

Core Competencies in Agripreneurship: A Scoping Review

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Agripreneurship is frequently included in programs and research that aim to increase communities' economic development. This scoping review aims to understand how agripreneurship is operationalized in research and practice. We analyzed 76 studies that were conducted across 97 countries to determine their research practices and the competencies they examined. The results showed the studies examine agripreneurial competencies, agripreneurial system, agripreneurial outcomes, agripreneurial training, and knowledge generation. Agripreneurship is operationalized through the core competencies of agripreneurship. The core competencies identified were business skills, characteristics, social skills, knowledge, other skills, communication skills, external supports, agricultural skills, values, and background. Integrating all these competencies in agripreneurship interventions and research could increase the ability of participants to start and maintain their enterprise.

Keywords: rural entrepreneurship, economic development, enterprise, international development, small and medium enterprises

Introduction

Economic development is often seen as the hallmark method for eradicating poverty in developing countries (Banerjee & Duflo, 2012; Polak & Warwick, 2013; Sen, 1999) and countries around the world have been turning to entrepreneurship to spur economic growth, innovation, and job-creation (Baxter et al., 2014; Departamento Nacional de Planeacion, 2011; Egorov et al., 2019; OECD et al., 2019; Ozaralli & Rivenburgh, 2016; United Nations, 2015; Vodă & Florea, 2019; Yami et al., 2019). As of 2022, countries categorized as low-income averaged 74.84% reporting self-employment (i.e. working on their own account or with one or a few partners) and lower-middle income countries reporting an average of 57.27% (World Bank, 2022). This contrasts with 14.47% in high-income countries. Therefore, in the poorest countries, larger shares of the population have some type of small business or are self-sustaining, and much of that work is in agriculture (Gindling & Newhouse, 2014). Entrepreneurship can create jobs and opportunities for urban and rural populations while also promoting individual, community, and societal wellbeing (Dong et al., 2021; Franco & Newey, 2020; Henderson & Weiler, 2010; Pathak, 2021). Rural areas in particular have been identified as ripe for entrepreneurship development, especially with youth (Departamento Nacional de Planeacion, 2011; Egorov et al., 2019; Rezaei-Moghaddam & Izadi, 2019). Agricultural extension and education has been developing entrepreneurs across the United States and abroad in agricultural and related fields through a variety of programming in response to community needs (Campbell & Edwards, 2024; Iyer, 2019; Schmidt et al., 2022; Wang, 2014). Despite the promise of entrepreneurship, it is important to note that self-employment and entrepreneurial endeavors may be out of necessity (Jayachandran, 2020) and that entrepreneurship itself is complex due to an assortment of technical and interpersonal knowledge, skills and characteristics (Cunningham & Lischeron, 1991). Policy makers and development institutions, such as agricultural extension, have recognized the need to support entrepreneurs but there is not cohesive evidence on what programs best serve them.

With many small enterprises operating within the agricultural sector, entrepreneurship can support innovation and the achievement of sustainable development goals across resiliency, climate-smart adaptations, and economic growth (Sulaiman et al., 2024; Sulistyorini et al., 2024). Agricultural entrepreneurship could enable rural communities to reach their development goals while maintaining their traditions. Agricultural entrepreneurship, or agripreneurship, develops new opportunities or creates on-farm diversification to create or grow an agribusiness, such as agritourism, direct marketing, and multifunctional farming (Choo & Park, 2022; Fitz-Koch et al., 2017; Kordel, 2016; Tohidyan Far & Rezaei-Moghaddam, 2019; Zawadzka & Kurdys-Kujawska, 2018). Agripreneurship can increase revenue, resilience, and unity across the agricultural value chain while reducing urban migration and subsidy dependence (Fitz-Koch et al., 2017). Current research on agripreneurship focuses on entrepreneurial skills, diversification, entrepreneurial motivation, farm structure, and finances (Dias et al., 2019b; Fitz-Koch et al., 2017). However, many agripreneurship programs aim to build a variety of entrepreneurship competencies without including information that is particular to agricultural needs despite differences in resources, culture, and access between urban and rural areas.

Agripreneurship program content varies amongst the inclusion of technical, soft, and business skills (Authors, 2024; Abukari et al., 2022; Adeyanju et al., 2021; Magrefi et al., 2018; Nain et al., 2019; Ubfal et al., 2022). To build relevant competencies, agripreneurship programs need to be attuned to community needs but also specifically address program content and outcomes. Agricultural and rural entrepreneurship program content, purposes, and outcome measures vary greatly despite the goal to educate youth and adults on agripreneurship. Though regional differences are expected to account for culture- and context-dependent variability, a

lack of cohesion can result in inadequate preparation for future agricultural entrepreneurs. Therefore, the purpose of the scoping review is to understand how agripreneurship is operationalized in research and practice. To achieve the study's purpose, the research objectives are as follows:

- (1) Identify commonalities within agripreneurship research purposes, objectives, and outcome measures,
- (2) Clarify the key competencies of agripreneurship.

Materials and Methods

A scoping review systematically examines literature, synthesizes evidence, and addresses knowledge gaps (Munn et al., 2018). Therefore, this methodology was appropriate to achieve the study's purpose as it allowed for the gathering of relevant literature to identify and synthesize agripreneurship practices to promote understanding of this phenomenon. For this study, 'competencies' refers to a wide range of knowledge, characteristics, skills, and abilities.

This scoping review followed the guidelines proposed by Arksey and O'Malley (2005). First, we identified the research question: How is agripreneurship operationalized in research and practice? Then we developed the search strategy, defined inclusion and exclusion criteria of relevant studies, and extracted and synthesized study data to report the results. Step one, identifying the research question, necessitates the definition of parameters to identify the important aspects of the research question (Arksey & O'Malley, 2005). First, agripreneurship was defined as generating new opportunities or engaging in on-farm diversification to create or grow an agribusiness (Fitz-Koch et al., 2017). This was essential to beginning the search for relevant sources.

Search Strategy

To search for relevant sources, articles were limited to those published between 2000 and 2022. This time frame aimed to capture the uptick in articles on agripreneurship that occurred around 2000 signaling agripreneurship as a separate discipline from entrepreneurship through to contemporary times (Dias et al., 2019a). The predetermined search terms and Boolean operators were chosen based on cursory searches on Google Scholar (Table 1). Four internet databases were used to find relevant literature according to the predetermined search terms and Boolean operators: Google Scholar, Web of Science, PubMed, and Science Direct (Arksey & O'Malley, 2005; Baker et al., 2022; Brüne & Lutz, 2020; Catalano et al., 2019; Fitz-Koch et al., 2017). These databases were selected to ensure inclusion of relevant sources. This process was validated by examining scoping reviews published on similar topics (e.g. food innovations, agripreneurship definitions, and entrepreneurship) and comparing their reference list to ours. For this research, the search terms 'rural' and 'agripreneurship' were both included in order to capture a wide range of articles since there is a large amount of overlap between rural and agripreneurship since agripreneurship includes rural areas, and rural entrepreneurship can include agricultural enterprises (Dias et al., 2019a; Fortunato, 2014).

Table 1*Search Terms and Boolean Operators*

Concept	Search Terms
Entrepreneurship	‘entrepreneurship’, or ‘small business development’, or ‘small to medium enterprises’
Agricultural Entrepreneurship	‘Agricultural entrepreneurship’ or ‘agricultural diversification’, or ‘agritourism’, ‘agro-entrepreneurship’, ‘agriprenurship’ or ‘rural entrepreneurship’
Entrepreneurship Education	‘Entrepreneurship education programs’, ‘entrepreneurship training’

Study Management and Screening

Covidence systematic review management software was used for the management of the publications and screening process. Table 2 demonstrates the inclusion and exclusion criteria were determined based on increasing knowledge of existing literature (Arksey & O'Malley, 2005). Quantitative studies and the quantitative sections of mixed-methods studies were selected for inclusion since quantitative research has clearly delineated outcome measures compared to qualitative research in order to appropriately align with research objective one (Creswell & Creswell, 2023). The timeline, January 2000 to December 2022, was set to include the uptick in agriprenurship articles, the transition of agriprenurship as a separate discipline from entrepreneurship, and to finalize those articles able to be included in the review (Arksey & O'Malley, 2005; Dias et al., 2019a). Initial inclusion and exclusion were based on the title and abstracts of each publication by one researcher. If the title and abstract did not clarify inclusion or exclusion, the full publication was read. For those that were included after reading the abstract, the full publication was read to confirm inclusion (Arksey & O'Malley, 2005).

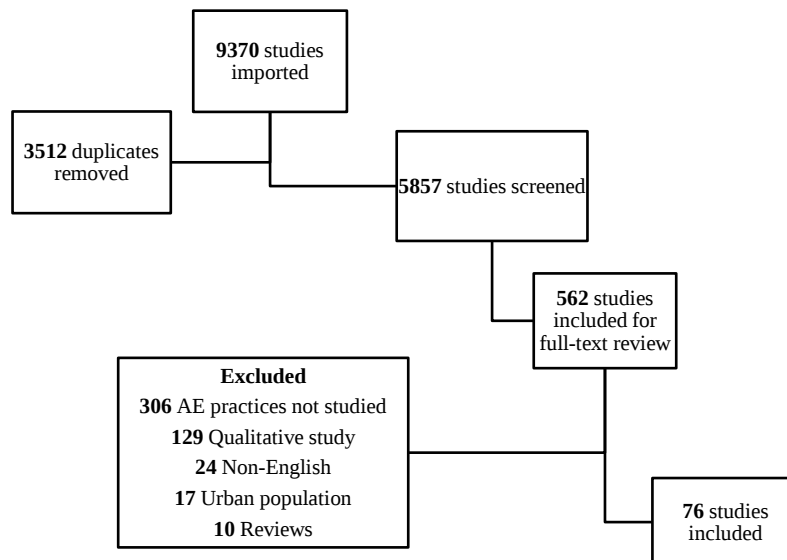
Table 2*Inclusion and Exclusion Criteria*

Inclusion Criteria
1. Quantitative studies examining the possible factors related to agriprenurship. 2. Studies focusing on agriprenurship or rural entrepreneurship or entrepreneurship education. 3. Intervention, independent variable, or dependent variable incorporates entrepreneurship competencies, skills, or characteristics. 4. Participants are rural youth or rural adults 5. Peer-reviewed studies published in English between January 2000 and December 2022
Exclusion Criteria
1. Qualitative Studies 2. Studies without agriprenurship or rural entrepreneurship or entrepreneurship education. 3. Secondary articles and reviews. 4. Studies published in a non-English language and before January 2000 and after December 2022 5. Studies which do not include entrepreneurship competencies, skills, or characteristics in study intervention, independent variable, or dependent variable.

The selected databases generated 9370 references, of which 3512 duplicates were removed. Upon initial screening, two studies were exactly the same despite having different publication outlets and were therefore combined into one study. The resulting 5857 studies were screened and ultimately, 76 studies were included in the scoping review (Figure 1).

Figure 1

Literature Review Search and Screening Process



Data Extraction and Synthesis

Once all the relevant articles were identified, article information was charted based on a template developed by the research team. The template included the following categories: authors, year of publication, research method, country of study, sample size, purpose and objectives, intervention, independent variables, outcome measures, and the competencies included in the program or study (Arksey & O'Malley, 2005). Two authors independently extracted this information. Initially, inter-coder reliability was 96%, calculated via Holsti's method (Mao, 2017). After discussion, discrepancies were solved resulting in 100% agreement. Open coding determined the categories and main themes of agripreneurship competencies, purposes, and outcome measures (Baker et al., 2022; Deroover et al., 2021). This coding was not mutually exclusive as some studies had more than one purpose or objective, outcome measure, and competency. Each purpose or objective, competency, and outcome measure was coded individually. Elements from the coding form were summarized and reported using descriptive statistics (Pollock et al., 2021; Xu et al., 2023). This procedure led to the identification of 76 studies which were included in the review.

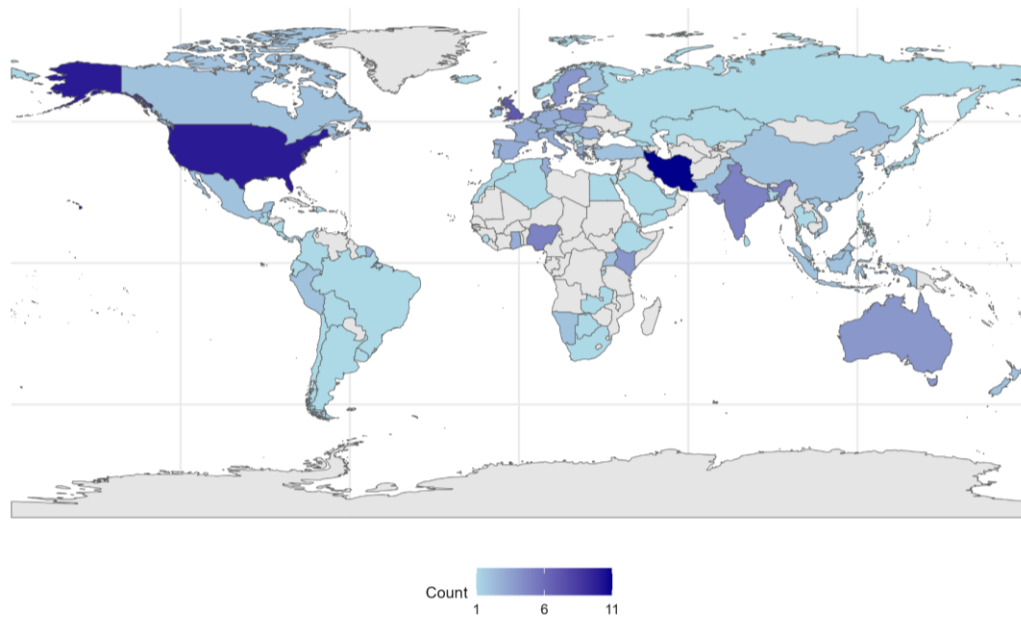
Results

Most of the 76 studies included were research studies ($n = 41$); the others were program evaluations ($n = 35$). These studies were published between 2005 and 2022. Across all publications, 97 countries were included with Iran ($n = 11$) and the United States ($n = 10$) being the most common locations of the studies (Figure 2). Other countries were represented with one to seven publications. Among the included publications, research methods varied with surveys being the most common ($n = 26$). Other publications included evaluation research (Adeyanju et al., 2021; Shetty et al., 2022; Val et al., 2019), randomized experiments (Tingey et al., 2020; Ubfal et al., 2022), non-randomized experiments (Al-Awlaqi et al., 2021; Unnikrishnan et al., 2022), mixed-methods (Kremel & Wetter-Edman, 2019; Omidi Najafabadi

et al., 2016), and case studies (Bannor et al., 2021; Lans et al., 2014; Morselli & Gorenc, 2022). The publications' sample sizes ranged from 19 to 211754 participants, with the median being 282. Appendix A includes summary of each included studies' authors, publication year, country, research method, sample size, purpose and objectives, independent variables, outcome measures, and competencies.

Figure 2

Countries Represented by the Included Publications



Current Research in Agripreneurship

The commonalities between the studies are evident across their purposes, objectives, and outcome measures. The included studies comprised five themes for the purpose and objectives of their agripreneurship study- *agripreneurial training* ($n = 35$), *agripreneurial competencies* ($n = 26$), *contextualization* ($n = 13$), *agripreneurial outcomes* ($n = 11$), and *agripreneurial system* ($n = 9$). These themes are not mutually exclusive as some studies included purposes and objectives spanning themes.

Most studies focused on assessing agripreneurial training in both formal and non-formal education programs and a majority were impact evaluations which assessed changes across agripreneurial competencies and business performance (Adeyanju et al., 2021; Agbarevo & Iworie, 2018; Cárcamo-Solís et al., 2017; de Mel et al., 2014; Ebata & Hernandez, 2017; Fairlie & Holleran, 2012; Gielnik et al., 2017; Hashim et al., 2011; Huis et al., 2019; Idrus et al., 2014; Michaelides & Benus, 2012; Opolot et al., 2018; Premand et al., 2016; Rosas et al., 2022; Shetty et al., 2022; Tingey et al., 2020; Unnikrishnan et al., 2022; Valdivia, 2015). Other training programs investigated the program process (Eades et al., 2016; Marquez-Berber et al., 2015). The focus on assessing the efficacy, utility, and comprehensiveness of agripreneurial training was a hallmark of these studies. Frequently, these studies did not detail exactly what training entailed or provided a curtailed version, such as focusing on the training topics or training methods. Assessing formal and non-formal training was usually an aspect of studies. In addition, these studies also endeavored to measure the development of agripreneurial competencies.

Agripreneurial competencies studies aimed to assess diverse agripreneurial skills, characteristics, knowledge, and abilities. Some studies only expressed their aim to assess

competencies without detailing what competencies entailed (Modak et al., 2018; Phelan & Sharpley, 2011). Some studies did enumerate the particular skills, characteristics, knowledge, and abilities they were examining (C.-C. Chen & Liang, 2020; de Lauwere, 2005; de Lauwere et al., 2018; Karimi et al., 2011; Mupfasoni et al., 2018; Shankar et al., 2015). Studies assessing competencies were mostly needs assessments (Ağızan & Bayramoğlu, 2020; Ataei, Ghadermarzi, et al., 2020; Bannor et al., 2021; de Lauwere et al., 2014; Khorrami et al., 2018; Lans et al., 2014; Modak et al., 2018; Phelan & Sharpley, 2011). Other than needs assessments, several studies aimed to address certain competencies' influence on agripreneurship intention, performance, and outcomes (C.-C. Chen & Liang, 2020; de Lauwere, 2005; de Lauwere et al., 2018; Karimi et al., 2011; Muchira, 2018; Mupfasoni et al., 2018; Omid Najafabadi et al., 2016; Rezaei-Moghaddam et al., 2019; Shankar et al., 2015; Sher et al., 2019; Wale et al., 2021).

Contextualization studies incorporated objectives with the aim of enhancing researchers' and practitioners' understanding of agripreneurship. Most common was the desire to theorize, develop, and discuss entrepreneurship development (Abbasi et al., 2021; Bignotti et al., 2021; Graskemper et al., 2021; Kummitha & Majumdar, 2015; Lekang et al., 2017; Pliakoura et al., 2020; Rezaei-Moghaddam et al., 2019; Sunaryo et al., 2014; Val et al., 2019). In addition, there were also studies that sought to identify barriers to agripreneurship or describe entrepreneurship educators (Ataei, Ghadermarzi, et al., 2020; Ataei, Karimi, et al., 2020; H. Chen et al., 2021; Khorrami et al., 2018).

Agripreneurial outcomes studies examined factors that impact agripreneurial intention and business performance. These studies were mostly assessing existing intentions of non-agripreneurs (Ataei, Karimi, et al., 2020; C.-C. Chen & Liang, 2020; Ephrem et al., 2021; Ifeanyi-obi & Ewurum, 2019; Khorrami et al., 2018). For agripreneurs, they commonly assessed the relationships between business performance and diverse competencies (Choo & Park, 2022; de Lauwere, 2005; Kamuri, 2021; Pöder, 2017; Sher et al., 2019; Ubfal et al., 2022).

Agripreneurial system studies highlighted how networks, industry conditions, and institutions influence agripreneurs (Martin et al., 2013; Mehlhorn et al., 2015; Meng et al., 2022; Pindado & Sanchez, 2017; Quinn et al., 2014; Wale et al., 2021). Commonly, agripreneurial system studies investigated the support for agripreneurship in the entrepreneurial ecosystem and individual households. They often examined entrepreneurial ecosystems' and agripreneurs' resource access ability to influence agripreneurs and their enterprises (de Lauwere, 2005; Karimi et al., 2011; Khorrami et al., 2018; Meng et al., 2022; Pindado & Sanchez, 2017).

The outcomes of current agripreneurship research also shared commonalities. All the studies were aimed at supporting agripreneurship, but the outcomes measured diverse variables. Therefore, the outcome measures were classified into six themes based on the dependent variables examined in the study. Of the studies included in this review, 69 studies had at least one dependent variable. Studies not included were needs assessments or purely descriptive. The six themes are: *competency* ($n = 28$), *performance* ($n = 22$), *business development* ($n = 12$), *orientation* ($n = 11$), *community* ($n = 5$), and *other* ($n = 12$). Studies measuring the influence of factors on competencies measured various skills, characteristics, abilities, and knowledge. The competencies present across the studies are explored in section 3.2.

Performance studies commonly measured business success which was based on income, sales, productivity, and business resilience. Income measures were the most common among performance studies but were often used in conjunction with other performance

indicators (Bignotti et al., 2021; Cárcamo-Solís et al., 2017; de Lauwere et al., 2018; Shetty et al., 2022). Typically, agripreneurship training and orientation positively impacted sales, income, business resilience, and profitability (Agbarevo & Iworie, 2018; Alvarado-Van der Laat & Lekuton, 2011; Bignotti et al., 2021; Elert et al., 2015; Hashim et al., 2011; Idrus et al., 2014; Michaelides & Benus, 2012; Opolot et al., 2018; Rosas et al., 2022; Shankar et al., 2015; Shetty et al., 2022). However, de Mel et al. (2014) found that a cash grant in conjunction with training led to an increase in profits, but not training alone. Other studies found increases in performance outcomes were short-lived or only occurred for men (Ubfal et al., 2022; Valdivia, 2015).

Business development studies highlighted the likelihood and follow-through of participants in engaging in agripreneurship typically following formal or non-formal education. Agripreneurship training and the implementation of public/private partnerships significantly increased the likelihood of participants to access capital and start or grow a business (Abukari et al., 2022; Alaref et al., 2020; Ebata & Hernandez, 2017; Elert et al., 2015; Fairlie & Holleran, 2012; Idrus et al., 2014; Michaelides & Benus, 2012; Opolot et al., 2018; Phelan & Sharpley, 2011; Premand et al., 2016; Quinn et al., 2014; Rosas et al., 2022). Diversification and business creation were the most common outcome measures in this theme.

Orientation studies explored factors that increased agripreneurial intention such as competencies and agripreneurial training. These studies commonly found links between higher levels of agripreneurial competencies and intention (Ataei, Karimi, et al., 2020; C.-C. Chen & Liang, 2020; Ifeanyi-obi & Ewurum, 2019; Mupfasoni et al., 2018; Omid Najafabadi et al., 2016; Sher et al., 2019). Agripreneurship training also increased agripreneurial orientation (Al-Awlaqi et al., 2021; Kummitha & Majumdar, 2015; Val et al., 2019).

Community studies commonly assessed the relationships between agripreneurship, its competencies, and development. Development was positively associated with agripreneurial competencies and training (Abbasi et al., 2021; de Lauwere, 2005; Premand et al., 2016). In addition, community studies also identified community level barriers to agripreneurship such as government policies and a lack of leadership and information (Ataei, Ghadermarzi, et al., 2020; Rezaei-Moghaddam & Izadi, 2019). These studies commonly sought to address community concerns and opportunities.

The studies in the other theme reflect the uncommon outcome measures present across the included studies. These studies measured health outcomes, participants' opinions on training effectiveness and satisfaction, empowerment, the entrepreneurial system, and adoption of innovations (Adeyanju et al., 2021; Eades et al., 2016; Huis et al., 2019; Ifeanyi-obi & Ewurum, 2019; Khorrami et al., 2018; Marquez-Berber et al., 2015; Marquis et al., 2015; Shankar et al., 2015; Tingey et al., 2020; Unnikrishnan et al., 2022; Valdivia, 2015). These uncommon outcome measures indicate the variety within agripreneurship research as each outcome was only explored in one or two studies.

Agripreneurship Competencies

The 10 key competencies identified based on the scoping review encapsulate the plethora of themes present within the study. The key competencies were classified into 10 themes based on the independent and dependent variables examined in the study. Independent and dependent variables were included to ensure that every study was included in the analysis since some studies were descriptive and did not contain dependent variables. The 10 key competencies- business skills, characteristics, social skills, knowledge, other skills, communication skills, external supports, agricultural skills, values, and background- are described below in Figure 3. Each of the themes is better conceptualized by its categories.

Figure 3*Competencies: Themes and Categories (n = 76)*

Business Skills (N = 381)	• Business Development, Management, Finance, Business Process, etc.
Characteristics (N = 292)	• Problem Solving, Achievement, Leadership, Innovative, Growth-mindset, etc.
Social Skills (N = 83)	• Collaboration, Gender Awareness, Mentoring, Networking, Teamwork, Professionalism, etc.
Knowledge (N = 46)	• Information, Business Development, Economics, Laws and Regulations, Production, Society
Communication Skills (N = 34)	• Speaking, Writing, Conflict Resolution, English, Negotiation
External Supports (N = 34)	• Funding, Resources, Support System
Other Skills (N = 33)	• Coping Mechanisms, ICT, Technical Skills
Agricultural Skills (N = 24)	• Cultivation, Soil Sciences, Agronomy, Livestock Production, Technology Integration, Value-addition
Values (N = 22)	• Ethics, Social Norms
Background (N = 6)	• Age, Education Level, Previous Experience

Most studies, 67, were included in the business skills theme with those studies comprising a total of 381 instances of business skills ($n = 381$). Several studies examined the relationship between business skills. Significant relationships were found between management skills, subjective norms, confidence, social network, and volunteering (Ağızan & Bayramoğlu, 2020). Other studies sought to discover how business skills impacted or predicted entrepreneurial development, performance, or orientation. Khorrami et al. (2018) found that networking skills, occupational adaptation, and entrepreneurial climate were effective at predicting entrepreneurship behavior. Other studies found that marketing, opportunity identification, and business planning had significant positive influence on agribusiness development and performance (Abbasi et al., 2021; Choo & Park, 2022; Lans et al., 2014; Opolot et al., 2018). Several studies examined the impact of training on participants' business skills or business performance. A few studies found that agripreneurship trainings built participants' capacity in business skills (Ifeanyi-obi & Ewurum, 2019; Kremel & Wetter-Edman, 2019; Lekang et al., 2016; Marquez-Berber et al., 2015). Other studies found that business skills training positively influenced agribusiness performance (Hashim et al., 2011; Michaelides & Benus, 2012; Valdivia, 2015) and child nutrition (Marquis et al., 2015). Some studies did not find a significant relationship between business skills and entrepreneurial performance or the desire to start an agri-enterprise (Bignotti et al., 2021; C.-C. Chen & Liang, 2020). These findings show that context and training programs are important when identifying business skills influence and the relationships between them.

Many studies examined characteristics with a total of 292 instances of characteristics ($n = 292$). These studies often combined examining business skills and characteristics (Bruno, 2014; Cárcamo-Solís et al., 2017; Ebata & Hernandez, 2017; Pliakoura et al., 2020; Rosas et al., 2022; Shankar et al., 2015). Wale et al. (2021) found that male smallholder farmers tend to

exhibit more entrepreneurial characteristics than female smallholder farmers. Several studies investigated the influence of entrepreneurial training on participants' characteristics and vice-versa. Participants often developed confidence, initiative, problem-solving, risk tolerance, and persuasion characteristics due to entrepreneurship training (Fairlie & Holleran, 2012; Morselli & Gorenc, 2022; Sunaryo et al., 2014). Other studies examined the impact of characteristics and soft skills on business outcomes (Kamuri, 2021; Ubfal et al., 2022). Ubfal et al. (2022) determined that soft skills training had a significant positive short-term influence on business outcomes. Val et al. (2019) examined methods of instruction for characteristic development finding that design thinking strategies fostered developing entrepreneurial characteristics. The influence of characteristics in agripreneurship is well established, but much research is still being conducted to discern how much influence and how to establish desired characteristics in agripreneurs.

The social skills theme was present in 45 studies and included six categories with a total of 83 instances ($n = 83$). Several studies examined the influence of farmers' groups and partnerships on entrepreneurial skills, business performance, and agripreneurship training (Choo & Park, 2022; Salau et al., 2017; Valdivia, 2015). Salau et al. (2017) found that farmer association membership did not have a significant impact on entrepreneurial skills. Studies which included mentorship found significant positive influences of mentorship and their programs on business performance (Elert et al., 2015; Michaelides & Benus, 2012; Quinn et al., 2014). Other studies investigated the entrepreneurial systems' impact on social intelligence and interpersonal skills' impact on business performance (de Lauwere, 2005; de Lauwere et al., 2014; Karimi et al., 2011; Lans et al., 2014). Karimi and Ataei (2011) found that the entrepreneurial ecosystem had a significant positive impact in social intelligence which had a positive and significant impact on entrepreneurial skills. All of the studies examining social skills also examined business skills suggesting that many agripreneurship programs and training divide their attention between social and business skills.

The knowledge theme was present in 31 studies and included six categories with a total of 46 instances ($n = 46$). Knowledge comprised the information, business development, economic knowledge, laws and regulations, production knowledge, and societal knowledge categories. Chen et al. (2021) identified production and legal knowledge as key challenges farmers experience when establishing value-added businesses. Other studies aimed to assess farmer knowledge after agripreneurship training and to identify farmer needs (Bannor et al., 2021; Bruno, 2014; Cárcamo-Solís et al., 2017; Martin et al., 2013; Mupfasoni et al., 2018). Mupfasoni et al. (2018) discovered that farmer groups in Burundi had little knowledge of social and economic sustainability compared to environmental sustainability. Several studies found that there was a significant positive impact of knowledge on business performance, development, and entrepreneurial intention (Ataei, Karimi, et al., 2020; Gielnik et al., 2017; Idrus et al., 2014).

Communication skills encompassed skills across four categories in 20 studies for a total of 34 instances ($n = 34$). Communication skills included the general communication, conflict resolution, English language, and negotiation categories. Several studies examined what communication, conflict resolution, and negotiation skills students gained during their studies or training (Ağızan & Bayramoğlu, 2020; Alvarado-Van der Laat & Lekuton, 2011; Ataei, Ghadermarzi, et al., 2020; Cárcamo-Solís et al., 2017; Gielnik et al., 2017; Karimi et al., 2011; Marquez-Berber et al., 2015; Pöder, 2017). Ağızan & Bayramoğlu (2020) found that communication skills, which they termed technical skills, had a significant positive relationship with initiative and volunteerism. Other studies determined that English skills were important for agripreneurs (Alvarado-Van der Laat & Lekuton, 2011; Bruno, 2014). Phelan and Sharpley (2011) uncovered that farmers viewed negotiation as the least important skill for

agritourism enterprise, while Ataei, Ghadermarzi, et al. (2020) identified that experts viewed farmers' lack of negotiation skills as a key barrier for rural entrepreneurship. The difference between farmer perspectives and expert perspectives demonstrates a gap in understanding and practice.

The other skills theme incorporated a variety of skills and was present in 21 studies across three categories for a total of 33 instances ($n = 33$). Coping mechanisms, information and communication technology skills, and technical skills categories comprise other skills. Most of these studies examined other skills within the context of trainings and courses (Alaref et al., 2020; Hosseini & Pouratashi, 2011; Shetty et al., 2022; Tingey et al., 2020; Ubfal et al., 2022; Unnikrishnan et al., 2022; Valdivia, 2015). Hosseini and Pouratashi (2011) determined that participants in entrepreneurship courses had statistically significant higher scores for dealing with failure than their friends and the control group. Technical skills- such as non-agricultural vocational skills, sexual and reproductive health, and nutrition- were integrated into entrepreneurship training programs and had positive impacts on business outcomes in the long-term (Alvarado-Van der Laat & Lekuton, 2011; Shetty et al., 2022; Unnikrishnan et al., 2022; Valdivia, 2015).

External supports included three categories in 24 studies for a total of 34 instances ($n = 34$). These skills tended to focus on how to acquire or use funding, resources, and support systems. Often, studies included resources, funding acquisition, and support systems within training or educational programs (Abukari et al., 2022; Bannor et al., 2021; Eades et al., 2016; Michaelides & Benus, 2012; Morselli & Gorenc, 2022; Shetty et al., 2022). Abukari et al. (2022) ascertained training participants who were able to save financial capital were more likely to be employed in both agribusiness and non-agribusiness ventures following training. Other studies focused on the role of funding, resources, and support systems in agribusiness performance and intention (Ataei, Ghadermarzi, et al., 2020; Omidi Najafabadi et al., 2016; Parcell & Sykuta, 2003; Rezaei-Moghaddam et al., 2021; Wale et al., 2021). Ephrem et al. (2021) determined that youth with increased access to funds decreased their intention to engage in agribusiness. In addition, Omidi Najafabadi et al. (2016) determined that social support, which includes both familial and governmental support, had no impact on entrepreneurial intention. These findings suggest that other factors are more important for agripreneurship development than available funding, resources, and support systems.

The agricultural skills theme encompassed a variety of skills across 10 studies for a total of 24 instances ($n = 24$). Agricultural skills were frequently included within training and agripreneurship development programs to assess their perceived benefits and participants' skills (Adeyanju et al., 2021; Agbarevo & Iworie, 2018; Eades et al., 2016; Marquez-Berber et al., 2015; Opolot et al., 2018; Shetty et al., 2022; Unnikrishnan et al., 2022). Participants in the Fadama III program found that agricultural skill building in gari, broiler chicken, egg, yam mini-sett, sheep, plantain chips, odorless fufu, fish, and honey production were the most beneficial (Agbarevo & Iworie, 2018). Also, training enhanced farmers agricultural skills in value-addition, soil management, and post-harvest handling when they were available (Opolot et al., 2018). Other studies aimed to assess farmer's agricultural skills' needs (H. Chen et al., 2021; Pliakoura et al., 2020; Salau et al., 2017). Pliakoura et al. (2020) discerned that farmers desired increased knowledge and skill in new cultivation techniques, natural resource-energy utilization, and product marketing. Participants' wish to gain additional agricultural skills for their agri-enterprise indicates that agripreneurship programs and training should emphasize the agricultural part of agripreneurship.

The values theme referred to 22 instances ($n = 22$) across two categories in 16 studies. The values theme focused on the types of enterprises training participants established and study

participants' understanding of social norms, culture, and ethics (Bruno, 2014; Ephrem et al., 2021; Huis et al., 2019; Karimi et al., 2011; Kummitha & Majumdar, 2015; Mehlhorn et al., 2015; Pöder, 2017). Huis et al. (2019) integrated modules addressing prejudice and gender roles within entrepreneurship training and discovered significant positive increases in women's empowerment at the end of training.

The background theme was the narrowest with six total instances ($n = 6$) across four studies. These items referred to participants' previous experience (H. Chen et al., 2021), age (Graskemper et al., 2021), and education level (Abukari et al., 2022; Adeyanju et al., 2021; Graskemper et al., 2021). While other studies may have included age, previous experience, and education level in their participant characteristics, these studies analyzed their influence on entrepreneurial aspects finding increased age and experience had a positive influence while increased education level had a negative influence (Abukari et al., 2022; Adeyanju et al., 2021; H. Chen et al., 2021; Graskemper et al., 2021). Chen et al. (2021) described time as the largest issue for both in-experienced and experienced farmers for diversification, but ambiguous regulations and lack of labor were second most important for in-experienced farmers and experienced farmers respectively. Participants with higher levels of formal education negatively influenced agripreneurship performance and development (Abukari et al., 2022; Adeyanju et al., 2021; H. Chen et al., 2021; Graskemper et al., 2021). Graskemper et al. (2021) discerned that older farmers are significantly more likely to reduce, expand, and/or diversify their operations compared to younger farmers.

Discussion

Agripreneurship has been recognized as a way to alleviate poverty in developing countries (Dzingirai, 2021). The aim of this scoping review was to understand how agripreneurship has been operationalized within current research and practice. Overall, the scoping review identified a wide range of practices and competencies of agripreneurship. The most common research practices were evaluating trainings, survey methodologies, and understanding the impact of training on agripreneurial competencies. Numerous competencies were included across research and practice, but business skills were the most common across all studies.

Current Research

Overwhelmingly, many research and development interventions focused on identifying, examining, and measuring numerous entrepreneurial competencies. Other studies focused on contextualization, the agripreneurial system, agripreneurial outcomes, or agripreneurial training. These objectives indicate the common practices among agripreneurship researchers. The focus on agricultural entrepreneurs' knowledge, skills, and characteristics indicates that understanding how to develop agricultural entrepreneurs is vital when considering agripreneurship research, programming, design, and implementation. Many purposes, objectives, and outcomes focused on understanding agricultural entrepreneurs' mindset and abilities which can point to their key characteristics, enabling researchers and practitioners to highlight what makes agricultural entrepreneurs engage in entrepreneurship and succeed. This common purpose across a variety of research locations, methods, and measurement indicates that researchers are still in the process of identifying agripreneurship's key knowledge, skills, and characteristics.

The five themes for purpose and objectives indicate that previous studies have examined agripreneurship through multiple perspectives. However, the agripreneurial system is the least studied, suggesting that there is a knowledge gap present on how institutions and culture can impact agripreneurship. Agripreneurship training evaluation being the most frequent research objective indicates that there is a desire to understand how competency

development impacts agripreneurs and their businesses. However, most of these studies focus on short-term individual gains rather than long-term impacts. Future research and practice should consider long-term assessments and include not just individual gains but community and household impacts when analyzing formal and non-formal agripreneurial education.

Agripreneurship is being researched worldwide, but most frequently in Iran and the United States. The needs of agricultural entrepreneurs vary in different contexts. While skills, knowledge, and abilities can provide a foundation for them, understanding the system within which they are trying to succeed is vital (Fitz-Koch et al., 2017). The objectives of research and practice were not markedly different across regions. Future research should focus on understanding the entrepreneurial environment in developing countries to provide nuanced approaches that help agricultural entrepreneurs succeed.

The outcomes measures for agripreneurship studies were slightly more varied with six themes. When defining their outcomes, researchers commonly measured agricultural entrepreneurs' competencies, their perception of their competencies, or gained competencies. These competencies covered knowledge, skills, abilities, and characteristics of agripreneurs. Other indicators included performance, business development, orientation, community, and others.

The measurements common across all outcomes were often on an individual level, with few studies examining community outcomes. While entrepreneurship may increase individual livelihoods (Dong et al., 2021; Franco & Newey, 2020; Henderson & Weiler, 2010; Pathak, 2021), the impact of development interventions may shift depending on the program, design, and implementation of that intervention. Since many studies that highlighted livelihoods focused solely on income rather than multidimensional perspectives of livelihoods, there is little understanding about the impacts of agripreneurship other than an increase in income (Abukari et al., 2022; Agbarevo & Iworie, 2018; Unnikrishnan et al., 2022; Wale et al., 2021). Future research should endeavor to explore community outcomes related to agripreneurship.

Generally, the purpose and objectives of studies aligned with the outcome measures. One difference was the inclusion of the agripreneurial system within the objectives, but not within the outcomes. While the outcomes did include community, those studies highlighted the impact of agripreneurship on communities while the agripreneurial system highlighted institutions, organizations, and networks within which agripreneurs operate. The included studies addressed multiple facets of agripreneurship appropriately. Understanding other researchers' purposes, objectives, and outcome measures when studying agripreneurship research sheds light on gaps within the literature. There were few research instances measuring entrepreneurial outcomes and long-term impacts of agripreneurial training. Future research should address measuring both short- and long-term household, community, and societal outcomes of agripreneurship. Practitioners should work to ensure that their agripreneurship programs address the multiple facets of agripreneurship such as the entrepreneurial system, training, and competencies.

Competencies

All the studies aimed to investigate agripreneurship competencies. The 10 themes-business skills, characteristics, social skills, knowledge, communication skills, external supports, agricultural skills, values, background, and other skills- encapsulate a wide range of competencies considered important for agripreneurship. Business skills were the most frequently referenced within the literature. This core competency for agripreneurship was the most common including skills across management, finance, and business creation. The focus on business skills demonstrates the need for agricultural entrepreneurs to develop them and

indicates the assumptions of researchers and practitioners. One assumption is that researchers believe that business skills will help agricultural entrepreneurs succeed. Increased levels of business skills are associated with business success (Abbasi et al., 2021; Choo & Park, 2022; Hashim et al., 2011; Lans et al., 2014; Michaelides & Benus, 2012; Opolot et al., 2018; Valdivia, 2015). Yet, success is often viewed from a productivity and profit lens, which may not reflect the totality of values present within agripreneurs (Asongu & Odhiambo, 2021; Benería, 2011; Desmarais, 2011). Another assumption is that agripreneurs lack these skills. While there is a need to foster these skills, solely teaching business skills when a plethora of other competencies can enhance business skills ignores their interconnectedness and the requirement to be adept in a variety of competencies (Ağızan & Bayramoğlu, 2020).

Characteristics were the second most common type of competency included in agripreneurial research and practice, which could denote an assumption that entrepreneurial characteristics can be developed. In addition, social skills, knowledge, and communication skills rounded out the top five competencies for agripreneurship. While some researchers may consider communication skills as a part of social skills, the ability to navigate social situations and use appropriate forms of communication is not necessarily inherent (Estival et al., 2024; Grover et al., 2020). Separating these skills allows for deeper understanding of their attribution to the agricultural entrepreneurial context. People's ability to start a business venture can depend on their social and communication skill acumen (Bauman & Lucy, 2021). When considering the key competencies for agripreneurship, including not just business skills, but growing individual's characteristics, social skills, knowledge, and communication skills are considered the basic requirements of agripreneurial training.

The main difference between agripreneurship and entrepreneurship is evident in the inclusion of agricultural skills. While most agripreneurial research and practice emphasized providing farmers and agriculturalists with the skills to become business owners, several studies incorporated instruction or assessment of agricultural skills (Adeyanju et al., 2021; Agbarevo & Iworie, 2018; H. Chen et al., 2021; Eades et al., 2016; Marquez-Berber et al., 2015; Opolot et al., 2018; Pliakoura et al., 2020; Salau et al., 2017; Shetty et al., 2022; Unnikrishnan et al., 2022). Skills such as cultivation, soil sciences, agronomy, livestock production, technology integration, value-addition highlight the need for both crop and livestock agripreneurship. The inclusion of agricultural skills also indicates that value-addition and diversification is typically a vital component of agripreneurship. The agricultural skills included targeted the situation of each studies' participants, underpinning the importance of contextualization within agripreneurship.

Other competencies focused on finding and accessing external supports for agricultural businesses, other skills, values, and background. External support acquisition had a mixture of findings. There was little in common other than the objectives of the studies including external support competencies. Future research should seek to clarify the benefits and drawbacks of different kinds of external support such as land, money, and familial support. Other skills were integrated within agripreneurship training either as a function of the agripreneurship training itself, or additional program goals. Specifically, technological skills were common within this competency. As technology becomes more accessible and reliable, the integration of ICT skills and using technology in agriculture has become more (Ayim et al., 2022; Khan & Law, 2015). Values and background were the least common of the 10 key competencies for agripreneurship. This lack of understanding of cultural values and individual backgrounds could signal that researchers and practitioners assume that culture is not impacting individual agripreneurial decision-making. However, people are not isolated from their culture and environment. Future research and practice should consider how culture and environment influence agripreneurial decision-making from the type of agripreneurship to management and leadership decisions.

Empowerment was only examined in two studies (Huis et al., 2019; Tingey et al., 2020); however, many studies included discussions of empowerment within their introduction and literature reviews. Often studies cited how agripreneurship was important for women and youth's empowerment (Ataei, Ghadermarzi, et al., 2020; Ataei, Karimi, et al., 2020; Shankar et al., 2015). Empowerment was most readily discussed in economic terms and focused more on profit and business creation rather than women's agency and access to resources (Shetty et al., 2022; Tingey et al., 2020). In addition, promoting empowerment was frequently utilized as a rationale for the study (Muchira, 2018; Shankar et al., 2015; Valdivia, 2015). These studies continued to make claims about how agripreneurship enables empowerment but did not test that assumption. Agripreneurship programming and research should strive to test the assumptions that have been seen as providence within the discipline. While empowerment may be occurring for one program, in one community, assuming that it is happening everywhere and all the time can cloud researcher and practitioner judgement as well as prevent striving for best practices.

Integrating all 10 core competencies in agripreneurship interventions could increase the ability of participants to start and maintain their enterprise. One method could be to address the competencies following the Dreyfus's (1980) Five-Stage Model of Adult Skill Acquisition. This model encourages skill acquisition and has been widely adopted across a variety of disciplines (Mangiante et al., 2021; Spector & Ma, 2019; Sultan et al., 2020). By bringing a learner through the five stages (novice, advanced beginner, competence, proficiency, and expertise) with instruction from the educator and their personal experience with the skill (Dreyfus & Dreyfus, 1980), agricultural extension and education programming could align with this model to increase a variety. For example, to build agripreneurs' opportunity identification skills, first clarification of their current skill level should be undertaken. If a learner is a novice, then the educator provides rules for determining how to identify an opportunity such as profit margin. If they are an advanced beginner, then instructor can point out the situational aspects that require some previous knowledge to apply such as how much profit margin the learner is comfortable with and weighing that against the amount of time investment. For an agripreneur who is in the competency stage, the educator then helps them sort through the relevant and irrelevant information to help make decisions about opportunity identification. The proficient learner is then able to make these decisions quickly through ample experience but may not know how to best enact that decision, which is where the educator assists. The expert no longer needs the instructor's support and can make decisions and enact them on their own. By using the Dreyfus's (1980) Five-Stage Model of Adult Skill Acquisition agricultural extension and education professionals and researchers could better support agripreneurs along their personal development pathway and provide attuned capacity building to them.

While time and resources can decrease the scope of studies and education, research and education of prospective and current agripreneurs should incorporate all competencies to ensure a comprehensive study and program. No identified study included all 10 core competencies, suggesting that agricultural extension and education may already be working to attune their agripreneurial programs to their community's needs, or may be missing competency building opportunities. Practitioners and researchers should align community programming and needs to ensure that extension and development programs address needs rather than create them. Researchers and practitioners should investigate the relationships between agripreneurship competencies and how they relate to entrepreneurial success in context.

Limitations and Recommendations

This scoping review experienced some limitations. The scoping review only searched four databases and studies that researched agripreneurship could exist in other databases. Also, there was a plethora of research on agripreneurship in Farsi identified. However, due to the inclusion criteria, this research could not be included in the scoping review. Therefore, those studies may have found additional factors that contribute to agripreneurship. Future studies should also examine qualitative studies and the qualitative sections of mixed methods studies. Including these studies and sections for future scoping or systematic reviews could provide insight into the process of agripreneurship and the development of competencies. Their inclusion could also provide a more holistic image of the current purposes of agripreneurship research. In addition, future research could explore the overall effect size through a meta-analysis of program impacts. Future research on agripreneurship should aim to include additional databases in their search strategy and additional languages and methodologies in their criteria.

Another limitation is the variation between studies within the scoping review. The studies used a variety of assessments to evaluate their objectives. The variation between methods and measurements prevented the researchers from conducting quality assessments on the included studies. While scoping reviews do not require quality assessments (Munn et al., 2018), future research could limit the research design used in order to conduct quality assessments. Additionally, conducting systematic reviews or meta-analyses could allow researchers to investigate relationships between agricultural entrepreneurs and entrepreneurial outcomes. Future research in this area should focus on connecting the competencies to entrepreneurial success through quantitative methods.

Conclusion

Scholars addressing agripreneurship are honing its niche competencies. Research and practice often concentrate on the impact of training programs on agripreneurial competencies. Yet, identifying the impact of agripreneurship on individuals and communities remains an arduous task for scholars. The competencies identified span a wide range of business skills, agricultural skills, social skills, knowledge, communication skills, and characteristics. Better understanding of the multiple facets of agripreneurship is a continual process. This scoping review provides insights into the current state of agripreneurship research so that future researchers can prioritize their efforts. In addition, clarifying the key competencies of agripreneurship allows for it to be clearly operationalized in future research and practice. With a clear conceptualization of what competencies agripreneurs need and what agripreneurship entails, academia and industry can unify to support development endeavors worldwide. As efforts in agripreneurship are attuned to support the livelihoods of individuals across communities to increase their income, business performance, and business resilience, the subsequent economic development could lift individuals and communities out of poverty.

Author Contributions: A.Z. – conceptualization, formal analysis, investigation, methodology, validation, writing-original draft; J.N.- writing-original draft, writing-review and editing. R.L. - formal analysis, validation; M.R. –writing-review and editing.

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Appendix A*Scoping Review Included Studies*

Authors	Year	Country	Research Method	Sample Size	Purpose	Outcomes	Competencies
Abbasi et al.	2021	Iran	Survey	240	Evaluate the factors affecting the development of rural entrepreneurship in a case study of villages in Torbat-e Heydarieh, Kadkan district	Community development	Business skills, Social skills, External supports, Characteristics, Knowledge
Abukari et al.	2022	Ghana	Impact analysis	4702	Examine the determinants of gender-based participation of the youth in income generating enterprises in cocoa growing areas in Ghana	Community development	Business skills, Social skills, Knowledge, Background
Adeyanju et al.	2021	Nigeria	Impact analysis	977	Investigate the impact of agricultural training programmes on youth agripreneurship performance in Nigeria.	Engagement	Business skills, Agricultural skills, Background
Agbarevo & Iworie	2017	Nigeria	Impact analysis	180	Determine the extent the Fadama 111 Development Project has been able to help participating farmers/agro-processors in acquiring entrepreneurial skills needed to successfully run their chosen agribusiness enterprises	Performance	Characteristics, Agricultural skills
Ağızan & Bayramoğlu	2020	Turkey	Survey	76	Examine the relationship between the social capital and the entrepreneurial skills of agricultural farms.		Business skills, Communication, Social skills, Characteristics, Values

Authors	Year	Country	Research Method	Sample Size	Purpose	Outcomes	Competencies
Alaref et al.	2020	Tunisia	Randomized controlled trial	1451	Study the medium-term impacts of entrepreneurship education four years after students' graduation.	Competencies, Business Creation	Business skills, Social skills, Other skills, Characteristics
Al-Awlaqi et al.	2021	Yemen	Non-randomized experimental study	1337	Examine the causal relationship of entrepreneurship training upon entrepreneurial orientation in the micro-business industry.	Orientation	Business skills, Characteristics
Alvarado-Van der Laat & Lekuton	2011	Australia	Impact analysis	282	Describe the constructivist model that has been developed to teach agricultural undergraduate students at EARTH University.	Performance	Business skills, Communication, Other skills, Characteristics, Values, Knowledge
Ataei et al.	2020a	Iran	Cross sectional study	373	Specify entrepreneurial competencies required for launching SMEs among rural youth and the impact of entrepreneurial competencies on rural youth's intention to launch SME.	Intention	Business skills, Communication, Social skills, Characteristics, Knowledge
Ataei et al.	2020b	Iran	Multi-method	146	Rank the barriers of the application of the value chain in the context of rural entrepreneurship	Community development	Business skills, Communication, Other skills, Characteristics, Values
Bannor et al.	2021	Ghana	Case study	134	Examine the entrepreneurial status of farmers involved in the production of non-timber forest products	Competencies	Business skills, Social skills, Characteristics, Knowledge

Authors	Year	Country	Research Method	Sample Size	Purpose	Outcomes	Competencies
Bignotti et al.	2021	Namibia	Survey	477	Develop an agricultural entrepreneurship development model	Performance, Productivity, Income	Business skills, Social skills, Other skills, Characteristics
Bruno	2014	Romania	Cross sectional study	2743	Measure the training and managerial consultancy needs of the current and future entrepreneurs		Business skills, Communication, Social skills, Other skills, Characteristics, Values, Knowledge
Carcamo-Solis et al.	2017	Mexico	Impact Analysis	213	Determine whether the program contributed to the development of entrepreneurial skills, attitudes, and self-efficacy among primary-school students.	Competencies Performance	Business skills, Communication, Social skills, Characteristics, Values, Knowledge
Chen & Liang	2020	Taiwan	Survey	1083	Examine the agriculture entrepreneurial intentions of current farmers and distinguished differences between farmers	Intention	Business skills, Communication, Social skills, Characteristics
Chen et al.	2021	United States	Mixed-methods	98	Identify produce growers' barriers and motivators to starting and expanding value-added businesses		Knowledge, Agricultural skills, Background
Choo & Park	2022	South Korea	Survey	196	Examine agritourism farms' characteristics and financial and managerial resources that are positively related to the performance	Performance	Business skills, Social skills

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De Lauwere	2005	Netherlands	Survey	752	find out how and if Dutch agricultural entrepreneurs are dealing with the complex changes in agriculture	Economic development	Business skills, Social skills, Characteristics
De Lauwere et al.	2014	Poland Lithuania Slovenia	Survey	1038	Give insight in the competencies and entrepreneurship of dairy farmers in Poland, Lithuania and Slovenia	Competencies	Business skills, Social skills, Characteristics
De Lauwere et al.	2018	Lithuania Poland Slovenia	Survey	1030	Gain insight into the self-reported competencies of dairy farmers, their future plans, and business outcomes	Competencies, Income, Performance	Business skills, Social skills, Characteristics, Knowledge
de Mel et al.	2014	Sri Lanka	Randomized controlled trial	1252	measure the impact of the Start-and-Improve Your Business Program	Business Outcomes	Business skills, Characteristics
Eades et al.	2015	United States	Case study	23	Outline the origins of, challenges, lessons learned, strategies, and evolution of the program		Business skills, Knowledge, Agricultural skills
Ebata & Hernandez	2017	Nicaragua	Case study	10194	Examine the association between trainings in two entrepreneurial practices and commercialization in non-local markets	Entrepreneurial system, Diversification	Business skills, Social skills, Characteristics
Elert et al.	2015	Sweden	Impact analysis	211754	Study the long-term impact of entrepreneurship education and training in high school on entrepreneurial entry, performance, and survival.	Business outcomes, Resilience, Business creation	Business skills, Social skills

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Ephrem et al.	2021	Democratic Republic of the Congo	Survey	600	Examine the extent to which perceived social norms and psychological capital affect youths' intentions to pursue agribusiness opportunities	Intention	Other skills, Characteristics, Values, Background
Fairlie & Holleran	2012	United States	Randomized controlled trial	2692	Explore whether personality or psychological traits predispose individuals to benefit more from entrepreneurship training	Business creation	Characteristics
Gielnik et al.	2017	Kenya	Randomized controlled trial	227	Examine the short- and long-term effects of an action-oriented entrepreneurship training	Competencies	Business skills, Communication, Social skills, Characteristics, Knowledge
Graskemper et al.	2021	Germany	Impact analysis	745	Develop a classification scheme, then analyze determinants of entrepreneurial choices		Business skills, Social skills, Characteristics, Background
Hashim et al.	2011	UK	Impact analysis	136	Assess the Inita project	Competencies, Performance	Business skills
Hosseini & Pouratashi	2011	Iran	Impact analysis	90	Investigate the influence of entrepreneurship courses on entrepreneurial competencies of agricultural students.	Competencies	Business skills, Social skills, Other skills, Characteristics
Huis et al.	2019	Vietnam	Randomized controlled trial	4041	Assess the impact of this training on female microfinance borrowers and their husbands	Empowerment	Business skills, Social skills, Characteristics, Values

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Idrus et al.	2014	Malaysia	Impact analysis	40	Investigate whether the training content of the WEP has an effect on women starting their own businesses	Performance, Business creation	Business skills, Communication, Social skills, Characteristics, Knowledge
Ifeanyi-obi & Ewurum	2019	Nigeria	Mixed-methods	94	Assess the influence of entrepreneurship education on career aspirations of agriculture undergraduates	Effectiveness, Career aspiration	Business skills, Characteristics
Kamuri	2021	Kenya	Survey	52	Explore creating as a behavioral attribute of entrepreneurship and its relationship with innovation and performance outcomes from an industry ecosystem perspective	Performance	Characteristics
Karimi & Ataei	2022	Iran	Survey	269	aimed to shed light on the impact of the entrepreneurial ecosystem on the entrepreneurship skills of agriculture students mediated by social and emotional intelligence.	Competencies	Business skills, Communication, Social skills, Other skills, Characteristics, Values, Knowledge
Khorrami et al.	2018	Iran	Case study	123	Examine the relationship and impact of entrepreneurial competencies, entrepreneurial climate, demographics, and entrepreneurial behavior.	Behavior	Business skills, Social skills, Characteristics, Knowledge

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Kremel & Wetter-Edman	2019	Sweden	Mixed-methods	26	Study the didactic experiences from developing and implementing an entrepreneurship course		Business skills, Characteristics, Knowledge
Kummitha & Majumdar	2015	India	Case study	Up to 240	Discuss the teaching model on social entrepreneurship developed by Tata Institute of Social Sciences	Competencies, Career Aspiration	Business skills, Characteristics, Values
Lans et al.	2014	Netherlands	Cohort study	19	How do high-and low-performing small agricultural firms differ in terms of the extent to which their owner-managers develop and use specific entrepreneurial competence?	Performance	Business skills, Social skills, Characteristics
Lekang et al.	2016	UK	Survey	180	Determine the perceived utility of experiential learning units being replicated in other sociocultural and geographical areas	Satisfaction	Business skills, Social skills, Characteristics, Values
Lekang et al.	2017	India	Survey	180	Find out the comprehensiveness of courses offered in Experiential Learning Program		Business skills, Communication, Other skills, Knowledge
Marquez-Berber et al.	2015	Australia	Evaluation	60	Analyze the planning, development, and results of the technical and the entrepreneurial training for horticultural production	Satisfaction	Business skills, Communication, Social skills, Characteristics, Values, Agricultural Skills

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Marquis et al.	2015	United States	Non-randomized experimental study	179	Examine if participation in an entrepreneurial and nutrition education intervention with microcredit relates to the nutritional status of children	Nutritional Status	Business skills
Martin et al.	2013	UK	Case study	494	Investigate business support needs		Business skills, Knowledge
Mehlhorn et al.	2015	US, Australia, & New Zealand	Mixed-methods	50	Explore the current state of integration of entrepreneurship across universities in agricultural education.	Competencies	Business skills, Social skills, Other skills, Characteristics, Values
Meng et al.	2022	China	Survey	285	Analyze the relationship among network embeddedness, entrepreneurial resources, and entrepreneurial ability	Performance	Business skills, Social skills, Characteristics, Knowledge
Michaelides & Benus	2012	United States	Randomized controlled trial	4198	Examine the impact of Project GATE on the likelihood of starting a new business, likelihood of self-employment in a new business, self-employment, salary employment, overall employment, and earnings.	Performance, Business creation	Business skills, Social skills, Knowledge
Modak et al.	2018	India	Impact analysis	150	Find out level of overall competency and most influential entrepreneurial competency of post graduate students	Competencies	Business skills, Social skills, Characteristics

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Morselli & Gorenc	2021	Italy and Slovenia	Case study	40	Test the Korda method for students and describe how the EntreComp framework was utilized for evaluation	Competencies	Business skills, Social skills, Other skills, Characteristics, Values
Muchira	2018	Kenya	Mixed-methods	1324	Measure young people's entrepreneurial self-efficacy	Competencies	Business skills, Social skills
Mupfasoni et al.	2017	Burundi	Mixed-methods	56	Study knowledge, motivation and early-stage outcomes of sustainable agricultural entrepreneurship	Competencies, Orientation	Business skills, Characteristics, Knowledge
Omidi Najafabadi et al.	2016	Iran	Mixed-methods	146	Identify the relationship among entrepreneurial skills, self-efficacy, attitudes, psychological traits, social norms, perceived desirability, social support, and intentions.	Intention	Business skills, Communication, Social skills, Characteristics, Knowledge
Opolot et al.	2018	Uganda	Non-randomized experiment	184	Assess the influence of the training on smallholder farmers' competences, productivity and organizational capacity.	Competencies, Performance, Development	Business skills, Communication, Social skills, Characteristics, Agricultural skills
Parcell & Sykuta	2005	United States	Survey	172	Ascertain student interest in agriprenurship	Intention	Business skills, Social skills, Knowledge
Phelan & Sharpley	2011	UK	Survey	118	Examine the range of skills and competencies that farmers identify as important for successful diversification and they evidency	Competencies, Diversification	Business skills, Communication, Social skills, Other skills, Characteristics, Knowledge

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Pinadado et al.	2018	25 countries	Cross sectional study	1877	Examines the effect of human and social capital on new business opportunity identification	Competencies	Business skills, Characteristics
Pindado & Sanchez	2017	90 countries	Cross sectional study	7770	Analyze differences existing between new and established agripreneurs and their differences in non-agricultural ventures.	Competencies	Business skills, Social skills, Characteristics
Pliakoura et al.	2020	Greece	Survey	412	Investigate the needs of farmers for the EE and how they mediate entrepreneurial skills and farmers' knowledge of their business.		Business skills, Other skills, Characteristics, Values, Knowledge, Agricultural Skills
Poder	2017	Estonia	Impact analysis	1051	Study the entrepreneurial activities and competencies of university graduates	Competencies	Business skills, Communication, Social skills, Other skills, Characteristics, Values, Knowledge
Premand et al.	2016	Tunisia	Randomized controlled trial	1702	Analyze the impact of the entrepreneurship track on labor market outcomes by relying on randomized assignment of the program among applicants	Economic development, Business creation	Business skills, Characteristics, Knowledge

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Quinn et al.	2014	UK	Case study	21	Explore the policy and practice of a peripheral rural region food support program for small food enterprises and the impact on business development and innovation	Development	Business skills, Social skills
Rezaei-Moghaddam & Izadi	2019	Iran	Survey	185	Develop indicators of entrepreneurship in rural small enterprises and identify the effective factors and obstacles to provide strategies of entrepreneurship development	Entrepreneur development	Business skills, Characteristics, Values
Rezaei-Moghaddam et al.	2021	Iran	Survey	269	Analyze the entrepreneurial resilience of small and medium-sized businesses among rural women	Resilience	Business skills, Communication, Characteristics
Rezaei-Moghaddam et al.	2019	Iran	Survey	307	Identify and analyze the marketing activities among rural women entrepreneurs.	Competencies	Business skills, Characteristics
Rosas et al.	2022	Sierra Leone	Randomized controlled trial	3854	Examine the impact of a cash plus intervention on youth entrepreneurship and skills formation	Competencies, Resilience, Funding	Business skills, Characteristics
Salau et al.	2017	Nigeria	Survey	55	Assess the level of entrepreneurship skills of small and medium scale poultry farmers	Competencies	Business skills, Communication, Social skills, Other skills, Characteristics, Agricultural skills

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Shankar et al.	2015	Kenya	Randomized controlled trial	257	Discern gender-specific differences in involvement in the energy sector in regard to business outcomes	Satisfaction, Performance	Business skills, Characteristics
Sher et al.	2019	Pakistan	Survey	260	Find the impact of opportunity recognition on agriculture entrepreneurship and farmers entrepreneurial performance.	Performance, Intention, Orientation	Business skills, Characteristics
Shetty et al.	2022	India	Impact analysis	386	Analyze the impact of entrepreneurship development programs on the economic aspects of trainees	Performance	Business skills, Other skills, Characteristics, Agricultural Skills
Sunaryo et al.	2014	Indonesia	Impact analysis	297	Evaluate the program, contribute to literature, and to provide a view of how an entrepreneurship education can be approached differently in different environment	Competencies	Business skills, Communication, Characteristics
Tingey et al.	2020	United States	Randomized controlled trial	394	Report on entrepreneurship, economic, and social well-being outcomes	Behavior, Mental Health	Business skills, Communication, Social skills, Other skills, Characteristics, Knowledge
Ubfal et al.	2022	Jamaica	Impact analysis	945	Study effectiveness of hard and soft skills training compared to a soft-skills only training	Business outcomes	Business skills, Social skills, Other skills, Characteristics

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Unnikrishnan et al.	2022	Canada	Non-randomized experiment	2567	Assess the impact of an integrated skills training program given to youth living under the poverty line	Adoption of innovations, Engagement	Business skills, Social skills, Other skills, Knowledge, Agricultural skills
Val et al.	2019	Cyprus Spain Denmark France	Evaluation	300	Present a program based on Design Thinking and its empirical application	Competencies, Orientation	Social skills, Characteristics
Valdivia	2015	Peru	Randomized controlled trial	1979	Evaluate the impacts of a business training plus intervention	Adoption of innovations, Performance	Business skills, Communication, Social skills, Other skills, Characteristics
Wale et al.	2021	United States	Mixed-methods	458	Assess drivers of smallholder farmers' entrepreneurial spirit and their ability to take advantage of opportunities.	Competencies	Business skills, Characteristics