Food and Agriculture Education: A Framework for the Tallahassee Community

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Abstract:
This project is focused on improving Environmental Education in Tallahassee, specifically in regards to the Food and Agriculture System. This paper draws on research about environmental education practices as well as issues within the agriculture system to develop an understanding about not only the need for Food and Agriculture Education, but also the ideal ways to engage students, teachers, and the community. The primary research in this study involved qualitative interviews with local community members and educators who are involved in Environmental Education. Themes and issues of the interviews were discussed as a foundation for an educational framework proposal. The framework involves four key elements 1) an online website of relevant content and lessons 2) a networking initiative to connect farmers and community organizations with teachers and students 3) educational opportunities for teachers and other educators 4) a connection between student’s community engagement and classroom success.

Introduction
The food system in the United States is studied by numerous academic disciplines, each containing different perspectives on how the system functions in reality and how it should ideally function. Ecologists and biologists may examine the effects of herbicides on bee populations, for example, while a political scientist may study the regulation of such chemicals by the government and resistance to such regulation from the private sector. A sociologist, in turn, may look at how food deserts and crop subsidies may contribute to obesity among lower-income groups. Outside of academia, a small farmer may wonder how they can compete with large-scale agribusinesses that use expensive herbicides, fertilizers, genetically modified crops, and sell to a market that values lower cost over nutritional quality. When considering the United States’ food system, it is a considerable challenge, and pressing need, to educate consumers and policymakers such that they can make informed, ethical decisions while purchasing food and deciding on regulations and incentives surrounding agriculture.
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Though there have been many efforts to raise awareness about the social problems that arise in relation to food production, much of public is still unsuspecting of the harmful methods by which their food is produced, and the government and corporate interests that impact the agricultural system (Pollan, 2006). Besides food being an absolute necessity of life, it is an important element of our economic and social societies. Therefore, it should have a more prominent place in the education system, and teachers should have more resources that empower them to study the complexity of the food system. Students learn about civics and government in order to become educated, productive citizens. I assert that critical perspectives on food production should be added to academic conversations within social science and environmental education.

This paper will, first, review relevant literature on both environmental education and the agricultural system. It will then present the perspectives of the local community that have been gathered through qualitative interviews. This information will be used to form a framework for increasing food and agriculture education for K-12 students that fits within the capacities of the Tallahassee community.

Current Perspectives and Approaches to Environmental Education

Throughout the relatively brief history of environmental education in colleges and schools, there has been considerable debate on how to combine the disciplines of science, social science, and the humanities. As environmental education is inherently interdisciplinary, it has fallen through the cracks in K-12 education systems. Thus, environmental education has found a niche in community organizations whose missions align with protecting natural resources, such as conservation groups and gardening cooperatives. Most of these services come in the form of community education, such as farm tours, workshops, pamphlets, and fundraising events. Environmental education is present at the higher education level. Graduate programs in Sustainable Development and Agriculture are emerging with new support and funding from various government and international organizations. Some curricula provide a stronger focus on biology and ecology, while others aim to connect understanding of social structures and culture. This portion of the paper will serve as a review of the various approaches in the field today and give the foundation that my framework will employ.

The Need for a Problem Solver/Systems Approach
According to Vincent and Focht (2009), there are three curriculum routes that one can follow when developing an educational framework in this field: the Environmental Scientist, the Environmental Citizen, and the Environmental Problem Solver. The Scientist is focused on mastery of a single discipline such as chemistry, biology, or ecology. The Citizen includes basic literacy in the natural sciences, but emphasizes social implications, and the humanities. The Problem Solver focuses on the systems approach to address the multiple dimensions of environmental issues, and is intrinsically interdisciplinary (Vincent and Focht, 2009).

The educational framework developed in this paper will serve to address environmental issues by incorporating a systems approach between lessons and concepts. The interactions between different social, scientific, international, local, governmental, corporate, and cultural institutions will be highlighted. In order to better prepare students to be Environmental Problem Solvers, there will be collaborative learning practices that begin with partnerships between community and educational institutions. This will help learners navigate the channels of the many groups that work in the environmental field.

Community Based Learning

According to Mooney and Edwards, “community based learning refers to any pedagogical tool in which the community becomes a partner in the learning process” (Mooney & Edwards, 2001). A community partnership may mean working directly with community organizations or giving students opportunities to explore issues within their own neighborhood. Environmental Education can easily lend itself to community based learning because so many practices and types of knowledge are influenced by historical, geographical, and sociopolitical contexts. It also encourages connections within the community network and gives a personal element to the subject matter. Community based learning also challenges traditional educational practices because it draws on the knowledge of experts that may not be typically thought of as scholars (Boyer, 1990). Education that creates interactions between students and local food producers may, in fact, strengthen the place of local farmers in the regional economy (Wright 2006).

Current Food System

The conventional food system is the driving force behind the advancement and need for agricultural education. Average citizens are unaware of the processes that create, transport, preserve, and dispose of
their food. The vast majority of our calories are produced in mass quantities by a few corporations and then transported across the globe. In recent years, there has been an emergence of a counterculture that disagrees with the social and environmental implications of this model.

Commodity Agriculture

Contemporary food production in the United States is characterized by a high degree of industrialization—that is, much of the agricultural sector is large-scale, highly mechanized with intensive technical inputs (e.g., genetically modified seeds, fertilizer, pesticide/herbicide, growth hormones), and has an emphasis on profit and/or low prices. Within an industrial framework of food production, the system of growing crops and raising livestock is simply another type of commodity production. Therefore, “commodity agriculture” is the practice of growing and raising crops with the goal of producing as much as possible with maximized efficiency. These ideals are rooted in experimental biology, which values yield output, and neoclassical economics, which boosts profitability through land, labor, capital, and management (Lyson & Guptill, 2004; Kay, 1986). In the commodity agricultural system, farming practices are greatly influenced by a handful of multinational corporations and subsidies set by the U.S. Department of Agriculture. In this system, individual farmers have relatively few degrees of freedom. Farms, accordingly, have become more independent of the local community and are often owned by outside companies as locations for a highly standardized and centralized production system (Kay, 1986).

As a consequence of the industrialization of agricultural production, the food system has been able to increase yields to levels that defy “natural” environmental capacities. Soil fertility is increased through synthetic fertilizers, biocides control pests and plants, and optimal plants are modified through genetic engineering (Lyson & Guptill, 2004). Therefore, the agriculture system is dependent not only on natural factors like land and water, but also on the industries that surround chemical production, distribution, and research. The interests of the industry corporations are protected and supported by tens of billions of dollars in government subsidies each year (Lyson & Guptill, 2004).

Another practice of commodity agriculture is regionalization and large farming operations. Monoculture, the practice of growing only one product or even one strain (e.g., today’s ubiquitous yellow dent corn), depletes soil of nutrients over time, as the same crop is grown season after season.
Industrial farmers must then use synthetic fertilizers to make up for the nutrient deficient in the soil. With the stakes so high, the few types of crops that are planted must be optimal. Farmers increasingly use genetically modified crops that are resistant to certain chemicals or bugs. This is beneficial to monoculture but detrimental to the level of biodiversity in the soil.

As different regions of the country have come to specialize in particular crops and animals—corn and soy in the Midwest, citrus in California—no one region grows everything that it needs. Food is shipped all over the country and the world, and, as a result, chemicals must be used to keep food fresh and ripe. The production, transportation, and processing of food are huge contributors to global climate change and emissions in our atmosphere (Matthews, 2014). This research shows that food production and agriculture have immense effects not only on our economy and social structures, but also on the environment. Despite efficiency, the continuation of these methods jeopardizes future environmental and food security.

It is important to note that despite the many criticisms of commodity agriculture that are presented in this paper, there are cultural and technological conditions that have led to the creation and perpetuation of this system. As the world population grows at an exponential rate, food production must become more efficient with limited resources. The industrial system has allowed us to produce enough food for the entire world. Despite this, political, economic, and social forces have prevented equal distribution, so people still starve in an era of plenty. Further, cultural and personal connections to food drive production markets. As the United States becomes focused on instant gratification and meals that are heavy in meat and corn products, its food system works to meet consumer demands. Commodity agriculture is not intrinsically negative, but the effects of its practices must be examined and critiqued.

*Civic Agriculture*

Though the mainstream food system is reliant on commodity agriculture, there is a growing resistance to this method and a growing demand for alternatives. While commodity agriculture is built upon a production- and profit-maximizing business model, “civic agriculture” is an umbrella term used to classify production practices and transactions that value community health and personal relationships (between farmers, consumers, and citizens alike) in addition to economic viability. According to Lyson (2004), civic agriculture refers to the “emergence and growth of community-based...
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agriculture and food production activities that not only meet consumer demands for fresh, safe, and locally produced foods, but create jobs, encourage entrepreneurship, and strengthen community identity.” In recent years, community-centered agriculture has become much more popular and can be seen in the reemergence of farmer’s markets, community gardens, local processing, and local food cooperatives (Wright, 2006).

Farmers and consumers that are part of the local, civic agriculture community are highly passionate individuals who see small-scale farming as a connection with their food and the earth. As part of this project, I interviewed several civic agriculture advocates. They held strong opinions not only about industrial agriculture, but also the importance of alternative methods that can be taught:

“Industrial farming sucks. So young people don’t go into it. I mean you’re just a chemical custodian. There’s a cookbook of this is what you spray when and, you know, there’s no passion or soul or creativity in that kind of farming. And in [sustainable farming] it’s totally that. You have to be really passionate, it’s really complex. It is knowledge that is on the verge of being lost” (Herman Holley, Turkey Hill Farm)

Another participant echoed this sentiment and identified local agriculture as the most influential method of production, even more important than organic agriculture. This is because local agriculture is often so small scale that it does not use monoculture and other industrial practices that are detrimental to the biodiversity of the surrounding ecosystems and the health of the soil.

In addition to the health of communities, civic agricultural practices are seen as more sustainable and better able to meet the needs of local consumers. Whereas commodity agriculture is focused on mass sales of monocrops, civic agriculture provides localized products that are sensitive to the social, demographic, and cultural desires of the region (Lyson & Guptill, 2004). Currently, however, the impact of civic agriculture is limited. Due to the size of these operations, civic agriculture makes up a tiny fraction of all farming sales in the United States and is often seen as a “premium product.” For this reason, civic agriculture is much more likely to be located near high-income communities in urban and suburban regions (DeLind 1999, Govindasamy et al., 1998).

Community Supported Agriculture (CSA) is one form of civic agriculture that has generated a lot of interest. A CSA involves community
members contributing money to a farmer at the beginning of a growing season in exchange for a frequent share in the product. Many small farms are supported through CSAs, as they would not otherwise have the resources to front the costs of production throughout the season. Several scholars have noted the significance of this trend as it forms a direct relationship between the producer and consumer while creating a community with shared risks and rewards (Wells et al, 1999; Durrenberger, 2002). Successful CSAs rely on media, activism, and the volunteerism of non-profit organizations (Janssen, 2010). These assertions support the idea that agricultural and food education is vital to the success of alternative food systems and civic agriculture.

Defining and Maintaining Sustainability

A third central concept in a systems problem-solving approach to Food and Agriculture Education is “sustainability.” According to Michael Pollan, a renowned author in the field, it is easier to define what is not sustainable than to define what is. Something is unsustainable when “a practice or activity cannot go on as it has much longer, [and] because of various internal contradictions, it will sooner or later break down” (Pollan, 2006). Ironically, efforts to increase sustainability of food production also have internal contradictions. For instance, when sustainability is sought through more efficient use of agricultural inputs, it may sacrifice environmental health. The contradictions with the blueberries from Chile (as exemplified previously) are a prime example of how organic agriculture that produces healthier food for human consumption is not necessarily a better alternative for soil health.

Environmentally friendly foods, farmers’ markets, and CSAs are usually the purview of the college-educated middle class, with working class and poor families more likely to rely on the commodity agricultural system that produces cheap calories (Janssen, 2010). For those financially able to act on a preference for “sustainable” food products, organic farming is at the forefront. Organic agriculture is intended to have a smaller environmental impact: to enhance biological diversity within the soil, and to minimize the use of non-renewable resources by recycling waste and using local, renewable resources where possible (Smith, 2010).

Purpose and Objectives for Project

The purpose of this research is to assess the current efforts of agricultural advocacy and education in the Tallahassee region in hopes of creating...
a framework for future public, K-12 agricultural education. Presently, information about commodity versus civic agriculture is entering the public consciousness through the efforts of community agencies and local food advocates such as farmers and community organizers. Therefore, the goal of this paper is to create an educational framework that instructors may use to incorporate the experiences and expertise of community members. This study will serve to identify opportunities for collaboration between teachers, schools, and those in the local agricultural community. The intended benefit is to foster, in environmental education students, a greater understanding of the complex relationship between the environment and the way we produce, distribute, and consume food in the United States.

Methods and Procedures

This project utilized qualitative interviews with experts in both the agricultural and educational fields within the Tallahassee area. As the community is relatively small, the participants were identified through a word-of-mouth process in which participants recommended other relevant individuals. The findings may be biased towards the ideas of small-scale farming or the particular ecology and culture of the Big Bend region of North Florida as a result of the snowball sampling technique. Overall, there were five participants. Wes and Kristi are both Master’s students in the community who are studying Urban and Regional Management and Soil Science. They individually work with two different community organizations, the Agronauts and the Damayan Garden Project. Herman and Louise are a married couple in their mid-60’s who have their own farm and started the Red Hills Small Farm Alliance. Sheri is a local high school teacher who started her own school garden. The interviews were about 45 minutes in length, conducted in local coffee shops, and recorded using a digital recorder. The interview questions differed slightly based on the individual’s experience and areas of expertise. Overall, the questions followed these themes:

1. Background in agriculture and food
2. Involvement in education
3. Student’s understanding of agriculture and food systems
4. Strategies the individual employs in curriculum planning and development
5. Capacities of Tallahassee Agricultural Community

6. Thoughts on improving education strategies in the region

At the end of each interview, I asked the respondent about the specific needs and resources that would be useful to improving environmental education. Consequently, many of the framework components were created directly from their suggestions.

Findings and Discussion

Student Understanding of Agriculture and Food System

The most prevalent theme in the interviews was the perception that students and adults do not know where their food comes from or what food looks like in its natural form. For example, one interview participant is the founder of an organization that works within the school system. He and his colleagues had students keep a food diary. The results of the food diary exercise revealed that their middle and high school students mostly ate hot wings, fried chicken, and French fries. Students rarely ate vegetables, and when they did, they were often canned and not fresh. An implication of these observations is that what young people eat is not only an indication of their overall health and nutrition, but also reveals something about their limited understanding of what food is. One interviewee expressed that even when students were involved in gardening, they still struggled with the concept that food came from plants and that food from the earth is safe to eat.

“A student and I picked off a green bean, and I ate it. The student was alarmed that I put that in my mouth. That I put something in my mouth that was from this plant. He was like, ‘what are you doing?’ It’s like this is a green bean; this is what we’re trying to grow. We’re trying to eat it.”

Learning that one should eat “an apple a day” does not connect students to the food system that grows, harvests, washes, waxes, and transports those apples...

One reason for the lack of knowledge about food production is that we are taught nutrition and healthy eating habits from the perspective of the options at a grocery store, or the choice between eating out and eating in. Learning that one should eat “an apple a day” does not connect students to the food system that grows, harvests, washes, waxes, and transports those apples. Participants of
the study stressed that the food pyramid and the current teaching nutrition tools such as ChooseMyPlate.gov are only meant to be teaching aids, rather than the absolute model of nutrition. The images and concepts in Food and Drug Administration (FDA) nutrition guides, for example, are more consistent with an industrialized, commodity food production system than with civic agriculture and community-based food markets.

According to the food growers and educators I interviewed, students are developing a greater appreciation for food by working in community and school gardens. Elementary age students readily make the connections between food they grow and food they eat at home. However, the interviewees perceived that their older students have more established eating habits and already have conceptions about what they like and don’t like. While they may enjoy working in a community garden or learning about agriculture, it does not necessarily translate into different food choices. To connect with these older students, food advocates and educators may try to find other ways to connect with students’ interests.

**Teaching Strategies**

When asked about instructional strategies, all participants of the study advocated for outdoor education. They stressed that a crucial element of any environmental curriculum is to directly experience the environment. Both the Agronauts and the Damayan Garden Project focused most of their energy on gardening and teaching through hands on experiences outside. “Problem Based Learning” is popular in this field and is a helpful strategy when teaching through the systems approach. In this method, a problem is presented to students and they must examine all of the different factors before making a decision. Students may spend a whole semester deciding whether to plant pears or apples in the community, but each week they will learn about different elements of the problem such as packaging costs, labor, pesticide usage, or transportation. Interviewees concluded that teaching about agriculture in this systemic way also allows for students to understand other disciplines such as economics, government, and business at the same time.

**Community and Classroom- Creating a Connection**

Though there are a few community programs that reach out to schools, the vast majority of public school students in Leon County, Florida, do not receive agriculture or food education. Many groups seek to educate the public and Tallahassee community about sustainable agriculture, but most
of this knowledge is passed through the community. In order to reach a larger population, there must be teachers and educators within the public school system that are invested in creating educational opportunities for this content.

One participant from the study spoke about this issue in her previous work at her undergraduate university. She worked with a school system that was eager to implement agricultural education but needed support. Participants felt that there is often a division between the content to be taught and the ability to relay that information in an effective way to students. One strategy that the schools employed was the creation of a workshop series for teachers. The teachers who participated gained familiarity with the content and were then able to translate it into lessons for their students.

Proposed Education Network

Based on an examination of the environmental education literature and interviews with the local farming community and educators, the following conclusions can be made. First, it is clear that a sound environmental education curriculum must incorporate the food production system, studied from multiple disciplinary perspectives. Second, such a curriculum should increase students’ understanding of the distinction between different modalities of agricultural production, both “industrial” (or commodity) and “community” (or civic), and increase students’ critical thinking as it relates to the internal contradictions that arise in the pursuit of sustainability. Third, the best approach to achieve this enriched environmental education curriculum is by bringing community-based knowledge and experiential learning into the school.

The framework proposed in this paper would create a space for interaction between community agriculture/food advocates and educators within the public school system. I propose a framework rather than a specific curriculum, because teachers must meet standards and benchmarks specific to their school, district, and state. What would be most beneficial, according to many of the respondents that were interviewed, is a way to gain better access to content that captures local interests and incorporates key concepts such as sustainability, or civic and commodity agriculture. To support these efforts, community members can provide content and networking through an online platform.

As a prototype test, I propose developing the Tallahassee Agriculture and Food Education Network with a primary mission of increasing

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collaboration between educators, community members, and farmers. The proposed framework would be designed to work in conjunction with other elements of an overall initiative to increase sustainable food and civic agriculture education. The main components of this framework include: an online website of relevant content and lessons, a networking initiative to connect farmers and community organizations with teachers and students, educational opportunities for teachers and other educators, and a connection between student’s community engagement and classroom success. In developing the components of the proposed framework, I drew heavily from the comments made by educators in the interviews.

The first component of this framework is an online platform that allows for content sharing. The interviews revealed that many community organizations make their own presentations and lesson plans and do not currently have a system to share information with other groups. Indeed, as the Sustainable Food Movement has gained momentum, a great amount of instructional resources is readily available—including documentaries, webpages, PowerPoint presentations, class exercises, and field trip templates. Interviewees articulated that they have no trouble finding content. However, it is very time consuming to sift through all of the available information to design lesson plans that are culturally relevant and age appropriate.

An online sharing platform would be beneficial to teachers who teach environmental education and teachers who wish to incorporate food production concepts and relevant information into other courses. This innovation would likely be beneficial to students and community members, as well. Members of the Tallahassee Agriculture and Food Education Network (farmers, teachers, and organizers) would be able to post information on topics relating to Food and Agriculture that they have created or have used in the past that could be sorted by content and grade level. This information could be presented in the form of videos, articles, worksheets, pamphlets, or presentations and lesson plans. This is an example of grassroots education, where the knowledge and content is not only created by curriculum builders or scientific experts, but also by people connected to the industry in a real way.

The website will be an important tool for achieving the second component of the proposed framework: building up a network of local farmers, community organizations, teachers, and students that encourages collaboration and participation from all groups. Every piece of content on the online site will be attached to the member who posted the information,
so teachers or students can contact that member for further discussion and questions. Experts can choose to make a profile that displays their areas of interest as well as information about coordinating presentations or fieldtrips. Creating an interactive network between educators and community members is critical for building support for changing the way environmental education is presented. In Tallahassee, there is a Food Network that provides opportunities to interact at weekly meetings. This group, with some teachers as members, has been created within the last few years and would be a good starting point for the Tallahassee Agriculture and Food Education Network.

Professional development for teachers is the third component of the proposed framework. The interviews with educators exposed the apprehension educators feel when beginning to teach about a topic that is new to them. The need for teacher training was echoed in all of the interviews as participants often noted that teachers, community members, and students were learning together throughout the process.

Lastly, in order to create an educational experience that truly fosters involvement and participation in the community, the fourth component of the proposed framework is to connect community engagement—via the experiential learning about food production—to classroom success. Potential benefits include critical thinking skills and heightened student engagement. One of the respondents that was interviewed described the desire to make learning like a game. The hope was to give students points or credit for activities they do in the community and use those points towards curriculum standards in the public school system. For example, students might earn English credit for writing a letter to a political leader about a local environmental issue and they might earn science credit for visiting a farmers’ market. This system of earning points for engagement is an important way to include participatory education in a school system that does not often have the resources to do experiential learning during the school day.

Conclusions

Environmental Education is a crucial part of securing a sustainable future. Food and Agriculture issues influence physical and social health, economic well-being, and the fabric of our natural ecosystems. As it is clear that current commodity agriculture practices are not sustainable, the skills necessary to improve our food production system must be provided to students. Therefore, a Food and Agriculture Education framework that
Allegra promotes environmental problem solving is critically important to students in K-12 education.

After studying the experiences of teachers, students and community agriculture organizations, a framework that promotes community interaction with schools has been developed. This concept allows for community participation with localized curriculum, while also expanding the capacities of the school system, namely teachers, to continue this education in the absence of outside organizations. Overall, this framework could be an asset to the Tallahassee community as its food and agriculture education evolves.

Author Bio:

Jacqueline Allegra is a graduate of Florida State University with a B.S. in Social Science. She has received numerous awards for her academic and leadership endeavors, including a Fulbright ETA Grant and the FSU Honors Outstanding Scholar Award. Allegra hopes to create social change by pursuing a career in documentary film production.
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