Advancements in Agricultural Development
Volume 4, Issue 1, 2023
agdevresearch.org

Examining Level of School Garden Integration among Georgia Elementary Agricultural Education Teachers

J. Frederickson[1], J. Peake[2]

Abstract

This study used the GREEN (Garden Resources, Education, and Environment Nexus) tool to examine the level of school garden integration in elementary agricultural teachers' classrooms. The tool describes the 19 necessary components (e,g., organizational support, garden space) for gardens to become integrated within the school. This study utilized mixed methods with a concurrent triangulation design based on quantitative data obtained from an online questionnaire and qualitative data collected from focus groups. The findings were used to validate the findings produced by the other method. The population consisted of elementary agriculture teachers in Georgia. Though a definitive model does not yet exist for elementary agriculture education, it was clear that teachers rely on hands-on, experiential teaching activities such as garden maintenance tasks and taste tests. Teachers struggle most with volunteer and parent involvement and social events in the garden, largely because of the lasting impacts of the COVID-19 pandemic. Future research should consider how the results of the GREEN tool can shape professional development topics and help teachers set goals to improve their garden's level of integration. Research should also examine how COVID-19 impacted school garden programs.

Article History

Received: November 17, 2022
Accepted: January 30, 2023
Published: February 9, 2023

Keywords

quantitative; focus groups; experiential learning; environmental education; gardening

1. Jade Frederickson, PhD Student/Research Assistant, University of Georgia, 129A Four Towers, 405 College Station Road, Athens, GA 30602, jade.frederickson@uga.edu, https://orcid.org/0000-0001-9165-7830
2. Dr. Jason Peake, Professor, University of Georgia, 130 Four Towers, 405 College Station Road, Athens, GA 30602, jpeake@uga.edu, https://orcid.org/0000-0002-1431-5447

Introduction and Problem Statement

Agricultural education endeavors to teach children about "the plants, animals, and natural resource systems" (Talbert et al., 2014, p. 264). Until recently, students in secondary education and up were often the recipients of such instruction (National Association of Agricultural Educators, 2022), but Georgia is one state that piloted programming at the elementary level (Georgia Senate Bill 330, 2018). Georgia House Bill 1303 later passed, changing the pilot to an ongoing program.

Teaching agricultural education at the elementary level is not a new idea despite this recent legislation. Previous research suggests the lack of agricultural literacy among today's youth as well as agriculture's permeation into many areas of life (e.g., food and clothing production) as reasons why it would behoove schools to introduce children to this subject at younger ages (Hess & Trexler, 2011; Koy & Tarpley, 2020). Other research (Knobloch et al., 2007; Mabie & Baker, 1996; National Research Council, 1988) further documents the importance of teaching younger children about agricultural education, especially as it relates to experiential learning. School gardens are one avenue for experiential learning (DeMarco et al., 1999) where teaching in gardens pairs with subjects of agriculture, math, English, and science, among others (Ozer, 2007). Thorp (2005) also explored the impact gardening can have on children, postulating that gardens are places where wonder and creativity flourish. Though beneficial for learning, gardens often suffer from lack of funding, student use, care and attention, integration within the school community, and longevity of the program (Burt et al., 2017a, 2017b). There is also little research on how such an encompassing tool could supplement learning in the elementary agricultural classroom.

Theoretical and Conceptual Framework

The Agricultural Education Model

Agricultural education today aims to teach students about agriculture's relation to animal and poultry sciences, food and nutrition, the environment, horticulture, biotechnology, and mechanical skills (Croom, 2008; National Association of Agricultural Educators, 2022). Several programmatic developments came together over time to assist in the development of the three-component model for agricultural education, a model used to disseminate information regarding the aforementioned content areas. Specifically, the three components are classroom or laboratory instruction; experiential learning, often through a Supervised Agricultural Experience (SAE); and leadership education, usually through Future Farmers of America (FFA).

Elementary Agricultural Education

Georgia Senate Bill 330 and House Bill 1303 may have provided the space for elementary agricultural education, but no three-component model exists for these age ranges. Additionally, because the program is newer, few state standards exist. Peake et al. (2020) thus conducted a study to establish appropriate agricultural standards based on the needs of elementary students in Georgia. The study involved 16 stakeholders—middle and high school agriculture teachers, elementary school teachers, elementary and middle school principals, state and

national agricultural program representatives, Georgia state staff, and commodity group representatives—who decided on 52 relevant topics. Bailey (2021) later conducted a needs assessment to further assess the appropriateness of these standards. The results of this study indicated teachers needed guidance on how to introduce experiential learning opportunities in the elementary setting.

Experiential Learning

Experiential learning (Kolb, 1984) is an important theory that has permeated into the practice and teaching of agricultural education (Baker et al., 2012). Basic tenets of this theory propose that agricultural education should be a mechanism by which educators help students move beyond simply retaining knowledge to creating new meaning in other areas of their life. Educators are encouraged to provide children with relevant, relatable, concrete, and hands-on opportunities. A natural and easy-to-incorporate example of this is school gardens, a long-standing experiential learning and agricultural education practice (Williams, 2019).

Evaluating Integration of School Gardens

School gardens offer hands-on learning across many subjects, expose children to healthy behaviors, and allow for connections with the community. For students to receive a wide range of benefits, gardens must be well-integrated within the school community (Burt et al., 2017a). The GREEN (Garden Resources, Education, and Environment Nexus) Tool describes the necessary components for gardens to become integrated within the school. The conception itself is a circle, with four domains lining the outside of the circle: Resources and Support, Physical Garden, Student Experience, and School Community. Each domain has a variable number of components, which are oriented in an N-S, E-W fashion. The components are arranged from the outside of the circle moving in to suggest that moving inward can lead to a more integrated garden. Resources and Support is the suggested entryway.

Purpose

The purpose of this study was to examine the level of school garden integration in elementary agricultural education teachers' classrooms. The following objectives were set after reviewing the literature but prior to collecting data:

1. Describe elementary agriculture school garden characteristics.
2. Describe elementary agriculture teachers' level of school garden integration.
3. Utilize GREEN Tool results to determine topic areas for future professional development for Georgia elementary agriculture educators.

Methods

This study was mixed methods in nature and used a concurrent triangulation design (QUANT + qual) based on quantitative data obtained from an online questionnaire distributed via Qualtrics and qualitative data collected from follow-up focus groups that were used to validate both sets of data (Leedy & Ormrod, 2019). This study operated as part of a larger initiative to

learn more about Georgia elementary agriculture teachers. As elementary agricultural educators do not receive Extended Day Extended Year pay, compensation of $300 was offered to subjects to increase participation. This study was conducted as part of a larger NIFA/USDA grant focusing on professional development for elementary agriculture education teachers.

The questionnaire was distributed online via Qualtrics to all identified elementary agriculture education teachers in Georgia (*N* = 35). Because this program first operated as a pilot program, this contact information was readily available from the Georgia Department of Education. Those who completed the initial questionnaire were asked to participate in a focus group. The questionnaire was initially open for completion during the first three weeks of June 2022 with a focus group planned to be held at the end of the month. Because teachers' schedules vary and participation was limited, the researchers extended the data collection period through mid-August. A second focus group occurred in the middle of August. Throughout the duration of the data collection period, 15 total teachers (*n* = 15) completed the questionnaire in its entirety for a response rate of 42.9%, and 11 teachers (*n* = 11) attended the focus groups.

The online questionnaire was modeled after the GREEN tool scorecard, which has four domains comprised of 19 total components deemed essential to having a well-integrated school garden. Each component was written as a question. For example, *budget and funding* is one component of the *resources and support domain*. This statement read, "I have enough funds to support my school garden." The teacher was asked to read the statement presented for each component and then rate on a scale of one to seven, one being the lowest and seven being the highest, how well each component described their school garden. Researchers worked with Dr. Kate Burt to develop this questionnaire (K. Burt, personal communications, May 12, 2022). To situate this tool for elementary agriculture education teachers, the researchers included a demographics question that asked teachers to explain the number of years and their experiences working in a garden. Another addition was to include a question about whether the teacher believed they were the best individual at their school to answer this survey. Finally, each component also asked teachers to rate their confidence of how true they believed their answer to be about the evaluative component of the garden. For example, when considering the *budget and funding component* again, once the teacher responded, they were asked, "How confident are you in your ability to answer this question about your school's garden? (1 is not confident at all, 7 is very confident)."

The reliability of the tool for elementary agricultural education teachers in Georgia could not be established due to the small sample (*n* = 15 for quantitative and *n* = 11 for qualitative). The various backgrounds and experiences in gardening, teaching, and agriculture education allowed the research team to establish the population as experts among those in elementary agriculture education. A review by the sample population allowed the researchers to establish face, criterion, and content validity of the questionnaire.

Limitations

Significance could not be determined due to the small sample size. Only descriptive measures (means and standard deviations) via SPSS Version 27 were used in reporting measures. Another

limitation of the study was that because the questions were worded based on the scorecard, some questions were purposely left double-barreled. Focus groups were conducted to mitigate these concerns and clarify the quantitative nature of the questionnaire.

Findings

Participant Demographics

Eighteen individuals completed the online questionnaire, 16 indicated they had school gardens, and of the 16, 15 participants completed the questionnaire in its entirety. Table 1 describes relevant participant demographic characteristics. All 15 teachers taught a combination of kindergarten through fifth grade; two teachers also taught middle school (sixth through eighth) grades.

Table 1

Participant Demographic Characteristics (n = 15)

Characteristic	*f*	*%*
Gender		
Female	11	73%
Male	4	27%
Age		
30 to 40	6	40%
41 to 50	5	33%
51 and over	4	27%
Certification		
Agriculture education	9	60%
Elementary education	6	40%
Total years of teaching experience		
0 to 5	1	7%
6 to 10	5	33%
11 to 15	1	7%
16 to 20	4	27%
More than 20	4	27%
Years teaching agriculture		
0 to 5	11	73%
6 to 10	2	13%
More than 10	2	13%
Years of experience farming or gardening		
0 to 5	2	13%
6 to 10	2	13%
11 to 15	3	20%
16 to 20	1	7%
More than 20	7	47%

Describing their School Garden Characteristics

Every teacher indicated they had some type of school garden that their students used in some capacity. Table 2 describes the types of gardens and the student garden interactions. Several teachers described using more than one type of gardening setting or interaction activity.

Table 2

Teacher's Garden Characteristics (n = 15)

Component of the Garden	*f*	%
Type of Set-Up		
Raised or galvanized garden bed(s)	15	100%
Pollinator garden	6	40%
Alternative system (e.g., hydroponic, aeroponic, etc.)	5	33%
Greenhouse	4	27%
Fruit production (e.g., fruit trees, berry bushes)	4	27%
Container garden	3	20%
School cafeteria garden	2	13%
Open field plot	2	13%
Hoop house or high tunnel	2	13%
Chicken coops	2	13%
Themed garden (e.g., salsa, pizza, etc.)	1	7%
Sensory garden	1	7%
Ways Students Interact		
General care and maintenance (e.g., seeding, planting, weeding, etc.)	15	100%
Related classwork (e.g., plant life cycles, observation journals, etc.)	10	67%
Taste tests or related cooking activities	3	20%
Garden bed construction	2	13%
Outdoor classroom space	2	13%
Hydroponic maintenance and care	1	7%
Nutrition education lessons	1	7%

Fifteen teachers indicated they had some type of raised bed. The second and third most common types of gardens were pollinator gardens and alternative systems, respectively. Additionally, every teacher indicated their students participated in the general maintenance and care of the garden. Most teachers (*n* = 10, 67%) indicated they connect the garden to learning in the classroom.

Evaluating Level of Garden Integration

Four domains comprise the GREEN Tool: resources and support, physical garden, student experience, and school community. Each domain with the resulting scores from the questionnaire will be discussed independently, where each section presents a table displaying highest and lowest GREEN tool scores as well as related confidence scores. The confidence scores indicate whether the teacher believed the GREEN Tool score they assigned each component is accurate for their garden (e.g., confidence of 7 indicates they believed they

accurately described that component's effect on their garden). Eighteen of the nineteen mean confidence scores were above six, so teachers were confident that they could answer the questions related to their school garden. The highest and lowest scores were also provided as context for the range of teachers' responses.

Domain 1 – Resources and Support

The five components of domain one are budget and funding, network and partner organizations, administrative support, professional development, and organizational structure. The GREEN Tool and related confidence score are listed in Table 3. Administrative support (*M* = 5.2) refers to support from key leaders within the school community, whereas organizational structure (*M* = 3.3) refers to the individuals that determine how to operate the garden program. The focus group conversations revealed several key points. First, many teachers indicated that their local Farm Bureau and garden-related supply stores were huge sources of support (component: network and partner organizations). Several, however, expressed they wished they had more chances to connect with their fellow elementary agriculture education teachers. Additionally, many teachers indicated their administration was supportive of their garden program, yet they still lacked any sort of regular funding and professional development opportunities to support and sustain their program. Thus, again, teachers rely on their external partnerships to support their programs.

Table 3

Summary and Comparison of GREEN Tool and Confidence Scores for Domain 1 (n = 15)

	GREEN Tool Scores				Confidence Scores	
Component	Lowest	Highest	*M*	*SD*	*M*	*SD*
Administrative Support	3	7	5.2	1.4	6.3	0.6
Network and Partner Orgs.	3	7	4.8	1.8	5.9	1.3
Budget and Funding	1	7	4.4	2.2	6.3	0.6
Professional Development	1	7	4.4	2.1	6.2	0.6
Organizational Structure	1	7	3.3	2.1	6.1	0.6

Note. For GREEN Tool scores, on a scale of one to seven, one being the lowest and seven being the highest, score indicates how well each component described their school garden. For confidence, one is not confident at all, and seven is very confident.

Domain 2 – Physical Garden

The five components of domain two are planning and establishing the physical space, garden care and upkeep, space for the physical garden, crop vitality and diversity, and evaluation and feedback. The GREEN Tool and related confidence score are listed in Table 4. Both planning and establishing the physical space and space for the physical garden had the highest mean scores (*M* = 5.7) each. The evaluation and feedback component had the lowest mean score (*M* = 4.3). Regarding the two highest mean scores, these components refer to the deliberate action taken to plan the garden based on the school's needs and the actual space devoted to the garden, respectively. Evaluation and feedback refer to the communication or information one receives about the effectiveness or efficacy of the garden. The focus group conversations revealed some

conflicting points, especially in relation to the planning and establishing the physical space component. Several teachers indicated the garden's location was not ideal, particularly because they were not involved in the planning process. For example, two teachers mentioned their garden is on the opposite side of the school grounds from their classroom, making it hard to walk over there during the allotted class time. Several others also mentioned water hookups were not close to the garden, and at least one indicated the garden was too close to the playground areas. Despite these contradictions, almost all teachers said they were proud of the garden and enjoyed its space, despite some of the difficulties they expressed related to its layout. Regarding evaluation and feedback, teachers often rely on the expressed emotions of the students. This falls more clearly under domain 3, which will be discussed next.

Table 4

Summary and Comparison of GREEN Tool and Confidence Scores for Domain 2 (n = 15)

	GREEN Tool Scores				Confidence Scores	
Component	Lowest	Highest	*M*	*SD*	*M*	*SD*
Planning and establishing the physical space	1	7	5.7	1.6	6.4	0.4
Space for the physical garden	1	7	5.7	1.9	6.3	0.6
Crop vitality and diversity	2	7	5.1	1.6	6.3	0.6
Garden care and upkeep	3	7	4.9	1.8	6.2	0.6
Evaluation and feedback	1	7	4.3	1.7	6.3	0.7

Domain 3 – Student Experience

The six components of domain three are connection with the curriculum, learning opportunities, time spent in the garden, activities, engagement, and tasting. The GREEN Tool scores and related confidence scores are listed in Table 5. The connection with the curriculum component had the highest mean score (*M* = 6.3) whereas the tasting component had the lowest mean (*M* = 4.5). The high mean for connections with the curriculum indicates that teachers do not struggle with matching teaching in the garden to state-mandated learning objectives. The high mean for this domain is unsurprising given the data presented in Table 2, which indicates that 10 teachers utilize the garden to support learning in other subjects. The focus group conversations also corroborated this; most of the agriculture teachers confirmed they do not struggle relating the state standards to learning in the garden. One participant indicated that although they must work harder to lesson plan, they do not struggle to connect the curriculum with learning in the garden.

Tasting as a component had the lowest mean score in this domain, which was not anticipated given that Table 2 shows three teachers indicated this was a way the students interacted with the garden. Additionally, during the focus groups, several teachers indicated the students loved tasting what they grew. A consideration for this low score could be that teachers only considered tasting activities that they led to be the criteria for this component (i.e., they may not count whether the students taste the vegetables in the cafeteria rather than in their classroom).

Table 5

Summary and Comparison of GREEN Tool and Confidence Scores for Domain 3 (n = 15)

Component	GREEN Tool Scores				Confidence Scores	
	Lowest	Highest	*M*	*SD*	*M*	*SD*
Connection with curriculum	6	7	6.3	0.5	6.3	0.6
Engagement	5	7	6.2	0.6	6.4	0.4
Learning opportunities	5	7	5.9	0.9	6.3	0.6
Activities	5	7	5.9	0.7	6.4	0.4
Time spent in the garden	4	7	5.7	1.2	6.3	0.6
Tasting	3	7	4.5	1.3	6.4	0.4

Domain 4 – School Community

The three components of domain four are volunteer and parent involvement, social events, and food environment. The GREEN Tool and related confidence score are in Table 6. All components in domain four ranked low relative to the components of the other domains. The conversations during the focus groups were also the shortest when discussing this domain. At least one teacher in each focus group mentioned the COVID-19 pandemic played a significant impact on their school's ability to bring in volunteers or host social events. For example, the teacher specifically mentioned that their school will not allow volunteers; thus, this domain's components may not be as relevant to their garden's success.

Table 6

Summary and Comparison of GREEN Tool and Confidence Scores for Domain 4 (n = 15)

Component	GREEN Tool Scores				Confidence Scores	
	Lowest	Highest	*M*	*SD*	*M*	*SD*
Food environment	1	7	4.3	1.6	6.0	0.4
Social events	1	7	3.4	2.4	6.4	0.4
Volunteer involvement	1	7	2.9	2.2	6.3	0.6

Table 7 provides a summary of the GREEN Tool component and confidence scores, ranked highest to lowest. Each line also indicates which domain covers that component.

Table 7

Highest to Lowest Ranked Mean GREEN Tool Scores for all Components (n = 15)

Component	Domain	Mean GREEN Tool Score	Mean Confidence Score
Connection with curriculum	3	6.3	6.3
Engagement	3	6.2	6.4
Activities	3	5.9	6.4
Learning opportunities	3	5.9	6.3
Time spent in the garden	3	5.7	6.3
Space for the physical garden	2	5.7	6.3
Planning and establishing the physical space	2	5.7	6.4
Administrative Support	1	5.2	6.3
Crop vitality and diversity	2	5.1	6.3
Garden care and upkeep	2	4.9	6.2
Network and partner organizations	1	4.8	5.9
Tasting	3	4.5	6.4
Budget and funding	1	4.4	6.3
Professional development	1	4.4	6.2
Evaluation and feedback	2	4.3	6.3
Food environment	4	4.3	6.0
Social events	4	3.4	6.4
Organizational Structure	1	3.3	6.1
Volunteer and parent involvement	4	2.9	6.3

Note. Domain 1 is Resources and Support, Domain 2 is Physical Garden, Domain 3 is Student Experience, and Domain 4 is School Community.

Conclusions, Discussion, and Recommendations

Objective 1: Describe Elementary Agriculture School Garden Characteristics

All teachers indicated they had some type of garden in their elementary agricultural education program, where raised beds were the most common followed by pollinator gardens and alternative systems. All teachers indicated their students participated in the general maintenance and care of the garden.

Objective 2: School Garden Integration Levels

The GREEN Tool proposes that a well-integrated school garden will have all 19 components. From the findings, the qualitative data did seem to support the quantitative findings in that teachers generally noted they do not struggle engaging students in the garden, either via physical activities or classroom learning. Corroborating data can be seen in Tables 2 and 5. Though a definitive model does not yet exist for this age sector of agriculture education, these findings suggest elementary agricultural education teachers use the garden as a way to implement experiential learning. Future research should examine if and how experiential

learning is age-appropriate in the elementary agricultural classroom. Specific questions should focus on what ways a school garden contributes to this teaching, and whether an integrated garden (i.e., sustainable and a part of the school's culture) changes the efficacy of experiential learning. Future research should also examine the efficacy of the components in domain 4, which all ranked in the lowest five of the 19 components (Table 7). Specific attention should be given to questioning whether the absence of these three components affects the longevity of a school garden program and if these three components are relevant to the elementary agriculture classroom. Attention should also be given to if and how these three components contribute to the experiential learning approach. For example, a question could be: If parents come in to volunteer *and* give a talk about how gardening plays a role in their life, does this increase the potentiality of gardens as experiential learning?

Objective 3: Future Professional Development Opportunities

Table 7 provides an ordered list of school garden components where elementary agriculture teachers scored highest and lowest. These data suggest that volunteer and parent involvement, organizational structure, social events, food environment, and evaluation and feedback are the five areas where professional development could most benefit elementary agriculture education teachers. However, it is noteworthy that professional development ranked 14 of the 19 components considered necessary for having a well-integrated school garden. Considering the relatively low-rank order of this component, an emergent question is: how is professional development best delivered to elementary agriculture teachers? These teachers lack extended day and extended year funding for non-school-day professional development which inhibits their ability to be trained in other areas identified in Table 7. Addressing these roadblocks in professional development would be beneficial because it would allow others looking to implement school gardens to know where potential weaknesses may occur.

At least two teachers indicated the ongoing pandemic affected their ability to bring external individuals into the school. Thus, a final avenue for research could be exploring how such an emergency determines short and long-term courses of action for school garden programs.

Acknowledgements

This study was conducted as part of a larger NIFA/USDA grant titled Professional development for agricultural literacy in elementary agriculture teachers (PDAL EAT), which focuses on professional development for elementary agriculture education teachers. Project No. RNIFA0001309501.

J. Frederickson - formal analysis, investigation, writing - original draft, writing - review & editing, visualization; **J. Peake** - conceptualization, methodology, validation, investigation, resources, writing - review & editing, supervision, funding acquisition.

References

Bailey, H. (2021). *A needs assessment of Georgia elementary agriculture education* [Master's thesis, University of Georgia]. UGA Theses and Dissertations. https://esploro.libs.uga.edu/esploro/outputs/9949374967702959

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

Burt, K. G., Koch, P., & Contento, I. (2017a). Development of the GREEN (garden resources, education, and environment nexus) tool: An evidence-based model for school garden integration. *Journal of the Academy of Nutrition and Dietetics, 117*(10), 1517–1527. https://doi.org/10.1016/j.jand.2017.02.008

Burt, K. G., Koch, P., & Contento, I. (2017b). Implementing and sustaining school gardens by integrating the curriculum. *Health Behavior and Policy Review, 4*(5), 427–435. https://doi.org/10.14485/HBPR.4.5.2

Croom, B. (2008). The development of the integrated three-component model of agricultural education. *Journal of Agricultural Education, 49*(1), 110–120. https://doi.org/10.5032/jae.2008.01110

DeMarco, L. W., Relf, D., & McDaniel, A. (1999). Integrating gardening into the elementary school curriculum. *HortTechnology, 9*(2), 276–281. https://doi.org/10.21273/HORTTECH.9.2.276

Georgia Senate Bill 330. (2018). https://www.legis.ga.gov/legislation/52045

Hess, A. J., & Trexler, C. J. (2011). A qualitative study of agricultural literacy in urban youth: What do elementary students understand about the agri-food system? *Journal of Agricultural Education, 52*(4), 1–12. https://doi.org/10.5032/jae.2011.04001

Knobloch, N. A., Ball, A. L., & Allen, C. (2007). The benefits of teaching and learning about agriculture in elementary and junior high schools. *Journal of Agricultural Education, 48*(3), 25–36. https://doi.org/10.5032/jae.2007.03025

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

Koy, K., & Tarpley, R. (2020). Evaluation of elementary agricultural education curriculum for integration. *NACTA Journal, 65*, 334–339. https://www.nactateachers.org/attachments/article/3146/2021-0434%20FINAL.pdf

Leedy, P. D., & Ormrod, J. E. (2019). *Practical research planning and design* (12th ed.). Pearson.

Mabie, R., & Baker, M. (1996). A comparison of experiential instructional strategies upon the science process skills of urban elementary students. *Journal of Agricultural Education, 37*(2), 1–7. https://doi.org/10.5032/jae.1996.02001

National Association of Agricultural Educators. (2022). *What is agricultural education?* https://www.naae.org/whatisaged/

National Research Council. (1988). *Understanding agriculture: New directions for education*. National Academy Press. https://eric.ed.gov/?id=ED338795

Ozer, E. J. (2007). The effects of school gardens on students and schools: Conceptualization and considerations for maximizing healthy development. *Health Education & Behavior*, *34*(6), 846–863. https://doi.org/10.1177/1090198106289002

Peake, J. B., Rubenstein, E. D., & Byrd, B. (2020). Content topic development for elementary agricultural education curriculum. *Journal of Agricultural Education, 61*(3), 101–111. https://doi.org/10.5032/jae.2020.03101

Talbert, B. A., Vaughn, R., Croom, B., & Lee, J. S. (2014). *Foundations of agricultural education.* Pearson.

Thorp, L. (2005). A season for seeds: Notes from a schoolyard garden. *Culture and Agriculture, 27*(2), 122-130. https://doi.org/10.1525/cag.2005.27.2.122

Williams, P. A. N. (2019). *Georgia agricultural education instructors and school gardens: Current practices, perceived benefits, barriers and resources* [Doctoral dissertation, University of Georgia]. UGA Theses and Dissertations. https://getd.libs.uga.edu/pdfs/williams_patricia_a_201905_edd.pdf