## Introduction

As career opportunities in the agricultural industry continue to increase, there is an ongoing need for trained graduates to meet workforce demands (Fernandez et al., 2020). Though technical knowledge is important, a recent survey of agribusiness organizations indicated problem-solving, decision-making, organization, teamwork, and communication are the most important skills for employees (Johnson, 2024). Similarly, a study exploring the perceptions of leaders in agriculture and natural resources indicated a high desirability for employable skills such as dependability, critical thinking, problem-solving, initiative, and clear communication in potential hires (Easterly et al., 2017). Research on the skills required for future agricultural communicators revealed, from an industry perspective, the most valued technical skill among recent graduates is the ability to communicate in written form (Leal et al., 2020). However, it was also noted this skill was not perceived by industry as sufficiently developed in graduates (Leal et al., 2020).

According to the American Association of Colleges and Universities (AAC&U), employers have high confidence in higher education and believe a college education is valuable, especially for developing the knowledge and skills they deem important to career success (Finley, 2021). Arkes (1999) concluded employers may "value associate's and bachelor's degrees because the acquisition of these credentials marks unobservable attributes such as motivation, character, and perseverance" (p. 140). However, employers also noted recent college graduate hires were not prepared for workforce success (Finley, 2021; Johnson, 2024; Robinson & Garton, 2008), indicating a disparity between colleges' ability to cultivate vital workforce skills and employers' expectations. To better prepare college students for the workforce, prior research recommends inviting local industry professionals into the classroom and integrating industry elements into curricula to help students connect their work to its future application (Alston et al., 2020; Hendrix & Morrison, 2018).

It is broadly argued the purpose of post-secondary education is to develop civically engaged students and improve societies (Lagemann & Lewis, 2012). In a recent study of employers' perceptions of *quality* higher education, employers were most concerned with graduates' personal qualities, such as work ethic, passion, commitment to learning, and interpersonal skills, rather than the process by which students acquired these skills, such as specific class work (Dicker et al., 2019). However, in the same study, employers also indicated quality institutions developed relationships with industry, signaling a need for universities to engage with their larger community. As digital education opportunities, such as massive open online courses (MOOCs) and tuition-free universities, have been presented as low-cost alternatives for knowledge acquisition and skills development (Bowen, 2015), it is imperative for higher education institutions to provide value-driven education that prepares graduates to meet industry needs. Though research indicates that hiring managers prefer traditionally educated applicants over those who attended MOOCs (Rosendale, 2017), liberal arts schools have introduced more vocational and professional degree programs as a method to improving value (V. L. Baker et al., 2012; Wolf, 2003), even though these programs may differ from the original purposes of higher education (Barber et al., 2013). However, Colby et al. (2011) found some of the best undergraduate business programs combined elements of liberal arts education and professional training, indicating a new model for success.

The land-grant university system was developed with a tripartite mission: teaching, research, and extension (Schuh, 1986). Though research in this model still has a theory-based

component, it is often applied in nature with the purpose of disseminating the results to interested stakeholders (Hurdle, 2025). Agricultural science programs have integrated experiential learning techniques for decades (Andreasen, 2004). In agricultural higher education programs, students often engage in internships, service-learning efforts, research, or practical in-class activities (Burmesch et al., 2024; Charoenmuang et al., 2024; Coleman et al., 2024; Hall et al., 2009; Shoulders & Myers, 2013; Splan et al., 2011). Though activities often feature a hands-on component, Coleman et al. (2024) emphasized the importance of creating a holistic experience to help students reflect on the activity and understand its application in their broader learning.

Research has indicated that students prioritize possessing and displaying technical skills over developing higher-order behavioral traits, such as teamwork or communication (Bentley University, 2014; Chan, 2016; Dunne & Rawlins, 2000). When skills, such as communication, are integrated into coursework, instructors should highlight their inclusion in the curricula and their relevance to careers (Leal et al.,2020). In a recent study, students who had identified the type of career they wanted to pursue were more confident in their employability skills than those who were uncertain of their career path, indicating that instructors should help students identify their career path early and engage in high-impact opportunities that cultivate workforce skills (Parrella et al., 2023). Considered a high-impact experience, undergraduate research has been explored as a method to increase interest in science while also preparing students for the workforce (Hernandez et al., 2018; Rodenbusch et al., 2016).

Undergraduate research broadly includes scientific inquiry, creative activity, or scholarship which produces some original work from students, usually under the guidance of a faculty member or mentor (Kinkead, 2003). Splan et al. (2011) stated learning should be authentic and student-centered to allow students to take an active role in knowledge creation with real-world implications. With the ability to learn from mistakes, undergraduate research opportunities encourage students to approach situations through inquiry and become self-regulating, motivated learners (Splan et al., 2011). Though undergraduate research can help develop students' knowledge, it also builds transferrable workforce skills such as critical thinking, collaboration, communication, and self-confidence (Ashcroft et al., 2020). Hendrix and Morrison (2018) noted students emphasized the importance of verbal communication but lacked confidence in demonstrating the skill when assessing their workforce readiness. Students did not prioritize written communication as an essential workforce skill and ranked writing formal reports as the area in which they felt the least confident in their skills. Parrella et al. (2024) found students generally believed communication skills to be important and teamwork to be of lesser importance, but they contrarily lacked confidence in their communication skills compared to their strong teamwork skills. Student confidence and engagement can be enhanced by allowing students to engage in relevant and beneficial research (Hunter et al., 2007). In their exploration of undergraduate research in an agricultural communication context, Stebner et al. (2016) found that students who engaged in a research project with a topic of interest had a more positive experience and developed a greater appreciation for research and its applications compared to those who were simply exposed to research through a lecture-style format.

The National Survey on Student Engagement (NSSE) tracks *research with faculty* as an educational high-impact practice (HIP) on both the first-year and senior surveys. Though undergraduate research is generally thought to contribute to students' learning, only 5% of first-year students engaged in research, while 22% of graduating seniors reported having participated (NSSE, 2019). However, undergraduate research is often more impactful when students engage earlier in their undergraduate experience (Ashcroft et al., 2020). A recent survey of students

indicated undergraduates do not participate in research due to a preference for more practical experiences like internships, lack of time, or a lack of interest in doing research (Nyame-Mensah, 2023).

In light of these challenges, undergraduate research must be reframed as a workforce development tool, emphasizing its lasting benefits beyond the scope of the activity and integrating real-world implications through connections with industry. Students may be more open to engaging with industry-focused research studies, as they will find value in developing industry-specific knowledge and skills, especially if they have identified their career path (Hunter et al., 2007; Parrella et al., 2023; Stebner et al., 2016). At the same time, research experiences provide opportunities to develop the necessary higher-order behavioral skills, such as communication, critical thinking, and teamwork (Hernandez et al., 2018; Rodenbusch et al., 2016). There is a need, therefore, to explore the perceptions of industry perspectives of undergraduate research and its potential for improving undergraduates' workforce readiness.

## Theoretical Framework

Undergraduate research is often explored in the context of constructivist and experiential learning theories (Coleman et al., 2024; Hunter et al., 2007; Stebner et al., 2016). In constructivist learning theory, learners are active participants in developing their knowledge by interacting with the environment rather than passively consuming information (McBrien & Brandt, 1997; Piaget, 1970). Constructivism empowers learners with autonomy and fosters their motivation, while teachers act as facilitators who guide students through the inquiry process (Doolittle & Camp, 1999). Social constructivism, proposed by Vygotsky (1986), takes constructivist learning further by integrating development from social contexts, especially from faculty mentors, but also other engaged individuals, such as industry professionals (Green, 2005; Hunter et al., 2007). Learning is student-centered and situated in students' particular methods of meaning-making, developing knowledge in negotiated, social, and contextual processes (Friere, 1990; Giroux, 1988; Shor, 1987).

In constructivist pedagogy, the student and teacher work together on a project of mutual interest and engage in a two-way, dialogue-based journey of knowledge building, which Lave and Wenger (1991) and Wenger (1998) extended into a learning model coined "community of practice" (Lave & Wenger, 1991, p. 29). In this model, the learner is socialized into the community (i.e., scientific research) through a process of mutual engagement, guidance, and support by someone seasoned in the activity (i.e., faculty members). This student-mentor process allows learners the chance to work within the realms of ambiguity and uncertainty under the guidance of an expert to help students more successfully navigate these situations on their own in the future (Brown et al., 1989). Farmer et al. (1992) emphasized the importance of the expert to provide students with opportunities for self-expression and reflection. Undergraduate research is particularly appropriate for this "community of practices" approach due to the nature of developing scientific knowledge and the opportunities for students to wrestle with the inherent difficulties and unknowns of research activities (Hunter et al., 2007).

Experiential learning is distinct from, yet related to, social constructivist learning. It encourages education through hands-on experiences, where the student identifies and pursues a topic of interest to develop meta-cognitive skills (M. A. Baker et al., 2012; Kolb, 1984). The experiential learning theory (ELT) includes six propositions: 1) Learning is a process, not just an outcome; thus, feedback must emphasize the student's learning journey; 2) A primary factor in

learning is testing students' assumptions about topics through relearning and restructuring; 3) The learning process is driven by the process adjusting to and resolving conflict; 4) Learning is not just about gaining knowledge; it involves the holistic human development through 5) learners' interactions with the environment in which they are engaged; 6) Learning is seen from a constructivist perspective and involves the process of knowledge creation through a conservation-based, dialectical process (A. Y. Kolb & Kolb, 2005). Based on these tenets, it is important for experiential learning opportunities highlight not only knowledge creation but also student reflection and metacognitive development so students can apply their learning skills in other contexts (M. A. Baker et al., 2012; A. Y. Kolb & Kolb, 2009).

## Purpose and Objectives

Using social constructivist and experiential learning theories, this qualitative case study explored the role of undergraduate student research in developing graduates who will be prepared to meet the needs of industry and future careers through the perspectives of industry and university professionals. This study was guided by three research questions:

1. How can recent graduates with strong research skills contribute to the success of their employer?
2. How do industry and university professionals perceive the role of undergraduate research in social science?
3. What types of issues do industry and university professionals identify that require exploration from a social science perspective?

## Methods

This study employed a qualitative case study design, which is used to conduct an in-depth analysis of a phenomenon with clearly defined bounds, or qualifying criteria (Creswell & Creswell, 2018; Merriam & Tisdell, 2015). As defined by Creswell and Creswell (2018), qualitative research is "an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem" (p. 4). Case studies are useful for exploring and evaluating the dynamics of an activity, especially in a real-world context (Creswell & Poth, 2016; Yin, 2017). Researchers do not seek to control variables (Crowe et al., 2011), instead they explore the depth of the case through a variety of perspectives (Mott & Haddad, 2025).

This study was guided by an interpretivist perspective. Interpretivists believe in the subjective nature of reality, interpreting participants' understanding of their own reality to develop an understanding of the phenomenon at hand (Rossman & Rallis, 2012). As interpretivist researchers, we aimed to explore the complexities of participants' varied perspectives and experiences to inform our research questions. Researcher perspectives are key in this ontology, as researchers are influenced and guided by their past knowledge, opinions, and beliefs. Therefore, we outline our positionality below so readers may understand how we reached the conclusions described later in this manuscript.

The research team consisted of three agricultural communication faculty members at The Ohio State University and Texas Tech University and one graduate student at Ohio State. With experience in agricultural communication, the research team recognizes the need for well-prepared agricultural communication graduates. The team believes in the importance of engaging undergraduate students in research opportunities for personal, professional, and academic

development. All faculty researchers have experience conducting research alongside undergraduate students, though the graduate student researcher does not. Two of the faculty also co-teach an undergraduate research methods course. Of the whole team, the graduate student researcher was the one most recently employed in the agricultural industry, working as a communication director who, among other duties, supervised agricultural communication interns.

## Definition of Case & Participant Selection

This study was part of a larger USDA-funded project that sought to explore undergraduate research in agricultural communication. In this study, the case was undergraduate research as workforce development, with a specific focus on agricultural communication and research in social science. To explore the case, ten industry and university professionals were selected from Ohio and Texas to provide their perspectives on undergraduate research in the context of workforce development. Purposive sampling was used to select research participants from a variety of agriculture, food, and natural resources (AFNR) disciplines who had exposure to social science and undergraduate research (Merriam & Tisdell, 2015). Participants were selected based on their experience working with current students, recent graduates, or former undergraduate researchers. Participant aliases were generated by requesting a list of 10 gender-neutral names via ChatGPT. Table 1 describes the participant aliases, their organization description, and selection rationale.

**Table 1**

*Study participant aliases and organization descriptions*

| Alias | Source | Description |
|---|---|---|
| Alex | Industry | Agricultural marketing company |
| Jordan | Industry | Livestock advocacy association |
| Taylor | Industry | Farmer advocacy association |
| Casey | Industry | Crop advocacy association |
| Morgan | Industry | Livestock advocacy association |
| Avery | University | Student development faculty |
| Jamie | University | Food science faculty |
| Riley | University | Meat science faculty |
| Cameron | University | Natural resources faculty |
| Quinn | University | Plant and soil science faculty |

## Data Collection

A semi-structured interview guide was used to direct participant interviews, which were conducted by the faculty members of the research team (Creswell & Poth, 2016). The interview guide explored participants' perspectives of social science research, the purpose of undergraduate research, potential research topics, and their role in undergraduate research (see Table 2). Upon recruitment to the study, participants scheduled a time to meet with the researchers in-person or via Zoom for 30 to 45 minutes. Each interview was recorded using Otter.ai, which provided interview transcripts which were edited for accuracy, and identifying

information was removed by the researchers prior to analysis. Researchers also completed reflexive memos after each interview to capture their thoughts and add to the audit trail (Halpern, 1983).

**Table 2**
*Excerpt of Interview Protocol with Related Research Questions*

| Research Question | Interview Question |
|---|---|
| RQ1: Research skills in workforce | Looking ahead, I want you to think about hiring a new or recent graduate to join your team. How could a graduate prepared with a strong set of research skills help to enhance the work of your lab /organization?<br><br>How can a research skillset in social science benefit your business or discipline? |
| RQ2: Role of social science research | Tell me what you think about or what comes to mind when I mention social science research. What does social science research look like to you?<br><br>Based upon your experience, what do you see as the potential for integrating social science in your discipline / profession? |
| RQ3: Issues in need of research | Describe the types of issues that are in need of exploration from a perspective of social science or agricultural communication.<br><br>What research questions or problems could we help you to address? |

## Data Analysis

Qualitative data analysis is the process of taking collected data and translating them into related, unified categories (Adu, 2019). By thoughtfully reducing codes to themes, findings become clearer and more presentable (Richards, 2021). The data were analyzed by a graduate student using DelveQDA, an online qualitative code management software. Using an inductive approach, the 10 participant interviews were coded collectively to create one codebook. We used thematic coding to explore our research questions. Thematic coding is appropriate when exploring individuals' perspectives regarding a phenomenon and can be used to explore meanings in research data across participants (Clarke et al., 2015; Saldaña, 2021). The data were first analyzed for inductively generated codes, which were grouped into categories. Categories were then grouped into categorical themes to address the research questions. Categorical themes offer detailed descriptions of researcher-observed patterns in the data, expressed through extended phrases or sentences, rather than one- or two-word phrases (Saldaña, 2021).

## Trustworthiness

In qualitative research, the concepts of validity and reliability are supplanted by trustworthiness, which reflects the researcher's capability to convince readers that the findings deserve consideration (Lincoln & Guba, 1985; Nowell et al., 2017). Trustworthiness is often achieved through four measures: credibility, transferability, dependability, and confirmability. Credibility was achieved through prolonged engagement with the data to ensure the interpretations aligned with the participant's accounts. Transferability is the extent to which study findings can be applied to another setting (Tobin & Begley, 2004), though it falls to those seeking to apply the findings to determine the applicability of the transfer, as the original researcher cannot account for all potential applications (Lincoln & Guba, 1985). To determine if findings can be transferred, we have provided rich, thick descriptions of our data and findings. Dependability, or the understanding of the logic driving the research process, was achieved by creating an audit trail including raw data, researcher memos, data reduction and analysis processes, and process notes (Halpern, 1983; Koch, 2006). Lincoln and Guba (1985) noted confirmability can be established when credibility, transferability, and dependability have been achieved.

## Findings

This study aimed to explore the case of undergraduate research as a workforce development opportunity. The research questions that guided this study sought to understand how research skills could contribute to students' career success, how professionals perceive the role of undergraduate research, and what issues they believe are important to explore. Participants thought that students with strong research skills would greatly benefit their future employers, regardless of that organization's need for research. The following themes were identified in relation to the research questions: (1) *Success in the workplace is more than technical knowledge*; (2) *Research skills are desirable workforce skills*; and (3) *Social science research can address agricultural issues alongside industry*.

### *Success in the Workplace is More than Technical Knowledge*

When thinking about the success of new graduate hires, participants indicated that, first and foremost, students need to demonstrate a good work ethic. "Whether they have the technical skill of it or not, sometimes it's less important. We can teach that… I cannot teach you to be motivated to want to do this job and to provide value" (Jordan). Along with a strong ethic, participants sought students who demonstrated a passion for their work. "I would rather have somebody who's passionate and hardworking and just excited to learn. Those are the most important to me; that's perfect" (Cameron). In addition, participants valued new hires who can work efficiently and effectively, manage their time well, and be motivated to do their work. "Being able to not have someone hold your hand and tell you exactly what to do. Being able to look at a problem and say, 'Okay, well, this is how I'm going to solve this.'" (Quinn).

As workplaces are often collaborative in nature, participants stressed the need for students to work effectively in a team. "But how you function and provide value in a workplace sometimes is less reliant on that and more reliant on: 'Can you be a good team member?'" (Jordan). They noted that students often dislike the idea of group work and don't recognize its importance in the workplace. "They want to do things on their own. They feel better, they're

more successful. They're not a big fan of working in groups… They hate it because they have no control of the other person (Riley). They also emphasized employees' ability to work effectively with diverse stakeholders, including farmers, consumers, industry partners, and politicians.

> I know a lot of people don't like to talk about politics, but it's so essential, really, for all organizations, and especially associations, especially agriculture, because you need some of those policies to help really successful organizations work, but I think you also have to work with both sides. (Casey)

Participants thought students typically have strong leadership skills but must invest more time collaborating in effective and purposeful group settings to better prepare for the realities of the workforce.

As recent graduates are likely to be the youngest members of any working team, they may be able to identify areas for company improvement or integrate up-to-date processes learned in school. Participants emphasized the need for new hires to ask new questions, challenge the status quo, and drive the exploration of new topics.

> They have a new fresh perspective of this organization as they've just been hired. They'll be valuable and challenging some of those ideas and also they can make a significant impact because, again, things are changing so fast that those ideas and skills are needed more than ever to help organizations take it to the next level (Casey)

Participants mentioned the importance of gaining expertise in their topic of interest but also being open to collaborating with other content areas. As stakeholders often have diverse perspectives, it is important to understand their needs and desires for the outcomes of their work.

Along with work ethic and teamwork, strong communication skills were described as critical to workforce success. "You have to have people skills. You have to have emotional intelligence to be able to communicate effectively. You can be smart as they come. But if you lack those emotions, you're going to struggle" (Riley). Participants viewed communication, both written and verbal, as key to working effectively within teams and keeping stakeholders informed. "I think that communication is huge. I've learned a whole lot about how to communicate efficiently in the workspace, just with the people that I work with every day, and then also with clients and other industry partners" (Alex). Participants emphasized the need to not only verbally present information but also to listen to feedback and questions.

> That listening skill is really valuable. You're energized as a scientist with this great information you have; sometimes, it's hard to hear what's being said or asked. It takes that ability to just pause and try to hear what's being said or not. (Jordan)

For communication professionals, there is also a need to understand and share the value of communication work to their company's bottom line. "Really putting a business lens on the communication so that you can show measurable outcomes for the work. Does it make membership more valuable? Does it help accomplish the mission? Does it increase sales? Does it change attitudes?" (Taylor).

Participants thought engaging in undergraduate research would provide students the opportunity to develop these higher-order behavioral traits. "If I had gone through some of those

processes earlier and had that skill set, I think it would help me be a better communicator and do a better job of keeping our members apprised" (Morgan). Research was viewed as even more impactful when it could be applied in a real-world context. "That's where I'm able to connect the applied side with the research, and then bring students in, so that in hopes that they take the lecture, the labs they have now they see how it applies to real world" (Riley).

### *Research Skills are Desirable Workforce Skills*

Participants were asked to reflect on what research skills they would desire in a new hire and how those skills could be translated into a work environment. Above all, a well-rounded researcher with skills in quantitative and qualitative research methods and analysis was most desirable. "Bringing those people on with those skills to help you advance the mission and the vision of the organization and move forward. And that's where I think those strong research skills coming in" (Avery). Though participants noted these skills could be taught, those who enter a position with these abilities will likely have an advantage.

Participants indicated one of the most important skills for students was the ability to effectively communicate results and findings for academic and lay audiences. "You've got to be able to translate scientific jargon and findings into a way that the broader body of people are going to understand it" (Quinn). For consumers, this means putting results in easy-to-understand but not oversimplified terms, including effective data visualizations. "I would say that visual translation, but also written translation that can take a very complex topic and boil it down to still be accurate, factually accurate but not necessarily be in technical terms" (Jordan).

To be an effective researcher or employee, participants noted students must also understand the area in which they are working or seek out those who do. "I find that without having any sort of subject matter expertise, that there sometimes is a disconnect with language used or just knowing what questions to ask" (Jamie). Participants emphasized the significance of conducting a literature review to teach students how to locate relevant, credible, and appropriate sources. "So really identifying a valid resource of literature that you can move forward with to do a correct analysis when you're writing something… I think verifying from multiple places the accuracy of the information that you're trying to rely on." (Avery). After finding literature, it is important for students to be able to read, interpret, and communicate the information they read.

> I'm not expecting them to be a reviewer for a journal. But can you read a research report more than the abstract and figure out, 'Okay, here are the three things, or I see these five things…' We need somebody in the middle who can read and understand technical. But understands where the [communications] people and PR want to go and find that middle ground that we can all live with, because sometimes we're real far apart. (Jordan)

Overall, participants underscored the significance for students to locate, integrate, and disseminate technical information, regardless of their position.

Though participants expressed the value of undergraduate research to developing workforce skills, they also said they think students didn't know how to start engaging in research. To start, participants recommended students engage with a topic they were passionate about. "It has to be something that the students [are] interested in. Don't pick a topic that you don't like" (Casey). Participants encouraged students to seek out research opportunities with faculty members, especially if they find a topic of interest to both the student and the faculty

member. “Listen to what their research is. And if that’s something that interests you, don’t hesitate to go and ask them said, you know, ‘I’d like to do some undergraduate research is there some way I could get involved with that?’” (Avery). Participants recommended developing strong projects that will interest and benefit stakeholders, aligning research with potential funding opportunities. “If you’re asking for funding, make sure that you’re going to the right funding group that also would benefit” (Casey). In addition, identifying local or regional needs can be a strong way to find research partners. “As a Land Grant institution, our job is to serve community needs” (Riley).

According to the participants, data collection and analysis are critical elements of undergraduate research that also have applications in the workforce. “[My team does] some research on like, the state of the ag industry. Just having someone who can analyze that information and see how we can apply it to our communication strategies, I think, is extremely important.” (Alex). Jordan agreed: “We see many people who can do the skill, but they don’t have the experience to run the stats or tell you what is truly happening there.” Survey development and interviewing were viewed as highly transferable and valuable workforce skills.

> Some of them have never even considered how to effectively write survey questions or focus group questions. The perception is often that these are very simplistic activities and not methodological, not needing a skill set. And I think that you would probably agree with me, but that’s certainly not the case. Anybody can write a survey sure; whether that survey is a good survey is a whole other concept. (Jamie)

As organizations often utilize surveys or interviews, it is important, therefore, to develop students’ proficiency in both quantitative and qualitative collection and analysis methods and emphasize their application in the real world.

For agricultural communicators, social science research was viewed very similarly to their daily work. “When I think of research, and the [agricultural communication] space or just the public relations space, I think a lot about researching more about our audiences and what’s important to them, why they make their decisions, things of that nature” (Alex). Participants noted that communicators could take hard data and translate it into something that resonates with consumers.

> A lot of those communicators are falling into those roles because telling that sustainability story is becoming more and more important, even being able to understand how those impact reports work and being able to again, take that raw data and turn it into something that a consumer or a customer, if you’re in the X space, like a retailer, can understand and better articulate the efforts that are being made by understanding the science behind it (Morgan).

While communicators may not consider themselves technical experts in their specific industry, participants noted that they play a critical role in making research and science accessible to members and the public.

### *Social Science Research Can Address Agricultural Issues Alongside Industry*

Participants thought that social science research could be used to explore current issues in the agricultural industry and understand the diverse perspectives within each issue. With diverse backgrounds, participants mentioned a wide variety of content areas that students could explore. One of the most highly mentioned methods was audience analysis. Participants stressed the importance for students to evaluate audience needs, communication preferences, and learning how to develop messaging that resonates with different audience segments. "They're very good at getting to the point, but they don't account for the various audiences out there who may or may not pick up what they're putting down" (Riley). Participants stressed the importance of communicators understanding their audience, regardless of whether their job is research- or business-focused. "No matter where they go, just being able to better understand their audience and how they can effectively communicate with them is a big part of their job, and I think that' also a big part of research" (Alex). They also emphasized building trust in science and combatting misinformation through audience-appropriate messaging. "How do we make ourselves seem more credible and trustworthy, while also trying to combat the disinformation that is being spread?" (Morgan).

Participants indicated another important area for social science research was exploring consumer perspectives of industry practices and consumer actions in the marketplace. While several participants worked in fields or disciplines considered to be bench sciences, they noted how consumer perceptions and behaviors drive market trends, acceptance of practices, new technology, and more, and were critical elements of their particular content areas. "But the perception and customer perception, that's what drives it. And it's sometimes things that we [researchers] think are important are not actually what ends up being important out in the store" (Quinn). Participants also noted the importance of understanding consumer beliefs, especially how they related to political beliefs, to develop messaging that resonated with different groups. "Putting content in front of consumers and saying, "What do you like about this video? Where's your interest? What causes you to be concerned? Is it the words? Is it the image?" (Jordan).

Understanding audiences is important for the domain-specific topics that participants identified, the first being climate change. While broad in nature, participants mentioned specific avenues worth investigating, including farmer attitudes and beliefs toward climate change and the practices they use to combat its challenges, environmental sustainability in agriculture, and adopting renewable energy. To develop messaging that resonates with farmers, it is again important to understand their beliefs, perspectives of practices, and willingness to accept change. When farmers or producers are engaged in climate change practices, participants emphasized the importance of effectively capturing and sharing that information with consumers and assessing their responses to sustainability practices. "If we had a better understanding of where consumers are in relation to their expectations for these cage-free commitments, or better understanding of what is really driving their decisions when they go to the grocery store" (Morgan). Participants also noted the importance of understanding different practices by region, as what works in one area may be ineffective in another. "A farmer who farms cotton in [one region] is going to be, you know, far different from a farmer who farms cotton in [another region]" (Alex).

Organizational communication was another area participants expressed interest, especially those working in the industry. Participants noted the importance of understanding membership engagement, messaging strategies, members' reasons for joining, and

communication preferences. “And so, for us, it’s what information can we provide that will create that value?” (Taylor). Participants also emphasized the need for research in crisis and risk communication. Regardless of industry, participants thought it was important to understand crisis communication strategies for agricultural organizations, including best management practices, knowing how to respond, and consumer perspectives.

> We can refine that with those insights so that when it is time to use it—whether it’s a crisis or time to launch something for a marketing campaign to consumers— that we’ve done our diligence to try to make it the best it can be” (Jordan).

Taken together, research into organizational, crisis, and risk communications not only provides value to industry partners but offers real insights on pertinent topics like food safety, outbreaks, and recalls, specifically how consumers viewed the crisis, how companies responded, and how the situation was resolved. Finally, participants thought content and social media analyses were important for students to understand, as they can easily be translated into marketing research in the business world, especially for communicators. “Social media is so much a part of communicating about anything anymore” (Cameron).

## Discussion, Implications, & Recommendations

Workforce development is a critical concern for higher education, as employers expect new hires to be workforce-ready upon graduation (Arkes, 1999; Finley, 2021). While students are often focused on gaining technical knowledge during their undergraduate careers, previous research indicates they are less concerned with developing higher-order behavioral traits (Bentley University, 2014; Dunne & and Rawlins, 2000) and are, therefore, lacking these traits when starting their careers (Johnson, 2024; Leal et al., 2020). While participants acknowledged technical knowledge was important, they appeared more concerned with recruiting well-rounded graduates who possessed a strong work ethic, ability to work on a team, and robust communication skills, which aligned with previous research (Hendrix & Morrison, 2018; Parrella et al., 2023).

Although participants’ experiences with research varied, they viewed undergraduate research as an opportunity for students to increase their workforce readiness by developing higher-order behavioral skills. Through the activities necessary for completing a research project, including finding and reviewing credible sources, instrument development, data collection and analysis, and the interpretation and dissemination of results, participants believed that students would develop a working understanding of the value of professional skills, such as communication and teamwork, while also gaining industry-specific knowledge through experiential learning. In addition, they saw the value of undergraduate research in connecting students with real-world issues and developing their own knowledge and passion for topics important to industry. In this way, students could engage in socially constructed learning, by learning from both their faculty mentors and industry (Green, 2005; Hunter et al., 2007; Lave & Wenger, 1991; Vygotsky, 1986; Wenger, 1998). In addition, as an experiential learning opportunity, undergraduate research would expose students to some of the challenges industry professionals are dealing with, to better understand them and prepare for future careers in their selected industry (M. A. Baker et al., 2012; Kolb, 1984).

Social science research was particularly applicable in an agricultural communication context, as participants noted how research skills were directly transferable to common communication tasks, such as audience analysis, message development, understanding stakeholder perceptions, and effective storytelling. As recommended by Leal et al. (2020), students who engage in undergraduate research should be told the benefits and applicability of their research activities to better understand how it relates to their future careers. Faculty members should help students brainstorm projects that they can get excited about, which also have an industry application. Dedicated conversations with faculty members regarding the purpose and impact of their research will also allow students the chance to reflect on their experiences, a critical element of social constructivist and experiential learning (Coleman et al., 2024; Farmer et al., 1992; A. Y. Kolb & Kolb, 2005).

As workforce development continues to be an important function of higher education, this research establishes undergraduate research as a viable solution avenue to improving students' readiness for their future careers. Enhanced university-industry partnerships would allow additional experiential learning opportunities that benefit both industry and higher education (M. A. Baker et al., 2012; Kolb, 1984). The agricultural industry benefits from the increase in well-rounded students upon graduation, as well as research outputs that explore their specific issues. By allowing students to explore timely, industry-centered topics, undergraduate research socializes students in both research and industry communities of practice (Lave & Wenger, 1991), exposing them to best practices in research and exposing them to their future careers. Framing undergraduate research as an opportunity to intentionally network and build skills for their future career may encourage more students to participate in research opportunities, though it is important for students to identify their intended career early to maximize these benefits (Leal et al., 2020).

As outlined in social constructivist and experiential learning theories, it is important for faculty mentors to be intentional in designing and delivering learning opportunities (Brown et al., 1989; Doolittle & Camp, 1999; Farmer et al., 1992; A. Y. Kolb & Kolb, 2005; Vygotsky, 1986). Faculty members should understand students' career goals and develop a research project that aligns with their interests (Friere, 1990; Giroux, 1988; Shor, 1987). Throughout the research project, faculty mentors should highlight how each phase of the research process, including study development, literature review, data analysis, and manuscript development, relates to students' intended career, so that students can understand the purpose and application of the activities (Brown et al., 1989). Faculty should also connect students with industry partners to help build students' networks, emphasize the applicability of their work, and encourage learning from other social contexts (Green, 2005; Hunter et al., 2007). It is also important to incorporate meaningful reflection throughout all stages of the project, so that students can highlight skills and knowledge developed, address assumptions or ambiguity, ask questions, express concerns, and identify areas of improvement or necessary change (A. Y. Kolb & Kolb, 2005, Lave & Wenger, 1991; Wenger, 1998).

Though participants in this study worked in a variety of roles, they were all connected to agriculture in some way, either as industry professionals or faculty members. While they were asked to think broadly about undergraduate research, their workforce domain and the fact that this study was conducted by agricultural communication social scientists likely caused the interviews and subsequent results to focus on undergraduate research in the context of agriculture and, more specifically, agricultural communication. In addition, as a qualitative case study with a convenience purposive sample, these results are not generalizable to a larger population, though

they may be applicable to those exploring the case of undergraduate research for agricultural workforce development.

Future research should explore other perceptions of undergraduate research as a workforce development tool, including interviews with industry professionals and faculty members from a variety of agricultural domains. This research could also more effectively explore the perspectives of industry and faculty on the role of higher education in workforce development, which was not examined in this study. Research should also explore the perceptions of undergraduate students to understand how they view research and its feasibility during their undergraduate careers. Additionally, research exploring the current state and availability of undergraduate research in agricultural majors would be valuable for identifying how universities integrate undergraduate research into curricula, what successful integration looks like, the benefits of research for undergraduates, and lessons for other programs.

## References


Adu, P. (2019). *A step-by-step guide to qualitative data coding*. Routledge. https://doi.org/10.4324/9781351044516

Alston, A., Roberts, R., & English, C. (2020). Toward a holistic agricultural student recruitment model: A national analysis of the factors affecting students' decision to pursue an agricultural related degree. *Journal of Research in Technical Careers, 4*(1), 1–23. https://doi.org/10.9741/2578-2118.1071

Andreasen, R. J. (2004). Integrating experiential learning into college of agriculture capstone courses: Implications and applications for practitioners. *NACTA Journal, 48*(3), 52–57. https://nactaarchives.org/attachments/article/462/Andreasen_March04NACTA_JOURNAL-9.pdf

Arkes, J. (1999). What do educational credentials signal and why do employers value credentials? *Economics of Education Review*, *18*(1), 133–141. https://doi.org/10.1016/S0272-7757(98)00024-7

Ashcroft, J., Blatti, J., & Jaramillo, V. (2020). Early career undergraduate research as a meaningful academic experience in which students develop professional workforce skills: A community college perspective. In *Integrating professional skills into undergraduate chemistry curricula* (1365, pp. 281–299). American Chemical Society. https://doi.org/10.1021/bk-2020-1365.ch016

Baker, M. A., Robinson, J. S., & Kolb, D. A. (2012). Aligning Kolb's experiential learning theory with a comprehensive agricultural education model. *Journal of Agricultural Education, 53*(4), 1–16. https://doi.org/10.5032/jae.2012.04001

Baker, V. L., Baldwin, R. G., & Makker, S. (2012). Where are they now? Revisiting Breneman's study of liberal arts colleges. *Liberal Education, 98*(3), 48–53. https://eric.ed.gov/?id=EJ994656

Barber, M., Donnelly, K., & Rizvi, S. (2013). *An avalanche is coming: Higher education and the revolution ahead.* Institute for Public Policy Research. https://www.ippr.org/articles/an-avalanche-is-coming-higher-education-and-the-revolution-ahead

Bentley University. (2014). *Bentley University's PreparedU project on millennial preparedness*. https://www.slideshare.net/slideshow/prepared-u-project-on-millennial-preparedness/30584810

Bowen, W. G. (2015). *Higher education in the digital age: Updated edition*. https://press.princeton.edu/books/paperback/9780691165592/higher-education-in-the-digital-age

Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher, 18*(1), 32–42. https://doi.org/10.3102/0013189X018001032

Burmesch, L., Coleman, B., King, A., Legg, S., & Cartmell, D. (2024). Exploring student perspectives of project-based learning in an agricultural communications capstone course. *Journal of Applied Communications, 108*(4), Article 2. https://doi.org/10.4148/1051-0834.2555

Chan, R. Y. (2016). Understanding the purpose of higher education: An analysis of the economic and social benefits for completing a college degree. *Journal of Education Policy, Planning and Administration, 6*(5), 1–40. https://scholar.harvard.edu/files/roychan/files/chan_r._y._2016._understanding_the_purpose_aim_function_of_higher_education._jeppa_65_1-40.pdf

Charoenmuang, M., Knobloch, N., & Wang, H.-H. (2024). Localized land-grant partnership for STEM integration through AFNR: High school teachers' experiences. *Journal of Agricultural Education, 65*(3), 35–51. https://doi.org/10.5032/jae.v65i3.2462

Clarke, V., Braun, V., & Hayfield, N. (2015). Thematic analysis. In *Qualitative psychology: A practical guide to research methods* (3rd ed.) SAGE Publications.

Colby, A., Ehrlich, T., Sullivan, W. M., Dolle, J. R., & Shulman, L. S. (2011). *Rethinking undergraduate business education: Liberal learning for the profession*. The Carnegie Foundation for the Advancement of Teaching. https://cepa.stanford.edu/content/rethinking-undergraduate-business-education-liberal-learning-profession

Coleman, B., Bunch, J. C., & Roberts, T. G. (2024). Experiential learning in agricultural education: A philosophical discussion. *Journal of Agricultural Education, 65*(1), 283–302. https://doi.org/10.5032/jae.v65i1.2479

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches (Fifth Edition)*. SAGE Publications, Inc.

Creswell, J. W., & Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches*. SAGE Publications.

Crowe, S., Cresswell, K., Robertson, A., Huby, G., Avery, A., & Sheikh, A. (2011). The case study approach. *BMC Medical Research Methodology, 11*(1), 1–9. https://doi.org/10.1186/1471-2288-11-100

Dicker, R., Garcia, M., Kelly, A., & Mulrooney, H. (2019). What does 'quality' in higher education mean? Perceptions of staff, students and employers. *Studies in Higher Education*, *44*(8), 1425–1441. https://doi.org/10.1080/03075079.2018.1445987

Doolittle, P. E., & Camp, W. G. (1999). Constructivism: The career and technical education perspective. *Journal of Career and Technical Education, 16*(1). https://doi.org/10.21061/jcte.v16i1.706

Dunne, E., & Rawlins, M. (2000). Bridging the gap between industry and higher education: Training academics to promote student teamwork. *Innovations in Education and Training International, 37*(4), 361–371. https://doi.org/10.1080/135580000750052973

Easterly, R. G., Warner, A. J., Myers, B. E., Lamm, A. J., & Telg, R. W. (2017). Skills students need in the real world: Competencies desired by agricultural and natural resources

industry leaders. *Journal of Agricultural Education*, *58*(4), 225–239. https://doi.org/10.5032/jae.2017.04225

Farmer, J. A., Buckmaster, A., & LeGrand, B. (1992). Cognitive apprenticeship: Implications for continuing professional education. *New Directions for Adult and Continuing Education, 1992*(55), 41–49. https://doi.org/10.1002/ace.36719925506

Fernandez, J. M., Goecker, A. D., Smith, E., Moran, E. R., & Wilson, C. A. (2020). *Employment opportunities for college graduates in food, agriculture, renewable natural resources, and the environment, United States, 2020–2025*. U.S. Department of Agriculture National Institute of Food and Agriculture. https://www.purdue.edu/usda/employment/

Finley, A. (2021). *How college contributes to workforce success: Employer views on what matters most*. Association of American Colleges and Universities. https://www.aacu.org/research/how-college-contributes-to-workforce-success

Friere, P. (1990). *Pedagogy of the oppressed*. Continuum. https://doi.org/10.2307/30023905

Giroux, H. (1988). *Schooling and the struggle for public life: Critical pedagogy in the modern age.* University of Minnesota Press. https://doi.org/10.4324/9781315632254

Green, P. (2005). Spaces of influence: A framework for analysis of an individual's contribution within communities of practice. *Higher Education Research & Development, 24*(4), 293–307. https://doi.org/10.1080/07294360500284607

Hall, K., Rhoades, E., & Agunga, R. (2009). Student publications' place in the agricultural communication curricula. *Journal of Applied Communications, 93*(1), Article 4. https://doi.org/10.4148/1051-0834.1202

Halpern, E. S. (1983). *Auditing naturalistic inquiries: The development and application of a model*. Indiana University. https://eric.ed.gov/?id=ED234084

Hendrix, R., & Morrison, C. C. (2018). Student perceptions of workforce readiness in agriculture. *Journal of Agricultural Education, 59*(3), 213–228. https://doi.org/10.5032/jae.2018.03213

Hernandez, P. R., Woodcock, A., Estrada, M., & Schultz, P. W. (2018). Undergraduate research experiences broaden diversity in the scientific workforce. *BioScience*, *68*(3), 204–211. https://doi.org/10.1093/biosci/bix163

Hunter, A. B., Laursen, S. L., & Seymour, E. (2007). Becoming a scientist: The role of undergraduate research in students' cognitive, personal, and professional development. *Science Education, 91*(1), 36–74. https://doi.org/10.1002/sce.20173

Hurdle, C. (2025). Piecing it all together: An examination of Land-Grant history and contemporary contexts. *Journal of Agricultural Education, 66*(1), Article 26. https://doi.org/10.5032/jae.v66i1.2489

Johnson, B. (2024). *USA skills survey report 2023-2024*. AgCareers.com. https://www.agcareers.com/u-s-skills-survey-reveals-industry-workforce-needs-and-gaps.cfm#gsc.tab=0

Kinkead, J. (2003). Learning through inquiry: An overview of undergraduate research. New *Directions for Teaching and Learning, 2003*(93), 5–18. https://doi.org/10.1002/tl.85

Koch, T. (2006). Establishing rigour in qualitative research: The decision trail. *Journal of Advanced Nursing, 53*(1), 91–100. https://doi.org/10.1111/j.1365-2648.2006.03681.x

Kolb, A. Y., & Kolb, D. A. (2005). *Learning styles and learning spaces: Enhancing experiential learning in higher education*. Academy of Management Learning & Education. https://doi.org/10.5465/amle.2005.17268566

Kolb, A. Y., & Kolb, D. A. (2009). The learning way: Meta-cognitive aspects of experiential learning. *Simulation & Gaming*, *40*(3), 297–327. https://doi.org/10.1177/1046878108325713

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice-Hall Inc.

Lagemann, E. C., & Lewis, H. (2012). Renewing the civic mission of American higher education. In E. C. Lagemann & H. Lewis, *What is college for? The public purpose of higher education* (pp. 9–45). Teachers College Press.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge University Press. https://doi.org/10.1017/CBO9780511815355

Leal, A., Lawson, K., Telg, R., Rumble, J., Stedman, N., & Treise, D. (2020). Technically speaking: Technical skills needed for agricultural communication baccalaureate graduates. *Journal of Applied Communications, 104*(3), Article 1. https://doi.org/10.4148/1051-0834.2339

Lincoln, Y. S., & Guba, E. G. (1985). Establishing trustworthiness. In *Naturalistic Inquiry*. SAGE Publications.

McBrien, J. L., & Brandt, R. S. (1997). *The language of learning: A guide to education terms*. Association for Supervision and Curriculum Development. https://eric.ed.gov/?id=ED408713

Merriam, S. B., & Tisdell, E. J. (2015). *Qualitative research: A guide to design and implementation*. John Wiley & Sons.

Mott, R., & Haddad, B. (2025). A call to better qual: A philosophical and methodological examination to advance case study research. *Journal of Agricultural Education, 66*(1), Article 41. https://doi.org/10.5032/jae.v66i1.2762

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods, 16*(1), 1–13. https://doi.org/10.1177/1609406917733847

NSSE. (2019). *Engagement insights: Survey findings on the quality of undergraduate education*. Indiana University Center for Postsecondary Research. https://eric.ed.gov/?id=ED604974

Nyame-Mensah, A. (2023). *Infographic: Why don't certain students participate in formal research experiences?* Center for Evaluating the Research Pipeline. https://cra.org/crn/2023/11/infographic-why-dont-certain-students-participate-in-formal-research-experiences/

Parrella, J. A., Esquivel, C., Leggette, H. R., & Murphrey, T. P. (2023). Preparing agricultural leaders: An assessment of agricultural students' perceived importance and development of employability skills. *The Journal of Agricultural Education and Extension, 30*(2), 233–255. https://doi.org/10.1080/1389224X.2023.2179086

Piaget, J. (1970). Piaget's theory. In L. Carmichael & P. H. Mussen, *Carmichael's Manual of Child Psychology: Vol. 3rd Edition, Vol. 1*. Wiley.

Richards, J. C. (2021). Coding, categorizing, and theming the data: A reflexive search for meaning. In *Analyzing and Interpreting Qualitative Research: After the Interview (First Edition)*. SAGE Publications.

Robinson, J. S., & Garton, B. L. (2008). An assessment of the employability skills needed by graduates in the college of agriculture, food and natural resources at the University of Missouri. *Journal of Agricultural Education, 49*(4), 96–105. https://doi.org/10.5032/jae.2008.04096

Rodenbusch, S. E., Hernandez, P. R., Simmons, S. L., & Dolan, E. L. (2016). Early engagement in course-based research increases graduation rates and completion of science, engineering, and mathematics degrees. *CBE Life Sciences Education*, *15*(2), 1–10. https://doi.org/10.1187/cbe.16-03-0117

Rosendale, J. A. (2017). Gauging the value of MOOCs: An examination of American employers' perceptions toward higher education change. *Higher Education, Skills and Work-Based Learning*, *7*(2), 141–154. https://doi.org/10.1108/HESWBL-09-2016-0065

Rossman, G. B., & Rallis, S. F. (2012). *Learning in the field: An introduction to qualitative research*. SAGE.

Saldaña, J. (2021). *The coding manual for qualitative researchers (4th Edition)*. SAGE Publications, Inc.

Schuh, G. E. (1986). *Revitalizing the land grant university: An abridgment*. https://eric.ed.gov/?id=ED282473

Shor, I. (1987). *Critical teaching and everyday life*. University of Chicago Press. https://doi.org/10.2307/356596

Shoulders, C. W., & Myers, B. E. (2013). Teachers' use of experiential learning strategies in agricultural laboratories. *Journal of Agricultural Education, 54*(3), 100–115. https://doi.org/10.5032/jae.2013.03100

Splan, R. K., Porr, C. A. S., & Broyles, T. W. (2011). Undergraduate research in agriculture: Constructivism and the scholarship of discovery. *Journal of Agricultural Education, 52*(4), 56–64. https://doi.org/10.5032/jae.2011.04056

Stebner, S., King, A. E. H., & Baker, L. M. (2016). Expectations and experience: An exploratory study of undergraduate research experiences as viewed through the experiential learning theory. *NACTA Journal*, *60*(4), 364–371. https://nactaarchives.org/index.php/vol-60-4-dec-2016?start=0

Tobin, G. A., & Begley, C. M. (2004). Methodological rigour within a qualitative framework. *Journal of Advanced Nursing, 48*(4), 388–396. https://doi.org/10.1111/j.1365-2648.2004.03207.x

Vygotsky, L. S. (1986). *Thought and language—Revised edition (A. Kozulin, Ed.; revised edition)*. The MIT Press.

Wenger, E. (1998). *Communities of practice: Learning, meaning and identity*. Cambridge University Press.

Wolf, A. (2003). *Does education matter?: Myths about education and economic growth*. Penguin Business.

Yin, R. K. (2017). *Case study research and applications: Design and methods (6th edition).* SAGE Publications, Inc.