Relationship Between Agricultural Education and Adolescents' Career Aspirations in Agriculture: A Systematic Review

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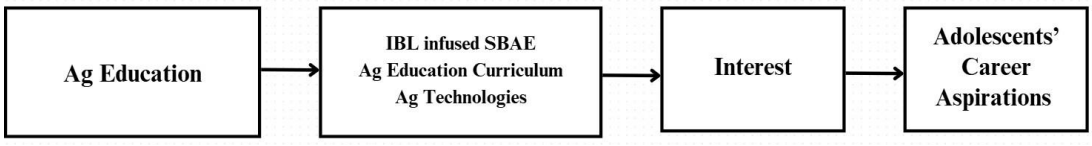
Introduction

Agricultural (Ag) education is a fundamental tool for educating younger generations about agriculture and natural resources. It helps students to learn about different Ag sciences, technologies, and enhances their knowledge about Ag careers. Formal Ag education is integrated into K-12 school systems through courses such as horticultural science and FFA. Among adolescents, Ag career aspirations are influenced by several factors such as their personal interests, family backgrounds, and educational experience, including Ag education (Adedapo et al., 2014). During adolescence, when career aspirations are developing, Ag education can shape students' career goals. However, youth view agriculture as an outdated profession (Alarima, 2019). Previous research examining the relationship between Ag education and adolescents' Ag career aspirations has shown mixed results; some studies found a positive association (Beecher et al., 2019), while others reported no association (Malau et al., 2024). These inconsistencies suggested a lack of clarity about how Ag education influences adolescents' Ag career aspirations. Addressing this gap, the systematic review synthesized evidence to study the relationship between Ag education and adolescents' Ag career aspirations. Specifically, this review asked: 1) How is Ag education associated with adolescents' career aspirations in agriculture? 2) Which program factors were identified as important in programs that demonstrated positive associations with agricultural career aspirations?

Conceptual Framework

This review was guided by Social Cognitive Career Theory (SCCT), conceptualizing how Ag education shapes adolescents' career aspirations through three key components of SCCT: self-efficacy, outcome expectations, and interests (Lent et al., 2002). During adolescence, exposure to Ag learning environments and repeated engagement with relevant activities can strengthen students' confidence (self-efficacy) and shape their expectations about future success (outcome expectations), which together influence their interests and aspirations in agriculture. Empirical studies in Ag education show that inquiry-based and STEM-integrated learning enhance students' self-efficacy, reinforce positive outcome expectations, and strengthen interest in Ag careers (Wells et al., 2015; Cosby et al., 2022; Manning et al., 2022). The working model (Figure 1) proposed that Ag learning experiences cultivated self-efficacy and outcome expectations, increasing interest in agriculture and strengthening adolescents' Ag career aspirations.

Figure 1
Working Model



Methods

This systematic review followed explicit, accountable methods to minimize bias and synthesize all relevant evidence (Gough et al., 2017) and was reported per PRISMA. The search was conducted across six databases - Agricola, CAB Abstracts, Education Source Ultimate, ERIC

(EBSCO), ProQuest Dissertations & Theses, and Web of Science, using three concepts: Ag Education, Adolescents (ages 12-18), and Career Aspirations. The subject headings, synonyms, and related terms were searched for each of the three concepts. Eligibility criteria followed PICOS principle (i.e., Population, Intervention, Comparison, Outcome, and Study design), based on empirical studies (quantitative, qualitative, mixed methods) published in the United States in English-language from 1986 to 2024 that examined the relationship between Ag education and adolescents' career aspirations. Covidence was used for screening 401 studies (Agricola 33; CAB 65; Education Source 63; ERIC 107; ProQuest 58; Web of Science 75), 94 duplicates were removed, leaving 307 for title and abstract screening (188 excluded), 119 for full-text review (99 excluded), and 20 were included. Two independent reviewers screened at each stage, and data extraction was conducted by the first author, capturing study authors, publication year, title, and objectives, study design, theoretical/conceptual framework, category of Ag education, program duration, and findings. The thematic synthesis (Thomas & Harden, 2008) was employed to analyze the 20 included studies. First, line-by-line coding was done to find initial themes in the data. Then, descriptive themes were developed based on the categorization of the initial themes.

Results

Majorly, Ag education was positively associated with Ag career aspirations among adolescents. Across 20 studies, 13 reported positive and seven reported negative associations. Ag career aspirations were captured through five different indicators: 1) career interest and motivation, 2) knowledge and awareness of Ag careers, 3) perceptions and attitudes toward Ag careers, 4) choice of Ag-related majors and careers, and 5) perceived benefits and barriers. Hands-on class sessions boosted Ag interest and motivation (Blanton, 2024). Ag education deepened adolescents' knowledge of career options, and preparation, fortifying outcome expectations (Copeland et al., 2020). Adolescents' perceptions of Ag careers shifted in a positive direction, but not always (Fraze et al., 2011). Deeper engagement with agriculture, such as FFA participation, was associated with selecting Ag majors and careers (Russell et al., 2019). Benefits (clarity about opportunities) and barriers (perceived low profit) further shaped adolescents' Ag career aspirations (Donaldson, 2022). Furthermore, the results found that nine out of 20 studies did not report the program details, such as program duration, learning approaches, and technologies used. The duration of the programs varied from 55minutes to one semester. Three programmatic factors were identified as important in programs that demonstrated positive associations with Ag career aspirations. First, inquiry-based learning refined critical thinking, and self-efficacy, increased Ag careers interest (Blanton, 2024). Second, interdisciplinary Ag curricula reframed Ag as modern and opportunity-rich, improving perceptions of Ag careers (Cotton et al., 2009). Third, exposure to Ag technologies such as biotech labs, made Ag realistic and future-oriented, strengthening adolescents' Ag career aspirations (Jean-Philippe et al., 2017).

Implications

Based upon the review findings, the future should address the following a) conduct long duration studies to learn and track the impact of Ag education on career aspirations of participants, b) conduct comparative studies between formal and informal Ag education programs to learn deeper insights into what instructional methods, strategies, curriculum, and activities worked best in influencing program participants' career interests, and c) systematic documentation of the program details to provide a clear picture of program influence.

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