcher notes several biases that could compromise the study's findings. For instance, being a minority in the agriculture sector, the researcher is likely to be biased in analyzing data in a way that favors minority populations. Also, the researcher is a former high school agriculture teacher, which raises the possibility of bias in viewing data in a way that favors agricultural educators. As a former teacher in agricultural education, specifically high school-aged students, the researcher

has not only experienced but also witnessed inadequate representation of minority communities within the agriculture industry, education, and related sectors. The researcher would constantly question the causes of the underrepresentation of students of color within many agricultural courses.

When the researcher was teaching in the classroom, the number of minority students interested in enrolling in the courses, clubs, and programs was significantly low. The researcher also noted inadequate representation of minority teachers in agricultural education and the entire industry. In the context of all these discoveries, it is possible that the researcher has an emotional attachment to the topic. Such an attachment may introduce bias and influence the findings to get the desired outcome.

The researcher intends to counter these potential biases by using Tracy's (2010) criteria for excellent qualitative research. According to Tracy (2010), qualitative researchers should observe the eight-point quality criteria. They can achieve this by focusing on concepts of the worthy topic, reliability, meaningful coherence, ethics, rich rigor, resonance, substantial contribution, and authenticity (Tracy, 2010). Observing these dynamics allows qualitative researchers to use quality and flexible studies depending on their goals, preferences, and skills. Besides the criteria, the researcher will also counter the identified biases by developing a thorough research plan. The researcher intends to remain aware of the probability of bias in every phase of the process (Borowska-Beszta, 2017). Assessing interview questions alongside team members will enable this awareness, as diverse perspectives can help the researcher determine an effective course of action.

The researcher also intends to contact professionals within the field or colleagues to have them review the research plan and data. Such a review will help to identify potential bias. The

outside perspective of a professional in the field can help the researcher observe the larger scope of the study areas (Borowska-Beszta, 2017). Also, the researcher will reinforce improvement areas and define patterns in the overall design process. The researcher intends to give professional contacts or colleagues a set of questions targeting particular topics to allow helpful feedback. Likewise, during the interviews, the researcher will post general questions first to introduce a topic before specifying or probing participants (Borowska-Beszta, 2017). The strategy will help the researcher to frame the line of questions to consider the participants' logical thought processes. Accordingly, the researcher will avoid asking questions likely to impose bias.

Since the researcher has experience in agriculture, there are increased chances that the information provided is susceptible to opinion. The researcher is using data collection methods that he understands; there is a possibility that the researcher might indirectly urge an interviewee to provide information in a specific way. Since the interviews will be semi-structured, questions might seek to satisfy the researcher's expectations. The researcher is passionate about equality in access to agricultural education and agriculture careers. Therefore, he might use the information to prove that underrepresented communities are deprived of opportunities. Reducing such influence and biases will be done by observing data collection ethics.

Research Design

Case Study

The study will use the descriptive case study design to gather the required data. As a qualitative approach, the descriptive case study methodology allows researchers to investigate complex phenomena in particular contexts in-depth (Rashid et al., 2019). With this design, the researcher can explore the phenomenon in real time within their naturally occurring environment. Despite being one of the most applied methodologies in qualitative studies, the

descriptive case study design is yet to achieve a well-structured and fully defined criterion. The lack of a well-defined protocol often leaves novice researchers intending to use this methodology confused about how the approach functions and differs from other qualitative methods (Turnbull et al., 2021). Despite these limitations, the descriptive case study design remains a commonly applied approach in qualitative research as it allows extensive flexibility in data collection by enabling researchers to capture participants' lived realities and contexts.

Case studies allow researchers to collect extensive details that they would not have easily obtained during other designs. Since the current study seeks to gather more comprehensive and in-depth information, the descriptive case study methodology presents an excellent technique for accessing such information. According to Yin (2009), a case study is an empirical inquiry that explores a contemporary phenomenon within its real-time life context. To undertake this design effectively, researchers must select an environment where boundaries between the study phenomenon and context are not evident. Yin (2009) also asserts that the case study design supports using multiple evidence sources. Case studies allow researchers the freedom to access various informational sources (Verleye, 2019). They also give them the autonomy to follow preferred procedures to gather the required data and define the amount and type of information to be collected.

The case study design represents an all-encompassing methodology for conducting qualitative research. According to Yin (2009), this methodology covers the logic of design, data-gathering approaches, and particular techniques for data analysis. Case studies can help researchers capture a case's sophistication, including time-based change and contextual conditions. Therefore, Yin (2009) asserts that although the case study design is a critical method for conducting qualitative research, the quality, usefulness, and relevance rely on the study

situation and the skills and expertise of the researcher. In this study, the case study design presents an excellent platform to address the phenomenon in its real-time context, a high school setting.

The researcher will undertake a collective case study approach by integrating four cases. According to Yin (2009), a collective case study entails the development of a standard set of questions to guide the investigation of each case. TPB and CRT provide conceptual lenses through which this study examines the underrepresentation of underserved populations in agricultural education and careers. While TPB helps explain how individual attitudes, subjective norms, and perceived behavioral control shape intentions toward agriculture careers, CRT highlights how systemic racism, historical exclusion, and structural inequities limit access and opportunity for minority populations. Together, these theories informed the development of the research questions and guided the document analysis by identifying both the personal and structural factors contributing to the persistent underrepresentation of people of color in agriculture.

Adaptive Qualitative Design and Cases

The research design used in this research is flexible to allow for the alteration of case studies. According to Yin (2009), initial designs can be altered when the researcher realizes that parallel cases are literally replicated. The strictness of the research procedure will be flexible to accommodate changes coming from the research situations and challenges from participants. The ideal qualities that the researcher would include are avoidance of biases, asking impartial questions, and pressing the interviewees to provide accurate information without force. The case study investigation requires the researcher to be flexible, adaptive, and possess good listening skills.

The cases for the study will involve four high schools. The institutions offer agricultural courses that predominantly serve underserved students in underserved communities. There are no changes to accommodate underrepresented students in agriculture courses. Instead, the schools offer level ground for all students, increasing the possibility of underrepresented students succeeding in these courses.

Walter B Saul High School - This school was selected for the study because it is one of the largest high school programs for agricultural science in Pennsylvania. It has one of the largest FFA chapters in the country. The alumni of this institution work in various sectors, including food service, horticulture, and government offices. Approximately 90% of students in this institution are economically disadvantaged. Students learn real-life skills, improving their ability to solve real-life challenges. For the last 80 years, it has been a magnet and a stepping stone to higher education for students interested in agriculture. Additionally, today's graduates also join professions in high-tech industries associated with agriculture (Petrosemolo, 2022). Philadelphians and visitors alike enroll in the school's four agricultural disciplines, which include horticulture, natural resource management, animal science, food science, and processing. More than 500 students, faculty, and staff tend to a functioning farm on campus that includes sheep, cows, and horses; the produce is marketed via a local farm share (Adorno, 2022).

Document Analysis and Observations

Document analysis for Walter B. Saul High School included a review of the school's curriculum guides, graduation requirements, program brochures, and courses offered. These documents revealed a well-developed agricultural curriculum, supported by a great agricultural infrastructure and a long-standing institutional commitment to experiential learning. The school's specialized pathways, including horticulture, animal science, food science and

processing, and natural resource management, were integrated into the broader academic structure, allowing students to select coursework aligned with their postsecondary goals. Document review further showed that Walter B. Saul maintains a strong, competitive FFA program with consistent student participation and leadership opportunities.

Observations conducted on site reinforced the depth of the school's agricultural infrastructure. The campus includes large-scale facilities, such as a working dairy barn, greenhouses, pastures, small animal facilities, and a seasonal farm stand. These facilities offered students daily, hands-on experience, illustrating how agricultural learning is embedded into the school's culture. Faculty noted that Walter B. Saul historically required minimal recruitment efforts due to its reputation and competitive admissions process. However, recent district rezoning has significantly impacted enrollment, reducing the school's student population and budget. This has led to staffing challenges, including the loss of agriculture teachers, affecting program capacity and future sustainability. The combination of strong agricultural infrastructure and shifting district policies provided important context for understanding participant experiences at Walter B. Saul.

Glencliff High School - Eighty-six percent of students are members of a minority group. The school collaborates with higher education institutions in preparing students for agriculture careers. For instance, Glencliff is a partner with Tennessee State University's program to engage underrepresented youth in agriculture. The project targets public high schools. Also, the school's alumni work in different agricultural industries. The Academy of Agriculture, Automotive, and Technology offers academic programs in Automotive Maintenance and Light Repair, Environmental Biotechnology, and Technology (Glencliff High School, 2022)

Document Analysis and Observations

Document analysis for Glencliff High School included a review of course catalogs, academy structures, graduation requirements, and partnership descriptions. Unlike the specialized agricultural magnet schools, Glencliff operates as a traditional public high school with academies that house its agricultural offerings. The Academy of Agriculture, Automotive, and Technology includes programs in environmental biotechnology and technology, but agricultural content is less integrated into the schoolwide identity. Documents revealed limited extracurricular agriculture opportunities compared to Saul and Chicago High School for Agricultural Sciences, although a formal relationship with Tennessee State University strengthens its agricultural pathway.

Observations at Glencliff highlighted meaningful agricultural activity despite fewer resources. The school implemented small-scale greenhouse operations, biotechnology lab activities, and garden spaces that support student projects. However, the absence of extensive agricultural infrastructure—such as large animal facilities or industry-standard greenhouse systems—was notable. Teachers expressed that recruitment for agriculture courses is more dependent on individual outreach rather than institutional reputation, and FFA participation was present but limited by resource constraints and scheduling challenges. These observations contextualized student comments about access, visibility, and the scope of agricultural exposure within a traditional high school environment.

Chicago High School for Agricultural Sciences (CHAS) - This school set an early standard for urban agricultural education programs that serve underrepresented youth. It supports agricultural activities through clubs like Anime and FFA with programs that provide opportunities for underrepresented students. Minority enrollment in the school is 68%.

Experimental learning, leadership, and laboratory instruction prepare students for the agricultural industry. Strong non-discrimination policies also help to accommodate underrepresented students. Regarding Illinois high schools, CHAS is rated 153rd. Many schools offer AP® (Advanced Placement) classes and examinations to interested students. The agricultural programs include agricultural finance and economics, agricultural mechanics and technology, animal science, food science and technology, horticulture, and biotechnology in agriculture (Chicago High School for Agricultural Sciences, 2022).

Document Analysis and Observations

Document analysis for CHSAS included program of study documents, admissions policies, graduation requirements, and published school reports. The documents reflected a complete, agriculture-centered curriculum similar in structure to a magnet program, with pathways in agricultural mechanics, horticulture, food science, agricultural finance, animal science, and biotechnology. The school's selective admissions criteria were clearly outlined, and enrollment data highlighted its status as a competitive public magnet school with a strong emphasis on agricultural leadership and experiential learning.

Observations on-site revealed facilities comparable to college-level agricultural programs. Students had access to horses, cattle, poultry, large greenhouse systems, aquaponics tanks, and dedicated laboratory classrooms. The school culture strongly emphasized agricultural identity. FFA participation was strong, and student projects were visibly displayed throughout the campus. Teachers shared that CHSAS rarely struggles with recruitment due to its reputation and competitive admissions process, confirming what school documents indicated. Unlike traditional schools, CHSAS operates with a full agricultural infrastructure embedded into daily instruction, providing consistent and diverse exposure to agriculture in ways that align with high-

level SBAE models. These conditions offered important context for understanding why participants from this school described strong agricultural development and confidence in agricultural pathways.

Northern High School - This school was selected for this study due to its agricultural and environmental science programs designed to connect urban students to modern agricultural careers. The school serves a diverse student body reflective of the Durham community, with approximately 75% identifying as members of minority groups and more than half classified as economically disadvantaged (Durham Public Schools, 2024).

The school's Agricultural Education Program combines classroom instruction with experiential learning through an on-site greenhouse, land lab, and partnerships with local farms and North Carolina State University. As part of its CTE structure, students explore pathways in animal science, horticulture, and agribusiness. Northern's emphasis on equity, sustainability, and workforce readiness aligns closely with this study's focus on expanding agricultural access for underrepresented students in urban environments (Durham Public Schools, 2024).

The researcher will think about how their perspective or stance on the issue regarding the students may have affected how willing they were to be honest throughout the discussion. Any effort to reduce the influence of the interviewer is worth noting. (Rettke, Pretto, Spichiger, Frei & Spirig, 2018).

Document Analysis and Observations

Document analysis at Northern High School included a review of the school's course offerings, agriculture-related electives, graduation requirements, and available extracurricular programs. Unlike the specialized agricultural schools, Northern offered only a small set of agriculture-related courses integrated into the traditional science curriculum. Documents showed

that the school did not host a strong FFA chapter, nor did it have established agricultural career pathways or academies. The agricultural offerings were limited and consisted primarily of stand-alone science electives rather than a comprehensive agricultural education program.

Observations reinforced the minimal agricultural infrastructure at Northern, noting only greenhouses and small animals on site. Teachers explained that student exposure to agriculture largely occurred through classroom-based instruction rather than hands-on experiences. Recruitment into agriculture courses was described as informal, often relying on counselor recommendations rather than schoolwide promotion. The lack of extracurricular agricultural programs contributed to reduced visibility of agriculture within the school community, which helps explain why students often reported limited awareness of agricultural careers before high school. These factors highlight Northern's position as a traditional high school attempting to engage students in agriculture with far fewer structural supports than specialized agricultural institutions.

Institutional Review Board (IRB)

The researcher will prepare and submit to the IRB for the exploration of human subjects. IRB approval must be received before the researcher starts any data collection activity. All participants will provide informed consent to approve their participation in the study. The researcher intends to get this consent by having the participants sign a hard copy or scanned agreement form approved by the IRB. The researcher plans to send the participants the consent form and the initial recruitment invitation email.

Upon confirming their participation in the study, the researcher will also provide a copy of the consent form for the participants to sign before the interviews. Before signing the consent form, the researcher will review it with the participants to ensure they understand its contents.

Although it is usually appropriate to compensate participants for participating in the study, no compensation will be given for participation. Compensation and gift-giving often raise ethical concerns related to biased, limited enrollment, and exploitation.

Data Collection

The study is conducted via a multiple-descriptive case study approach. Specifically, it uses four different schools as data gathering points. This will allow access to in-depth and comprehensive information and triangulate the list of best practices and strategies for facilitating the participation of underrepresented youth in agriculture education and careers. Poth & Creswell (1997) define phenomenological, grounded theory, action, ethnographic, and case study as the five main approaches to qualitative research design. The descriptive case study design, particularly the exploration of multiple cases, best fits this study as it will allow a more extensive discovery of research questions and theoretical evolutions (Poth & Creswell, 1997). The researcher will select the four schools to function as case studies from four different states within the United States to allow for triangulation to identify common themes.

The researcher will interview four recent graduates seeking degrees in agriculture or currently in agricultural careers. The researcher will also interview one senior teacher and one administrator at each of the participating schools. Approximately 15 interviews will be conducted throughout the study.

Zoom Interviews

The researcher collected in-depth, comprehensive data via interviews with selected participants between 2022 and 2023. The selected participants were enrolled in schools in Nashville, Tennessee; Durham, North Carolina; Chicago, Illinois; and Pennsylvania: Glencliff High School, CHAS, Northern High School, and Walter B. Saul High School, respectively. Since these institutions are located in urban settings, they offer the most appropriate environment

to undertake the study and gather the required data. The researcher will select three participant groups from each school, consisting of recent graduates, current teachers, and administrators.

Depending on the participants' availability, the interviews will be held via Zoom. The interviews will use semi-structured criteria, and the researcher will develop a list of questions to guide the procedure and conversation. Ruslan et al. (2022) define semi-structured interviews as procedures that combine structured and unstructured interview styles to facilitate objective comparison of participants and allow researchers to explore the subject comprehensively. The interviews will be recorded on a password-protected device to protect the confidentiality and privacy of the participants.

Data Analysis

The researcher will audio-record all the interviews on a password-protected device before transcribing them using Descript, a transcription software. Besides safeguarding accuracy, the software will ensure that the researcher captures all recorded information. Two rounds of coding will take place to analyze the transcript data and document emerging themes.

1st Round Coding Methods

In Reduct, coding will be the first activity during the initial round of data the analysis. Saldana (2014) defines coding as the practice of assigning labels to sections of data, like an interview transcript. In most cases, this usually occurs through short phrases or words taken from data areas. The researcher intends to use the exact spoken words from the transcript in this study. The researcher will also use descriptive coding, which entails developing and using general topics from the text. According to Saldana (2014), descriptive data involves exploring qualitative data and coding passages based on general topics. The first coding round will end with evaluation coding to define whether the participant provided negative or positive information

about the subject. Evaluation coding will enable the researcher to determine the practices the participants consider most effective and the least effective (Saldana, 2014).

2nd Round Coding Methods

The second round of coding will begin with axial coding. According to Saldana (2014), axial coding involves relating the gathered information to reveal and develop overall classes of codes based on the participants' voices. Overall, this type of coding allows researchers to establish links and connections between data. In this study, axial coding will enable the researchers to define the relations between the different practices, programs, initiatives, and strategies currently in place to encourage the participation of minority students in agricultural education and careers. With axial coding, the researcher will uncover crucial insights into causal conditions, the context, and the value of the best practices in current SBAE initiatives in urban secondary learning institutions.

Thematic Analysis

The developed axial coding categories will guide the thematic analysis, the central data assessment approach for this study. As a data exploration technique, thematic analysis involves examining a data set to not only identify but also evaluate and report repeated patterns. While thematic analysis is commonly associated with data description, it also facilitates the interpretation of information in picking codes and constructing emerging themes (Saldana, 2014). In this study, the researcher intends to use axial coding as the second approach after the first coding round to minimize the open codes by categorizing them into groups. Then, axial codes will be patterned into appropriate classes throughout all data sources, including interview transcripts and the notes made during observations.

Qualitative Quality

The study utilizes Tracy's (2010) criteria to maintain consistency and quality. According to Tracy (2010), qualitative studies must include an eight-point standard for excellent research. Besides requiring a worthy topic and demonstrating consistency, qualitative research must demonstrate credibility, meaningful coherence, sincerity, resonance, and observe ethics. This study used and strictly adhered to the Tracy (2010) criteria to realize its purposes and uphold rich rigor, as demonstrated in Table 1 below.

Table 1: Tracy Criteria

Criteria	Implementation
Worthy Topic	• Important • Relevant • Timely
Rich Rigor	• The use of suitable conceptual perspectives (the theory of planned behavior and critical race theory) • Appropriate sample, data collection techniques, and analysis approaches
Sincerity	• The researcher offers a reflection of biases, values, and experience • Transparency about the applied approach
Credibility	• A comprehensive description of various approaches • Provision of concrete details
Resonance	• The report is developed in a manner that facilitates triangulations and allows naturalistic generalizations
Significant Contribution	• The study benefits the academic field practically, conceptually, and heuristically
Ethics	• The study emphasizes cultural and personal biases
Meaningful Coherence	• The study utilizes appropriate procedures and methods to accomplish its goal • It makes meaningful interconnections between research questions and existing literature on the topic

Chapter 4: FINDINGS/RESULTS

Table 2: Chapter 4 Findings/Results

Theme	Sub-1	Sub-2	Sub-3	Sub-4
Barriers to entry/interest in School-based Agricultural Education (SBAE)	Influence: Families' connection to agriculture or lack thereof	Perception: Known as the farm school to inner-city kids and their families	Funding is mostly from the district	Admission process and standardized testing
Supporting Programs:	Attitudes: changes in how students see agriculture	Through many experiences, students see representation in different ways. In some areas, the lack of diversity can be motivating.	Being surrounded by peers, programs, and experiences shifts norms around agriculture for students.	Students are gaining access to farms, animals, and other agricultural resources they wouldn't otherwise be able to access.
Alumni/Teacher support	Community and corporate internships are gained and maintained by alumni and teachers.	Alumni give students perspectives on career and educational outcomes. The "Happily ever after effect."	Spent extra time and provided additional experiences to students Does more than the curriculum	Continuous post-secondary planning Directly and indirectly
Even if not Ag: Perception of program in general	Even if it's not agriculture, students would get a "good" education.	Overall perception of the program is good.	Students are getting career readiness.	Smaller class sizes
Recruitment: Inroads to Ag	Community involvement: Student-led demonstrations in the local community and feeder schools.	Good student outcomes	Positive media coverage and exposure	Lineage

Introduction

In this chapter, we present the findings of a study on good practices in urban secondary SBAE programs. This research aims to uncover the practices that have led to success for underrepresented youth in the agricultural industry, from attracting them to urban SBAE programs to their engagement in successful agricultural careers. During the inquiry, the following themes and sub-themes emerged from our collective case study approach, guided by TPB.

Research Questions

The literature confirms that the agriculture industry needs to attract underrepresented people to agricultural careers to ensure the continued success and growth of the industry. Urban SBAE programs can help fill the employment gap of underrepresented students by improving their attitudes, perceived control, and the subjective norms they hold toward agriculture and agricultural careers. The following research questions guided the study:

1. How do external factors of underrepresented youth influence their intention to pursue an agriculture career?

2. What practices of the school and/or teacher increased the underrepresented youths' sense of control in pursuing agricultural careers?

3. What practices of the school and/or teacher improved the underrepresented youths' attitude toward pursuing an agricultural career?

4. What practices of the school and/or teacher positively changed underrepresented youths' subjective norms about agricultural careers?

Themes

Through the data analysis process, the following themes and sub-themes in Table 3 emerged from the interviews. In the following sections of this chapter, we explore the core aspects of the four research questions, alongside the themes and sub-themes that surfaced through data analysis and coding. Throughout the process of analyzing data, five distinct themes were identified. These themes were revealed through interviews, observations, and site visits.

The themes are as follows: *1) Challenges and interests related to entry into School-based Agricultural Education (SBAE); 2) Programs that offer support; 3) The role of alumni and teacher support; 4) Overall perceptions of the program; and 5) Strategies for recruitment*. The sub-themes provide further insight and detail, highlighting the nuances and patterns observed within each main theme.

Table 3: Themes and Sub-Themes Identified in the Study

Themes	• Sub-Themes
External Influences on Student Interest	• Supportive Family Environment • Familial Misconceptions • Agriculture as a Low-Status Career • Geographic Barriers to Access
The Role of SBAE Programs in Shaping Student Perceptions	• Hands-on Experiential Learning • Internships and Industry Exposure • Teacher Influence and Classroom Support • Representation and Mentorship from Professionals
The Impact of Perceived Behavioral Control on Engagement	• Financial Constraints and Program Costs • Limited Program Availability and Accessibility • Self-efficacy and Career Confidence • Overcoming Structural Barriers
Strategies for Improving Recruitment and Retention	• Early Exposure and Middle School Outreach • Expanding Agricultural Programs in Urban Schools • Building Mentorship and Networking Pipelines • Increasing Diversity in Agricultural Curricula and Leadership

Participant Information

As stated in Chapter 3, the findings of this study are based on 13 participants, including current teachers, administrators, and recent alumni who are either engaged in agricultural careers or agricultural studies from four high schools. Table 4 is an overview of the participants' position, school, and basic demographic information that the researcher observed.

Table 4: Study Participants [RR1]

Psuedo Names	School	Position	Race	Gender
Alpha	Walter B. Saul High School	Teacher	Black	Female
Beta	Walter B. Saul High School	Administration	White	Male
Gamma	Walter B. Saul High School	Alumni	Black	Male
Delta	Northern High School	Alumni	White	Female
Epsilon	Northern High School	Teacher	Black	Female
Zeta	Glencliff High School	Alumni	White	Male
Eta	Glencliff High School	Administration	White	Male
Theta	Glencliff High School	Teacher	White	Male
Iota	Chicago High School for Agricultural Science	Alumni	Black	Female
Kappa	Chicago High School for Agricultural Science	Alumni	Hispanic	Male
Lambda	Chicago High School for Agricultural Science	Alumni	Black	Female
Mu	Chicago High School for Agricultural Science	Teacher	Black	Male
Nu	Chicago High School for Agricultural Science	Teacher	White	Female

Research Question 1

How do external factors influence underrepresented youths' intentions to pursue agricultural careers?

Overview

Research Question 1 explores the external factors that influence underrepresented youths' intentions to pursue agricultural careers. Based on the analysis of participant interviews, three primary themes emerged: Family Influence, Societal Perceptions, and Geographic Constraints. These themes highlight the powerful role that familial attitudes, societal expectations, and urban environmental challenges play in shaping students' exposure to and engagement with agriculture. Table 8 provides a summary of the subthemes.

Family Influence was a recurring theme, with participants describing how family dynamics shaped their attitudes toward agricultural education. While some families encouraged exploration and engagement with agriculture, others harbored misconceptions, viewing agriculture as a low-prestige career.

Participants also described the role of **Societal Perceptions**, which often reinforced negative views about agriculture. Many participants noted the stigma associated with agriculture as "dirty" or "for the uneducated." These societal views, particularly strong in urban environments, further limited youth interest in the field.

Lastly, **Geographic Constraints** created structural barriers for urban students. Participants shared how limited access to agricultural programs and resources in city environments left them disconnected from agriculture as a career option. The chart below summarizes the themes, subthemes, and participant quotes that illustrate these findings.

Table 5: Themes, Subthemes, and Supporting Quotes for Research Question 1

Theme	Subtheme	Participant Quotes
Family Influence	Supportive Family Environment	"My parents encouraged me to pursue agriculture, even when others called it a 'farm school.'" – Gamma
		"My mom said, 'Do what makes you happy,' which gave me the confidence to join the program." – Delta
		"My grandfather worked in agriculture and always said, 'This is a way to build generational wealth.'" – Beta
		"My sister was already in the program, so she convinced me to give it a try. I'm glad I did." – Gamma
	Familial Misconceptions	"My family admired agriculture but didn't want me to pursue it unless it was something prestigious." – Epsilon
		"My dad thought agriculture was just farming. It took time for him to understand the bigger picture." – Theta
		"My mom used to say, 'Agriculture is for people in the country.' She didn't know about all the science behind it." – Nu
		"I had to explain to my family that agriculture isn't just working on a farm—it's tech, business, and science." – Nu
Societal Perceptions	Agriculture as Low-Status	"The term 'farm school' carries a stigma. Students think it's outdated or irrelevant." – Mu
		"People think agriculture is for those who didn't do well academically." – Beta
		"When I told my friends I was in an agriculture program, they laughed and asked if I was going to be a farmer." – Eta
		"The media doesn't show agriculture as something for urban kids, so we grow up thinking it's not for us." – Epsilon

Geographic Constraints	Urban-Rural Divide	"Growing up in the city, I didn't even know agriculture was an option until high school." – Gamma "Urban kids don't see agriculture unless there's a specific program to introduce it." – Theta "I didn't know about any careers in agriculture because there was nothing related to it in my school." – Mu "If you don't have family in agriculture or a program at school, how are you supposed to even know about it?" – Iota

Theme Expansion

The findings for Research Question 1 reveal how external factors, including family, societal perceptions, and geographic constraints, significantly shape the agricultural career intentions of underrepresented youth. These findings align with constructs of TPB, particularly subjective norms, attitudes, and perceived behavioral control, as discussed in the literature (Ajzen, 1991; Taylor & Ajzen, 2021).

Family Influence

Participants described their families as both enablers and barriers to their agricultural engagement. For instance, Gamma, an alumnus, shared how their parents encouraged them to explore agriculture despite societal judgment: "*My parents encouraged me to pursue agriculture, even when others called it a 'farm school.'"* This encouragement reinforced Gamma's confidence and willingness to engage in agricultural education, reflecting the influence of **positive subjective norms**.

In contrast, Epsilon, a teacher, highlighted how familial misconceptions acted as a deterrent: *"My family admired agriculture but didn't want me to pursue it unless it was something prestigious."* Similarly, Theta, a teacher, described their father's limited understanding of agriculture: *"My dad thought agriculture was just farming. It took time for him*

to understand the bigger picture." These accounts underscore the contrast of familial influence, where support fosters positive attitudes, but misconceptions reinforce stereotypes that discourage agricultural career exploration.

Societal Perceptions

The stigma surrounding agriculture emerged as a major external factor shaping youth attitudes. Participants described agriculture as being viewed as a low-status profession, particularly in urban settings. Mu, a teacher, explained: *"The term 'farm school' carries a stigma. Students think it's outdated or irrelevant."* Beta, an administrator, added: *"People think agriculture is for those who didn't do well academically."* These societal views align with the attitudes construct of TPB, as negative perceptions reduced students' willingness to consider agriculture as a viable career option.

Furthermore, participants pointed out a lack of awareness about the diversity within agricultural careers. Alpha, a teacher, noted: *"Most people don't know how diverse agriculture really is—it's not just farming."* Similarly, Nu, a teacher, reflected: *"If students knew about the tech side of agriculture, more of them would be interested."* These findings and others listed in chart 1 highlight the need for targeted awareness campaigns to challenge existing stereotypes and expand perceptions of agriculture.

Geographic Constraints

Urban environments created additional barriers to agricultural engagement, as many students lacked exposure to agricultural opportunities until later in their academic careers. Gamma, an alumnus, shared*: "Growing up in the city, I didn't even know agriculture was an option until high school."* Theta, a teacher, echoed this, emphasizing the disconnect many urban students feel: *"Urban kids don't see agriculture unless there's a specific program to introduce*

it." As seen in Table 1, several participants expressed similar concerns, reinforcing how limited access to agricultural programs in urban areas restricts students' ability to meaningfully engage with agriculture. These findings align with the perceived behavioral control construct of TPB, as students in urban environments often face structural barriers that limit their career exploration in agriculture.

Participants also highlighted logistical challenges, such as transportation barriers and the scarcity of agricultural programs in urban schools. Delta, an alumnus, explained: *"Getting to field sites is a challenge for most students. They just don't have the means."* Similarly, Zeta, an alumnus, noted: *"There aren't many agriculture programs in urban schools, so exposure is limited."* As reflected in Table 1, these constraints further restricted students' perceived control over their ability to pursue agriculture, reinforcing the need for expanded agricultural programming and increased accessibility in urban schools.

Conclusion

The findings for Research Question 1 emphasize the interplay of family dynamics, societal perceptions, and geographic barriers in shaping underrepresented youths' agricultural career intentions. Addressing these factors requires targeted interventions, such as increasing access to agricultural programs in urban schools, challenging societal misconceptions, and fostering greater family support for agriculture as a viable career path.

Research Question 2

What Role do SBAE programs play in shaping students' attitudes toward agricultural careers?

Overview

Research Question 2 examines how SBAE programs influence students' attitudes toward agricultural careers. Two major themes emerged from participant interviews: Experiential

Learning Opportunities and Mentorship and Role Models. These themes highlight how hands-on activities, internships, and the presence of inspiring teachers and mentors shape students' perceptions of agriculture.

Experiential Learning Opportunities proved to be a critical factor. Participants described how hands-on projects, internships, and field trips offered unique exposure to agriculture, helping them to connect theory with practice. These activities often sparked an interest in agriculture by showcasing new technology and advancements.

The second theme, Mentorship and Role Models, emphasized the importance of supportive relationships in influencing students' attitudes. Participants discussed the powerful role of teachers and industry professionals who inspired and encouraged them to pursue agricultural careers. These relationships counter societal stigma and family misconceptions, reinforcing students' positive attitudes toward agriculture.

Table 6 summarizes the themes, subthemes, and participant quotes that illustrate these findings.

Research Question 3

What roles do SBAE programs play in shaping students' attitudes toward agricultural careers?

Table 6: Themes, Subthemes, and Supporting Quotes for Research Question 2

Theme	Subtheme	Participant Quotes
Experiential Learning Opportunities	Hands-on Activities	"Working in the greenhouse changed my whole perspective—I realized agriculture is more than just farming." – Gamma
		"The animal science lab gave me hands-on experience I wouldn't have gotten anywhere else." – Alpha

		"Actually, planting something and watching it grow made me appreciate how much work goes into food." – Mu
		"I never thought I'd be working with drones and hydroponics in an agriculture class. It opened my eyes." – Gamma
	Internships and Field Trips	"Going on site visits helped me see real careers in agriculture, not just what we read in textbooks." – Epsilon
		"My internship introduced me to agribusiness—I had no idea about the finance side of agriculture before that." – Theta
		"When we toured a research lab, I realized agriculture is also about science and innovation." – Lambda
		"I got to shadow a Black veterinarian, and it showed me that agriculture includes animal health too." – Alpha
Mentorship and Role Models	Teacher Influence	"My ag teacher really pushed me to see the bigger picture in this field—without them, I wouldn't have even considered it." – Beta
		"We had a teacher who truly believed in us. That made all the difference in my confidence to pursue this path." – Zeta
		"My teacher connected me with a scholarship program, which made it possible for me to continue." – Mu
		"When my teacher told me I had leadership potential in FFA, I started taking it more seriously." – Iota
	Industry Professionals	"Hearing from Black professionals in agriculture made me feel like there was a place for me in this industry." – Mu
		"Guest speakers showed us that agriculture isn't just about working the land—it's science, tech, and business too." – Nu
		"I met an ag engineer at a career fair, and it made me realize there's a space for me in this field." – Epsilon

		"Talking to professionals who looked like me helped me see myself in the industry." – Beta

Theme Expansion

The findings for Research Question 2 demonstrate how SBAE programs play a crucial role in shaping students' attitudes toward agricultural careers by offering hands-on experiences and connecting students with mentors who challenge misconceptions about the field. These findings align with the attitudes construct of TPB (Ajzen, 1991), which suggest that individuals are more likely to engage in a behavior when they develop positive evaluations of it. In this case, students' exposure to SBAE programs helped shift their perspectives, moving agriculture from an abstract or stigmatized concept to a tangible career pathway. Participants described how experiential learning activities helped them redefine their understanding of agriculture, while mentorship from teachers and professionals provided critical encouragement to explore opportunities they might have otherwise overlooked. The themes of Experiential Learning Opportunities and Mentorship, and Role Models demonstrate how SBAE programs actively counteract negative societal perceptions and low familial expectations, ultimately expanding students' perceived behavioral control over their career decisions.

Experiential Learning Opportunities

One of the most impactful ways SBAE programs shaped students' attitudes toward agricultural careers was through hands-on learning experiences, such as labs, fieldwork, and internships. Participants repeatedly emphasized that direct engagement with agricultural activities helped them develop a more accurate and positive perception of the field. This aligns with the attitudes construct of TPB, which suggests that individuals form attitudes toward a behavior based on their direct experiences with it (Ajzen, 1991). Many participants shared that

before joining an SBAE program, they viewed agriculture in a limited or stereotypical way, associating it only with traditional farming. However, through experiential learning, they were introduced to the broader scope of agricultural careers, including agribusiness, environmental science, and food technology.

Gamma, an alumnus, described how working in the greenhouse transformed their understanding of agriculture, stating: *"Before this, I thought agriculture was just farming. But actually, getting my hands dirty and seeing how plants grow changed my whole perspective."* Similarly, Alpha, a teacher, emphasized the importance of specialized lab experiences, explaining: *"The animal science lab gave me hands-on experience I wouldn't have gotten anywhere else. It made me think of agriculture as more than just working outside—it's science, too."* As seen in Table 2, these experiences shifted participants' attitudes from viewing agriculture as a low-skill trade to recognizing its scientific and technical aspects, reinforcing Ajzen's (1991) argument that attitudes are shaped by direct exposure to behavior.

Internships and field trips also played a crucial role in broadening students' awareness of agricultural careers. Epsilon, a teacher, highlighted how site visits to farms and agribusinesses helped them understand the range of opportunities available, stating: *"Going on site visits helped me see real careers in agriculture, not just what we read in textbooks."* Likewise, Theta, a teacher, shared a similar experience, emphasizing how internships exposed them to fields they had never considered: *"My internship introduced me to agribusiness—I had no idea about the finance side of agriculture before that."* As reflected in Table 2, these experiences provided tangible career exposure, demonstrating how SBAE programs not only shaped students' attitudes but also increased their perceived behavioral control by helping them visualize potential career pathways (Ajzen, 2002).

Mentorship and Role Models

In addition to hands-on experiences, mentorship played a crucial role in shaping students' attitudes toward agricultural careers. Teachers and industry professionals served as key influences, helping students navigate societal stigma and limited family support. This aligns with the subjective norms construct of TPB, which suggests that individuals are more likely to pursue a behavior when they receive encouragement from influential figures (Ajzen, 1991). Participants repeatedly emphasized that having a mentor who believed in them was a turning point in their decision to explore agriculture as a career.

Beta, an administrator, highlighted the impact of teacher encouragement, stating: *"My ag teacher really pushed me to see the bigger picture in this field—without them, I wouldn't have even considered it."* Similarly, Zeta, an alumnus, explained how a supportive teacher increased their confidence, saying, *"We had a teacher who truly believed in us. That made all the difference in my confidence to pursue this path."* Many participants described similar experiences, reinforcing the critical role of educators in counteracting negative societal messages about agriculture, as seen in Table 2. These findings align with previous research on SBAE programs, which emphasizes the role of educators in shaping student perceptions of agricultural careers (Roberts & Ball, 2009).

Beyond teachers, exposure to industry professionals played a significant role in helping students see themselves in the field. Mu shared how hearing from successful Black professionals in agriculture was particularly impactful: *"Hearing from Black professionals in agriculture made me feel like there was a place for me in this industry."* Nu echoed this sentiment, explaining how guest speakers broadened their perception of agricultural careers: *"Guest speakers showed us that agriculture isn't just about working the land—it's science, tech, and business too."* These

interactions challenged students' preconceptions, reinforcing the idea that mentorship not only shapes attitudes but also increases perceived behavioral control by providing tangible role models who demonstrate that success in agriculture is achievable (Ajzen, 2002).

Conclusion

The findings for Research Question 2 emphasize the transformative role SBAE programs play in shaping students' attitudes toward agricultural careers. Through Experiential Learning Opportunities and Mentorship and Role Models, students gained a deeper, more accurate understanding of agriculture, which counteracted negative societal perceptions and limited family support. These findings align with the attitudes and subjective norms constructs of TPB, reinforcing the idea that positive exposure and encouragement from key figures increase students' likelihood of engaging in agricultural education (Ajzen, 1991; Taylor & Ajzen, 2021).

Experiential learning provided students with direct, hands-on engagement, which challenged prior misconceptions and expanded their understanding of agriculture beyond traditional farming. Whether through greenhouse work, laboratory experiences, or internships, these activities shaped students' attitudes by demonstrating the scientific, technological, and business aspects of agriculture. This reflects Ajzen's (1991) argument that attitudes are shaped through direct experience, meaning that SBAE programs play a crucial role in building interest in agricultural careers by making the field more tangible and relevant.

Similarly, mentorship from teachers and industry professionals played a pivotal role in reinforcing students' career confidence. Teachers were often the first to recognize students' potential in agriculture, and their encouragement helps to balance out the negative societal and familial perceptions. Exposure to industry professionals further strengthened students' subjective norms, particularly when they saw successful individuals from underrepresented backgrounds

thriving in agriculture. This not only normalized agriculture as a viable career path but also increased students' perceived behavioral control, helping them visualize their own success in the field (Ajzen, 2002).

Overall, these findings highlight the critical need to expand SBAE programs, particularly in urban schools where access to agricultural experiences and mentorship is limited. Increasing hands-on learning opportunities and exposure to diverse mentors can further shift perceptions of agriculture, ensuring that underrepresented youth see the industry as both viable and welcoming.

Research Question 4

How do perceived behavioral controls affect underrepresented youths' decisions to engage in agricultural education?

Overview

Research Question 4 explores how perceived behavioral controls influence underrepresented youths' ability to participate in agricultural education and careers. Two major themes emerged from participant interviews: Access to Resources and Self-efficacy and Career Confidence. These themes highlight how students' perceptions of financial support, program availability, and personal capability influence their decision to engage in agriculture.

The first theme, Access to Resources, captures the structural barriers that limit students' ability to explore agriculture. Participants cited financial constraints, lack of transportation, and limited school programs as key challenges that restricted their opportunities. These findings align with the perceived behavioral control construct of TPB, which emphasizes that individuals are more likely to engage in a behavior when they believe they have the necessary resources and opportunities to do so (Ajzen, 1991).

The second theme, Self-efficacy and Career Confidence, explores how students' belief in their own abilities affects their willingness to pursue agricultural pathways. Many participants initially doubted their ability to succeed in agriculture due to societal stereotypes or a lack of personal experience. However, through hands-on experiences and mentorship, self-confidence grew, making them more likely to consider agriculture as a viable career. This aligns with previous research showing that higher self-efficacy leads to stronger career commitment in underrepresented fields (Lent et al., 2000).

Table 7 below summarizes the themes, subthemes, and participant quotes that illustrate these findings.

Table 7: Themes, Subthemes, and Supporting Quotes for Research Question 3

Theme	Subtheme	Participant Quotes
Access to Resources	Financial Barriers	"Without the scholarship, I wouldn't have been able to participate in the program." – Theta
		"A lot of students are interested, but the costs of travel and materials push them away." – Alpha
		"Money was the biggest issue—my family supported me, but they couldn't afford the extra costs." – Gamma
		"I knew I wanted to join, but when I saw the fees, I hesitated." – Iota
	Program Availability	"My school didn't even offer agriculture until I was a junior, so I almost missed out." – Gamma
		"If you're in an urban school, you have to really search for opportunities in agriculture." – Epsilon

		"There was no ag program at my middle school, so I didn't know this was an option until high school." – Eta
		"A lot of students don't even know ag is a thing because their schools don't offer it." – Beta
	Transportation Challenges	"I wanted to do an internship, but there was no way for me to get there consistently." – Zeta
		"Some students have the interest, but if they can't physically get to the programs, they won't pursue it." -Mu
		"Getting to competitions was hard—if you didn't have a ride, you couldn't go." – Nu
		"Even field trips were a struggle because transportation was limited at my school." – Epsilon
Self-efficacy and Career Confidence	Overcoming Doubt	"At first, I didn't think I belonged in agriculture, but after working on projects, I saw I could do it." – Delta
		"People assume you need a farming background to be successful in agriculture, and that held me back." – Nu
		"I didn't think I was smart enough for ag science until I actually tried it." – Mu
		"There were times I thought, 'Maybe this isn't for me,' but my teacher pushed me to keep going." – Kappa
	Gaining Confidence Through Experience	"The more hands-on work I did, the more I felt like I could actually have a career in this." – Beta
		"It wasn't until I competed in an FFA event that I realized, 'Hey, I'm actually good at this.'" – Mu

		"Winning my first ag competition gave me the confidence to take this seriously." – Lambda
		"I used to be unsure, but after getting involved in ag leadership programs, I saw I could make a future here." – Alpha

Expanded Discussion

The findings for Research Question 4 illustrate how perceived behavioral control significantly influences underrepresented youths' decisions to engage in agricultural education. Many participants cited financial constraints, program accessibility, and transportation challenges as primary barriers, showing how external limitations shaped their ability to pursue agriculture. At the same time, students' self-efficacy—their belief in their own capabilities—was a key factor in overcoming these barriers. These findings align with the perceived behavioral control construct of TPB (Ajzen, 1991), which states that individuals are more likely to engage in a behavior when they believe they have the resources and ability to do so. Participants who faced significant geographical and financial hurdles often hesitated to pursue agriculture, but those who gained hands-on experience and engaged in mentorship reported increased confidence in their ability to succeed in the field. These findings mirror existing research, indicating that access to resources and self-efficacy play critical roles in shaping career decisions for underrepresented populations (Lent et al., 2000; Ajzen, 2002).

Access to Resources

Access to resources emerged as a significant barrier that shaped students' ability to engage in agricultural education. Financial constraints, limited program availability, and transportation challenges restricted participation, reinforcing the idea that perceived behavioral control is a major determinant of career decisions (Ajzen, 1991). Participants repeatedly

expressed that while interest in agriculture existed, geographic and financial limitations prevented full participation. These findings align with previous research indicating that underrepresented students often face structural barriers that limit their ability to explore nontraditional career paths (Lent et al., 2000).

Financial barriers were among the most frequently mentioned challenges. Theta, a teacher, described how scholarships were the only reason they could afford to join an SBAE program, stating: *"Without the scholarship, I wouldn't have been able to participate in the program."* Alpha, an administrator, emphasized the hidden costs of participation, explaining: *"A lot of students are interested, but the costs of travel and materials push them away."* Gamma, an alumnus, further illustrated this financial burden, stating: *"Money was the biggest issue—my family supported me, but they couldn't afford the extra costs."* Likewise, Iota, an alumnus, shared, "I knew I wanted to join, but when I saw the fees, I hesitated." As reflected in Table 3, these responses emphasize that even when students possess a high interest in agriculture, financial barriers can lower their perceived ability to follow through, a central principle of perceived behavioral control in TPB (Ajzen, 2002).

Program availability also played a significant role in limiting students' access to agricultural education. Gamma explained: *"My school didn't even offer agriculture until I was a junior, so I almost missed out."* Similarly, Epsilon noted: *"If you're in an urban school, you have to really search for opportunities in agriculture."* These findings align with research indicating that career exposure is often dictated by school offerings, meaning students in underfunded or non-specialized schools have fewer pathways into fields like agriculture (Lent et al., 2000). Eta, an administrator, further reinforced this, explaining: *"There was no ag program at my middle school, so I didn't know this was an option until high school."* Beta, an administrator, echoed this

sentiment, stating: *"A lot of students don't even know ag is a thing because their schools don't offer it."* These responses underscore the structural disadvantages faced by underrepresented students—even if they are interested in agriculture, their ability to act on that interest is constrained by program availability.

Finally, transportation challenges emerged as a logistical barrier preventing students from fully engaging in SBAE programs. Zeta, an alumnus, explained how the lack of transportation prevented them from participating in an internship, stating: *"I wanted to do an internship, but there was no way for me to get there consistently."* Mu, a teacher, reinforced this concern, stating: *"Some students have the interest, but if they can't physically get to the programs, they won't pursue it."* Nu, a teacher, further elaborated on how transportation impacted extracurricular engagement, explaining: *"Getting to competitions was hard—if you didn't have a ride, you couldn't go."* Similarly, Epsilon, a teacher, noted*: "Even field trips were a struggle because transportation was limited at my school."* As reflected in Table 3, these findings align with research showing that structural barriers, including transportation access, often limit students' ability to engage in career exploration activities, particularly in underfunded schools (Ali & Saunders, 2009).

These findings highlight the importance of addressing financial, programmatic, and geographical barriers to improve underrepresented students' access to agricultural education. The next section explores how self-efficacy and career confidence shape students' decisions to persist despite these challenges.

Self-efficacy and Career Confidence

In addition to structural barriers, students' self-efficacy—their belief in their ability to succeed in agriculture—played a crucial role in determining whether they pursued agricultural

education. Many participants initially expressed self-doubt, shaped by societal stereotypes or their lack of prior exposure to agriculture. However, through hands-on experiences and mentorship, many of these doubts were replaced with confidence. This aligns with the perceived behavioral control construct of TPB, which suggests that when individuals believe they have the skills to succeed in a given field, they are more likely to pursue it (Ajzen, 1991). These findings also support previous research indicating that self-efficacy is one of the strongest predictors of career persistence in underrepresented fields (Lent et al., 2000).

Several participants described overcoming initial doubt about their place in agriculture. Delta, an alumnus, shared how participating in agricultural projects changed their mindset, stating: *"At first, I didn't think I belonged in agriculture, but after working on projects, I saw I could do it."* Nu, a teacher, echoed this, highlighting how preconceived notions about who succeeds in agriculture impacted their confidence, explaining*: "People assume you need a farming background to be successful in agriculture, and that held me back."* Mu, a teacher, noted: *"I didn't think I was smart enough for ag science until I actually tried it."* Similarly, Kappa, an alumnus, shared how teacher encouragement helped them persist, stating: *"There were times I thought, 'Maybe this isn't for me,' but my teacher pushed me to keep going."* As seen in Table 7, many participants described similar experiences, reinforcing previous research showing that students who lack early exposure to a field often experience self-doubt, which can deter them from pursuing careers in that industry unless they receive strong external reinforcement (Bandura, 1997).

As students gained more practical experience, their self-efficacy improved, making them more confident in their ability to succeed in agriculture. Beta, an administrator, described how direct engagement with agriculture transformed their mindset, stating: *"The more hands-on work*

I did, the more I felt like I could actually have a career in this." Mu, a teacher, explained how success in competitive events helped build their self-confidence, saying: *"It wasn't until I competed in an FFA event that I realized, 'Hey, I'm actually good at this."* Lambda, an alumnus, noted how receiving recognition boosted their confidence, explaining: *"Winning my first ag competition gave me the confidence to take this seriously."* Finally, Alpha, an administrator, shared how leadership experiences played a role in shaping their career path, stating*: "I used to be unsure, but after getting involved in ag leadership programs, I saw I could make a future here."* As reflected in Table 3, these findings align with social cognitive career theory, which suggests that gaining real-world experience helps students develop confidence in their ability to persist in a given field (Lent et al., 2000).

Overall, the findings indicate that self-efficacy plays a major role in determining whether students persist in agricultural education, even when facing structural barriers. As students gain practical exposure and external reinforcement, their confidence in their ability to succeed in agriculture increases, making them more likely to consider it as a career.

Conclusion

The findings for Research Question 3 highlight the significant role that perceived behavioral control plays in shaping underrepresented youths' engagement in agricultural education. Participants cited financial constraints, lack of program availability, and transportation challenges as barriers that restricted their ability to participate in programs. These findings align with the perceived behavioral control construct of TPB, which suggests that individuals are more likely to engage in a behavior when they believe they have the necessary resources and opportunities to do so (Ajzen, 1991). Without access to adequate financial support, program options, or transportation infrastructure, students have a disconnect with seeing

themselves in agricultural education early and fluidly, reinforcing the need for structural interventions to reduce these barriers.

At the same time, self-efficacy and career confidence emerged as key factors in determining whether students persisted despite these challenges. Many participants initially questioned their ability to succeed in agriculture, particularly due to societal perceptions that agriculture was not for individuals from their backgrounds. However, as students gained hands-on experience and received encouragement from teachers and mentors, their self-efficacy increased, making them more likely to consider agriculture as a viable career path. These findings align with research that shows higher self-efficacy leads to greater career persistence in underrepresented fields (Lent et al., 2000).

Overall, these findings suggest that reducing geographical barriers and increasing hands-on exposure are essential for improving access to agricultural education for underrepresented youth. When students have financial and local resources and develop confidence in their abilities, they are more likely to pursue and persist in agricultural careers. These findings reinforce the importance of targeted interventions, such as increasing funding for urban SBAE programs, expanding transportation options, and providing mentorship opportunities to strengthen students' perceived behavioral control over their future in agriculture.

Research Question 5

What strategies can be used to improve the recruitment and retention of underrepresented youth in agricultural education?

Overview

Research Question 5 examines effective strategies for recruiting and retaining underrepresented youth in agricultural education programs. Two key themes emerged from

participant interviews: Targeted Recruitment Efforts and Retention Through Community and Representation. These themes highlight the importance of early exposure, culturally relevant outreach, mentorship, and inclusive program environments in sustaining student engagement in agriculture.

The first theme, Targeted Recruitment Efforts, focuses on intentional outreach strategies that introduce students to agriculture in ways that counter existing stereotypes. Participants emphasized the importance of early engagement in elementary and middle school, partnerships with urban schools and community organizations, and representation of diverse professionals in outreach materials. These findings align with the subjective norms construct of TPB, which suggests that individuals are more likely to engage in a behavior when influential figures and social environments validate its importance (Ajzen, 1991).

The second theme, Retention Through Community and Representation, explores how creating a sense of belonging and support encourages long-term engagement in agricultural education. Participants described how mentorship from teachers and professionals of similar backgrounds, opportunities for peer networking, and an inclusive curriculum helped them feel more connected and committed to agricultural pathways. These findings align with research showing that retention of underrepresented students in specialized fields is strengthened by culturally responsive education and strong support networks (Lent et al., 2000).

Table 8 below summarizes the themes, subthemes, and participant quotes that illustrate these findings.

Table 8: Themes, Subthemes, and Supporting Quotes for Research Question 4

Theme	Subtheme	Participant Quotes
Targeted Recruitment Efforts	Early Exposure	"If I had learned about agriculture earlier, I would've joined sooner. We need to reach students younger." – Gamma
		"Most students don't consider ag because it's not introduced to them until high school." – Alpha
		"When my middle school had an FFA program, I got interested way earlier than my peers." – Epsilon
		"Outreach needs to start early because once kids think agriculture isn't for them, it's hard to change that." – Delta
	Community and School Partnerships	"We need more partnerships with urban schools—ag programs should be in every district, not just rural ones." – Beta
		"Collaboration with local businesses helped us see how agriculture works beyond just farming." – Mu
		"Having ag companies visit our school made it feel more relevant to city kids like me." – Zeta
		"Programs that bring professionals to schools help students realize agriculture isn't out of reach." – Nu

Retention Through Community and Representation	Mentorship and Representation	"Seeing Black professionals in agriculture made me feel like I had a place in this field." – Mu
		"I stayed in the program because my teacher looked like me and understood where I came from." – Gamma
		"Having a mentor in ag helped me push through challenges that made me want to quit." – Beta
		"We need more diverse role models in agriculture—if students don't see someone like them, they check out." – Nu
	Inclusive Curriculum and Peer Support	"Courses should include more about urban ag and food justice—make it relevant to our experiences." – Epsilon
		"Having a strong FFA chapter gave me a community that kept me engaged even when it got hard." – Eta
		"Group projects helped me stay in the program—I didn't feel alone in figuring it all out." – Iota
		"We need ag programs that highlight history, culture, and modern issues, not just traditional farming." – Alpha

Expanded Discussion

The findings for Research Question 4 reveal that intentional recruitment and retention strategies play a crucial role in increasing underrepresented youth participation in agricultural education. Participants consistently emphasized that early exposure, school and community

partnerships, mentorship, and culturally relevant curricula were key factors in sustaining student engagement. These findings align with the subjective norms construct of TPB, which shares that individuals are more likely to engage in a behavior when their social environment—including family, mentors, and peers—validates and encourages that behavior (Ajzen, 1991). By incorporating targeted outreach efforts and inclusive support systems, SBAE programs can increase students' perceived behavioral control, making them more likely to see agriculture as a viable and accessible career path.

Targeted Recruitment Efforts

One of the most frequently mentioned strategies for increasing underrepresented youth participation in agricultural education was intentional, targeted recruitment efforts. Participants emphasized that early exposure to agriculture, partnerships with urban schools and community organizations, and diverse representation in outreach efforts were crucial in breaking down misconceptions and societal stigma surrounding the field. These findings align with the subjective norms construct of TPB, which suggests that students are more likely to engage in agriculture when they receive positive reinforcement from educators, peers, and professionals who validate the field as a worthwhile career option (Ajzen, 1991).

Early Exposure

Many participants stressed the importance of introducing agriculture to students before high school, arguing that by the time students reach adolescence, they often have already formed negative perceptions about agriculture. Several participants in Table 4 echoed this, emphasizing that early exposure is critical in shaping students' openness to agricultural education. Iota, an alumnus, shared: *"If I had learned about agriculture earlier, I would've joined sooner. We need to reach students younger."* Similarly, Alpha, a teacher, highlighted the lack of exposure in

middle school, stating, *"Most students don't consider ag because it's not introduced to them until high school."* These findings support research indicating that early career exposure is a key determinant in whether students explore nontraditional career paths (Lent et al., 2000).

Other participants pointed out that middle school agriculture programs were effective in engaging students early. Epsilon, a teacher, explained*: "When my middle school had an FFA program, I got interested way earlier than my peers."* Likewise, Delta, an alumnus, emphasized how early intervention can counteract negative stereotypes, stating: *"Outreach needs to start early because once kids think agriculture isn't for them, it's hard to change that."* As reflected in Table 6, these findings suggest that expanding middle school SBAE programs could play a crucial role in increasing recruitment among underrepresented youth.

Community and School Partnerships

Participants also emphasized the importance of strong partnerships between SBAE programs, urban schools, and local organizations in making agriculture more accessible to underrepresented students. Many participants in Table 8 echoed this sentiment, reinforcing that school and community collaboration play a vital role in broadening student engagement. Beta, an administrator, noted: *"We need more partnerships with urban schools—ag programs should be in every district, not just rural ones."* These partnerships help bridge the gap between students and agricultural education, reinforcing the idea that agriculture is a viable career option regardless of location.

Others highlighted how exposure to professionals and local businesses made agriculture feel more relevant. Mu, a teacher, shared: *"Collaboration with local businesses helped us see how agriculture works beyond just farming."* Similarly, Zeta, an alumnus, explained how guest speakers from the agricultural industry helped urban students feel more connected to the field,

stating: *"Having ag companies visit our school made it feel more relevant to city kids like me."* These findings align with research indicating that career exposure through industry partnerships is an effective strategy for increasing participation among historically underrepresented groups (Ali & Saunders, 2009). Nu, a teacher, further reinforced this, stating: *"Programs that bring professionals to schools help students realize agriculture isn't out of reach."*

Others highlighted how exposure to professionals and local businesses made agriculture feel more relevant. Mu, a teacher, shared: *"Collaboration with local businesses helped us see how agriculture works beyond just farming."* Similarly, Zeta, an alumnus, explained how guest speakers from the agricultural industry helped urban students feel more connected to the field, stating: *"Having ag companies visit our school made it feel more relevant to city kids like me."*

Lastly, Nu, a teacher, further stated: *"Programs that bring professionals to schools help students realize agriculture isn't out of reach."* As seen in Table 4, these findings align with research indicating that career exposure through industry partnerships is an effective strategy for increasing participation among historically underrepresented groups (Ali & Saunders, 2009).

Retention Through Community and Representation

Beyond recruitment, participants emphasized that retention strategies must focus on fostering a sense of belonging and support for underrepresented students in agricultural education. Two key factors emerged as essential for keeping students engaged: mentorship from diverse role models, inclusive curricula, and peer support networks. These findings align with the subjective norms and perceived behavioral control constructs of TPB, which suggest that when students feel supported by mentors and peers and see clear pathways to success in a field, they are more likely to persist (Ajzen, 1991).

Mentorship and Representation

Participants repeatedly highlighted the importance of seeing professionals and educators who shared their backgrounds and experiences in agricultural education. Many participants in Table 8 echoed this, supporting that representation and mentorship shape students' persistence in the field. Mu, a teacher, described how representation influenced their decision to stay in the program, stating: *"Seeing Black professionals in agriculture made me feel like I had a place in this field."* Similarly, Iota, an alumnus, emphasized the role of relatable mentors, explaining: *"I stayed in the program because my teacher looked like me and understood where I came from."* These findings align with previous research indicating that underrepresented students are more likely to persist in a field when they have mentors who reflect their identities and experiences (Lent et al., 2000).

Other participants highlighted the role of mentorship in navigating challenges. Beta, an administrator, shared: *"Having a mentor in ag helped me push through challenges that made me want to quit."* Nu, a teacher, reinforced the idea that mentorship provides both emotional and professional support, stating: *"We need more diverse role models in agriculture—if students don't see someone like them, they check out."* These findings suggest that expanding mentorship opportunities with diverse agricultural professionals could significantly impact student retention.

Other participants highlighted the role of mentorship in navigating challenges. Kappa, an alumnus, shared: *"Having a mentor in ag helped me push through challenges that made me want to quit."* Another alumnus, Lambda, spoke to the idea that mentorship provides both emotional and professional support, stating: *"We need more diverse role models in agriculture—if students don't see someone like them, they check out."* As reflected in Table 4, these findings suggest that

expanding mentorship opportunities with diverse agricultural professionals could significantly impact student retention.

Inclusive Curriculum and Peer Support

Participants also stressed that curricula and classroom experiences must be relevant to students' lived experiences to keep them engaged. Epsilon, a teacher, explained how integrating urban agriculture and food justice issues made coursework more meaningful, stating: *"Courses should include more about urban ag and food justice—make it relevant to our experiences."* Similarly, Alpha, an administrator, emphasized the importance of historical and cultural context in agriculture education, stating: *"We need ag programs that highlight history, culture, and modern issues, not just traditional farming."* These findings align with research suggesting that culturally responsive teaching increases engagement and persistence among underrepresented students in STEM and agriculture-related fields (Gay, 2018).

Peer support also played a crucial role in retention. Eta, an administrator, described how having a strong FFA chapter helped sustain engagement, stating: *"Having a strong FFA chapter gave me a community that kept me engaged even when it got hard."* Likewise, Iota, an alumnus, noted that collaborative learning experiences helped them stay committed, explaining: *"Group projects helped me stay in the program—I didn't feel alone in figuring it all out."* These findings reinforce the idea that creating a strong community within SBAE programs enhances retention by providing social and academic support (Bandura, 1997).

Conclusion

The findings for Research Question 4 emphasize the critical role that targeted recruitment and retention strategies play in increasing underrepresented youth participation in agricultural education. Participants highlighted early exposure, school and community partnerships,

mentorship, and inclusive curricula as key factors in both attracting students to SBAE programs and ensuring their long-term engagement. These findings align with the subjective norms and perceived behavioral control constructs of TPB, reinforcing the idea that when students receive encouragement from mentors, peers, and professionals, and when they perceive agriculture as accessible and relevant, they are more likely to persist in the field (Ajzen, 1991; Lent et al., 2000).

Intentional recruitment strategies were a recurring theme, with participants stressing that early outreach in elementary and middle school is essential to overcoming misconceptions about agriculture. Many students who joined SBAE programs in high school expressed that they would have been more engaged if they had been introduced to agriculture at a younger age. Similarly, partnerships between schools and agricultural organizations were identified as effective tools for expanding awareness and access, particularly in urban areas where exposure to agricultural careers is limited.

Retention strategies focused on creating a sense of belonging through mentorship and culturally relevant education. Participants noted that having mentors and teachers from similar backgrounds helped them feel validated and supported in agricultural spaces. Additionally, an inclusive curriculum that incorporated urban agriculture, food justice, and diverse agricultural histories was seen as a crucial factor in maintaining student engagement. These findings align with research on culturally responsive teaching, which suggests that students are more likely to persist in a field when their learning experiences reflect their lived realities (Gay, 2018). Overall, these findings highlight the need for SBAE programs to implement intentional recruitment and retention efforts that address both structural barriers and social influences. Expanding early outreach, strengthening mentorship opportunities, and developing inclusive

curricula can significantly improve engagement among underrepresented students, ensuring that agriculture is seen as a viable and welcoming career path for diverse populations.

Chapter 5: DISCUSSION, RECOMMENDATIONS, AND CONCLUSION

Introduction

This chapter provides a comprehensive discussion of the study's findings, highlighting how external influences, SBAE program structures, perceived behavioral control, and recruitment/retention strategies impact the participation of underrepresented youth in agricultural education. The findings are analyzed through the lens of the TPB (Ajzen, 1991), which explains how attitudes, subjective norms, and perceived behavioral control influence students' career intentions.

The chapter begins with a summary of key findings, followed by recommendations based on the study's results. The recommendations are guided by each research question, offering strategies to increase access, improve recruitment, and enhance retention in agricultural education programs post-secondary and within the agriculture industry. The chapter then discusses the limitations of the study and proposes directions for future research to further examine how SBAE programs can better support underrepresented students. The chapter concludes with a call to action, emphasizing the importance of policy reform, inclusive programming, and sustained mentorship to create equitable opportunities in agricultural education.

Recommendations Based on Research Findings

Research Question 1: How do external factors influence underrepresented youths' intentions to pursue agricultural careers?

The findings from Research Question 1 suggest that family influence, societal perceptions, and geographic constraints significantly impact underrepresented youths' engagement in agricultural education. These external factors often contribute to negative

perceptions, limited awareness, and restricted access to agricultural opportunities, particularly in urban settings where agricultural education programs and exposure are scarce. The findings align with TPB, particularly regarding subjective norms, as many students' perceptions of agricultural careers were shaped by family expectations, peer influence, and societal attitudes (Ajzen, 1991). Addressing these barriers requires intentional strategies that challenge misconceptions, increase agricultural exposure, and provide structural support to facilitate access for underrepresented students.

One of the primary external barriers identified was the societal and familial misconception that agriculture as a low-status profession. Several participants described encountering hesitation from family members who viewed agriculture as a career of last resort rather than a field offering diverse and lucrative career pathways.

These findings suggest a need for targeted awareness campaigns that educate both students and their families on the modern opportunities within agriculture. Schools, universities, and agricultural organizations should develop outreach programs that highlight career diversity within agriculture, including agribusiness, biotechnology, food science, and environmental sustainability.

Additionally, integrating agricultural career education into community-based events, school programming, and digital media campaigns can help shift these narratives. Given the role of subjective norms in shaping career intentions, these efforts must extend beyond students and directly engage parents, extended family, teachers, and community influencers to reshape broader societal perceptions of agriculture. In short, make agricultural careers more attractive, accounting for their potential to offer lucrative careers for all students.

In addition to combating misconceptions, the findings also reveal that limited geographic access to agricultural programs in urban settings significantly restricts students' exposure to the field. Many participants indicated that before high school, they had no meaningful engagement with agriculture and, as a result, never considered it a viable career option. Expanding urban agricultural education initiatives is necessary to address this gap. One strategy involves the integration of agricultural education into STEM-focused curricula, particularly in urban middle and high schools that do not currently offer agricultural coursework. The incorporation of hydroponics, aquaponics, urban gardening, and precision agriculture, even cannabis/hemp studies into school-based science courses, can serve as an early introduction to agriculture while remaining relevant to students in non-rural environments.

Additionally, establishing partnerships between SBAE programs, community organizations, and local businesses can create more opportunities for urban students to gain hands-on experience in agriculture without requiring access to rural settings. These initiatives align with the perceived behavioral control construct of TPB, as increasing exposure to agricultural opportunities within students' existing environments can increase their perceived ability to pursue agricultural careers.

Finally, perhaps engaging with Farm Bureau and Cooperative Extension to leverage existing programs that offer agricultural literacy programs to youth could be helpful in exposing children in urban areas to agriculture. For example, Farm Bureau Agriculture in the Classroom programming could be a great tool for exposing agricultural opportunities to underrepresented youth before career decisions are solidified.

Another significant challenge identified in this study was the financial burden associated with participation in agricultural programs, internships, and extracurricular activities. Several

participants reported that they or their peers were unable to fully engage in FFA competitions, field trips, or summer programs due to financial limitations. To address these barriers, policymakers and educational institutions must work to increase financial accessibility through scholarships, stipends, and grant funding for underrepresented students. Expanding scholarship opportunities specifically designated for urban and minority students could help alleviate the cost burden associated with participation in SBAE programs.

Additionally, many participants noted that transportation challenges often prevented them from accessing agricultural experiences outside of their immediate communities. Providing transportation stipends and school-sponsored travel funding for students to participate in internships, industry field trips, and leadership conferences could further expand access. Outside of policy and federal/state funding, schools must rally the support of community partnerships by having local farmers loans or gift animals, equipment, and, most importantly, their time to train these students.

Finally, this study found that agricultural stigma persists, in large part due to the way agriculture is portrayed in mainstream media, historical implications, and educational materials. Participants emphasized that many people, particularly those in urban environments, continue to associate agriculture exclusively with farming and rural labor rather than recognizing its connections to technology, sustainability, and innovation. To address this, agricultural education stakeholders must work to promote more inclusive and representative portrayals of agriculture in educational content, media, and recruitment efforts.

Updating agricultural textbooks to reflect diverse career paths, featuring success stories from minority professionals in agriculture, and incorporating urban agricultural issues into SBAE curricula can help students see agriculture as relevant to their own experiences. For example,

children of immigrants are able to see agriculture through a different lens compared to non-immigrant children due to some of their families' roles in the agricultural industry.

In current accessible literature for example, the most common roles held by immigrant workers include field crop laborers, fruit and vegetable pickers, packagers, sorters, and agricultural equipment operators. It is important to address the way agriculture is traditionally portrayed, particularly as it relates to immigrant labor. The agricultural workforce in the United States relies heavily on immigrant workers, particularly in crop production, animal production, and food processing sectors. According to data from the American Immigration Council (2023), nearly 49% of all U.S. agricultural workers are foreign-born, and this number rises to approximately 57% in crop production alone. In some sectors, such as hand-packaging and produce sorting, immigrants make up more than 70% of the workforce.

Agricultural organizations should collaborate with content creators, filmmakers, and digital influencers to produce media that challenges outdated stereotypes and presents agriculture as a field of opportunity for all students, regardless of background or geographic location.

The findings from Research Question 1 indicate that family, societal, financial and geographic barriers create significant obstacles to the recruitment of underrepresented youth in agricultural education. However, through targeted outreach, expanded urban SBAE programs, financial support mechanisms, and inclusive media representation, these barriers can be addressed, increasing both awareness and access for students who have historically been excluded from agricultural pathways. These recommendations align with TPB, suggesting that by reshaping subjective norms over time, increasing exposure, and improving perceived behavioral control, more underrepresented youth may be encouraged to engage in and persist within agricultural education and eventually careers.

Research Question 2: What roles do SBAE programs play in shaping students' attitudes toward agricultural careers?

The findings from Research Question 2 highlight the transformative role of SBAE programs in shaping students' perceptions of agriculture, particularly through experiential learning opportunities and mentorship from teachers and industry professionals. Participants who engaged in hands-on learning experiences, such as laboratory work, field trips, and agricultural internships, described a significant shift in their understanding of agriculture, moving beyond traditional stereotypes of farming to recognizing the industry's scientific, technological, and business-oriented aspects.

Likewise, mentorship from teachers and industry professionals played a critical role in reinforcing students' career confidence and challenging societal and familial misconceptions about agriculture. These findings align with the attitudes construct of TPB, which suggests that positive direct experiences and encouragement from influential figures can reshape an individual's perception of a given career path (Ajzen, 1991). Based on these findings, the following recommendations are proposed to enhance SBAE programs and maximize their impact on student engagement.

A key recommendation is the expansion of experiential learning opportunities in SBAE programs, particularly for students in urban environments where direct exposure to agriculture is often limited. Many participants indicated that their attitudes toward agriculture changed only after participating in hands-on learning experiences, such as greenhouse work, agriscience experiments, and industry site visits.

To ensure that more students have access to these opportunities, SBAE programs should further integrate STEM-focused curricula, allowing students to explore agriculture through

interdisciplinary approaches that connect agricultural education to science, technology, and environmental sustainability. Additionally, increasing the availability of paid internships and apprenticeships within the agricultural sector would provide students with real-world exposure to agricultural careers while also alleviating financial barriers that may prevent low-income students from participating. These experiential opportunities should be structured to highlight the diversity of agricultural professions, including those in biotechnology, precision agriculture, and agribusiness, ensuring that students understand the full range of career options available to them.

Another critical recommendation is the intentional recruitment and retention of diverse educators and mentors within SBAE programs. The study findings indicate that students who saw representation from similar racial or cultural backgrounds were more likely to feel validated in their interest in agriculture and confident in their ability to succeed in the field. Many participants described how seeing Black and Hispanic professionals in agriculture challenged their initial perceptions that the field was not meant for people like them, reinforcing the importance of representation in agricultural education.

To address this, SBAE programs should actively recruit, support, and retain educators from underrepresented backgrounds through scholarships, professional development programs, and mentorship pipelines for future agricultural educators. Additionally, SBAE programs should establish formal mentorship initiatives that connect students with professionals from diverse backgrounds, ensuring that underrepresented youth have access to role models who can provide guidance, encouragement, and career insights.

The findings also suggest that FFA and other SBAE-affiliated leadership programs must adopt intentional inclusivity initiatives to ensure that underrepresented students feel welcomed and valued within these spaces. Some participants described feeling isolated or excluded within

FFA competitions and conventions, which impacted their willingness to engage in leadership roles. Addressing this requires intentional reform efforts to ensure inclusion within SBAE leadership programs. These efforts should include culturally responsive programming, targeted leadership development initiatives for minority students, and anti-bias training for FFA advisors and program coordinators. Expanding scholarship and leadership opportunities for underrepresented students can further increase participation and engagement in SBAE extracurricular activities, reinforcing students' connection to the field.

Additionally, the findings indicate that guest speakers and industry partnerships play a significant role in reshaping student attitudes toward agricultural careers. Many participants noted that hearing directly from professionals working in agriculture helped them see the industry as modern, dynamic, and aligned with their interests.

Expanding career exposure programs that bring agricultural professionals into SBAE classrooms, whether through virtual speaker series, career fairs, or industry site visits, can further strengthen students' understanding of career pathways. These partnerships should be designed to showcase the broad scope of agricultural careers, ensuring that students recognize the field's intersections with engineering, environmental science, finance, and entrepreneurship.

The findings from Research Question 2 suggest that SBAE programs play a powerful role in shaping student perceptions of agricultural careers, particularly through experiential learning and mentorship. However, to maximize their impact, these programs must ensure that all students—regardless of geographic location, racial background, or socioeconomic status—have access to hands-on experiences, strong mentorship, and inclusive leadership opportunities. Expanding experiential learning, increasing educator diversity, enhancing mentorship programs, and reforming SBAE leadership structures will help create a more inclusive, representative, and

impactful agricultural education system. These recommendations align with TPB's attitudes construct, suggesting that providing students with direct, positive experiences in agriculture can lead to more favorable career perceptions and long-term engagement in the field.

Research Question 3: How do perceived behavioral controls affect underrepresented youths' decisions to engage in agricultural education?

The findings from Research Question 3 indicate that perceived behavioral control plays a significant role in shaping students' engagement in agricultural education and career pathways. Participants described how financial barriers, lack of program availability, and transportation challenges restricted their ability to participate in SBAE programs, reinforcing external limitations on their career choices. However, participants who developed strong self-efficacy through hands-on learning, mentorship, and early career successes were more likely to persist in agricultural education despite these challenges.

These findings align with the perceived behavioral control construct of TPB, which suggests that when individuals believe they have the necessary resources and abilities to pursue a career path, they are more likely to engage with it (Ajzen, 2002). Addressing the barriers identified in this study requires intentional interventions that increase accessibility, expand program availability, and enhance student self-efficacy through structured support systems.

One of the primary barriers identified in this study was the financial cost associated with agricultural education programs and extracurricular opportunities. Many participants expressed that fees for FFA membership, competition travel, field trips, and access to everyday agriculture resources (farm animals, land, specialized equipment, etc.) were limitations, particularly for students from urban and low-income backgrounds. To address this, policymakers, school

districts, and agricultural organizations must develop scholarship and grant programs specifically targeted toward underrepresented youth in agricultural education.

Providing full financial sponsorships for students to participate in SBAE programs, competitions, co-op programs with farms, and industry-related internships would reduce the economic burden associated with participation and increase the likelihood that students from urban and low-income backgrounds fully engage in agricultural education. Furthermore, many students reported that transportation limitations often prevented them from accessing SBAE-related activities outside of school. Schools and community partners should explore transportation funding initiatives that provide stipends, rideshare partnerships, or school-sponsored travel options to ensure that students can participate in field experiences and off-campus learning opportunities.

Recent attempts by National FFA to remove the burden of individual dues to participate in FFA may seem like a small effort but could potentially make a real difference for urban and underrepresented youth. These findings suggest removing any financial barrier will increase participation in FFA and agricultural education. Based on the findings of this study it is recommended the National FFA revisit options to remove individual dues as a requirement for participating in FFA.

Beyond financial and logistical constraints, the study findings suggest that students' sense of self-efficacy plays a major role in determining whether they persist in agricultural education. Participants who initially doubted their ability to succeed in agriculture—often due to lack of prior experience, societal stereotypes, or low representation of minorities in the field—described how hands-on experiences helped them develop the confidence to see themselves in agricultural careers.

To strengthen self-efficacy, SBAE programs must implement early exposure initiatives that allow students to build foundational agricultural skills before high school. Many participants expressed that competing in FFA events, engaging in laboratory-based agriscience projects, or participating in school gardens helped them develop confidence in their abilities. Expanding micro-credentialing programs within SBAE curricula, where students can earn industry-recognized certifications in agricultural science, agribusiness, or sustainable food systems, could further increase students' perceived competence and career confidence. These credentialing programs would allow students to demonstrate their expertise and feel validated in their agricultural skillset, reinforcing their belief that they belong in the industry.

Mentorship also emerged as a critical factor in increasing students' confidence and sense of belonging in agricultural spaces. Many participants emphasized that mentors helped them persist in agricultural education, particularly when they faced challenges or self-doubt. SBAE programs should develop structured mentorship initiatives that connect underrepresented students with professionals in the agricultural sector. Establishing peer mentorship networks within SBAE programs, where older students or program alumni can provide guidance to younger participants, could further strengthen retention efforts. Additionally, school districts should partner with minority-led agricultural organizations, HBCUs, and industry professionals to create career pipeline programs that provide students with ongoing mentorship, internships, and professional development opportunities.

The findings from Research Question 3 indicate that reducing external barriers while simultaneously strengthening student self-efficacy is essential for increasing engagement in agricultural education. Addressing financial constraints, expanding program accessibility, and developing mentorship-driven support systems will help students from underrepresented

backgrounds develop the confidence and resources needed to persist in agricultural education and careers. These recommendations align with TPB's perceived behavioral control construct, reinforcing that when students have the necessary support, skills, and opportunities, they are more likely to pursue and persist in agricultural pathways.

Limitations of the Study

While this study provides valuable insights into the factors influencing the recruitment and retention of underrepresented youth in agricultural education, it is not without limitations. As with any qualitative research, certain constraints may affect the generalizability and scope of the findings. The following limitations should be considered when interpreting the results of this study.

One of the primary limitations of this study is the sample size and geographic scope. The study participants were drawn from a specific subset of students enrolled in urban SBAE programs, many of whom attended specialized agricultural high schools or participated in agriculture-related extracurricular activities. While these students provided rich, in-depth perspectives on their experiences, their views may not fully capture the experiences of students in rural SBAE programs or those who may have been interested in agricultural education but lacked access to such programs. Future research should consider conducting a comparative study between urban and rural SBAE students to examine how geographic location and resource availability impact participation in agricultural education.

Another limitation of this study is the reliance on self-reported data from participant interviews. While qualitative interviews allow for a deep exploration of participants lived experiences, they are inherently subject to recall bias and personal interpretation. Participants' reflections on family influence, mentorship, and societal perceptions were shaped by their own perspectives, which may have been influenced by external factors. Additionally, given that some

participants had already committed to agricultural education, their responses may have reflected a positive bias toward the field. Future research should consider incorporating longitudinal methods that track students' engagement with agricultural education over time, providing a more comprehensive picture of their evolving perceptions and career trajectories.

The study's findings are also limited by the lack of quantitative data to support broader statistical generalizations. While qualitative research is well-suited for exploring complex social and educational phenomena, the absence of quantitative measures on recruitment rates, retention trends, and program accessibility limits the ability to determine the statistical significance of identified barriers and facilitators. Future studies could employ mixed-method approaches that incorporate survey data, enrollment records, and retention statistics to provide a more comprehensive understanding of participation trends in agricultural education.

Another limitation of this study is the lack of longitudinal tracking of students' long-term career decisions. While this research provides insights into the factors influencing students' initial engagement with agricultural education, it does not assess whether these students ultimately persist in agricultural careers beyond high school or postsecondary education. Longitudinal research that follows students through college, workforce entry, and career progression could provide deeper insights into the long-term impact of SBAE programs on underrepresented students' agricultural career pathways.

Despite these limitations, the study provides important contributions to the field of agricultural education, offering practical recommendations for increasing representation and accessibility in SBAE programs. The findings underscore the critical role of mentorship, early exposure, and systemic support in fostering long-term engagement in agricultural education and career pathways.

Future Research Directions

While this study provides valuable insights into the factors influencing the recruitment and retention of underrepresented youth in agricultural education, further research is needed to expand upon these findings and address gaps that were beyond the scope of this study. Several key areas for future research have emerged, including longitudinal studies on student retention and career persistence, intervention-based studies on recruitment strategies, comparative analyses of SBAE program effectiveness, and intersectional research on barriers faced by underrepresented groups in agriculture. Expanding research in these areas will allow educators, policymakers, and industry leaders to develop more targeted and sustainable strategies for increasing representation and equity in agricultural education and careers.

One significant area for future research is longitudinal studies that track the long-term career trajectories of students who participate in SBAE programs. While this study explored the factors influencing initial engagement with agricultural education, it did not assess whether students persist in agricultural careers beyond high school and postsecondary education. A longitudinal approach could provide deeper insights into whether early exposure and mentorship lead to long-term career commitment in agriculture or if other external factors ultimately deter students from staying in the field. Such studies could also identify points of attrition in the agricultural career pipeline and inform policy interventions aimed at increasing retention among underrepresented youth.

Another critical area for future research is intervention-based studies that assess the effectiveness of recruitment and retention strategies for underrepresented students. While this study identified mentorship, culturally relevant curricula, and early exposure as key factors in increasing participation, additional research is needed to measure the impact of specific interventions. Experimental or quasi-experimental studies could evaluate the effectiveness of

targeted recruitment programs, scholarship initiatives, urban agricultural curriculum reforms, and mentorship pipelines. By assessing which strategies yield the highest engagement and retention rates, educators and policymakers can make data-driven decisions on how to best support underrepresented students in agricultural education.

Finally, comparative research examining SBAE program effectiveness across different geographic and demographic contexts is another critical area for further investigation. This study focused primarily on urban SBAE programs and specialized agricultural high schools, which may not fully capture the experiences of students in suburban or rural SBAE programs. Future research should explore how resource availability, community perceptions, and school funding models impact student engagement in agricultural education across urban, suburban, and rural settings. Additionally, comparative studies could examine differences in recruitment and retention strategies between states or regions to identify best practices that could be applied on a broader scale. Future research comparing successful and unsuccessful urban agriculture programs could help strengthen SBAE programs in general, and not just rely on specialized schools solely dedicated to agriculture with admission requirements and limitations. The expansion and improvement of SBAE programs in traditional zoned high schools could reach more students.

The findings from this study highlight the importance of continued research on increasing access and equity in agricultural education. By expanding research in these key areas—longitudinal student tracking, intervention-based studies, comparative analyses, and intersectional research—future scholars can contribute to a more comprehensive understanding of the systemic challenges facing underrepresented students in agriculture. These efforts will be

critical in shaping policies and practices that foster a more diverse and inclusive agricultural workforce.

Implications for Policy and Practice

The findings of this study have significant implications for agricultural education policy, SBAE programs, and broader workforce development initiatives in the agricultural sector. The systemic barriers identified—including misconceptions about agricultural careers, limited access to SBAE programs, financial constraints, and a lack of diverse representation—highlight the need for intentional policy interventions that expand opportunities for underrepresented youth in agriculture. By addressing these structural challenges, policymakers, educators, and industry leaders can create a more equitable and inclusive agricultural education system that fosters long-term engagement among diverse student populations.

One of the most critical policy implications is the need to expand SBAE program accessibility, particularly in urban and low-income school districts. Many participants in this study described how geographic constraints and selective admissions policies limited their ability to enroll in specialized agricultural high schools. While these institutions provide high-quality agricultural education, their restrictive admissions processes prevent many interested students from participating. Policymakers should consider expanding the capacity of these schools or implementing satellite programs within traditional urban high schools to increase access to agricultural education for a broader range of students. Additionally, agricultural education should be integrated into existing STEM and CTE programs to ensure that students in non-agricultural schools are still exposed to agriculture-related career pathways.

Another key policy implication is the need for increased funding and financial support for students in SBAE programs. This study found that financial barriers, including program fees, transportation costs, and competition expenses—significantly limited student participation in

agricultural education opportunities. To address this, policymakers should advocate for targeted funding initiatives, such as scholarships for minority students in SBAE programs, transportation stipends for students in underfunded districts, and grant programs for schools to develop sustainable urban agriculture initiatives. By reducing economic barriers, more students from historically marginalized communities can fully engage in agricultural education without financial constraints impeding their participation.

The findings also emphasize the importance of policy initiatives that promote diverse representation in agricultural education and leadership. Many participants noted that the lack of minority educators and role models in agricultural spaces contributed to feelings of exclusion and self-doubt. To address this, policymakers should implement teacher recruitment and retention initiatives aimed at increasing diversity within SBAE faculty. Providing scholarships and loan forgiveness programs for minority agricultural educators, expanding teacher mentorship programs, and incorporating cultural competency training for SBAE instructors are critical steps in fostering more inclusive educational environments. Additionally, agricultural organizations and FFA leadership bodies should prioritize diversity, equity, and inclusion (DEI) initiatives to ensure that underrepresented students feel valued and supported in agricultural leadership roles.

Beyond education policy, this study has implications for workforce development strategies within the agricultural industry. Several participants described how societal misconceptions and a lack of awareness of modern agricultural careers deterred students from considering agriculture as a viable profession. To address this, industry leaders must invest in marketing and outreach initiatives that showcase the broad career opportunities available in agriculture, particularly in agribusiness, technology, environmental science, food security, and emerging industries like hemp and cannabis. Strengthening partnerships between SBAE programs and agricultural

employers can help students see clear career pathways and gain hands-on experience through internships, apprenticeships, and mentorship programs.

The findings from this study underscore the urgent need for systemic policy interventions, increased funding, and strategic partnerships to dismantle barriers to agricultural education. By expanding program accessibility, providing financial support, increasing teacher diversity, and strengthening industry collaborations, policymakers and educators can create a more inclusive agricultural education system that prepares a diverse new generation of agricultural leaders.

Final Conclusion

Across the United States, agriculture is experiencing a significant workforce shortage that spans nearly every major segment of the industry. Growing global food demands, rapid advances in agricultural technology, and evolving environmental challenges all require a highly skilled labor pool. Yet research continues to show that the number of individuals entering agricultural career pathways is not sufficient to meet industry needs. The *Journal of Agricultural Education* (JAE) has repeatedly identified this shortage as a critical concern, emphasizing the need for a larger and more diverse pipeline of qualified agricultural professionals. Roberts and Harder (2009), for example, noted that workforce gaps persist in agribusiness, natural resources, agricultural engineering, plant and animal systems, and food science—fields essential to the sustainability of the agricultural sector.

The shortage extends into agricultural education itself. According to Smith, Lawver, and Foster (2020), the persistent national agricultural teacher shortage results in reduced program offerings and fewer student entry points into agriculture. When schools cannot staff agricultural

programs, entire communities lose access to high-quality agricultural learning experiences that prepare students to pursue agricultural careers.

The findings of this study align strongly with these national trends. Urban students consistently reported that they did not consider agriculture a viable field until they gained exposure through SBAE programs. Experiential learning, culturally relevant curricula, and meaningful mentorship were key to shifting their perceptions and increasing their confidence. Findings consistent with JAE literature show that such experiences are essential for strengthening the agricultural workforce pipeline (Knobloch, 2003; Roberts & Ball, 2009). The findings suggest that expanding SBAE programs in urban areas not only supports equity goals but also represents a needed strategy for addressing the general workforce shortage.

By improving access to agricultural education in urban schools, reducing financial barriers, and strengthening partnerships with agricultural organizations, the industry can tap into a large and largely overlooked pool of potential talent. The participation of underrepresented youth is not only vital for diversifying the industry, but it is essential for meeting the nation's long-term labor demands.

The findings of this study align closely with existing research in agricultural education, particularly regarding the importance of early exposure, experiential learning, and supportive learning environments. Roberts and Ball (2009) found that hands-on learning opportunities significantly shape students' perceptions of agricultural careers, a finding seen throughout this study in participants who frequently credited experiential activities for reframing their views of agriculture.

Similarly, Vincent, Henry, and Anderson (2012) reported that minority students often lack awareness of the depth of agricultural career opportunities. This finding is strongly

supported by participants in this study who described entering SBAE programs with limited or stereotypical understandings of agriculture. Bowling and Ball (2020) further documented the structural barriers faced by minority students, including financial constraints, limited program access, and cultural stigma. These are challenges that participants in this study described.

The national teacher shortage identified by Smith, Lawver, and Foster (2020) also resonates with the study's findings, particularly the need for expanded program capacity in urban schools. Altogether, alignment between this study and existing literature reinforces the urgency of creating more inclusive, accessible, and well-supported SBAE programs to strengthen both educational outcomes and the agricultural workforce pipeline.

Overall, this study explored the factors influencing the recruitment and retention of underrepresented youth in agricultural education, focusing on external influences, SBAE program effectiveness, perceived behavioral control, and strategies for increasing participation in the field. Using TPB (Ajzen, 1991, 2002) as a theoretical lens, this research examined how attitudes, subjective norms, and perceived behavioral control shape students' willingness to engage in agricultural education and career pathways. The findings revealed that societal perceptions, family influence, financial barriers, and limited program accessibility create significant challenges for underrepresented students seeking to enter the field. However, the study also highlighted effective recruitment and retention strategies, including early exposure initiatives, mentorship programs, and culturally responsive agricultural curricula, that have the potential to increase engagement and persistence among historically marginalized youth.

The study's findings have broad implications for agricultural education policy, workforce development, and DEI initiatives. The results indicate that expanding access to SBAE programs in urban and low-income school districts, increasing financial support for students, and

diversifying the agricultural education workforce are essential steps toward improving representation in agricultural careers. Furthermore, strengthening partnerships between SBAE programs and industry stakeholders can help students develop clear career pathways and see agriculture as a viable, innovative, and rewarding field.

While this study provides critical insights into the challenges and opportunities within agricultural education, further research is needed to track long-term student retention, assess the effectiveness of targeted recruitment strategies, and explore intersectional barriers beyond race and ethnicity. Addressing these gaps will provide a more comprehensive understanding of how to sustain underrepresented students in agricultural education and careers over time.

Ultimately, the findings reinforce the importance of intentional, systemic efforts to remove barriers to agricultural education for underrepresented youth. If educators, policymakers, and industry leaders implement data-driven, equity-focused recruitment and retention strategies, they can help cultivate a more diverse, representative, and inclusive agricultural workforce. By committing to expanding access, increasing mentorship opportunities, and integrating culturally responsive curricula, the field of agricultural education can evolve to better reflect the diverse communities it serves and ensure that all students, regardless of background, have the opportunity to thrive in the industry.

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Appendix A: IRB Research Protocol

The purpose of a research protocol is to document your research question(s) and describe how you will address it. Documenting your research plan will help you articulate the necessary steps for a reproducible and replicable study. This protocol template has been designed to guide researchers through ethical and methodologic considerations in developing a research plan. It will be useful in developing research output such as theses, dissertations, presentations, and journal articles. It will help ensure that you are developing and designing an ethically sound and scientifically valid study. Additional resources are available in the resource section of the Human Research Protection Program website. The Tips document provides additional details for each section along with helpful tips.

INSTRUCTIONS:

- Use this "TEMPLATE PROTOCOL (HRP-503a)" to prepare a study protocol outlining your research plan for research that only involves surveys, questionnaires, focus groups, or educational tests. Do not use for intervention, observational, or biomedical/clinical research.
- If your research involves minors, please, contact the human research protection program at irb@vt.edu to discuss your research plans to ensure you are using the correct template, as there are specific federal requirements for research with minors.
- Depending on the nature of your study, some sections and subsections might not be applicable to your research. If so, simply indicate "N/A."
- Once the IRB or HRPP approves your submission, your approved version of the protocol will be stored in the IRB Protocol Management online system.
- If your research plan changes, you might need to modify your protocol and submit an amendment. Please review our guidance on amendments for exempt research the Exempt Guidance for Amendments in PM to determine if an amendment is required.
    - If an amendment is required, please submit an amendment to Protocol Management with the requested modifications. Download your current protocol from Protocol Management and indicate the changes/revisions using the track changes feature to make review of the modifications easier to follow. If you are unable to use track changes, please create a new paragraph wherever you need to make a change and indicate "Amendment: Date." Protocol Management will store the older versions of your protocol if the IRB or HRPP need to compare them during the review.

PROTOCOL TITLE:

Include the full protocol title.
Urban Agricultural Education: Exploring good practices for recruiting and retaining underrepresented youth into the agricultural industry.

PROTOCOL NUMBER:

Include the number assigned in Protocol Management (verify this has been added before submitting the protocol to HRPP).
23-145

PRINCIPAL INVESTIGATOR:

Full Name and Degrees: Rick Rudd
Department: Agricultural Leadership Community Education
Telephone number: (540)231-4849
Email address: rrudd@vt.edu

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Funded or in the proposal phase? N/A
Is Virginia Tech the primary awardee or the coordinating center for the funding? If not, list the primary institution: N/A

VERSION NUMBER/DATE:

Include the version number and date of this protocol. Versions should start at 1.0.
1.0

REVISION HISTORY:

Use this table to keep track of changes. Add more rows as needed.

Revision #	Version Date	Brief Summary of Changes (i.e., the different sections)	Consent Change?

Table of Contents

1.0 Study Summary

Study Title	**Urban Agricultural Education: Exploring good practices for recruiting and retaining underrepresented youth into the agricultural industry.**
Primary Objective	The agriculture industry needs to attract under-represented people to careers in agriculture. Urban school-based secondary agricultural education (SBAE) programs can influence underrepresented student attitudes, perceived control, and subjective norms held about agriculture and agricultural careers.
Secondary Objective(s)	The secondary outcome(s) or goal(s) of your research N/A
Study Population	To whom will you be generalizing your findings? Recent high school graduates, teachers, and administrators.
Sample Size	How many people will you recruit for your study? 15
Research Design	Focus groups, or Interviews
Analytic Approach	Qualitative
Acronyms and Definitions	

2.0 Objectives

2.1 Describe the purpose, specific aims, and objectives of this study.

How do external factors of underrepresented youth influence their intention to pursue and agriculture career?

What practices of the school and / or teacher increased underrepresented youth sense of control in pursuing agricultural careers?

What practices of the school and / or teacher improved underrepresented youth attitude toward pursuing an agricultural career?

What practices of the school and / or teacher positively changed underrepresented youth subjective norms about agricultural careers?

2.2 State the hypotheses to be tested.

N/A

3.0 Background

3.1 Summarize published (or available unpublished) literature to build a rational for the research question(s), study objectives, and research design. If none are available, include a statement that there is no available research data. This section must provide a justification for the conduct of this study based on existing knowledge and should include your research question.

Education offers one of the key avenues to enhance diversity in the agricultural sector. For example, many SBAE programs exist in the United States' urban regions where students interested in agriculture can pursue related careers after completing the program either as entrants into the job market or by undertaking postsecondary education. The present study focuses on creating a comprehensive blueprint for recruiting, retaining, and preparing students in urban agricultural education is critical in cultivating diversity in the industry. Talbert et al. (1997) established that teaching in an urban classroom can be a barrier for even the most skilled agricultural education professional. Accordingly, the current study aims to identify the inner workings of successful urban agriculture programs and the limitations and barriers of unsuccessful programs. The researcher intends to equip teachers and school administrators with effective models to build and reform successful agricultural education to ensure the most significant impact on underserved students by preparing them for helpful careers in agriculture and postsecondary education.

Urban agricultural education shows promising results in steering underserved students towards related professions. It ends the stereotypes that youths typically associate with agriculture jobs because adding an agricultural module in an urban charter high school syllabus disproves the notion that resident students place on the field. Increasing familiarity with and insight into agribusiness offsets students' geographical and individual disconnect from the diversity of farming. For example, the University of Tennessee's High School Agricultural Education Initiative (HSAEI) helped many tenth graders to begin long-term partnerships with Title I urban high schools to apply and join agricultural programs in the future (Jean-Philippe et al., 2017). Therefore, the early introduction of agriculture in urban schools enriches under-represented students' advanced knowledge in the subject and employment opportunities. Teaching the subject to this demographic in more remote settings also yields positive intellectual and practical outcomes in conventional disciplines, such as math and science.

Agricultural education programs implemented in suburban areas usually attract marginal learners by offering unique learning opportunities. For example, under-represented students from urban places who are already interested in agriculture may lack institutions near them that teach farm work. Accordingly, attending out-of-town institutions may expose them to the quality farming knowledge and skills they desire.

This research proposes identifying and disseminating good practices in successful urban agriculture programs that serve underrepresented students and place them in agricultural careers, either through school to work or postsecondary education. The overall assumption driving this study is that increasing the numbers of minorities serving urban agricultural programs that utilize good practices by others will lead to more under-represented people being employed throughout

the agricultural industry. It is essential to understand the delivery of urban agricultural education in the country, the factors shaping it, the barriers affecting access to learning, and what can be done to ensure that more underserved communities can enroll in urban agricultural education.

The current study will help explore and understand how successful agricultural education programs are structured and the features or limitations of programs. The study also seeks to establish various factors that act as barriers when disseminating agriculture education to learners, particularly those from underserved communities. Finally, the study aspires to explore ways to equip educators and school administrators with models that can be used to build and reform successful agricultural education programs that have the most significant impact on underserved learners.

References:

Jean-Philippe, S., Richards, J., Gwinn, K., & Beyl, C. (2017). Urban youth perceptions of agriculture. Journal of Youth Development, 12(3). https://doi.org/10.5195/jyd.2017.497

Talbert, B. A., Larke Jr, A., Jones, W. A., & Moore, R. O. (1997). Recruitment and retention of underrepresented groups: A model for success. NACTA Journal, 51-56. https://www.nactateachers.org/attachments/article/693/Allen_Talbert_NACTA_Journal_March_1997-8.pdf

4.0 Statistical Analysis Plan

4.1 Describe the statistical methods that will be used to analyze the data you collect. The researcher will audio record all the interviews in a password-protected device before transcribing them using Reduct, an approved Virginia Tech ITPALS transcription software. Besides safeguarding accuracy, the software will ensure that the researcher captures all recorded information. Two rounds of coding will take place to analyze the transcript data and document emerging themes.

1st Round Coding Methods

In vivo coding will be the first activity used during the initial coding round. Saldana (2014) defines in vivo coding as the practice of assigning labels to sections of data like an interview transcript. In most cases, this usually occurs through short phrases or words taken from data areas. The researcher intends to use the exact spoken words from the transcript in this study. The researcher will also use descriptive coding, which entails developing and using general topics from text. According to Saldana (2014), descriptive data involves exploring qualitative data and coding passages based on general topics. The first coding round will end with evaluation coding to define whether the participant provided negative or positive information about the subject. Evaluation coding will enable the researcher to determine the practices the participants consider most effective and the least effective (Saldana, 2014).

2nd Round Coding Methods

The second round of coding will begin with axial coding. According to Saldana (2014) axial coding involves relating the gathered information to reveal and develop overall classes of codes based on the participants' voices. Overall, this type of coding allows researchers to establish links and connections between data. In this study, axial coding will enable the researchers to define the relations between the different practices, programs, initiatives, and strategies currently in place to encourage the participation of minority students in agricultural education and careers. With axial coding, the researcher will uncover crucial insights into causal conditions, the context, and the value of the best practices in current SBAE initiatives in urban secondary learning institutions. The developed axial coding categories will guide the thematic analysis, the central data assessment approach for this study. As a data exploration technique, thematic analysis involves examining a data set to not only identity but also evaluate and report repeated patterns. While thematic analysis is commonly associated with data description, it also facilitates the interpretation of information in picking codes and constructing emerging themes (Saldana, 2014). In this study, the researcher intends to use axial coding as the second approach after the first coding round to minimize the open codes by categorizing them into groups. Then, axial codes will be patterned into appropriate classes throughout all data sources, including interview transcripts and the notes made during observations.

Qualitative Quality

The study utilizes Tracy's (2010) criteria to maintain consistency and quality. According to Tracy (2010), qualitative studies must include an eight-point standard for excellent research. Besides requiring a worthy topic and demonstrating consistency, qualitative research must demonstrate credibility, meaningful coherence, sincerity, resonance, and observe ethics. This study used and strictly adhered to the Tracy (2010) criteria to realize its purposes and uphold rich rigor.

References:

Saldana, J. (2014). The coding manual for qualitative researchers (3rd ed.). SAGE Publishing.
Tracy, S.J. (2010). Qualitative quality: Eight "big-tent" criteria for excellent qualitative research. Qualitative Inquiry, 16(10), 937-851. DOI: 10.1177/1077800410383121

5.0 Procedures Involved

5.1 Provide a description of:

- All research procedures being performed. Start with recruitment and end with when participation is complete.
- Include the estimated duration of participant’s participation (i.e., how long will it take participants to complete survey(s), questionnaire(s), focus group(s), or educational test(s)?).
- If the research involves deception include a justification (why it is necessary) and describe the debriefing process. You will need to request and justify an alteration of the consent process in section 12.2.

The researcher will conduct interviews with the selected participants to gather the required data. The participants will be selected from three schools to allow the researchers sufficient access to in-depth and comprehensive data. The researcher intends to select three schools in Nashville, Chicago, and Pennsylvania to undertake the study, which will take place 2023. The three cases will occur at Glencliff High School, Walter B. Saul High School and Chicago High School for Agricultural Sciences. Since these institutions are located in urban settings, they offer the most appropriate environment to undertake the study and gather the required data. From each school, the researcher will select three participant groups consisting of recent graduates, current teachers, and administrators.

Depending on their availability, the interviews will be via zoom. The interviews will use semi-structured criteria, and the researcher has developed a list of questions to guide the procedure and conversation. Using the same interview questions, the researcher will a focus group with recent graduates from each school. The interviews will be recorded on a password-protected device to protect the confidentiality and privacy of the participants.

Please select the methods that you will use to collect data about participants. Upload all data collection forms to Protocol Management.

☐	Screening questionnaire(s)
☐	Survey(s), including online survey(s)
☐	Demographic questionnaire(s)
☒	Interview guide(s) or question(s)
☒	Focus group(s)
☐	Other, please specify**:** Click here to provide a response.

5.2 What data will you collect during the study and how you will obtain them? Please include the name of the software and descriptions of electronic data collection, database matching, and app- or device-based data collection. If third party software will be used, please provide the name of the software, and indicate if you have confirmed that the software has been approved for use (see https://vt.cobblestone.software/public/).

6.0 The researcher will conduct zoom interviews then transcribe and code the video recordings.

6.1 Will your research involve any audio and/or video recordings?

☒ Yes, respond to question 5.4
☐ No, skip to question 5.5

6.2 Who will transcribe or code audio and/or video recordings? If third party software will be used, please provide the name of the software, and indicate if you have confirmed that the software has been approved for use (see https://vt.cobblestone.software/public/).

7.0 The researcher will transcribe and code the video recordings.

7.1 Please select the identifiers you will obtain (whether directly from participants or from another source). The collection of social security numbers, student records, including grades and assignments, may require approval from Virginia Tech data stewards prior to use. Please contact the Privacy and Data Protection Program at prdp@vt.edu for information on additional approvals.

☒	Name
☐	Geographical subdivisions smaller than a state, including street address, city, county, precinct, zip code, and equivalent geocodes (note, the initial three digits of a zip code are not considered identifiable)
☐	Elements of dates (except year) directly related to an individual, including birth date, admission date, discharge date, date of death, and single year of age over 89 and all elements of dates (including year) indicative of such age (note, such ages and elements may be aggregated into a single category of age 90+)
☐	Phone numbers
☐	Fax numbers
☒	Electronic mail addresses (e-mail)
☐	Social Security numbers
☐	Medical record numbers
☐	Health plan beneficiary numbers
☐	Account numbers
☐	Certificate/license numbers

☐	Vehicle identifiers and serial numbers, including license plate numbers
☐	Device identifiers and serial numbers
☐	Web Universal Resource Locators (URLs)
☐	Internet protocol (IP) address numbers
☒	Biometric identifiers, including finger and voice prints (audio recording)
☒	Full face photographic images and any comparable images (including video recording)
☐	Student record number or identification number
☐	Student grades or classroom assignments
☐	Username for online or computer accounts
☐	Any other unique identifying number, characteristic, or code (note this does not mean the unique code assigned by the investigator to code the data)**:** Click here to provide a response.

8.0 Participant Population

8.1 Provide a general description of the individuals who will be included in your study (e.g., Virginia Tech undergraduate students, a national sample of adults with engineering degrees) and how you will screen them for eligibility.

The researcher will interview three recent graduates that are seeking degrees in agriculture or are currently in agriculture careers. The researcher will also interview one senior teacher and one administrator at each of the participating schools.

8.2 Provide the geographic location of where you will recruit participants (e.g., New River Valley; Blacksburg, VA; Paris, France).

Nashville, TN, Chicago, IL, and Philadelphia, PA

8.3 Describe any populations or groups that you will target for inclusion in or exclusion from your sample. Please indicate why these groups have been selected and how your participant selection is equitable.

Recent graduates, current teachers, and administrators from urban agriculture programs.

8.4 Will your research involve individuals who are vulnerable (pregnant women, minors, prisoners, adults with decisional impairment, students, and individuals who are economically or socially disadvantaged)? Pregnant women should be included in minimal risk studies that pose no risk to the woman or fetus.

☐ Yes, respond to question 6.5

☒ No, skip to question 6.6

8.5 Please specify which vulnerable populations you are including and provide justification for including these individuals. Describe additional safeguards you will include to protect their rights and welfare.

N/A

8.6 Indicate the total number of participants to be enrolled and how this number was determined (e.g., sample size calculation [show], number of available participants in a finite pool, number of tests funding award would allow).

A total of approximately 15 participants will be a part of the study.

9.0 Recruitment Methods

9.1 Describe when, where, and how you will recruit potential participants. If recruitment will be online, include the name(s) of participant management system (e.g., Ripple), the social media platform or online forums that you will use, include web address and contact information (for example MTURK, Facebook, Twitter, or Reddit). If recruitment will be in person include the specific location(s) (e.g., students in the library, community members at a gathering, or members of a local gym) and the methods that you will use to identify potential participants.

Upon IRB approval, research will start Spring of 2023. Each school will be sent an initial email that outlines the scope of the study, how the results will be used, and permission to interview teacher and administrators.

Once participants are identified, they will receive a consent email and guidance on participation expectations and timeline of the study. Participants will receive an email to schedule Zoom

interviews. Before each interview researcher will go over consent form and timeline of the interview. Before the interview starts the researcher will advise participants that interviews will be recorded on a password-protected device to protect their confidentiality and privacy. At the completion of each interview, the researcher will store the interview on a password secured computer.

9.2 Describe materials that you will be used to recruit participants. Use the Worksheet on Advertisements HRP 315.1 as a guide. Attach final copies of these documents with this protocol in Protocol Management and be sure to include the IRB protocol number on each document.

- For flyers, attach the final copy of printed flyers.
- For Virginia Tech News, Facebook postings and ads, newspaper ads, websites, MTurk/SONA/online survey systems, etc.
- For email recruitments, please include the subject line as well as the text.
- For advertisements meant for audio or video broadcast, please submit the wording of the advertisement prior to taping (to avoid having to re-record with approved language) and submit the final recorded version for IRB review before use.
- Describe any payment to participants. Please review HRP 092.1 Payment to Research Participants to ensure you are following the most recent guidance. Separate payments into appropriate categories, such as reimbursement for expenses, time and effort, and additional incentives for study participation. For each category, specify the amount (including any pro-rated amount), schedule, and method of payment.

Email to teachers, students, and administrators for participation in the survey

Title: **Urban Agricultural Education: Exploring best practices for recruiting and retaining underrepresented youth into agricultural industry.**

Dear [Insert Participants Name],

I am asking to interview recent alumni who are in agriculture-related careers or in post-secondary education programs related to agriculture, agriculture teachers in your school, and school administrators who provide leadership in your school.
If you agree to participate, the interview should take approximately 30 minutes to complete via Zoom. Your responses will be confidential and not be associated with your email. You will can self-schedule using the following link: INSERT URL

Thank you for considering my request.

Quintin

Reminder email to participants for upcoming Interview

Title: **Urban Agricultural Education: Exploring best practices for recruiting and retaining underrepresented youth into agricultural industry.**

Dear [Insert Participants Name],

If you agree to participate, the interview should take approximately 30 minutes to complete. The answers you provide in the survey will be confidential and not be associated with your email.

You will can self-schedule using the following link: INSERT URL

Thank you for considering my request.

Quintin

10.0 Risks to Participants

10.1 List the reasonably foreseeable risks, discomforts, hazards, or inconveniences to the participants related to their' participation in the research. Include a description of the probability, magnitude, duration, and reversibility of the risks. Consider physical, psychological, social, legal, privacy, reputational, and economic risks. Do not indicate "no risk" or "N/A." Instead, for studies with very low risk (e.g., anonymous online survey on a mundane topic) indicate "The investigators are not aware of any risks from participation in this study." or "No more than risks that are found in everyday life." Common risk types include:

- Psychological (e.g., potential for stress, discomfort, and/or embarrassment)
- Social (e.g., potential for discrimination or stigmatization and disruption of personal and family relationships)
- Legal (e.g., potential for disclosure of illegal activity, negligence)
- Privacy (e.g., potential for personal information being accessed, used, or disclosed without the participants' knowledge or consent, breach of confidentiality/security)
- Reputational (e.g., loss of stature in the community, in business, or negative media coverage)
- Economic (e.g., potential for individuals to lose access to economic services, employment, insurability)

No more than risks that are found in everyday life.

10.2 Describe procedures or safeguards intended to reduce the probability and magnitude of risks.

The participants will be provided consent forms at the beginning of the study and will have the option to leave the research project at any time. The participants will be provided a consent form before the beginning of the interview as well and have the option to leave the interview at any point.

10.3 If applicable, describe risks to others who are not participants (e.g., mandatory reporting of abuse, unflattering results generalized to identifiable or vulnerable communities):

No more than risks that are found in everyday life.

11.0 Potential Benefits to Participants

11.1 Describe the potential benefits individual participants might experience from participating in the research. Include the probability, magnitude, and duration of the potential benefits. Do not include benefits to society or others. Do not list monetary or non-monetary compensation for participation, as this is not a benefit. If there are no anticipated direct benefits for participants, please state that below.

There are no anticipated direct benefits for participants.

12.0 Data Management and Confidentiality

12.1 Describe procedures that you will use to ensure the validity of collected data.

- How will you prevent the data from being inadvertently changed?
- How will data be accessed by the study team?
- How will you prevent those not on the study team from accessing the information?
- How will you back up your data to protect them from loss?
- How will you ensure that all copies of the data will remain at Virginia Tech when there is a change in study personnel?

Prior to the interview questions and content will be reviewed by the research team to ensure the data that will be collected is addressing the research questions being explored. The data will be password protected on a Virginia Tech drive that only the research team can access. The drive can only be accessed by people listed on the IRB. The data will be stored on multiple approved sources to protect from loss. Access will be removed if there is any personnel changes.

12.2 From the list below check all the processes you will use to handle and secure study data during collection, storage, use, and transmission. Describe the

process in the text field. Keep in mind that data is owned by Virginia Tech and must be stored on the university's resources. Helpful resources are available on the Privacy and Research Data Protection Program website. Include information about:

☐ Training of study staff

☐ Authorization of access

☐ Password protection

☐ Encryption

☐ Physical controls

☐ Separation of identifiers and data

☒ Equipment or devices data to be used to collect or store data

☐ Other, specify below

The data will be stored on a password secured computer that is only accessible to researchers listed on the research protocol.

12.3 Do you plan to store data online or in the cloud?

☒ Yes, respond to question 10.4
☐ No, skip to question 10.5

12.4 Please indicate the location of storage and any software used to access or input data. Please ensure that the data storage and software have been approved for use for Virginia Tech. You can review the list of approved software and data storage services at https://vt.cobblestone.software/public/. If you need assistance determining an appropriate location for your data or confirming software or storage have been approved, please contact the Privacy and Research Data Protection Program at prdp@vt.edu.
The data will be stored and restricted VT Google drive with google syc disabled that only is accessible on a password secured computer that is only accessible to researchers listed on the research protocol.

12.5 Does your research involve collaborators from other institutions or organizations?

☐ Yes, respond to question 10.6
☒ No, skip to question 10.7

12.6 For collaborative projects, describe how data will be handled and secured. If a central storage mechanism will be used, please indicate which institution is hosting the data:

N/A

12.7 Describe the plan for data disposition following the conclusion of the study (e.g., long-term archive of data, data destruction).

- How long will the data be stored?
- Where and how data will be stored?
- What information will be included in the long-term storage of data?
- When and how will personal identifiers be destroyed?
- Who will have access to the data during long term storage?
- Will you make the data available through a public or curated archive? Are you obligated to do so by a sponsor/grant agreement?

All data collected will be stored and saved on a password secured computer. Only researchers included on the research protocol will have access to the raw data.

13.0 Provisions to Protect the Privacy Interests of Participants

13.1 Describe the steps that you will take to protect participants' privacy interests. "Privacy interest" refers to a person's desire to place limits on with whom they interact or to whom they provide personal information (e.g., collecting the minimal amount of private information required to complete the study, protecting the data once it is obtained, obtaining a Certificate of Confidentiality).

Participants completing the study will be informed that their individual responses will be kept confidential and that they do not need to answer any questions they do not feel comfortable answering.

13.2 Describe steps that you will take to make participants feel at ease with the research situation in terms of the questions being asked. "At ease" does not refer to physical discomfort, but the sense of intrusiveness a participant might experience in response to questions, making it clear on surveys that participants can discontinue at any time, not asking questions about private or sensitive issues unless necessary for the research.

Participants will be reminded that they may leave the study at any point. As mentioned above, the participants will not be forced to answer any questions they feel uncomfortable about.

13.3 Describe any required reporting that might occur because of your research questions, study populations, and data collection methods. Examples of required reporting in the Commonwealth of Virginia and Virginia Tech include:

- Any suspicions (e.g., circumstantial, disclosed) of child abuse (physical, emotional, sexual) and neglect
- Sexual discrimination and/or sexual violence that involves a student
- Disclosure or signs of intention to harm oneself (i.e., suicidal ideation and/or plan)
- Disclosure or signs of desire to harm others (i.e., homicidal ideation and/or plan)
- Suspected abuse, neglect, or exploitation of vulnerable adults (e.g., individuals with a disability, elderly persons)

The research team does not anticipate the collection of any information that would result in required reporting. The survey and interview pose minimum risk to participants in the study.

14.0 Consent Process

14.1 Indicate the process by which you will inform participants about the study and determine their voluntary decision to participate. If consent is implied that process should be described here. Please upload the information sheet and scripts referenced in this section to Protocol Management.

Consent will be obtained at the start of the study. The consent form will be given to the participants to review and sign, agreeing to the terms and conditions. A consent form will be provided at the beginning of the survey and at the beginning of the interviews for participates to review.

14.2 Does your research involve non-English speaking participants?\

☐ Yes, respond to question 12.3
☒ No, skip to question 12.4

14.3 Indicate what language(s) other than English are understood by prospective participants or representative and describe the process you will use to ensure that the information will be provided in a language that they understand.

N/A

14.4 Does your research involve participants who are not yet adults (minors: infants, children, teenagers)?

☐ Yes, respond to question 12.5
☒ No, skip to question 12.6

14.5 Describe the criteria that you will use to determine legal age for consent to treatments or procedures involved in the research under the applicable law of the jurisdiction in which the research will be conducted (e.g., in Virginia, individuals under the age of 18 years). Make sure you include the appropriate consent or assent template. If you are unsure which one to include contact the HRPP at irb@vt.edu. The inclusion of children includes some restrictions and additional information might be needed.

- For research conducted in Virginia, review "SOP: Legally Authorized Representatives, Minors, and Guardians (HRP-013)" to determine which individuals in the state meet the definition of "minor."
- For research conducted outside of the Virginia, please describe the legal requirements for that state's or locality's definition of "minor." Describe the process for obtaining parental permission. Federal requirements state that:
- Permission from one parent is acceptable for studies that involve no greater than minimal risk OR involve greater than minimal risk but present the prospect of direct benefit to the minor participant.
- Permission from both parents is required in all other cases (unless one parent is deceased, unknown, incompetent, or not reasonably available, or when only one parent has legal responsibility for the care and custody of the minor).

Describe whether you will obtain permission from individuals other than parents or legally authorized representatives, and if so, who will be allowed to provide permission. Describe the process you will use to determine these individuals' authority to consent to the minor's general medical care.

- Indicate whether you will obtain assent from all, some, or none of the minors. If you will obtain assent from some minors, indicate which minors will be required to assent. Consider chronological age and intellectual capacity when determining who will be required to provide assent (e.g., infants are unable to assent, while teenagers are likely able to read and sign an assent form).
- When assent of minors is obtained, describe whether and how you will document it. Will minors sign an assent form or give verbal assent?

This research doesn't include minors.

14.6 For research that involves deception describe how the study meets all of the following criteria for an alteration of the consent process:

- The research involves no more than minimal risk to the subjects
- The alteration will not adversely affect the rights and welfare of the subjects
- The research could not practicably be carried out without the alteration/deception
- (Optional but encouraged in most cases) Subjects will be provided with additional pertinent information after participation (i.e., debriefing for studies involving deception)

N/A

Appendix B: Recruitment Letter to Agricultural Schools

As a Black, former urban agriculture teacher the under-representation of minorities in agriculture was a problem I identified and tried to rectify in my role by recruiting minority students and helping them secure careers in our nations largest industry, agriculture. I am now pursuing my Ph. D. at Virginia Tech and hope to discover good practices that can help urban agriculture programs do the same.

The agriculture industry has a historical under-representation of minority workers in high-skill, high-wage agricultural careers. Under-represented youth are often reluctant to pursue agriculture as a career path, largely because of persistent misconceptions of agriculture as a hands-on, labor-intensive careers for low-skilled individuals. I would like to examine the success off urban agricultural education programs like yours to discover what you do to bring under-represented youth to agricultural careers and secondary education in agriculture-related fields.

I am asking that I be permitted to interview recent alumni who are in agriculture-related careers or in post-secondary education programs related to agriculture, agriculture teachers in your school, and school administrators who provide leadership in your school. By interviewing administration, teachers, and alumni from Three different urban school-based agricultural education programs, I am seeking to:

1. How do external factors of underrepresented youth influence their intention to pursue an agriculture career?
2. What practices of the school and/or teacher increased underrepresented youth's sense of control in pursuing agricultural careers?
3. What practices of the school and/or teacher improved underrepresented youth's attitude toward pursuing an agricultural career.
4. What practices of the school and/or teacher positively changed underrepresented youth's subjective norms about agricultural careers?

1. Identify good practices in recruiting and retaining under-represented students into secondary school-based agricultural education program.
2. Identify good practices in placing secondary agriculture students in agriculture-related careers and post-secondary education.

The results of this research will offer a set of best practices for urban agricultural education programs that will be shared with teachers, administrators, school boards, and policy makers in hopes of creating more school-based agricultural education programs that can successfully attract and retain under-represented students in agriculture and lead them to agricultural careers.

Thank you for considering my request. I am happy to answer any questions you may have about my study.

Appendix C: Participant Consent Letter

Title of research study: Urban Agricultural Education: Exploring good practices for recruiting and retaining underrepresented youth.

Principal Investigator: Dr. Rick Rudd, rrudd@vt.edu
Other study contact(s): Quintin Robinson, quintin@vt.edu

Key Information: The following is a short summary of this study to help you decide whether or not to be a part of this study. More detailed information is listed later on in this form.

- Identify good practices in recruiting and retaining under-represented students into secondary school-based agricultural education program.
- Identify good practices in placing secondary agriculture students in agriculture-related careers and post-secondary education.

Detailed Information: The following is more detailed information about this study in addition to the information listed above.

The agriculture industry has a historical under-representation of minority workers in high-skill, high-wage agricultural careers. Under-represented youth are often reluctant to pursue agriculture as a career path, largely because of persistent misconceptions of agriculture as a hands-on, labor-intensive careers for low-skilled individuals. I would like to examine the success of urban agricultural education programs like yours to discover what you do to bring under-represented youth to agricultural careers and secondary education in agriculture-related fields

Whom can I talk to?

If you have questions, concerns, or complaints or think the research has hurt you, talk to the research team at Quintin@vt.edu.

This research has been reviewed and approved by the Virginia Tech Institutional Review Board (IRB). You may communicate with them at 540-231-3732 or irb@vt.edu if:

You have questions about your rights as a research subject

- Your questions, concerns, or complaints are not being answered by the research team
- You cannot reach the research team
- You want to talk to someone besides the research team to provide feedback about this research

How many people will be studied?

15 participants will be interviewed.

What happens if I say yes, I want to be in this research?

- Participants will be asked to take part in a 30-minutes to 1-hour-long interview where they will be asked questions about their experience with the agriculture program.
- The interviews will be conducted over Zoom.
- The interviews will then be analyzed to provide a set of best practices for urban agricultural education programs that will be shared with teachers, administrators, school boards, and policymakers.
- Participants will be recent alumni, current teachers, and administrator.

What happens if I say yes, but I change my mind later?

You can leave the research at any time, for any reason, and it will not be held against you.

If you decide to leave the research, contact the investigator so that the investigator can remove you from interviewing process and data that has been collected prior to.

Is there any way being in this study could be bad for me? (Detailed Risks)

There are no known risks to participating in this study.

What happens to the information collected for the research?

We will make every effort to limit the use and disclosure of your personal information, including research study and medical records, only to people who have a need to review this information. We cannot promise complete confidentiality. Organizations that may inspect and copy your information include the IRB, Human Research Protection Program, and other authorized representatives of Virginia Tech.

The results of this research study may be presented in summary form at conferences, in presentations, reports to the sponsor, in academic papers, and as part of a thesis/dissertation.

Can I be removed from the research without my OK?

The person in charge of the research study or the sponsor can remove you from the research study without your approval. Possible reasons for removal include failure to comply or failure to complete the interview.

We will tell you about any new information that might affect your health, welfare, or choice to stay in the research.

What else do I need to know?

Any expenses accrued for seeking or receiving medical or mental health treatment will be your responsibility, not that of the research project, research team, or Virginia Tech.

Appendix D: Interview Protocol

Teachers

- How do families of underrepresented students influence youth ag career choice?
- What are the community norms for underrepresented youth pursuing agricultural careers? Have they changed over time? If so, how and why?
- How do peers influence underrepresented student's intentions to pursue an agricultural career?
- How do historical perspectives, agriculture's current state, and the perceived future of agriculture influence underrepresented youth perceived behavioral control in pursuing an agricultural career? (how they see themselves in agriculture careers)
- How does the agriculture education program influence students' attitudes about agriculture?
- What are some supporting programs and opportunities offered that excite students about agriculture?
- What recruiting strategies have successfully worked to recruit and retain unrepresented students?
- How have the school, programs, administrators, alumni and teachers worked to support youth success in the ag program and prepare youth for agriculture careers?
- Has participation increased or decreased among students who pursue ag careers? If so, why? What do you thing is impacting this behavior?
- What practices do you follow to prepare students for ag careers and future education?

Admins

- What are the barriers for underrepresented students in your school district to pursue careers in agriculture?
- How do families of underrepresented students influence ag career choice?
- What are the community norms for underrepresented students pursuing agricultural careers?
- How do historical perspectives, agricultures current state and the future of agriculture influence underrepresented students perceived behavioral control in pursuing an agricultural career? (how they see themselves in agriculture careers)
- How does the agriculture education program influence students' attitudes about agriculture?
- What are some supporting programs and opportunities offered in agriculture that excite students about agriculture?
- What recruiting strategies have successfully worked to recruit and retain unrepresented students in your agriculture program?
- How have the school, programs, administrators, alumni and teachers worked to support youth success in the ag program and prepare youth for agriculture careers?
- Has participation increased or decreased among underrepresented students who pursue ag careers? If so, why? What do you thing is impacting this behavior?

- What practices do your agriculture teachers and your school follow to prepare students for ag careers and future education?

Alums

- How has your family influenced your decision to pursue or not pursue agriculture?
- How supportive were your peers in your interest in agriculture?
- How did the school, programs, administrators, alumni and teachers, or others influence your intention (decision) to pursue an agricultural career?
- What did the school, teacher, and other school officials do to attract and retain you in the agricultural education program?
- How did the agricultural education program increase your abilities in agriculture and give you confidence to pursuing an agriculture career?
- What did the school, teacher, and other school officials do to build and maintain good attitudes about the agriculture program?
- What are some supporting programs and opportunities offered that excited you most about agriculture?
- What did the agriculture program, teachers, or others do to prepare you for an agriculture careers or pursuing future education in agriculture?

Appendix E: A priori Propositions

Research Question	Proposition	Supporting Literature	Questions
1. How do external factors influence underrepresented youth intentions to pursue an agricultural career? (EXTERNAL FACTORS)	Youth in urban communities often come from families who are not familiar with agriculture careers or education. Parents and peers have significant influences on youth career paths. Social norms in urban communities and in communities of color do not support career choices in agriculture. Teacher and school practices can influence youth decision making about agriculture careers and education.	(Swinehart, 2013) (Heim,2019) (Hartmann & Martin, 2021) (Gilman, 2013) (London, 2021) (Key & Todd, 2021) (Benson 2022) (Lawrence, Rayfield, Moore, & Outley, 2013) (Retallick & Martin, 2005) (U.S. Department of Education, 2016)	• What are the barriers for underrepresented youth in the school districts studied to pursue careers in agriculture? • How do families of underrepresented youth influence ag career choice? • What are the community norms for underrepresented youth pursuing agricultural careers? • How do peers influence underrepresented youth intentions to pursue and agricultural career? • How did the school, teachers, administrators, or other school officials influence underrepresented youth intention to pursue an agricultural career?

2. What practices of the school and / or teacher increased underrepresented youth sense of control in pursuing agricultural careers? (PERCEIVED BEHAVIORAL CONTROL	Teachers, schools and school officials can influence underrepresented youth control beliefs related to pursuing an agriculture career. Good practices can help youth see themselves in agriculture. Historical events/practices, the current state of agriculture and the future vision of the agriculture industry can affect underrepresented youth attitudes about pursuing agriculture careers.	(LaVergne, 2011) (Faulkner, 2018) (Hazen, 2017) (Dedrick, 2020) (Jean-Philippe et al., 2017) (Agovino et al., 2019) (Gordon, 2014) (Brown 2015)	• What did the school, teacher, and other school officials do to attract and retain underrepresented youth in the agricultural education program? • How did the agricultural education program increase underrepresented youth efficacy in agriculture and their perceived behavioral control in pursuing an agriculture career? • How do historical perspectives, agricultures current state and futuristic visions of agriculture influence underrepresented youth perceived behavioral control in pursuing an agricultural career?
3. What practices of the school and / or teacher improved underrepresented youth attitude toward pursuing an agricultural career? (ATTITUDE)	It is critical to expand youths view in agriculture to things that will encourage them to pursue agriculture. Teachers and schools must give Agriculture a new face and reputation. Programs must aggressively champion on numerous platforms to stimulate a new attitude among minority students. .	(McGovney-Ingram, 2011) (Whittinghill & Sarr, 2021) (Vommi & LaVergne, 2016) (Russ & Gaus, 2021) (Arends, 2017) (Jayaratne et al., 2019) Velez Clement and McKim (2018)	• How does the agriculture education program influence underrepresented youth attitudes in and about agriculture? • What did the school, teacher, and other school officials do to maintain good attitudes about the agriculture program? • What are some supporting programs and opportunities offered that excites students most about agriculture? • What recruiting strategies have

			successfully work to recruit and retain unrepresented students?
4. What practices of the school and / or teacher positively changed underrepresented youth subjective norms about agricultural careers? (SOCIAL NORMS)	People might have negative perceptions when they do not have any role models, or they believe that such professions are not for them. Increasing familiarity and insight into respective careers and academic pathways can offset students' disconnect with Agriculture. The early and consistent introduction of agriculture in urban schools enriches underrepresented students' advanced knowledge in agriculture and employment opportunities. People might have negative perceptions when they do not have any role models, or they believe that such professions are not for them.	(Jean-Philippe, 2017) (Holbert, 2021) (Bosnjak , 2020) (Bostic, 2021) (Dunlap, 2019) (Zahniser 2018) (Fry 2021) (Benson 2022) Kim (2017) (Tummons 2017) (Warren 2015) (Brown 2015) (Salazar, 2015)	• What are some experiences teachers, students, and programs have to see themselves successful in agriculture programs and careers? • How has the schools, programs, and teachers worked to support youth success in the ag programs and prepare agriculture careers? • Has participation increased or decreased over the years among youth who typically don't pursue Ag careers? • How did they prepare youth for Ag careers and future education? • Do youth now see Ag as a career they can be successful in?