

## Applying emerging core competencies to extension training courses for local food system practitioners

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### Abstract

In 2019, a national group of local food system educators and practitioners identified over 140

foundational core competencies critical to local food system development work and began to identify existing educational resources related to these competencies. This process resulted in a new aggregated resource: the Local Food System Practitioner and Educational Resource Database. Included in this database is a core competency matrix that distinguishes three levels of learning

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for each competency so that practitioners can identify learning opportunities most closely tailored to their educational needs. It also serves as a framework and competency matrix for educators to use to help assess and communicate the learning outcomes of their curricula. This framework is the overall concept for understanding the competencies, and the matrix is the tool developed to assess and evaluate the level at which an educational resource teaches a competency. In this article we apply the newly create core competency matrix to two existing local food system development courses. We share lessons learned from applying the matrix and insights gained from comparing two introductory level courses. We conclude with recommendations for improving the resource database and matrix to a more user-friendly model for educators and local food system practitioners.

### **Keywords**

Food Systems, Competency Framework, Professional Development, Curricula Providers, Professional Training

### **Introduction**

Over the last decade, local food systems have spurred interest in stimulating community development and local economies by contributing to local farm viability, promoting healthy eating habits among consumers, and addressing community food security and resilience (Schipanski et al., 2016); this interest grew dramatically throughout the COVID-19 pandemic. Local food practitioners identified training and education as needs to professionalize the field based on the results of two national surveys from the North American Food Systems Network (NAFSN), which were conducted in 2012 and 2019 (Hilchey et al., 2021). Meanwhile, additional groups and organizations, such as Cooperative Extension, have developed formal training opportunities to educate local food system practitioners on the interdisciplinary aspects of food system development, approaches to working in local food systems, and related research in this field, based on individual needs assessments

and curriculum development processes (Dunning et al., 2012; Lelekacs et al., 2016).

Due to the recognized need for training opportunities, in 2019 the U.S. Department of Agriculture Agricultural Marketing Service (USDA AMS) division supported a national Food System Core Competency project that included a group of national partners consisting of nongovernmental organizations, Extension professionals, universities, and food system practitioners, to identify a foundational set of core competencies and existing training opportunities for local food practitioners (Long & Chase, 2020). The funded project sought to further the understanding of local food systems practitioners' needs in different environments, cultures, and focus areas, as well as to identify what curricula are currently available to support food systems work.

We used competency-based education as the educational framework for this project. This framework is a useful approach to education that can benefit the food systems field because it helps practitioners gain knowledge and skills while making educational programs more accessible and affordable (Book, 2014). Competencies are defined as a set of skills, a knowledge base, and the attitudes necessary for a profession and can include core areas or standards of practices, skills, and expertise (Columbia University School of Nursing Center for Health Policy & Association for Prevention Teaching and Research [APTR], 2008; Soare, 2015). By identifying core competencies, educators can develop content to meet the needs of practitioners, help practitioners determine their primary interests and goals, and help them find educational programs that meet their needs.

The purpose of the initial USDA AMS-funded Food System Core Competency project was to develop a nationally determined set of competencies that could then be used to identify and tailor educational programs for food system practitioners that address different subsets of the skills needed in the field. Iowa State Extension and Outreach (ISUEO) led the USDA AMS-funded programs, and North Carolina State Extension (NC State Extension) participated as a

leading partner.<sup>1</sup> This initial effort resulted in a list of nine categories, 41 themes, and 142 competencies, each with three levels of learning objectives, as well as a database of 85 existing curricula (Long & Chase, 2020). In a second funded project in 2020, the core competencies were used to create a Food System Practitioner and Educational Resource Database<sup>2</sup> of educational resources and practitioners to facilitate individuals' ability to find curricula that suit their needs in order to build their competency in local food system development.

ISUEO and NC State Extension each offer formal foundational training opportunities for food system professionals: *Local Food Leader* from ISUEO and *Foundations of Local Food Systems Development* from NC State Extension. Both courses were developed prior to the national Food System Core Competency Project; however, both institutions were involved in the North American Food Systems Network (NAFSN, a professional development association for food systems practitioners) and had established a general understanding of local food practitioner needs. Both developed their curricula using place-based feedback and stakeholder engagement, which guided the prioritization of competencies as part of their curriculum development processes. Now that a set of nationally determined core competencies is available, there is an opportunity to compare these two curricula to provide insight into the process of applying the competency framework to classify and compare food systems curricula. This article shares the process of applying the framework and comparing these two curricula, lessons learned, and recommendations for next steps for assessing and communicating local food professional development opportunities for practitioners. The article concludes with updates on the recently developed database and shares ways for additional educators and practitioners to become involved in this ever-evolving project.

## Background and Literature Review

### *Need and Significance of Food System Education for Practitioners*

Local food system development work is multifaceted and cross-disciplinary; practitioners must be competent in sectors like food production, marketing, distribution, consumption, and community culture and systems dynamics to effectively support a community-based food system or specific project. Researchers have asserted that a systems approach that crosses academic fields, program areas, and institutions is required to address the complex questions and problems raised in local food systems development (Dunning et al., 2012; Meter, 2010). Local food system practitioners enter this work from various fields, including public health, farming, and community development. University Extension, nonprofits, government, and private businesses are examples of agencies and institutions that are engaged in local food systems development work with roles varying on the area of need and sector-based priorities. Extension agents and other local food systems practitioners are asked to use and leverage multiple existing programs to support local food systems, such as the Extension Master Gardener Program and Family and Consumer Science Programming, as well as develop resources for new areas of programming, like larger collective efforts that include coalition development and food policy councils that make decisions around regionwide planning (Bloom et al., 2020; Fitzgerald & Morgan, 2014; Reynolds, 2011). This requires technical knowledge in specific areas, such as production and business development, in addition to the ability to lead, facilitate, and participate in multidisciplinary collaborations that include stakeholders from across the food system (Raison, 2010). This diverse knowledge base and skill set can be cultivated through education and training programs, although the breadth of local food systems may

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<sup>1</sup> National Leading Partners for the Food System Core Competency Project include The Ohio State University, Colorado State University, National Center for Appropriate Technology, American Farmland Trust, Wallace Center, North American Food Systems Network (NAFSN), John Hopkins Center for a Liveable Future, Northeast Center to Advance Food Safety, and the Community, Local, and Regional Food Systems Community of Practice within eXtension.

<sup>2</sup> <https://foodsystemsdb.extension.iastate.edu/>

make it impossible for any single training program to address all the competencies needed.

### *Competency-Based Education*

The U.S. Department of Education's National Center for Education Statistics (Jones et al., 2002) defines a competency as "a combination of skills, abilities, and knowledge needed to perform a specific task" (p. vii); it "is often related to concepts like outcomes, skills, abilities, personality traits, capacities, knowledge, attitudes and values" (Soare, 2015, p. 973). Soare (2015) notes that competency-based education methods also support competency-based curriculum that describes a competency, assesses the competency, and then assesses a practitioner's ability to conduct the competency. While competency-based education has been adopted in multiple fields, such as medicine (Linsen et al., 2018), foreign language (Pop & Mazilescu, 2012), public health (Columbia University School of Nursing Center for Health Policy & APTR, 2008), and business (Dragoo & Barrows, 2016), it is a relatively new area for local food system educators and practitioners. To date, there has not been extensive development of competency-based education for Cooperative Extension, a gap which this Food System Core Competency project was designed to address.

Competency-based education, which has been labeled a "disruptive innovation" in education, is an approach that steps away from the traditional credit-based model of education by providing a framework for educators to create more accessible, affordable, transparent, and outcome-oriented curricula and learning materials (Book, 2014). Using the competency-based education approach is appropriate for local food systems practitioners because of the support and practice-based needs the approach provides for working professionals outside of traditional educational settings. We believe that the competency-based education framework allows independent local food systems learners to identify specific competencies they need to gain, based on their own professional and educational backgrounds and goals. Throughout the Food Systems Core Competency Project, the team regularly discussed how competency-based education could provide a method for educators across geographies

to work together on a common competency to identify learning objectives and outcomes, while allowing for each program to incorporate place-based history and knowledge that is valuable in local food systems development.

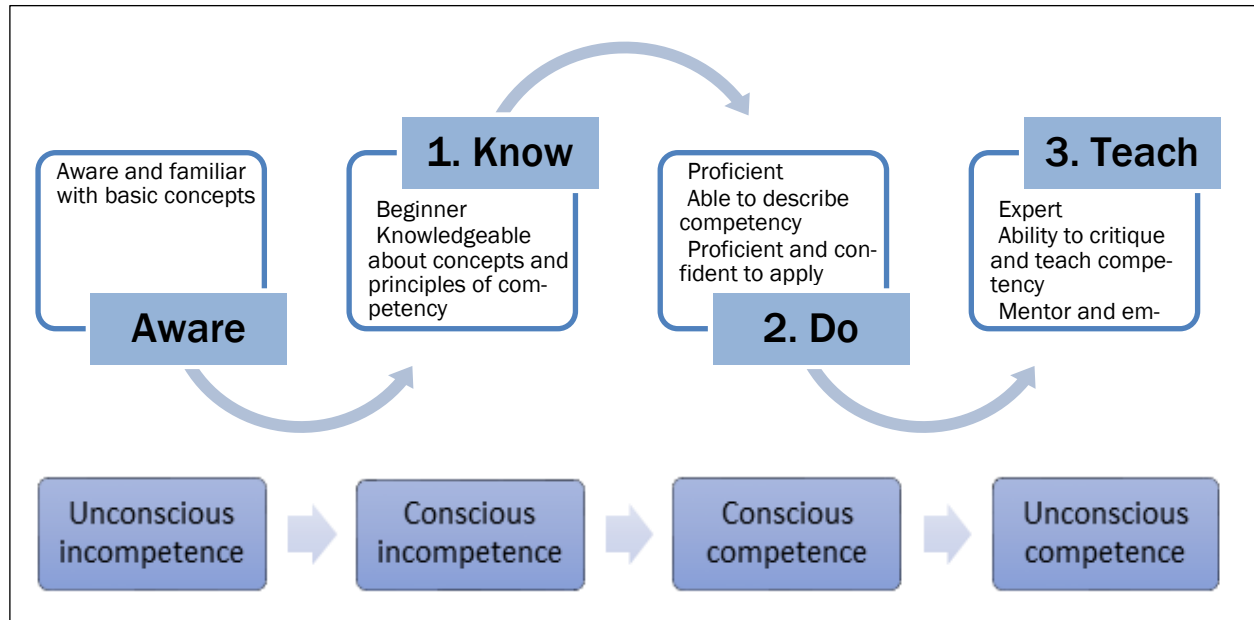
Another component of competency-based education is the ability to address various levels of learning. Bloom's taxonomy is commonly used in the education field to identify the components of learning, including six major categories: remembering, understanding, applying, analyzing, evaluating, and creating (Forehand, 2010). These levels of learning are also connected to the four stages of competence and the situational leadership model: unconscious, incompetence, conscious incompetence, conscious competence, to unconscious competence (Peel & Nolan, 2015). This relationship is displayed in Figure 1.

The levels of learning and development of competence over time is a direct result of instruction as well as the participants' ability to apply a skill (Peel & Nolan, 2015). This progression leads to being unconsciously competent or having the ability to be an expert in the field and create or teach new practices, which is considered a longitudinal phenomenon and may involve lifelong learning and continual work (Leppink, 2018). Additionally, this process shows that competence can include both short-term understanding as well as lifelong learning, which is a good fit for the diversity and depth of knowledge and competence necessary for local food system development.

### *Identifying Core Competencies for Food System Practitioners*

Beginning in 2014, NAFSN engaged national partners and local food system practitioners to discuss identifying a set of core competencies for local food systems work. In the following years, the network drafted a matrix that included four categories with a total of 42 competencies (Raison et al., 2017). The Food System Core Competency project built upon this early work by NAFSN, relying on leadership from Iowa State University Extension and Outreach, and included partnerships with over 30 national organizations to confirm the core competencies needed for work in local food systems. The project used a collective impact facilitation ap-

**Figure 1. Levels of Learning Related to Four Stages of Competence and Situational Leadership Model**



proach (Kania & Kramer, 2011) to work through group discussions on competencies for local food systems practitioners. These discussions began by reviewing the initial work from NAFSN and eX-tension, as well as literature reviews and the NAFSN matrix that was developed by partners during the summer of 2017 at the National Association of Community Development Extension Professionals (NACDEP) Conference to highlight various levels of learning from beginning (“describe”) to intermediate (“practice”), to expert (“teach”). Following these discussions, the project conducted a national survey of local food systems practitioners in fall 2019, seeking feedback on needed competencies related to nine categories that were iden-

tified through these initial discussions: food systems, equity, community capacity, government and policy, natural and built environment, economy and business development, public health and wellness, leadership, and evaluation. The survey received 140 unique responses; it included open-ended questions with requests for specific learning objectives and topics in each of the nine categories. Responses were coded and developed into a listing for each category (Long & Chase, 2020).

As the survey was being analyzed, the national partners continued discussions focusing on levels of learning and created the framework shown in Table 1.

Following the establishment of these three lev-

**Table 1. Levels of Learning Identified in the 2019 USDA AMS Food System Core Competency Project as They Relate to Bloom’s Taxonomy**

Level of Learning Identified in 2019 USDA AMS Core Competency Project	Description of Level of Learning	Related Levels of Bloom’s Taxonomy
Level 1: Know	A beginner level that focuses on the ability to understand and describe the content in each competency.	Remember and Understand
Level 2: Do	An intermediate level that involves practicing and participating in activities to show ability related to each competency.	Apply and Analyze
Level 3: Teach	Expert level which may involve evaluation, analysis, or teaching to demonstrate expertise in each competency.	Evaluate and Create

els, it was critical to develop a method for evaluating the level at which the individual curricula teach a competency. This was a difficult task, as the team wanted to showcase the breadth of options for how competencies could be taught, such as activities, lectures, or readings. To do this, the project team decided that learning objectives would be shared as a set of examples rather than as strict guidelines. Using examples helps showcase the breadth of options and can serve as a guide so that education providers can determine the extent to which their curricula meet each competency.

In late 2019, national partners with the Food Systems Core Competency Project determined the following nine categories, 41 themes, and 142 specific competencies (see Table 2 for categories and themes). Additionally, the team determined example learning objectives for each competency, which were summarized in a learning objective matrix; in the interest of space, we have not listed the compe-

tencies or learning objectives here.<sup>3</sup>

Following the success of this first phase of the project, a second phase began with the goal of developing a national database. The competencies and learning objectives were used to structure a second national survey to identify existing relevant educational resources; the results of this survey identified 85 educational opportunities (Long & Chase, 2020). The Food Systems Practitioner and Educational Resource Database<sup>4</sup> launched in 2021 as a tool to identify and aggregate individual practitioner profiles and educational opportunities to improve the competencies of food systems practitioners through various levels of learning in order to advance local food systems development. In the sections below, we provide insight into how curriculum providers can apply this matrix to their own curricula and the lessons we learned through the process of applying it to two existing courses.

**Table 2. Food System Core Competencies Identified through the USDA AMS Food System Core Competency Project**

Category	Themes
Food Systems	Common Language for Food Systems; Supply and Value Chain; Production and Wild Harvesting; Processing and Value-Added Agriculture; Aggregation and Distribution; Market Channels; Consumption; Food Safety; Food Systems Assessment
Equity	Cultural Humility; Historical Acknowledgement and Context; Power, Privilege and Position; Inclusion: Race, Ethnicity, and Income; Income and Resource Disparity
Community Capacity	Building Trust and Relationships; Community Development; Facilitation; Resource Identification
Economy and Business Analysis	Business Development; Business and Organization Legal Structures; Finance and Funding; Market Identification and Marketing Strategies; Economic Development Strategies
Governance and Policy	Policy Identification and Process; Organizing for Policy Change; Governance and Law: Regulations and Licensing Standards
Health and Wellness	Social Determinants of Health; Personal Health; Food Access and Nutrition Assistance
Environment	Planning for the Built and Natural Environment; Agroecology and Ecosystems; Waste Reduction, Reuse and Sustainability; Climate Impact; Built Environment; Disaster Preparedness, Response and Recovery
Leadership	Personal Leadership Styles; Communication and Interaction Skills; Teams and Working Groups
Evaluation	Evaluation and Defining Success; Data Sources and Uses; Strategies, Methods, and Evaluation Plans

<sup>3</sup> For a complete list of the competencies and learning objectives, see <https://foodsystemsdb.extension.iastate.edu/competencies>

<sup>4</sup> <https://foodsystemsdb.extension.iastate.edu/>

### Applying the Matrix: Course Overviews

To gain insight into how educators can apply the core competency framework, we applied it to two professional development courses developed by state Cooperative Extension programs to meet the needs of their stakeholders. These two courses were developed before the competencies were identified, so they are examples to test the applicability of the matrix to highlight directions for future improvements. Each course is taught in a different manner, one hybrid virtual/in-person, and one virtual self-paced; both utilize place-based materials and context in their teachings. This paper uses the competency matrix to evaluate each program's foundational course, targeting beginning practitioners. However, each state Extension offers additional courses at a more advanced level that are

not addressed here. The following section describes each course in more detail.

#### *Local Food Leader: Iowa State University*

The Local Food Leader (LFL) certification<sup>5</sup> is an individual skill development program for beginning local food practitioners and local food supporters and is focused on community food systems development. The goal of the certification is to increase capacity for local food practitioners working in food systems around the U.S.; further objectives are listed in Table 3. Prior to COVID-19, LFL consisted of a one-day, in-person workshop with individual and team activities, followed by four online modules with videos, presentations, reflections, and assignments. During the COVID-19 pandemic, this course went fully virtual and in-

**Table 3. Comparison of Course Objectives from Local Food Leader (Iowa State Extension) and Foundations of Local Food Systems Development (NC State Extension) that are Desired for Participants to Obtain Through Course Completion**

Local Food Leader	Foundations of Local Food System Development
1. Understand global, local, and community food systems.	1. Describe the key components and varying definitions related to local food systems.
2. Organize coalitions that work towards collective community goals and assist in the development of mission, vision, and core values.	2. Describe key challenges and opportunities and benefits of local/regional food systems work.
3. Manage and facilitate conversations effectively between dynamic groups of people.	3. Identify various types of local food systems initiatives that are occurring in their region.
4. Utilize an equity lens with food systems development.	4. Identify and mobilize community assets as they relate to building a local food system.
5. Understand community processes that include facilitation, project management, partnership, and building successful teams.	5. Understand principles and basic strategies of local food systems development practice that span disciplines and multiple food systems sectors.
6. Provide partners with tools and resources for developing various food systems sectors: production, transformation, distribution, consumption, and resource management (grants, best practices, research, etc.).	6. Understand how to identify and mobilize community assets as they relate to local food systems development.
7. Engage and empower community partners to work collectively towards a vibrant, healthy community food system that meets the needs of the participants and community members.	7. Support local food systems efforts by working with and/or educating growers, buyers, and community members in the development of high-performing local food systems.
8. Know about tools that exist to create food systems reports.	
9. Develop successful teams for successful project implementation.	
10. Construct plans of work, project scopes, and budgets.	
11. Understand the uses and types of logic models.	
12. Create evaluation tools that showcase project outcomes.	

<sup>5</sup> <https://www.extension.iastate.edu/ffed/virtual-trainings-certifications/>



cludes eight, two-hour virtual workshops over four months.<sup>6</sup> Participants receive a certificate upon completion. Two national cohorts have gone through the online certification as of January 2022, which includes 12 hours of workshops, three hours of optional cohort networking time, and approximately 60 hours of online module content.<sup>7</sup>

LFL was developed in 2016 as a response to local food coordinators in the state of Iowa requesting professional development related to their multifaceted job descriptions. In Iowa, the Regional Food Systems Working Group requested professional development around working in food systems and what it meant to be a food system practitioner, creating plans of work, facilitation methods, and evaluation best practices. Over time, the course changed from a one-day, in-person workshop to a hybrid platform with both workshops and online module assignments over the course of four months. Throughout its duration, the course has included an introduction to food systems, facilitation skills, equity in the food system, and evaluation. It has evolved to include work-life balance, building plans of work, and additional tools for financing programs.

In 2017, the Agricultural Marketing Resource Center funded the Local Foods Team (now Food Systems Team) to develop a full certification program with online modules for both Local Food Leader and a second certification called Community Food Systems. This development led to the course being expanded to national availability and launching the hybrid option. Between February 2018 and January 2019, seven Local Food Leader workshops were hosted in Iowa, North Carolina, Texas, Alaska, Colorado, Pennsylvania, and the U.S. Virgin Islands. Two participants (one from California and one from North Carolina) participated in an online-only option. To evaluate these workshops, feedback was gathered from partici-

pants following both the workshops and the online modules.<sup>8</sup> Four additional national certifications were hosted in Iowa, Nebraska, Oregon, and Massachusetts.<sup>9</sup> A total of 183 people participated in the workshops, and 112 registered for the online modules. Of those who registered for the online modules, 24 participants completed the full certification. Of those who received their certification, 23 participated in the Local Food Leader Train-the-Trainer course. The train-the-trainer was developed to support capacity for new trainers to teach the course nationwide. The train-the-trainer involves a course that teaches how to conduct workshop activities and shares suggested funding models for sustainability. It also includes four cohorts throughout the year to discuss new ideas around content, teaching practices, and ways to implement place-based curricula in addition to the LFL base curricula.

After each cohort, LFL evaluation data is gathered to shed light on its impact as well as to garner feedback for course development and future improvements. This is done through a pre- and post-evaluation as well as tests in the online modules. The evaluation plan includes an analysis of quantitative and qualitative data collected through anonymous surveys, completed by participants after participating in the workshop, pre- and post-knowledge change questions from online modules, and test questions regarding knowledge change. Based on the aggregated evaluation from February 2018 to January 2019, the Equity and Inclusion workshop section was rated as the most useful section (70% of participants), followed by evaluation (69%), facilitation and capacity building (69%), and working in food systems (69%). Eighty-nine percent of participants indicated they learned something new from the workshop, and 75% of participants would recommend the workshop to others.

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<sup>6</sup> See the cohort schedule at [https://www.extension.iastate.edu/ffed/wp-content/uploads/LFL-Workshop-Schedule\\_Oct2021\\_without-zoom.pdf](https://www.extension.iastate.edu/ffed/wp-content/uploads/LFL-Workshop-Schedule_Oct2021_without-zoom.pdf)

<sup>7</sup> See the Local Food Leader syllabus at [https://www.extension.iastate.edu/ffed/wp-content/uploads/LFL-Syllabus\\_1-21.pdf](https://www.extension.iastate.edu/ffed/wp-content/uploads/LFL-Syllabus_1-21.pdf)

<sup>8</sup> See the full evaluation report at [https://www.extension.iastate.edu/ffed/wp-content/uploads/1-21-LFL-Pilot-Certification-Evaluation-Report\\_Final\\_updated.pdf](https://www.extension.iastate.edu/ffed/wp-content/uploads/1-21-LFL-Pilot-Certification-Evaluation-Report_Final_updated.pdf)

<sup>9</sup> See the evaluation report for the four additional national certifications at [https://www.extension.iastate.edu/ffed/wp-content/uploads/20200210\\_Final-CFS-Hubs-Evaluation-Report.pdf](https://www.extension.iastate.edu/ffed/wp-content/uploads/20200210_Final-CFS-Hubs-Evaluation-Report.pdf)



### ***Foundations of Local Food Systems Development: NC State Extension***

Foundations of Local Food Systems Development (Foundations) is the first course in a three-course series offered through North Carolina State Extension's Overview of Local Food Systems Development Online Professional Development Training.<sup>10</sup> The three courses in this training are offered online and are self-paced and asynchronous. This introductory course is designed to provide foundational knowledge of local food system development and practice. The original funding for the course came from a Southern Sustainable Agriculture Research and Education (SARE) Professional Development Program grant to develop the curriculum, teach an in-person graduate course, and convert course materials into an online training program (Bloom et al., 2017). In 2014, we used a participatory course-development process to determine the topics, competencies, and resources that should be included in the curriculum, engaging with over 40 stakeholders who represented various sectors of the local food system in North Carolina.

In its current form, the course has three modules that require approximately 15 hours total to complete over three months; participants receive a certificate upon completion. There are an optional three additional hours of synchronous networking and content with instructors. The target audience for this course is people who are new to food systems development or have experience in the field and would like a broader and more complete understanding of local food systems. The three modules are Introduction to Food Systems, Community Engagement and Food Systems Change, and Introducing Regulatory Policy and Frameworks for Local Food Systems Development. In each module, examples of specific topics include the history of the U.S. food system, key terminology for local food system development, community engagement, and an overview of relevant state and local policies. Each module contains a variety of activities, such as videos, recorded presentations, forum posts, virtual field trips, learning activities, and quizzes that function as learning checks and evaluation tools. Participants are required to

achieve at least 80% on post-module quizzes to successfully complete the course. A complete list of course objectives is listed in Table 3.

The Foundations course is a prerequisite for the other two courses in the certificate series (Farm to Fork: Foundations in Local Food Supply & Value Chains and The Bottom Line: Economic Realities & Other Considerations of Local Food Systems) to ensure that participants have a certain level of foundational knowledge. The course evaluation uses quantitative and qualitative methods to collect, analyze, and determine knowledge and confidence attainment and attitude and behavior changes, with most of the outcome evaluation focusing on short- and intermediate-term outcomes. The evaluation data are also used to inform course improvements. Methods for course evaluation include pre- and post-module quizzes, surveys, and a six- to-twelve-month post-course interview. The evaluation data have consistently shown participants' gains in knowledge and intent to change behavior relative to the stated course learning objectives. An analysis of evaluation data from 2021 of pre- and post-test evaluations ( $N=22$ ) indicates that the participants who completed the training courses significantly improved their local food programming knowledge and skills, based on paired-sample t-tests of quiz and survey data. (See the report in Appendix B.) In 2021, program participants reported a statistically significant change in their level of confidence to support local food system development in their community after completing the online training course. The program was also effective in inspiring the participants to engage in local food development initiatives. For instance, 85% of post-course survey respondents indicated that they would develop professional collaborations and involvement in teaching and demonstration of local food systems topics, principles, practices, and resources in their communities. Qualitative findings from the evaluation show that participants feel more prepared to use a systems approach in their food system development work to support more robust food systems. These results are reflect past program evaluations and

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<sup>10</sup> <http://www.localfoodcourses.org/>

demonstrate the overall effectiveness of the program (Bloom et al., 2017).

## Methods

In order to compare the two courses, each course provider applied the learning objective matrix<sup>11</sup> to their respective course and identified which competencies their program addresses. Currently, educational resource providers review their own curricula to apply the competencies and upload their course information and addressed competencies to the online database. We used the same practice of internal review for this exercise to serve as a pilot for other educational resource providers. In the future there may be opportunities to consider third party reviews or assessment, possibly through NAFSN. The process we used is specifically for course providers to examine their competencies taught with the intent to best promote their product on the new database.

Each course provider team had three members and used individual and team reviews to discuss which level of learning their curricula fit within and any potential discrepancies in perspectives on to what extent the courses taught learning objectives. Then the determined level of learning for each course was compiled (Appendix A). Following the confirmation of competency and level of learning for each course in each team, the two teams developed a comparison matrix to discuss similarities and differences between the two courses. The teams compared the courses at all levels of the matrix, from the nine categories down to the 41 themes and 142 competencies with levels of learning. (See Table 4 for the review of category, theme, competency, and level of learning compared.) The following discussion revolved around an interest in learning how courses are similar and different, how objectives are taught and evaluated, and what insights may be gained into the process of applying the matrix to our courses.

## Results

The teams identified overlap within seven of the nine categories: Food Systems, Equity, Community Capacity, Governance and Policy, Health and Well-

ness, Leadership, and Environment; this overlap included 16 themes and 28 competencies. Local Food Leader covers competencies in other two categories, Economy and Business Analysis, and Evaluation, while Foundations of Local Food Systems Development addresses these competencies in more detail in later certificate courses.

Of the 28 shared competencies, we selected seven to focus on for the purposes of comparison because they contained the most in-depth information and unique aspects of the courses. We specifically chose only one competency per category and theme. Table 4 details those competencies and levels of learning; in Table 5, we further evaluate similarities and differences in activity and teaching practices. A more detailed review of the curricula can be found in Appendix A.

## Discussion

In applying the new competency matrix to existing courses, we were able to identify challenges of using the matrix from an educator's perspective and uncover similarities and differences between two foundational local food system development courses in how they achieve core competencies for participants.

### *Lessons Learned from Applying New Competency Matrix to Existing Curriculum*

Both course providers developed learning objectives and competencies based on participatory processes with practitioners across the food systems in their respective states and regions. These processes were important for both institutions to develop curricula that meet the needs of their constituents and stakeholders. When reviewing the curricula using the competency matrix, there were two questions that we wanted to answer: first, what are the competencies and level of learning of the course (discussed above); and second, what challenges arose when applying the competency matrix to existing curricula? To address the first question, our goal is to provide a model process to assess individual courses. Then, to address the second question, both teams identified wording that should be clarified to increase the utility of the matrix and

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<sup>11</sup> <https://foodsystemsdb.extension.iastate.edu/competencies>

**Table 4. An Overview of Seven Overlapping Competencies Taught in Iowa State Extension’s Local Food Leader and NC State Extension’s Foundations of Local Food System Development**

Category	Theme	Competency	Level of Learning
Food Systems	Common Language for Food Systems	Food Systems Components	Level 2: Effectively communicate about food systems components and their connections to one another
Equity	Cultural Humility and Self Awareness	Intersectionality	Level 1: Understand and define intersectionality
Community Capacity	Community Development and Strategic Planning	Frameworks	Level 1: Name and describe frameworks for community development
Governance and Policy	Policy Identification and Process	Identification	Level 1: Identify existing policies that impact your work
Health and Wellness	Food Access and Nutrition Assistance	Food Access	Level 1: Identify barriers to food access
Environment	Built Environment	Built Environment	Level 1: Define built environment
Leadership	Teams and Working Groups	Networks	Level 1: Identify community leaders and actors associated with areas of interest

**Table 5. Descriptions of How Each Competency and Level of Learning is Taught in Each Course**

	Foundations of Local Food System Development (NC State Extension)	Local Food Leader (Iowa State Extension)
<b>Food Systems Components (L2)</b>	We use a circular graphic to teach about the food systems elements, including food production, distribution and aggregation, food processing, marketing, purchasing, preparation and consumption, and resource and waste recovery. We include four external influences: social, political, economic, and contextual/environmental. For each element of the food system, we provide a definition and an example of an NC project or program. We introduce these concepts through a series of videos. Participants build on this knowledge and utilize it in a self-guided field trip activity and forum post.	We teach the Community Food Systems diagram that depicts a circular system of production, processing, distribution, consumption, and resource management. Additionally, it incorporates six community asset areas (driven by the community capitals framework): equity, economy, environment, education, policy, and wellness. Participants review the diagram and have discussions on their primary roles in the food system based on sector and asset area, and also engage in breakout rooms to determine challenges, strengths, and partnerships in each. Then, in the online course software Moodle, participants develop a partnership diagram to understand components and collaboration opportunities.
<b>Intersection (L1)</b>	Intersectionality is defined and applied in an assigned reading in the first introductory module that introduces concepts of justice in the food system (Ammons, 2014) along with other materials to introduce a systems approach to local food system development. This concept is built on in the additional modules and their understanding is assessed in the quiz for Module 1.	Intersectionality is taught in both the equity workshop and online modules. In the workshop, we teach the “Wheel of Difference,” (Gardenswartz & Rowe, 2010; Cultural Competence Learning Institute, 2020) to understand and identify areas of difference and intersections across individuals and communities. Participants break into small groups to discuss intersections in the food system relating to power and privilege. In the online modules, optional readings about intersectionality are offered to participants in Module 1.

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<b>Frameworks (L1)</b>	A series of videos introduces students to community engagement frameworks and methods, such as Community Voice. Developing partnerships, asset-based development, and community capitals are introduced in these videos and additional written materials (Emery et al., 2006). Case studies are provided to reinforce the content. We expose participants to several methods for community engagement that include study circles, windshield or walking tours of the community, in-depth interviews, focus groups, asset mapping, inventories, and visioning processes. Participants build on their knowledge with a self-guided field trip of a local food systems project of their choosing in their community, where they are asked to describe how they see community development frameworks applied.	Multiple community development frameworks are reviewed in workshops and modules through videos and readings. Strategic Doing and Collective Impact basics are taught, and participants then create plans of work and learn facilitation practices to engage the community. In Moodle, participants create an intentional group facilitation plan and reflect on Strategic Doing principles that move projects into the “doing” stage. They present a current community issue that could be worked through using the Strategic Doing four-question framework (Strategic Doing, n.d.)
<b>Identification (L1)</b>	We devote a module to introduce regulatory policy and frameworks for local food systems development. We begin with an introduction to government, law, and policy in the U.S. and North Carolina generally, and specific to food and agriculture, before moving into approaches to policy change. Participants watch a detailed video on the farm bill and learn about how “Big P” and “little p” policies can impact local food system development. We address our learning objectives through a series of videos, learning activities, and forum posts.	Policies are discussed in the first workshop with broad review and brainstorming on local, state, and federal policies that impact food system sectors. In Module 1, participants read about and watch a presentation on the farm bill implementation process. They also complete reflection questions on the connection between the farm bill and their work and community. Additionally, participants reflect on food policy councils and the role an FPC either does or could play in their community. Participants are then tested on their knowledge of the farm bill process in the Module 1 quiz.
<b>Food Access (L1)</b>	Participants watch a video identifying food access as a wicked problem and identifying barriers to food access that have their origins in the design and structure of the food system. If this topic is of particular interest to a participant, they can choose to explore the topic through the self-guided field trip and other forum posts.	In the first and second workshops, food accessibility is discussed both in regard to nutrition and general food and health considerations. The ability to access land or capital is also discussed. In Moodle, questions are posed broadly for individuals to explore areas and barriers within the food system, so if a participant is interested in food access, they have opportunities to explore and evaluate food access in their community.
<b>Built Environment (L1)</b>	While the built environment is mentioned a few times throughout the course, it is defined in an Extension publication that is assigned reading (Bargainer et al., 2018). The built environment is addressed in a section of our introductory module that encourages participants to understand their own community. The built environment is also described in a section on community capitals and assets.	In the workshops, participants discuss the difference between natural and built environment and the context of each. Additionally, throughout the course, scopes of work and evaluation are discussed, which in many cases include evaluating the constraints, barriers, and opportunities for the built environment to increase food access, contribute to food-based businesses, etc.
<b>Networks (L1)</b>	In addition to providing a video on “the power of networks,” we provide lists of state-level organizations and ask students to identify local-level food system actors in their communities. Case studies are provided throughout the course demonstrating the ways in which networks collaborate to support local food systems.	In-person workshops incorporate a network diagram to teach participants about the roles of partnerships and leadership. The diagram is also used to highlight bridging and bonding capital as well as gatekeepers in the community. Additionally, in the Evaluation module in Moodle, participants create a web of influence map that includes community and project networks and partnerships that they believe impact the food system in their area.

consistency in its application.

Based on this research, our suggested process for review of courses is to create an internal team to review material and teaching practice, conduct individual reviews with the matrix checklist, and then cross-compare and discuss how each internal reviewer evaluated the level of learning for each competency.

One issue that arose was the different ways to interpret each competency and learning objective, as well as a misunderstanding that these were *example* learning objectives, and not strict guides on what needed to be taught. It became clear that each team reviewed the list of objectives with different perspectives: one as a guide and example, and one as a standard and strict guide. This disparity resulted in confusion, because the competency matrix was designed to explore the various competencies and complexities of food systems rather than a standard set of objectives. Therefore, the matrix provides *examples* that courses may teach, rather than hard and fast rules or standards. The *examples* also became confusing and unclear for reviewers because of the nuanced and flexible approach. It was identified that it is easier to check off a competency and learning objective if there is a specific answer, rather than a suggested and potentially iterative response. For instance, the term “intersectionality” is used in the competency framework, but both programs had different interpretations and understandings of the meaning of this term.

An additional question that arose was how to account for the fact that a competency could be expressed and operationalized differently because of cultural context, place-based nuances, and other environmental and personal conditions. Competencies can also be taught through different materials such as videos, self-guided learning, and other activities. Each team was able to explore how its course incorporates a variety of teaching methods through the lens of place-based context for practitioners to fully understand different concepts, such as examples of food production, natural and built environments, and community and human capacity. Additionally, each course includes many examples of state-specific local food projects and policies, which are included as case studies, virtual field

trips, and used as examples to reinforce course objectives. For example, the NC State Extension Foundations course teaches the competency of “Food System Components” by providing state-specific examples of projects and local food companies for each stage of the food system. Place-based understanding is critical for understanding our local food systems because each community operates within a different context. It also enhances practitioner learning, as it gives them the opportunity to understand and describe concepts. However, applying these materials to the competency framework required determining whether placed-based materials fully addressed a competency, which was an added layer of ambiguity.

As our teams applied the matrix to our courses, we also formed questions on how in-depth we needed to cover a topic before we could confirm that we met the learning objective. The two teams agreed that simply referring to a competency was insufficient for level 1 learning and that “referring” to a topic was more appropriate for an awareness change, versus a knowledge change. One suggestion for improving the utility of the matrix is to better define parameters for whether a course meets a core competency. These two issues suggest that more work and description of each level of learning and suggested learning objectives need to be done to support educational resource providers in their efforts to determine the level of learning they are providing for each competency. Another recommendation that arose from this process is to create a glossary for the competencies that defines key concepts. This glossary would give educational resource providers a clearer understanding of each objective as they evaluate their resources and confirm their competencies and level of learning. Overall, the competency matrix promotes consistency and reliability to the process of applying curricula to the framework and benefits the utility of the new database for both education providers and practitioners who are seeking educational opportunities.

### *Lessons Learned from the Curriculum Comparison*

The new core competency matrix is a useful tool that allows educators to have meaningful discus-

sions and reflections on their curricula across programs. It also allows practitioners to select a course that best addresses their learning needs from a range of available educational opportunities. As the teams at NC State Extension and Iowa State Extension experienced, this tool prompts educators to have meaningful discussions about their curricula, investigate their internal teaching practices, and discuss the need to increase or change the way certain competencies are taught. Additionally, once educational resources have been evaluated through this tool, these available resources will be more easily compared in the new food system resource database.

Over the past several years, Iowa State Extension and NC State Extension have received questions from practitioners asking for a comparison between the two foundational courses. Both programs struggled to formulate a concise answer. Through this evaluation process, we were able to have a detailed discussion and identify key similarities and differences, including overlapping competencies in seven of the nine categories (the courses did not overlap in the remaining two categories: Economy and Business Analysis, and Evaluation). Even within the seven categories where the courses overlapped, our matrices did not completely align.

The core competency matrix provided an opportunity to make broad comparisons of competencies and outcomes. In our discussions, we noted that Local Food Leader is a course for a national audience that focuses more heavily on process-based and assessment skills like facilitation and evaluation, which allows the program to be distributed to a wider geography. While any local food system practitioner can enroll in Foundations of Local Food System Development, this course has a greater emphasis on regional context for the Southeast and the individual aspects of food systems related to production, distribution, and policy. We agree with the use of competency-based education practices as the use for the food systems database matrix, but we also believe that additional detail and definition of each competency is necessary for a clear understanding of what each level of learning should teach. Additionally, competency-based education connects to place-based context, which may be an educational need of a food system practi-

tioner. We encourage course providers to consider this element even though it is not explicitly addressed in the core competency matrix.

Overall, this exercise allowed us to understand how we meet common core competencies with different materials and teaching methods. We suggest that course providers use a similar process to identify and determine the competencies and levels of learning for each of their courses prior to placing them in the food systems database. We also encourage additional thought be put in to creating an external auditing or credentialing practice that could provide insight into best-practice curricula for each competency. This process also highlighted that while we achieve similar core competencies, our courses differ in pedagogical method and approach.

### **Conclusions**

The exercise of applying the core competency matrix to two introductory local food courses helped us to develop insight into the strengths and weaknesses of the newly developed framework and matrix for food system competencies, including identifying directions for future work on this project. To start, we recommend creating a glossary that can clarify key terms to ensure that educators apply the matrix and framework consistently. We also believe that more guidance is needed for educators on how to evaluate curricula in order to identify which level of learning is taught. Lastly, we recommend that an additional competency related to the place-based nature of local and regional foods should be adopted in the core competency matrix because, through comparison, each course fully realized the importance of teaching place-based food systems and the intersectionality that place has in equity, culture, climate, and general food system practices.


An additional question, which may require further research, is to consider how teaching materials qualify as adequately addressing the learning objective. For example, if the curriculum is developed to teach a particular skill and competency, but the participant does not complete or participate in all activities, will that competency still be learned and achieved in the same way? The assumed answer is no, and thus to fully meet the level of learning



through the curricula, it is also the responsibility of the participant to engage in and fully absorb information. For future work, there may be an opportunity to develop a comprehensive evaluation method to confirm the extent that each competency's level of learning is fully achieved. This could lead to an overarching systems-based evaluation method for all educational resources that select the same competency to then report the extent to which participants achieve the level of learning.

Once these issues are addressed, we believe that this tool has the potential to support course providers in assessing their competencies, and in turn, help practitioners to identify which course best fits meet their needs and interests. Through understanding competencies taught across curricula, there are opportunities to foster new partnership among educators either through sharing resources or other methods of peer-to-peer learning. For example, curricula that teach different competencies could complement each other (for example, a course teaching production could combine with a course focuses on community development). Complementary programs could consider discussing their teaching methods and materials to identify what works best for learners, as may programs that

teach similar content but with a different place-based focus or approach. There are also continued efforts from NAFSN's Training and Certification Circle, whose membership is made up of and open to curriculum providers and interested professionals, to research and develop a verification system for food system curricula. This could help connect new and beginning food system professionals with relevant training opportunities.

For now, the database continues to evolve, and while there are changes and edits that need to occur, this database is a strong resource for educational resource providers, existing practitioners, and potential practitioners and students to learn about resources and people working in this field across the nation. 

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### Appendices (both files can be downloaded from this article's webpage)

- Appendix A: North Carolina State and ISUEO Competency Matrix [Excel file ]
- Appendix B: North Carolina State Extension 2021 Foundations of Local Food System Development Evaluation Report

### References

- Ammons, S. (2014). *Shining a light in dark places: Raising up the work of Southern women of color in the food system*. Center for Social Inclusion. <https://cefs.ncsu.edu/resources/shining-a-light-in-dark-places-raising-up-the-work-of-southern-women-of-color-in-the-food-system-2014/>
- Bargainer, M., Eley, M., Fogel, J., Jakes, S., Peery, S., Prohn, S., Sanberg, N., Smutko, S. (2018). *Faciliator's guidebook—2018, Community-based food system assessment and planning* (Publication CV-88NP). Virginia Cooperative Extension. <https://www.pubs.ext.vt.edu/3108/3108-9029/3108-9029.html>
- Bloom, J. D., Lelekacs, J. M., Dunning, R., Piner, A., & Brinkmeyer, E. (2017). Local food systems course for Extension educators in North Carolina: summary of an innovative program. *Journal of Extension*, 55(4), Article 22. <https://tigerprints.clemson.edu/joe/vol55/iss4/22>
- Bloom, J. D., Lelekacs, J., Hofing, G., Stout, R., Marshall, M., & Davis, K. (2020). Integrating food systems and local food in Family and Consumer Sciences: Perspectives from the Pilot Extension Master Food Volunteer Program. *Journal of Agriculture, Food Systems, and Community Development*, 9(2), 197–220. <https://doi.org/10.5304/jafscd.2020.092.013>

- Book, P. A. (2014). *all hands on deck: ten lessons from early adopters of competency-based education*. WICHE Cooperative for Educational Technologies (WCET). <https://files.eric.ed.gov/fulltext/ED546830.pdf>
- Cultural Competence Learning Institute. (2020). *Diversity Wheel*. From Cultural Competence Learning Institute: <https://community.astc.org/ccli/resources-for-action/group-activities/diversity-wheel>
- Columbia University School of Nursing Center for Health Policy & Association for Prevention Teaching and Research [APTR]. (2008). *Competency-to-curriculum toolkit* (Revised edition). [http://www.phf.org/resourcestools/documents/competency\\_to\\_curriculum\\_toolkit08.pdf](http://www.phf.org/resourcestools/documents/competency_to_curriculum_toolkit08.pdf)
- Dragoo, A., & Barrows, R. (2016). Implementing competency-based business curricula in higher education. *Journal of Education for Business*, 91(7), 374–379. <https://doi.org/10.1080/08832323.2016.1237932>
- Dunning, R., Creamer, N., Lelekacs, J. M., O'Sullivan, J., Thraves, T., & Wymore, T. (2012). Educator and institutional entrepreneur: Cooperative Extension and the *building of localized food systems*. *Journal of Agriculture, Food Systems, and Community Development*, 3(1), 99–112. <https://doi.org/10.5304/jafscd.2012.031.010>
- Emery, M., Fey, S., & Flora, C. (2006). Using community capitals to develop assets for positive community change. *CD Practice*, 13, 1-19. <http://srdc.msstate.edu/fop/levelthree/trainarc/socialcapital/communitycapitalstodevelopassets-emeryfeyflora2006.pdf>
- Fitzgerald, N., & Morgan, K. (2014). A food policy council guide for Extension professionals. *The Journal of Extension*, 52(2), Article 23. <https://tigerprints.clemson.edu/joe/vol52/iss2/23>
- Forehand, M. (2010). Bloom's taxonomy: Original and revised. In M. Oregy (Ed.), *Emerging perspectives on learning, teaching, and technology* (pp. 41–47). <https://www.d41.org/cms/lib/IL01904672/Centricity/Domain/422/BloomsTaxonomy.pdf>
- Gardenswartz, L., & Rowe, A. (2010). *Figure 3.1 | Four Layers of Diversity* [Figure]. Managing diversity: A complete desk reference & planning guide. <https://www.shrm.org/LearningAndCareer/learning/ManagingDiversityFigures/FIGURE%2003-01%20Four%20Layers%20of%20Diversity.pdf>
- Hilchey, D., Li, X., & Gillespie, G. W. (2021). *Trends in the food system development profession in the U.S. and Canada: A comparison of 2012 and 2019 survey results*. North American Food Systems Network (NAFSN). [https://www.foodsystemsnetwork.org/docs/Trends\\_Report\\_Food\\_Systems\\_Development\\_Profession\\_2012\\_2019.pdf](https://www.foodsystemsnetwork.org/docs/Trends_Report_Food_Systems_Development_Profession_2012_2019.pdf)
- Jones, E. A., Voorhees, R. A., with Paulson, K. (2002). *Defining and assessing learning: Exploring competency-based initiatives* (Report NCES 2002-159). U.S. Department of Education, National Center for Education Statistics. <https://nces.ed.gov/pubs2002/2002159.pdf>
- Kania, J., & Kramer, M. (2011). Collective impact. *Stanford Social Innovation Review*, 9(1), 36–41. <https://doi.org/10.48558/5900-KN19>
- Lelekacs, J. M., Bloom, J. D., Jayaratne, K. S. U., Leach, B., Wymore, T., & Mitchell, C. (2016). Planning, delivering, and evaluating an extension in-service training program for developing local food systems: Lessons learned. *Journal of Human Sciences & Extension*, 4(2), 1–19. <https://www.jhseonline.com/article/view/692>
- Leppink, J. (2018). The art of acknowledging that we know nearly nothing. *Health Professions Education*, 4(2), 67–69. <https://doi.org/10.1016/j.hpe.2018.03.004>
- Linsen, A., Elshout, G., Pols, D., Zwaan, L., & Mamede, S. (2018). Education in clinical reasoning: An experimental study on strategies to foster novice medical students' engagement in learning activities. *Health Professions Education*, 4(2), 86–96. <https://doi.org/10.1016/j.hpe.2017.03.003>
- Long, C., & Chase, C. (2020). *Food system core competency project: Iowa State & USDA AMS Cooperative Agreement*. Iowa State University. [https://www.extension.iastate.edu/ffed/wp-content/uploads/2020\\_CoreCompetencyFinalReport2.pdf](https://www.extension.iastate.edu/ffed/wp-content/uploads/2020_CoreCompetencyFinalReport2.pdf)
- Meter, K. (2010). Metrics from the Field: Letting food systems emerge. *Journal of Agriculture, Food Systems, and Community Development*, 1(1), 23–26. <https://doi.org/10.5304/jafscd.2010.011.006>
- Peel, J. L., & Nolan, R. J. (2015). You can't start a central line? Supervising residents at different stages of the learning cycle. *Journal of Graduate Medical Education*, 7(4), 536–538. <https://doi.org/10.4300/JGME-D-15-00025.1>

- Pop, M.-C., & Mazilescu, C.-A. (2012). Competence-based curricular design for foreign language teaching in the Romanian technical universities. *Procedia - Social and Behavioral Sciences*, 46, 4200-4204. <https://doi.org/10.1016/j.sbspro.2012.06.226>
- Raison, B. (2010). Educators or facilitators? Clarifying Extension's role in the emerging local food systems movement. *Journal of Extension*, 48(3), Article 8. <https://tigerprints.clemson.edu/joe/vol48/iss3/8>
- Raison, B., Long, C., & Lelekacs, J. (2017, July). *NAFSN updated core competencies matrix*.
- Reynolds, K. A. (2011). Expanding technical assistance for urban agriculture: Best practices for extension services in California and beyond. *Journal of Agriculture, Food Systems, and Community Development*, 1(3), 197–216. <https://doi.org/10.5304/jafscd.2011.013.013>
- Schipanski, M. E., MacDonald, G. K., Rosenzweig, S., Chappell, M. J., Bennett, E. M., Bezner Kerr, R., Blesch, J., Crews, T., Drinkwater, L., Lundgren, J. G., & Schnarr, C. (2016). Realizing resilient food systems. *BioScience*, 66(7), 600–610. <https://doi.org/10.1093/biosci/biw052>
- Soare, E. (2015). Perspectives on designing the competence based curriculum. *Procedia - Social and Behavioral Sciences*, 180, 972–977. *Social and Behavioral Sciences*. <https://doi.org/10.1016/j.sbspro.2015.02.259>
- Strategic Doing. (n.d.). What are the “4 questions” and the “10 rules”? Retrieved October 2021 from <https://strategicdoing.net/4-questions-and-10-rules/#:~:text=What%20are%20all%20the%20possible,What%20will%20we%20do%3F>