



## Participants of the Cultivate ACCESS Program (Work in Progress)

### **Rachel Ibach, University of Nebraska-Lincoln**

Rachel Ibach is a masters student at the University of Nebraska-Lincoln in the Applied Science program. Her assistantship project focuses on increasing participation of underrepresented groups in STEM-related agricultural career fields through a mentoring and development program that engages high school youth with undergraduate students and industry professionals.

### **Dr. Jennifer Keshwani, University of Nebraska - Lincoln**

Jenny Keshwani is an Assistant Professor of Biological Systems Engineering and Science Literacy Specialist in the Institute of Agriculture and Natural Resources at the University of Nebraska-Lincoln. She is active in promoting science and engineering education in both formal and informal settings through her research, extension, and outreach activities. Dr. Keshwani is actively engaged in several cross-disciplinary regional and national efforts related to STEM education and outreach. Most recently, she was part of a team that received NSF funding to engage youth in STEM through wearable technologies.

### **Dr. Deepak R Keshwani, University of Nebraska, Lincoln**

Dr. Deepak Keshwani is an associate professor of Biological Systems Engineering at the University of Nebraska-Lincoln. In addition to research in the area of bioprocess and biosystems modeling, Dr. Keshwani is engaged in teaching and advising students across two academic colleges and is involved in numerous campus-wide student success initiatives including leading a civic-engagement program for first-year students.

### **Sydney E Everhart, University of Nebraska**

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# **Impacts on Self-Efficacy and Employability Skills of Women and Minority Participants of the Cultivate ACCESS Program**

## **Abstract**

Women and minorities are underrepresented in STEM-related agriculture (agSTEM) fields, such as agricultural engineering, agricultural technology management, and crop science. Despite support and demand by industry to increase diversity, there is a limited pool of qualified candidates from diverse backgrounds to fill these positions. A group of faculty and staff from the University of Nebraska-Lincoln received funding from the Women and Minorities in STEM program of the National Institute of Food and Agriculture to support the effort to increase participation of women and minorities in agSTEM careers. The Cultivate ACCESS (Agricultural Career Communities to Empower Students in STEM) program was deployed in the fall of 2018 and designed to highlight a range of STEM careers in agriculture while developing employability skills identified by industry. The objective of this program is to increase diversity in agSTEM fields and provide recommendations for future mentoring programs targeting underrepresented groups.

Cultivate ACCESS engages high school students (scholars) from communities in Nebraska with undergraduate students (ambassadors), and industry professionals (mentors) in an online mentoring and development program during the academic year. Ambassadors and mentors are from underrepresented groups in agSTEM majors and careers. Scholars received virtual and face-to-face mentoring from ambassadors and mentors. Program topics and activities included career pathway exploration in agSTEM, employability skill development, and self-efficacy. Ambassadors enrolled in an experiential learning course focused on training in cross-age peer mentoring, diversity and inclusion, and leadership skill development. Virtual training provided to mentors equipped them with the skills necessary to be effective mentors. A website was developed to serve as a source of information on the program and agSTEM careers that is accessible past the lifetime of the project. Scholar outcomes indicated by information gathered throughout the program are increased understanding and awareness of agSTEM careers, self-efficacy, and employability skills including teamwork, communication, and leadership. Focus-group interviews with ambassadors indicated increased leadership and mentoring skill development through their participation in the program. Mentors increased their mentoring ability as a result of their interactions with the Cultivate ACCESS scholars.

The findings from this program can guide development of future mentoring programs designed to target underrepresented groups in the agSTEM fields. Youth matched with mentors from similar backgrounds more strongly identify with their mentors as a role model and are inspired to pursue careers in fields that they may not have felt confident to enter before. Development of employability skills in youth are critical components of mentoring programs as underrepresented youth have limited access to training of these skills. Cross-age mentoring using college students can significantly enhance the overall impact of youth-adult mentoring programs.

## **Introduction**

Women and minorities are underrepresented in the Science, Technology, Engineering, and Math (STEM)-related fields (Funk and Parker, 2018). Diversity in organizations has been shown to increase innovation and financial returns (Hunt, Layton, and Prince, 2015). There is an opportunity to change representation of these groups in STEM-related agriculture, as higher education programs are predicted to have half of their graduates in science and engineering fields of agriculture be female (Goecker, et. al., 2015). Minority groups are also rising in population levels rapidly. In Nebraska, the Hispanic population is projected to double by 2050 (Linares and Drozd, 2013) and there will be more people from this group seeking higher education and employment opportunities. However, there is a projected shortage of employees to fill jobs in agriculture, food, renewable natural resources, and the environment (Goecker, et. al., 2015) despite rising population levels of minority groups and more female graduates in agriculture majors.

With the challenge of feeding 9 billion people on the planet by 2050, agriculture will rely heavily on STEM related careers such as agricultural engineering, agricultural technology management, and crop science to achieve this goal and must become more innovative than ever before. However, employers are struggling to recruit diverse employees, as there are fewer individuals graduating with degrees that fit into these categories. Our team recognized that increasing participation of individuals underrepresented in STEM-related agriculture careers may serve as a catalyst in solving problems faced by the industry. In response, we created the Cultivate ACCESS (Agriculture Career Communities to Empower Students in STEM) program funded by the USDA that works towards positive change in the industry when it comes to issues of diversity and inclusion by connecting high school youth from diverse backgrounds with undergraduate students and industry professionals in a holistic mentoring and development program.

## **Program Background**

The Cultivate ACCESS program seeks to increase participation of underrepresented groups from rural Nebraska in the STEM-related agriculture, food, and natural resources fields through engaging high school aged youth (scholars) in a holistic mentoring and development program with career professionals (mentors) and undergraduate college students (ambassadors). During program activities youth from underrepresented groups are paired with a mentor employed in a STEM-related agriculture field. Cultivate ACCESS ambassadors are University of Nebraska-Lincoln students who study a STEM-related major. Mentors and ambassadors are recruited from diverse backgrounds that reflect the demographics of high school scholars. Scholars receive mentoring from an adult and a peer who physically looks like them and can share personal stories of overcoming obstacles and facing adversity that youth may have encountered. Participation in mentoring experiences aids students in gaining scientific knowledge and engages them in career exploration and college admission (Phelan, Harding, & Harper-Leatherman, 2017). Latina/Latino students are positively impacted by college mentoring following college matriculation (Zalaquett & Lopez, 2006). On an organizational level, mentoring is an important part of socialization and career development (Hill and Gant, 2000). Studies have found that a person of color who encourages youth to pursue agriculture positively impacts youth from an

ethnic minority to seek participation in the industry (Jones and Larke, 2003). Sociocultural factors have a strong influence on women over individual career decisions (Wang and Degol, 2017). Intervention in the form of a mentoring program for women can help to increase participation of women in STEM. Gender roles and biases have a great influence on women (Wang and Degol, 2017) but intervention can help to shrink the gender gap. Women who receive support from another female have been found to be more successful and have lower dropout rates in STEM courses (Herrmann, et. al., 2016). This unique feature of matching youth with adults of similar backgrounds utilized by the Cultivate ACCESS program increases the likeliness of high school scholars to picture themselves in a STEM-related agriculture field and strengthens their confidence to pursue post-secondary education.

## **Objectives and Goals**

### *Scholars*

The objectives and educational goals for high school scholars is to develop a stronger understanding of career and educational pathways in the area of agSTEM, enhancement of employability skills, and strengthening of their own self-efficacy and confidence to pursue a career in agSTEM.

Youth are guided through career exploration, college majors, and the development of employability skills, the new industry term for soft skills by their mentor and ambassador in regular mentoring sessions. Youth are able to connect with their mentor and ambassador through email, phone calls, or video calls to accommodate schedules and participate wherever they are located. During these mentoring sessions mentors and ambassadors are provided with discussion prompts, activities, and other resources relevant to the assigned topic for that cycle. The topics of these cycles are tied to the desired objectives and educational goals to ensure development focuses on exploring agSTEM career and educational pathways, employability skills, and self-efficacy. The underlying belief is that through intentional mentoring, professional development, and enhanced knowledge of career opportunities, youth will envision themselves working in a career in the STEM-related fields of agriculture.

### *Mentors*

The objective and development goal for mentors is to increase mentoring ability and capacity. Cultivate ACCESS mentors receive training in the areas of mentoring and interpersonal skill development before engaging in the mentoring experience. To meet this objective, Cultivate ACCESS collaborators from the University of Nebraska-Lincoln created four training modules for mentors to complete prior to the start of the mentoring period. Skill development through training and practice in the Cultivate ACCESS program provides industry partners overview of content included in Cultivate ACCESS mentor training is provided in Table 1.

**Table 1:** Overview of Mentor Training

Module 1: Mentoring for Leadership Development	<ol style="list-style-type: none"><li>1. Key features of mentoring relationships</li><li>2. Mentoring versus coaching</li><li>3. Expected outcomes/impacts from mentoring relationships</li></ol>
Module 2: From Mentoring to Investing	<ol style="list-style-type: none"><li>1. Investment relationships model</li><li>2. How to identify mentee's talents</li><li>3. Impacting mentee self-concept through self-fulfilling prophecies</li></ol>
Module 3: Sharpening Interpersonal Capacities	<ol style="list-style-type: none"><li>1. Active listening</li><li>2. Finding hot buttons</li><li>3. Questions motivate people</li></ol>
Module 4: Setting Expectations	<ol style="list-style-type: none"><li>1. Commit to consistency</li><li>2. Establish communication norms</li><li>3. Identify a "bucket list"</li></ol>

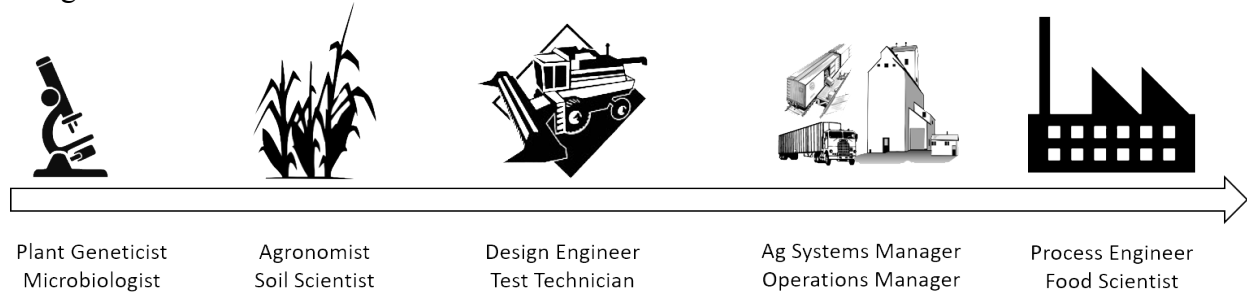
### *Ambassadors*

The objectives and educational goals for undergraduate student ambassadors is to increase their skills in cross-age peer mentoring, understanding of issues related to diversity and inclusion in agriculture, and develop strong leadership skills. Cultivate ACCESS ambassadors are located on campus and engage with Cultivate ACCESS leadership weekly to engage in activities tied to their developmental objectives and goals. Ambassadors spend approximately 5 hours each week interacting with scholars and mentors, attending team classes or meetings, and completing assigned tasks. Ambassadors assist Cultivate ACCESS leadership with the development of program activities, program marketing, and bridge the generational gap between scholars and mentors. Ambassadors are assigned to mentor-scholar pairs to oversee their interactions and provide assistance as needed.

During the fall semester of the academic year ambassadors enroll in an experiential learning course at the University of Nebraska-Lincoln facilitated by Cultivate ACCESS leadership team members. Course topics include training in peer mentoring, exploration of issues related to diversity and inclusion in the agriculture industry, and employability skills including leadership, teamwork, conflict resolution, and communication. During the spring semester ambassadors receive compensation for their work with Cultivate ACCESS as student workers for the Department of Biological Systems Engineering at the University of Nebraska-Lincoln. Ambassador's improve their skills through hands-on learning and are challenged to solve problems through creative thinking.

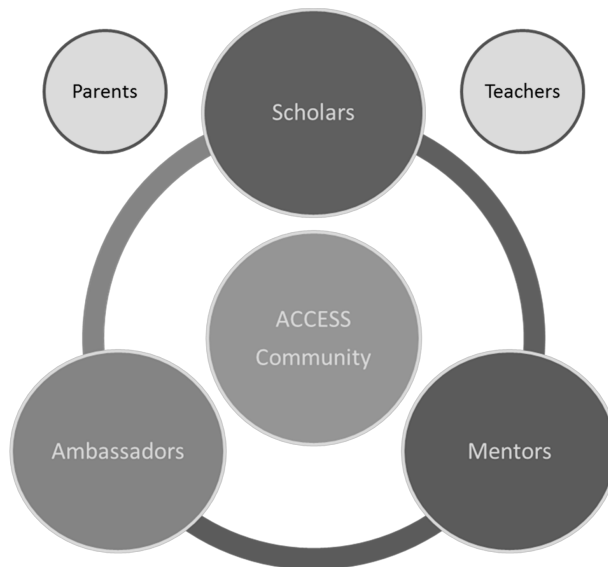
## Program Structure

This program was deployed using an agricultural crop production-to-processing continuum highlighting a range of agSTEM careers. The crop production-to-processing pipeline is provided in Figure 1.



**Figure 1:** Crop Production-to-Processing Pipeline

Cultivate ACCESS participants interact with each other in a continuous and dynamic system we call the ACCESS Community. The main circle of the ACCESS Community includes scholars, mentors, and ambassadors. These participants interact on a weekly basis to discuss topics provided to them by the Cultivate ACCESS leadership team and dive deep into their exploration of agSTEM careers and personal development. Outside of the main circle are parents and teachers. These participants do not engage as frequently with ambassadors and mentors but interact frequently with scholars at home and during school hours. Cultivate ACCESS provides support to these participants through resources focused on career and college planning. Parents and teachers are highly influential and integral to the success of youth. The ACCESS Community model is included in Figure 2.



**Figure 2:** ACCESS Community Model

High school students interested in participating in the program complete an application to be reviewed by the Cultivate ACCESS leadership team. Selection criteria is used to determine strong candidates for the program based on exhibiting an openness to learning more about agSTEM careers, leadership potential, and academic interest. Preference is given to applicants who belong to underrepresented groups in agSTEM fields. Once these candidates are selected they receive a formal offer from Cultivate ACCESS to participate in the program.

Industry mentor selection is tied to the demographics and interests of the scholars accepted into the program. Mentors are paired with scholars primarily on shared demographics and similarity in careers interests (e.g. female scholar interested in agricultural engineering is paired with a professional female agricultural engineer), and high leadership ability. Other criteria taken into consideration when recruiting and selecting mentors is prior mentoring experience, years of experience in their career, and interest in working with youth.

Undergraduate students interested in participating in the program complete an application and finalists are interviewed by the Cultivate ACCESS leadership team. Selection criteria for ambassadors includes a high interest or prior experience mentoring youth, high leadership potential, and academic ability. Preference is given to applicants who are in a STEM or agriculture related program of study and belong to an underrepresented group in agSTEM fields. An overview of selection criteria for program participants is included in Table 2.

**Table 2:** Candidate Selection Criteria and Considerations

	<b>Primary Selection Criteria</b>	<b>Other Considerations</b>
Scholars	Openness to explore agSTEM career fields Leadership potential Academic interest	Preference given to underrepresented groups
Mentors	Demographic match with a scholar Career aligned with scholar interest area High leadership ability	Prior mentoring experience Years of career experience Interest in working with youth
Ambassadors	High interest or prior experience in mentoring youth Leadership potential Academic ability	Preference given to STEM or agriculture related programs of study Preference given to underrepresented groups

## Year 1 Implementation

### *Participant Demographics*

Year 1 demographics include 22 total Scholars. 18 Scholars were female and 3 Scholars identified as Hispanic or Latino/a. Scholars represented 15 different communities in Nebraska. Scholars are between the grade levels of sophomores through seniors in high school.

Mentor demographics for Year 1 included 13 individuals. One mentor was male and 12 were female. Of this group nine identified as white, two Hispanic, and one Asian-American.

Ambassador demographics for Year 1 included three white females and one African male. Their programs of study ranged from Mechanized Systems Management, Integrated Science, and Agricultural Education.

### *Year 1 Program Delivery*

Cultivate ACCESS participants explore career pathways and develop employability skills during the program. In Year 1, scholars, mentors, and ambassadors were matched with each other prior to the start of formal mentoring based on a set of criteria. The primary criteria for matches was based on demographics (e.g. female mentor with female scholar, Hispanic mentor with Hispanic scholar). The secondary criteria for matches was based on career or subject interests of scholars (e.g. scholar interested in engineering or math matched with a professional agriculture engineer). Topics and activities were released to participants bi-weekly during the academic year of 2018-2019. Towards the end of each bi-weekly cycle journals over the provided materials and conversations were submitted to the Cultivate ACCESS leadership team by scholars and mentors. These journals allowed scholars and mentors the opportunity to reflect on their thoughts and experiences during that cycle. An outline of Year 1 program delivery is provided in Table 3.



**Table 3: Year 1 Discussion Topics and Journal Prompts**

Year 1 Bi-Weekly Cycle			
Day 1: Topic Released		Day 1 – 14: Scholars, Mentors, and Ambassadors Engagement on Topic	Day 14: Journal Submitted
Year 1 Schedule			
Cycle Date	Theme	Discussion Topics	Journal Prompts
9/10/18 – 9/14/2018 *1 week cycle	STEM	What is STEM?, What do you do?, How do you impact the world?	What does STEM mean to you?
9/17/18 – 9/28/18	Communication	Effective vs ineffective communication, appropriate communication channels, networking, pros and cons of social media	What is one thing you could do to network with your peers/mentors?
10/1/18 – 10/12/18	Career Stories	Mentor shares career journey including challenges, decisions made, education/technical skills developed	Mentor: What did you learn reflecting on your career story? Scholar: What is one step you can take towards your dream career?
10/15/18 – 10/26/18	Career Exploration	Mentor shares jobs available at their company and what skills/education are required.	Mentor: Did you learn about new pathways in your profession? Scholar: Which job at your mentor's company interested you and why?
10/29/18 – 11/9/18	Leadership	Positively influencing co-workers/peers and strategies used	What is one way you are influencing others around you? How do you notice?
11/12/18 – 11/30/18 *3 week cycle due to holiday	Self-Efficacy	Importance of showing gratitude. Recognizing your influencers and lessons learned from them	Write a thank you note to someone who positively influences you. Tell us who and why.
12/3/18 – 12/21/18 *3 week cycle due to holiday break	Self-Efficacy	Positive stress management	How do you recognize when you are stressed and what do you do about it?
1/7/19 – 1/18/19	Leadership	Effective teamwork, being a good follower, self-leadership	How will you improve your leadership?
1/21/19 – 2/1/19	Decision Making	Goal setting, time management, task prioritization	How do you prioritize goals?
2/4/19 – 2/15-19	Communication	How to improve communication skills	What is one thing you can do to improve your professional and personal communication?
2/18/19 – 3/1/19	Self-Efficacy	Overcoming obstacles (past/present/future) and reflecting on the experience	Describe an obstacle or intimidating situation you're facing. How can this challenge be an opportunity?
3/4/19 – 3/15/19	Leadership	Navigating differences in opinion and conflict management	Describe a situation when you had a difference in opinion with someone. Did you manage it successfully or unsuccessfully? What did you learn from it?
3/18/19 – 3/29/19	Diversity	Challenges and opportunities in work, school, and life regarding cultural and generational differences	How might a diverse group of people be better able to solve problems and make an impact?
4/1/19 – 4/13/19	Self-Efficacy	What do you see and appreciate in each other?	What are things you see and appreciate in yourself?

## Year 1 Outcomes

Participant experiences were documented from scholars and mentors in Year 1 through journal submissions and conversations with Cultivate ACCESS leadership. Ambassadors completed focus-group interviews with a third-party representative contracted through the University of Nebraska-Lincoln Methodology and Evaluation Research Core.

### *Scholars*

Indications of increased self-efficacy were found in journal submissions from scholars. Mentor's stories of overcoming adversity and barriers to their career helped scholars strengthen confidence in their ability to pursue careers in fields they may not have considered before:

"No matter your background, you can do whatever you set your mind to. My mentor is from Mexico and she became an engineer. I think having a story like that is amazing and makes me realize that I can accomplish my dreams." (Cultivate ACCESS Scholar, journal submission, Fall 2018).

"If you push yourself, everything really is limitless. Coming from a minority background in a small town sets me apart, but it also sets me up to have the chance to exceed expectations." (Cultivate ACCESS Scholar, journal submission, Fall 2018).

Other development indications from journal submissions showed increased understanding of career pathways. Guidance from adults and college students provided scholars with more resources and knowledge of opportunities in agSTEM than they initially had access to:

"The most surprising thing I learned this week was just how many different career paths my mentor's company hires and includes. I never even thought about how many there would be, so that was some great insight for me to learn." (Cultivate ACCESS Scholar, journal submission, Fall 2018).

Mentors who shared personal insight into their lives were better able to earn the trust of their scholars. This trust led to more open conversations where scholars felt more comfortable opening up to their mentors and asking questions:

"The more we talk the more comfortable I feel. My mentors have really opened up about their lives. Having done so, it made it easier for me to talk about the questions I have been wanting to ask. When you first meet someone it's hard to just open up and ask them anything. I love how patient they are with me." (Cultivate ACCESS Scholar, journal submission, Fall 2018).

### *Mentors*

Mentor journal submissions showed evidence of improvement in mentoring ability and forming cross-generational relationships. Mentors noted the importance of mentoring for young people and the positive impact these relationships have:

“She was excited to learn that I changed majors in college because she is unsure of what she wanted to do. I reassured her that most people change their major from what they started in and she felt a lot better about looking at future plans.” (Cultivate ACCESS Mentor, journal submission, Fall 2018).

“It would have been great to hear some of the things I've shared with her coming from a young professional when I was her age.” (Cultivate ACCESS Mentor, journal submission, Fall 2018).

Other outcomes indicated by mentors were increased confidence and self-efficacy in their own career. Mentors felt more confidence in their own pathway to their career and saw the value in sharing their story:

“I learned that I have more appreciation now for the courage to leave medical school than I did back when it was happening. Back then I thought of it as a failure, but being able to use that story today to mentor and coach others, and have them acknowledge that they found it interesting also makes me feel more positive about it on the whole.” (Cultivate ACCESS Mentor, journal submission, Fall 2018).

### *Ambassadors*

Ambassadors exhibited growth in peer mentoring and leadership ability. Ambassador interviews revealed that undergraduate students value interaction with younger people. Ambassadors enjoyed building a relationship with high school students and serving as a guide for them when exploring careers:

“As important as it is to be surrounded by peers and professionals, it’s also equally important to be surrounded by people younger than you. [Cultivate ACCESS] was like passing the baton backwards.” (Cultivate ACCESS Ambassador, interview, April 2019).

“[What was rewarding about working with Cultivate ACCESS scholars] was being a guide for them and a lifeline if they need it or if they have any questions about their future. It was the relationship building with them.” (Cultivate ACCESS Ambassador, interview, April 2019).

Ambassadors also saw value in developing a relationship with mentors. Interactions with mentors led to a better understanding of agSTEM in the professional world:

“[What was rewarding with mentors was] building relationships and communication with them. A few have been really helpful for [learning] what they do every day, what STEM is like in education, or agriculture, and it was a great basis for figuring out jobs and careers.” (Cultivate ACCESS Ambassador, interview, April 2019).

Ambassadors contributed their exposure to peers and professionals from diverse backgrounds to their increase in understanding of different cultures, backgrounds, and experiences. Ambassadors connected their experience with diverse groups to the development of a more open-minded approach to problems within agSTEM and the global community:

“[Cultivate ACCESS] gave me the importance of diversity and how people from different cultures, backgrounds, and experiences can come together and share views and advice.” (Cultivate ACCESS Ambassador, interview, April 2019).

### Year 1 Lessons Learned

Year 1 participants noted the bi-weekly cycle of new topics did not accommodate busy schedules well and only a small percentage of participants submitted journals regularly. Participants felt that they had little interaction with other participants in the program outside of their assigned scholar, mentor, and ambassador pairings. Mentor and ambassador feedback highlighted weak communication skills of high school scholars that led to some cases of communication breakdowns. This provided difficulty in maintaining consistent contact between scholars and mentors through virtual channels. Some scholar and mentor matches were less effective due to differences in communication styles and desired levels of interaction from both parties.

### Year 2 Implementation

#### *Participant Demographics*

Scholar demographics of Year 2 include 8 total scholars. 7 Scholars were female and one identified as Hispanic or Latino/a. Scholars represented 7 distinct rural communities in Nebraska.

8 Mentors were recruited for Year 2. One mentor was male and 7 were female. Of this group 6 identified as white, one as Hispanic or Latino, and one as Asian American.

Ambassador demographics for Year 2 include two white females, one African American female, and one African female. Their programs of study ranged from, Integrated Science, Animal Science, Biological Systems Engineering, and Veterinary Science.

#### *Program Restructure*

Feedback received at the end of Year 1 resulted in a restructure of program delivery for Year 2. Cultivate ACCESS was restructured to include an extended onboarding phase for program. The onboarding phase began in September of 2019 and encompassed the first two months of the program. The formal mentoring phase is active from November 2019 through April 2020. Scholars received training from the Cultivate ACCESS leadership team in virtual communication and how to interact with a professional. Scholars practiced writing emails and learned more about the structure of the program during onboarding. Program ambassadors were introduced to cross-age mentoring strategies and engaged with Cultivate ACCESS leadership through weekly experiential learning class sessions. One month into the onboarding phase ambassadors were paired with scholars. Ambassadors completed one face-to-face peer mentoring session with scholars and connected weekly to assist scholars in learning how to navigate virtual communication channels.

Mentors were recruited and trained during onboarding. The onboarding phase allowed Cultivate ACCESS leadership the opportunity to learn more about scholars and recruit mentors that fit

their mentoring needs more closely than in Year 1. Ambassadors connected to mentors they would be assisting throughout the program during the onboarding phase to build a relationship prior to mentors connecting with scholars. At the conclusion of the onboarding phase ambassadors assisted Cultivate ACCESS leadership with connecting mentors to their assigned scholars and began the formal mentoring period of the Cultivate ACCESS program.

Bi-weekly discussion cycles transitioned to a monthly cycle during the formal mentoring period. Virtual communication platforms were added to the structure of program delivery. Two virtual communication platforms were utilized to streamline information storage and engage all participants once a month in real-time conversations hosted by Cultivate ACCESS leadership. Slack, a collaboration hub widely used by businesses, provided a location for Cultivate ACCESS participants and leadership to interact and easily access program information. Zoom is a web collaboration service that can be used to connect multiple conference rooms and remote users. During the last week of each month during the spring semester scholars, mentors, ambassadors and Cultivate ACCESS leadership attended a meeting to discuss the monthly topic and network with each other.

An overview of Year 2 program delivery is included in Table 4.

**Table 4: Year 2 Program Delivery**

Year 2 Monthly Cycle			
First Monday of Month: Topic Released		Scholars, Mentors, and Ambassadors Engagement on Topic	Last Thursday of Month: Zoom Call
Onboarding Phase			
Cycle Date	Theme	Discussion Topics	Zoom Meeting
9/3/19 – 9/27/19	Onboarding Phase	<p><u>Scholars:</u> Virtual and professional communication training and increase understanding of Cultivate ACCESS program</p> <p><u>Mentors:</u> Cultivate ACCESS leadership team recruits program mentors</p> <p><u>Ambassadors:</u> Peer mentoring skill development</p>	No Zoom meeting this month
9/30/19 – 11/1/19	Onboarding Phase	<p><u>Scholars:</u> Continue virtual and professional communication training and begin connecting with Ambassadors</p> <p><u>Mentors:</u> Complete training modules</p> <p><u>Ambassadors:</u> Face-to-face visits with Scholars begins. Connect with assigned mentors.</p>	Ambassadors complete Fall site visits to Scholars No Zoom meeting this month
Mentoring Phase			
Cycle Date	Theme	Discussion Topics	Zoom Meeting
11/4/19 – 11/29/19	Setting Expectations and Career Exploration	Scholars and Mentors connected with assistance from Cultivate ACCESS leadership team and Ambassadors. Scholars and Mentors set expectations for mentoring relationship and begin to discuss career pathways Scholars are interested in.	No Zoom meeting this month  Ambassadors report to Cultivate ACCESS leadership progress on mentor-scholar connections.
12/2/19 – 12/18/19	Career Exploration	Mentor shares jobs available at their company and what skills and education is required.	1 hour Zoom meeting led by Cultivate ACCESS leadership. <u>Topic:</u> Introductions and overview of Cultivate ACCESS program.
1/13/19 – 1/31/19	Communication and Decision Making	<p><u>Communication:</u> effective vs ineffective communication, appropriate communication channels, networking, pros and cons of social media</p> <p><u>Decision Making:</u> goal setting, time management, task prioritization</p>	1 hour Zoom meeting led by Cultivate ACCESS leadership. <u>Topic:</u> Communication challenges and strategies to improve it.
2/3/19 – 2/28/19	Diversity and Inclusion	Challenges and opportunities in work, school, and life regarding cultural and generational differences. What does a diverse group look like, is diversity more than race, ethnicity, age, or gender.	1 hour Zoom meeting led by Cultivate ACCESS leadership. <u>Topic:</u> How we navigate issues related to diversity and inclusion in a positive way.
3/2/19 – 3/27/19	Teamwork and Leadership	<p><u>Teamwork:</u> Effective teamwork, when to be a good follower vs when to be the team leader.</p> <p><u>Leadership:</u> Positively influencing co-workers/peers and strategies used. Navigating differences in opinion and conflict management</p>	Ambassadors complete Spring site visits with Scholars. 1 hour Zoom meeting led by Cultivate ACCESS leadership. <u>Topic:</u> Strategies for developing our leadership capacity.
3/30/19 – 4/1/19	Self-Efficacy	Importance of showing gratitude. Recognizing your influencers and lessons learned from them. Positive stress management. Overcoming obstacles (past/present/future) and reflecting on the experience.	1 hour Zoom meeting led by Cultivate ACCESS leadership. <u>Topic:</u> Working through adversity and developing self-confidence.

## Year 2 Outcomes

Year 2 experiences are documented through information gathered in Slack and Zoom and through evaluation materials distributed in April of 2020 to scholars and mentors. Ambassadors complete one reflection per semester to describe their experience during that semester and one interview with a third-party representative from the University of Nebraska-Lincoln Methodology and Evaluation Research Core during the last month of the program. Initial findings and analysis of ambassador experiences in the fall of 2019 indicate growth in the desired outcomes of increased employability skills and peer mentoring ability to carry into their future careers in agSTEM fields.

### *Ambassadors*

Ambassadors provided insight on the first semester of Cultivate ACCESS through completing a personal reflection. Ambassadors noted improvement in the areas of communication, conflict resolution, time management, teamwork, and issues related to diversity and inclusion:

“I have had to grow exponentially in my communication, time management, and focus with tasks.” (Cultivate ACCESS Ambassador, reflection, Fall 2019).

“We have learned a lot about diversity the last few weeks and it has really opened my eyes on how diversity can impact a society, workplace, and in school... I want to implement this into my future professional career as a veterinarian. Not only have I learned about diversity, but also working in a collaborative group. All voices need to be heard which is important in almost every setting.” (Cultivate ACCESS Ambassador, reflection, Fall 2019).

“Another important skill I’ve developed is conflict management. Having this skill was really important to me because I’ve had bad experiences in the past, now I feel confident to know how to handle a situation correctly.” (Cultivate ACCESS Ambassador, reflection, Fall 2019).

“The experience is especially important in professional communication. Since a significant portion of the program is online, the how to’s of professional communication are emphasized. This will help me in my future professional communication as a significant portion of discussions are done by email and online in many workplaces.” (Cultivate ACCESS Ambassador, reflection, Fall 2019).

“As an ambassador, I get to work in a team with my fellow ambassadors and Cultivate ACCESS program heads. These team interactions will be very beneficial when I go into the real world and have to work with a team in a more professional setting.” (Cultivate ACCESS Ambassador, reflection, Fall 2019).

Ambassadors indicated awareness of the importance of peer mentoring and their influence as a role model on high school students:

“It has been great to get to know my scholars because I remember when I was in their shoes and wasn’t sure what I wanted to do. It has been a great experience to be someone they look up to, in

a sense that I have been through what they are about to experience.” (Cultivate ACCESS Ambassador, reflection, Fall 2019).

“I appreciate that I am a reliable source that my scholars can come to when they have questions about Cultivate ACCESS, life, or the potential of college.” (Cultivate ACCESS Ambassador, reflection, Fall 2019).

### **Implications for Future Programs**

The findings from Year 1 and initial findings from Year 2 of this program implicate the development of future mentoring programs targeting underrepresented groups. Our program outcomes support research claims that underrepresented youth are better able to connect with a mentor of a similar background and this relationship positively impacted self-confidence in their ability to pursue post-secondary education and careers in agSTEM. Scholars were able to feel more comfortable with a mentor who had similar experiences and interests. Minority students mentored by an adult of the same race or ethnicity recognized their background brings value to their community and perceptions changed from negative to positive in regards to their minority background. We recommend that future mentoring programs prioritize pairing youth with adult mentors who match their demographic background. Youth who more strongly identify with an adult mentor are able to experience positive growth in their own self-efficacy.

Experiential learning and peer mentoring experiences for undergraduate students results in many developmental benefits. Cultivate ACCESS ambassadors were provided with many developmental opportunities in weekly meetings or on campus to support their personal growth. Ambassadors were supported in determining which skills they needed to focus on and put them into practice through mentoring scholars. As ambassadors further developed communication and peer mentoring skills they achieved higher success in facilitating communication between scholars and mentors. We recommend that future mentoring programs involve undergraduate students in their program as they are vital to bridging generational gaps between high school students and adults. Additionally, undergraduate students should be provided with training and resources in the areas of peer mentoring and employability skill development to increase their confidence and success in serving within this role.

Virtual mentoring programs benefit from more flexibility in scheduling and the ability to connect with individuals in multiple geographic locations. However, there are unique challenges associated with virtual communication. We recommend that mentoring programs delivered primarily through virtual channels dedicate time to train participants in virtual communication techniques. Youth from rural communities may have limited access to prior training and understanding of virtual communication platforms and will require assistance in developing these skills. Mentoring relationships will be easier to establish and maintain if participants have adequate understanding of virtual communication etiquette and operation.

High school students, colleges students, and professionals must coordinate mentoring program activities around busy schedules. Designing programs that each individual can tailor to fit their individual needs allows participants to be more successful and complete all tasks. Bi-weekly cycles of new topics and assignments limited this flexibility for Year 1 participants. In many



cases there were instances of low quantity and quality of participant engagement in the program with a short time frame to complete conversations and submit a journal. Transitioning to monthly cycles of new topics and assignments during Year 2 and using monthly Zoom calls to engage in community reflection in place of individual journals addressed these issues. Participants were able to dive deeper into discussion topics in a monthly cycle versus a bi-weekly cycle. We recommend that mentoring programs consider using monthly topics as it allows enough time to complete tasks without overwhelming participants.

## **Conclusion**

As the world evolves agriculture faces many challenges and opportunities to improve the quality of life for our global community. The STEM-related fields of agriculture will play a key role in addressing these unprecedented challenges. Increasing participation of underrepresented groups in these careers is necessary to meet the demand of innovative solutions through bringing in a wider range of perspectives and life experiences. Mentoring programs such as Cultivate ACCESS are critical in the development of high quality and diverse professionals that will generate needed change in the industry and impact the globe within food, agriculture, and natural resources. Work presented in this paper provides information needed for other institutions and organizations to develop mentoring programs for their local communities.

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