

Engaging Values in Sustainable Agriculture and Food Systems Education: Toward an Explicitly Values-Based Pedagogical Approach

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Abstract

Agriculture education programs that provide integrative learning experiences that reflect the complexities, values, and challenges inherent to sustainable agriculture and food systems (SAFS) continue to evolve as faculty, staff, and students implement, experience, and modify them. Higher education institutions, especially land grant universities, have strengths that position them to implement such transformative learning and action methodologies. In this article we explore the principles, approaches, and practices consistent with integrative learning and a values-based pedagogical approach to curriculum design and teaching specific to SAFS. By a values-based pedagogical approach, we mean paying explicit attention to the values that (1) underpin different agricultural and food systems and their governance, (2) inform and shape education strategies and experiences, and (3) are held by different individuals in various encounters in the learning environment. We provide illustrations of practices across the education “life-cycle” — curricular design, implementation, and evaluation — that have used values-based pedagogy to guide the development, modification, and strengthening of SAFS curricula. Finally, we discuss some limitations and issues that arise when using such pedagogical frameworks. A value-based approach to SAFS curriculum development, teaching and integrative learning is dynamic rather than static. As such, we conclude by challenging educators to focus on connecting multiple values associated with SAFS with innovative curricular practices that allow emergence of new ways of teaching, learning, and knowing for all.

Keywords: Sustainable agriculture, food systems, values, integrative learning, appreciate inquiry, experiential learning, Land-Grant Universities

Introduction

Universities need to be more responsive to enact curricular change if we are to prepare students to understand the interconnections between rapidly changing agrifood systems and environmental, economic, and societal contexts, and prepare them to act as responsible, productive, and innovative citizens in a dramatically changing world. We see movement toward these ends (see introductory article), and we note that today's sustainable agriculture and food systems¹ (SAFS) educational landscape continues to evolve as faculty, staff, students, and administrators actively devise strategies to create learning contexts that better reflect their values and goals than does the current context. Whether we create new programs or modify existing ones, there appears to be an emerging consensus that fundamental changes are necessary in both *what* and *how* we teach (Boyer Commission 1998; Osborne 2007; NAS 2009). In this paper, we discuss our experiences with practices and rationale behind providing experiences that reflect the complexities and current and future challenges inherent to SAFS.

The National Academy of Sciences (NAS) (2009) report *Transforming Agricultural Education for a Changing World* offers nine recommendations essential to transforming agricultural and life science education to better address our agricultural systems and their need to adapt to rapidly changing social and biophysical environments. The integrated, interdisciplinary learning strategy advocated by the report's authors suggests a shift in teaching methodology and curriculum design. With integrated learning, students not only learn theory but gain authentic experiential practice and are able to integrate theory and practice as *praxis*. Likewise, educators, practitioners, and employers understand that SAFS education for undergraduates should provide diverse opportunities to examine complex problems from multiple perspectives, connect theory

¹ We refer to sustainable agriculture and food systems (SAFS) education in a similar but not synonymous way as our colleagues who refer to sustainable agriculture (SA) education.

and action inside and outside the classroom, and contend with the ethical implications and complex realities surrounding SAFS (Parr, Trexler, Khanna, & Battisti, 2007).

Institutions of higher education have recently developed different learning environments that challenge conventional modes of teaching and extend beyond traditional academic boundaries, i.e., experiential, interdisciplinary, systems-based education (Boyer Commission, 1998; Francis, Leiblein, Helenius, Salomonsson, Olsen, & Porter 2001; Huber & Hutchings, 2004; Kolb, 1984; Markus, Howard, & King, 1993; Newell 2001; Parr & Van Horn, 2006). A recurring theme found in the SAFS educational literature concerns the valuable role of community engagement; community-based social learning is becoming a more popular way of engaging students and cultivating responsive, reflective, and flexible learning environments (Akers, 2007; Emery, Flora, & Fey, 2006; Francis et al., 2001; Lieblein, Østergaard & Francis, 2004). Specifically within land grant universities (LGUs), many students and faculty members are creating momentum for achieving changes similar to those outlined in the NAS 2009 report, and the number of institutions with such SAFS programs continues to grow (SAEA, 2011).

Most SAFS programs now embrace the notion that sustainability is inherently based on values with increasing recognition that the question of what is to be sustained is ultimately a value judgment (Allen, Dusen, Lundy & Gliessman, 1991). Yet, based on our conversations at SAFS education conferences, we have noticed that many of us teaching within SAFS programs come from scientific traditions in which practitioners are largely silent about the values embodied in their decisions and work because they've been trained to see science as a values-free activity (see also Leiblein et al. 2007; Steiner and Posch 2006). This fundamental tension — between what we have been prepared to do and what we must do — means that thinking through the role of values in our educational work has never been more urgent.

In this paper, we assert that a values-based pedagogical approach² — which we define as paying explicit attention to the values that (1) underpin different agricultural and food systems and their governance, (2) inform and shape education strategies and experiences, and (3) are held by different individuals in various encounters in the learning environment — can usefully guide the design, development, revision, and strengthening of SAFS teaching and curricula. We discuss the processes of designing, implementing, and evaluating SAFS curricula along the principles of values-based pedagogy, emphasizing *integrative learning*, where students “connect skills and knowledge from multiple sources and experiences; apply theory to practice in complex social and biophysical settings; utilize diverse and even contradictory points of view; and understand issues and positions contextually” (Huber et al., 2004, p. 13).³ Finally, we discuss some limitations and issues that arise when using such an educational approach. We do not pretend to be subject matter experts in all of these disciplinary domains, but rather write as practitioners and life-long learners who have grappled with these issues in our experiences in the educational system and in the programs for which we now have responsibility. Thus, we cannot go into great depth in all matters discussed here, but rather aim to show how one might holistically approach the educational challenges and opportunities presented by recognizing the value-laden nature of agricultural and food systems.

Values and Educational Praxis: Challenges and Ways Forward

Values are a set of interpretations or beliefs concerning things of importance. They are socially constructed and personally developed, becoming extensions of our subjective viewpoints

² We maintain that all pedagogical approaches are based on values, even if they remain implicit and unexamined. Thus, what we are advocating is an “explicitly values-based pedagogical approach,” for which we use the shorthand “values-based approach” here.

³ To help students develop integrative habits of mind, experiential strategies, like service learning and internships, invite students to make connections between coursework and community, and theory and practice. Integrative learning is further strengthened when it is infused into decisions about course design, pedagogy, and assignments, and allows time and space for dialogic processes.

in that they are personal judgments of what is important. Educational institutions by their very nature provide a context in which students' values and ethical development are unavoidably influenced (Berkowitz, 1997; Colby, Ehrlich, Beaumont, & Stephens, 2003). Scholarly work is replete with arguments for and evidence about how our nation's democracy and our world's shared future depend on a more knowledgeable, civically engaged, and globally responsible citizenry (AAC&U, 2008; AAC&U, 2010; Dey, Barnhardt, Antonaros, Ott, & Holsapple, 2009; Hersch & Schneider, 2005; Palmer, 2011).

The qualities needed to respond to 21st century conditions described in existing SAFS literature both implicitly and explicitly infers shaping the student's academic experience through a values-based approach. Through integrative-learning, LGUs are potentially well equipped to help prepare students for civically engaged agriculture because of the wide range of applied disciplines taught and their commitment to community-based outreach and engagement (Colasanti, Reau, & Wright, 2009). Yet, despite their strengths, LGUs face significant epistemological⁴ challenges if they are to succeed in fulfilling their mandate as the preeminent adult agricultural education institutions in the U.S. Chief among these challenges is the tradition of positivism and the imbalanced privileging of objectivity in research and science education that we explore below.

Most debates over scientific inquiry being "value free" attempt to compress a large number of claims about objectivity into a singular concept that problematically conflates the various aspects (Daston, 1992; Lacey, 1999). Objectivity has made its way into pedagogy in the form of what prominent educator Parker Palmer calls "objectivism," often with dire consequences. Objectivism "portrays truth as something we can achieve only by disconnecting ourselves, physically and emotionally, from the thing we want to know" (Palmer, 2007, p. 52).

⁴ Epistemology refers to the rules that govern how we know what we know.

If we get too close to something, says say adherents of the philosophical position of objectivism, our subjective lives will contaminate the thing and our understanding of it, possibly biasing us toward it, thus threatening the purity of our knowledge. It is no wonder, under this epistemological perspective, that values are so rarely explicitly discussed in much higher education teaching, especially in the biophysical sciences (Palmer 2007).

We argue that meeting the needs of a changing agrifood system will necessitate a shift in teaching and learning paradigms at LGUs away from objectivism and toward approaches that deal specifically with the value-laden nature of agriculture and food systems generally (cf. Lieblein et al. 2007). In short, teaching approaches must enable students to deal with Schön's (2001: 191) "swamp":

In the varied topography of professional practice, there is a high, hard ground which overlooks a swamp. On the high ground, manageable problems lend themselves to solution through the use of research-based theory and technique. In the swampy lowlands, problems are messy and confusing and incapable of technical solution. The irony of this situation is that the problems of the high ground tend to be relatively unimportant to individuals or to society at large, however great their technical interest may be, while in the swamp lie the problems of greatest human concern. The practitioner is confronted with a choice. Shall he/she ... remain on the high ground where he can solve relatively unimportant problems according to his standards of rigor, or shall he descend to the swamp of important problems and non-rigorous inquiry?

We believe that such fundamental reform in SAFS education must occur across the entire "life-cycle" of educational programming, from curricula design and courses, to teaching approaches and evaluation. We maintain that each of these interdependent components must be

overlaid with a focus on *praxis*: practice informed by theories, and theories informed by practice. Thus, the sections below discuss each of these elements of the educational life-cycle by identifying theories and specific practices consistent with a values-based, integrative-learning approach. We draw upon our praxis with our two SAFS programs, a major and a minor, summarized in Table 1.

We must note from the outset that we have noticed in faculty meetings regarding SAFS programs and course creation that faculty sometimes express a fear of discussing values directly in the classroom or, even more pronounced, asking students to consider the relevancy of certain values. In the discussions we have been involved in regarding curriculum development and teaching, most faculty members take the stance that their role is not to impose values on students. While we are sympathetic to the goal of non-imposition, we take two issues with this stance. First, logically, it does not follow that discussing values and even identifying our own values will result in an imposition of those values on our students. Creating a safe space for deliberations of deeply important matters allows for engagement without domination that coerces conversion (as we discuss vis-à-vis teaching practice below). Second, when we look at the educational missions and goals of our campuses, they are all based on values, whether specifically identified or not. For instance, the institutional learning goals of one of our campuses includes: “Develop higher cognitive skills — Critical thinking, creativity, analytical ability” (Undergraduate Studies, 2010). In this case, it appears that the campus community has jointly agreed to value the cognitive domains of students, and to intentionally develop them. By asking our students to learn about, practice, and, ultimately, conform to academic norms, we are cultivating certain values and virtues, and not others. The battles of religious versus scientific authority over the last few centuries have often been about the values underlying epistemology — on the one hand,

conforming to orthodox religious perspectives because it is what the powerful say is true, versus the critical questioning and probing of various objects of study and taking empirical data seriously that is highly valued in most quarters of the academic enterprise. This means that values always already underlie the academic enterprise, specifically guiding its ways of inquiry and both interpretive and empirical knowing.

Furthermore, campus mission statements imply that their faculty consider it insufficient that their students cultivate academic values in isolation. In fact, universities commonly espouse cultivation of “virtues” or “values,” which includes taking ethical stances, including resolution through non-violent means, treating people as ends rather than means, etc. Taking our two campuses, UC Davis and Virginia Tech, these include ethics, responsibility, honor, tolerance, mutual respect, empathy, freedom of inquiry, personal and institutional integrity, and a culture of continuous improvement (Undergraduate Studies, 2010; University Strategic Plan, 2012).

Deeply unethical things can happen when the quest to know is disconnected from a deep commitment to the well-being of others, as numerous examples of medical research, such as the Tuskegee syphilis experiments, make clear (Caplan, 1992; Fairchild and Bayer, 1999). We cannot shy away from ethical commitments, our values, and others’ values, even if they make us uncomfortable. Rather, we need ways to productively engage with questions of values.

Curriculum Design

In our experiences, designing a curriculum using a values-based approach should start by seeking out multiple and divergent perspectives, worldviews, and paradigms. These differences cannot be reduced merely to correct and incorrect, true or false views of the world and things within it. Rather, many of these differences are underpinned by different value systems, including their ethical and moral dimensions, as well as different epistemological commitments.

It is useful to view SAFS education as having a broad constituency, internal and external to the university. Internally, in programs created by faculty and students from different disciplines, discussions around what is required in a SAFS curriculum need to be guided by openness and interest in the importance of other disciplines and ways of knowing. There are tensions, in which those involved have a tendency to push for their discipline being represented within the curriculum; this can create an imposing curriculum with the feeling that it has to cover all the bases. Externally, everyone is sustained by food, and, in a democratic society, everyone should have a say in food governance. There are also stakeholders in designing SAFS education with more detailed knowledge of components of agriculture and the food system, including those who work in the food system, academics, current students, former students, community-based organizations, NGOs and government agencies involved in SAFS work. Both internally and externally, individuals within these various positions often have divergent perspectives on a range of issues related to sustainability, especially regarding the values that underlie, and should underlie, the food system. Resolving the issues stemming from these divergent perspectives require consensus building across these diverse constituencies and ways of knowing. These issues can be solved or at least highlighted through methods like participatory research commonly used in the social sciences, as these have been developed over decades to elucidate different perspectives. Our two programs, for example, engaged students, community partners, and faculty in efforts to inform and shape the curriculum through distinct approaches.

Although our programs' curriculum design processes were conceptualized prior to the release of the NAS (2009) report, they both align strongly with its recommendations and the AAC&U's initiative recommending that educators better prepare students for civic responsibility and engagement. This speaks to the current milieu and emerging discourse within the SAFS

world. Both programs have created space to think holistically about SAFS, connected program values to empirical inquiry, enhanced critical and systems-level thinking, and cultivated social and cultural knowledge regarding healthy SAFS practices. Some scaffolding frameworks that anchor these programs include competency frameworks, appreciative inquiry, and experiential learning through fieldwork and community action projects, which we briefly explain below.

Competency frameworks, which identify the functionally linked knowledge, skills, and attitudes that should be developed from particular educational experiences, and can be applied in other contexts — can act as the structure around which curriculum goals are developed and learning activities designed. Emerging consensus exists around the idea that normative competencies are vitally important to sustainability education (Wiek et al. 2011). As we anticipate futures based on current trends, the question of *what should be* and *who should shoulder the cost* is always central, and debates over this depend on competing values, not merely empirics. Wiek et al. (2011, p. 209) define normative competence vis-à-vis sustainability as

the ability to collectively map, specify, apply, reconcile, and negotiate sustainability values, principles, goals, and targets. This capacity enables individuals to, first, collectively assess the (un-)sustainability of current and/or future states of social-ecological systems and, second, to collectively create and craft sustainability visions for these systems.

This capacity requires learners to acquire normative knowledge, including concepts of ethics, equity, justice, and social-ecological integrity, and methods like structured visioning and multi-criteria assessment.

Appreciate inquiry (AI) is a form of action research that attempts to advance the development or change of an organization or system, including curriculum (Cooperrider, Whitney, & Stavros, 2008). Current models of curricular design are typically deficit based; the gap between current performance and desired performance is analyzed and new instruction is designed to fill that gap. In contrast, appreciate inquiry (AI) methodology elucidates learners' values and maintains that they go beyond acquiring knowledge to become knowledge producers. Furthermore, AI supports a values-based SAFS curriculum planning-teaching-learning-assessment feedback cycle.

Incorporating AI into curriculum planning teams and course projects can become a blueprint on how to produce the organizational change needed to support values-based SAFS education. AI begins with researchers and/or practitioners identifying examples of the system at its best, its highest values and aspirations, followed by what is applicable (to the system in which the inquiry takes place and be validated in action), provocative (create knowledge, models and images that are compelling to system members and provoke people to take action), and finally collaborative (system members must be part of the design and execution of the inquiry). AI processes result in new knowledge, models, and theories that serve as generative metaphors that can compel new action. A focus on changing how people think instead of what people do, and a focus on supporting self-organizing change processes that flow from new ideas rather than leading implementation of directives, appear to be key contributors to AI affected change.

Fieldwork offers a wide range of important integrative learning opportunities. In some cases it allows students to actively participate in thoughtfully organized service-orientated experiences that meet needs of a civic agriculture stakeholder and/or initiative in a real community context. Research or action-based community project-focused fieldwork asks

students to seek answers to rigorous questions in the context of a specific social and physical location within the food system. Having a structured opportunity for dialoguing with people outside of the classroom and asking them why do what they do allows students to see other perspectives and discover what values drive people to do things, and how these values often come into confrontation with existing societal arrangements. As Allen (2010, p. 298) notes, “Local food efforts are generally embedded in and must act within social structures that may be contrary to their ideals and values.” Seeing these efforts, and the larger-scale constraints upon them, gives students the opportunity to attempt reconciliation of contradictions between what *is* and what they think and feel *should* be.

Teaching Practice

The classroom is a microcosm of the external community in important ways — e.g., lines of social difference and different socialization experiences can create tension, but also richness if handled well — and how we conduct our classes reflects our values and how we conceive of proper human relationships (hooks 1994). It can be paralyzing to seriously consider the question: is the way I teach a true reflection of my values, and does it serve my ultimate goals for this class, society, my students, and myself? But posing these kinds of question can also provide liberation from rote tradition if it encourages sympathetic self-reflection that spurs changes in practice (Palmer 2007).

Our main principles in considering teaching from a values-based pedagogical approach is that as teachers we need to (1) highly value our students as whole people and adults, with their own subjective domains and values, and (2) identify the values that underlie our teaching. Instead of fearing encounters with individuals who hold different belief and value systems than us, we can demonstrate our respect, and even a need, for accepting our differences (Palmer,

2007). For example, learning based on inclusive deliberation, from divergence to convergence and back again, is a process that never ends, but rather permeates the human endeavor to know, and ethos of democratic societies. Palmer argues that truth, in all modes, comes out of a *complex process of shared inquiry* — in short, a community of truth; this is at the heart of all academic research endeavors as well, formalized in processes like peer review. The community of truth is built around “an image of knowing that embraces both the great web of being on which all things depend and the fact that our knowledge of those things is helped, not hindered, by our being enmeshed in that web” (Palmer, 2007, p. 101). This is similar to Bain’s (2004, p. 47) conclusion that the best teachers make this kind of inquiry the center of the classroom experience by cultivating a “natural critical learning environment.”⁵ In this context, knowledge advances through conflict — *not* competition — which is “open and sometimes raucous but always communal, a public encounter in which it is possible for everyone to win by learning and growing” (Palmer, 2007, p. 106). Below we highlight a few practices that help cultivate these integrative teaching and learning interactions. We cannot do justice to the array of practices available and the subset that we have used, although we note a few more in Table 1 and point the reader to a number of available resources (Bain 2004; Bean 1996; Palmer 2007; Pretty et al. 2002; Weimer 2002).

Dialogue-based inquiry blended with appreciative inquiry generates “open space” where students can begin unraveling the basic assumptions surrounding agricultural and food issues with dialogue and consensus. Ultimately this can generate a more in-depth and authentic understanding of the values-laden concerns intrinsic to SAFS. Such practice enables students to become active learners and facilitates their academic development, personal growth, and civic

⁵ This involves embedding the skills and information we want to teach in assignments through questions and authentic tasks students should find fascinating, and through challenging students to rethink assumptions and examine their mental models of reality.

engagement.

Collaborative, interdisciplinary teaching promotes sharing of knowledge between faculty, students, and community partners, expands everyone's skills and knowledge about SAFS issues, thus benefiting the greater community (Clark & Button, 2011; Newell, 2001). When students are asked to integrate different and often conflicting viewpoints, they often show greater knowledge and understanding of the subjects studied and better decision-making (Johnson, Johnson, & Smith, 2000). Furthermore, teaching collaboratively can expand intellectual capacity in ways that transfers new knowledge via other scholastic activity (Newell, 2001). However, we note that the practice of collaborative teaching takes serious commitment from key constituents, especially faculty and their administrations.

Evaluation

An important question remains about how we assess the outcomes of these kinds of educational praxis, as their very purpose is often qualitatively different from producing students who are masters of a tightly defined, specialized disciplinary knowledge (Boix Mansilla and Dawes Duraising 2007). Base on our experiences, evaluation is a fundamental, yet commonly undervalued, piece in the pedagogical puzzle. When we take our teaching as seriously as our research scholarship, i.e., treating it as a serious intellectual endeavor, it means asking critical questions about its success or limitations, and gathering data to answer these questions (Bain, 2004). Our experiences suggest that both praxis and student learning can improve considerably, and in some cases rapidly, due to more holistic evaluation efforts.

Although we deal with a values-based approach linearly here — from design to teaching practice to evaluation — we note the importance of making educational praxis an iterative cycle, from design to implementation to evaluation to (re)design, to restart the cycle anew. For us, using evaluation that takes values seriously has meant that students should be able to ask what it

is that *they* value and how *their* education serves and/or does not serve their interests.

Ultimately, this would mean that students help create the topics and question by which they, and their formal educational activities, are evaluated. As such, we briefly discuss a number of evaluation models relevant to the task of evaluating values-based education, highlighting their relative strengths and weaknesses. We move from those that follow the principles outlined above most weakly to those that align most strongly. However, there are no perfect evaluation methods; rather, tradeoffs exist between intensity of data collection and analysis efforts, resources available, and intent of the evaluation, e.g., comprehensive curriculum evaluation vs. assessing specific assignments, internal communication versus external accreditation, etc. (Patton 2002). Many of these methods have been refined considerably — we cannot be exhaustive, but rather point our readers toward resources available.

Standardized evaluations used within higher education attempt to address the question of overall student learning. Because most institutions limit who is allowed to see which evaluations (the assessed faculty can see them, but their students and colleagues outside of their unit and merit committees cannot), the results tell us very little in comparative context, i.e., how well students are learning in these kinds of classes relative to other kinds of instruction method. Generally, these evaluations are not sufficient for the task at hand, “unless one believes that all varieties of good teaching can be crammed into the scales of a survey questionnaire” (Palmer, 2007, p. 96).

Customized evaluations, created by participating students and/or faculty members, allow evaluation questions to be tailored to the circumstances of the class. These kinds of assessments can take a lot or little time to perform and can employ a number of methods, including surveys, some of which can allow participants to shape the content of the survey. These evaluations can

be strengthened by using independent campus centers focused on teaching and learning outcomes, available on most campuses, as this allows for a third party data collector.

Reflective essays are assignments that require students to reflect on their learning as a personal experience by connecting their interests, values, and development with other cognitive and affective dimensions of learning. As such, they can serve dual purposes. First, they complete the learning cycle of experiential learning, meaning that it is not just experiences that help us learn, but, crucially, reflection upon those experiences (Dewey, 1938; Kolb, 1984). Second, reflective essays provide data rich windows into students' learning experiences to see how values influence student learning within classes and across a curriculum as a whole.

Self-assessments, wherein students are taken to be valid sources of both their own value systems and of self-knowledge, arise from critical pedagogy (Fernández-Balboa, 2007). The faculty at Alverno College has done a considerable amount of work conceptualizing, refining, and practicing this model, resulting in an engaged praxis that they clearly communicate to students and outsiders (Alverno College Faculty, 1994; 2000). In our own practice, we have combined self-assessments with competency development frameworks so that students self-assess their development across dozens of competencies at different stages in courses; we are currently working to integrate self-assessments across the curriculum. Similarly, peer-to-peer and external advisory board assessments can give students greater responsibility of their learning and autonomy to better understand the real world.

Conclusions

The NAS 2009 report recommends that we "situate" agricultural instruction at institutions of higher learning in a way that focuses on integrative learning and its outcomes in order to have graduates who are competent in connecting and applying knowledge and skills from multiple

sources to address real-world issues in real-world settings. This requires moving away from the scientific paradigm of positivism, and its corollary of objectivism in the classroom, and towards more experiential, interdisciplinary, and systems-based approaches to education.

We believe that these approaches are deeply enriched when values become a guiding element, and an object for deliberation. When learning and teaching methodologies reflect upon the multiple values that influence and shape SAFS, they can educate, promote democratic practice, challenge students via participatory dialogue, raise awareness about thought and language, develop analytical skills, and invite students to reflect critically and find increased agency through civic action. In our own experiences, a values-based pedagogical approach described above has been a crucial element in successfully transforming students into life-long, critically reflective learners who practice social and environmental responsibility and civic engagement within local and global communities (see also Galt et al. in revision). By developing innovative SAFS educational programs that engage values directly — by examining how they underpin food, agricultural, and social systems; how they underpin pedagogy; and the differences and similarities in values held by different individuals and groups — we strongly believe that teaching will advance learning outcomes essential for responsible citizenship.

Moving in this direction will require commitment from individuals within LGUs who see the need to deal with Schön's (2001) "swamp" of complex problems that matter greatly to society but that cannot be addressed through specialist and technical approaches alone, and to help prepare others to do the same. The work will also support the integrity of LGUs, as a deliberation on values will be essential for charting their future course and ensuring the mission of serving the public good. More appropriate educational methodologies that deal with the complexities of SAFS — including being explicit about values — will facilitate the emergence

of more powerful ways of meeting the challenges and opportunities of agriculture and food systems, a charge LGUs still take seriously. While potentially frightening, making values an explicit underpinning of educational activities and an explicit focus of critical attention yields large rewards, and is crucially important given the challenges of today.

Appendix

Table 1: Comparison of Two Sustainable Agriculture and Food Systems Programs

Characteristics	Major	Minor
Curriculum Development	<i>Interdisciplinary Curriculum Committees:</i> Faculty (8 departments), students; Delphi survey of academics, students, alumni, and practitioners	<i>Interdisciplinary Curriculum Task Force:</i> Faculty (8 departments), students, practitioners, NGOs, outreach and dining garden staff
Guiding Values	<ul style="list-style-type: none"> ▪ Interdisciplinary depth of knowledge ▪ Experiential learning, integrating theory and practice. ▪ Systems thinking ▪ Skill development, practical and social skills ▪ Linking real-world with classroom ▪ Community building, on and off campus ▪ Adaptive curriculum management 	<ul style="list-style-type: none"> ▪ Ecological stewardship and praxis ▪ Strong local economies ▪ Healthy people and communities food security/sovereignty ▪ Collaborative teaching ▪ Experiential-integrative learning ▪ Civic engagement/democratic participation
Curriculum Theoretical Frameworks	<i>Major and Minor</i>	
	<ul style="list-style-type: none"> ▪ Social Constructivism^a ▪ Experiential Learning^b ▪ Transformational Learning^c ▪ Critical Theory^d ▪ Participatory Learning^e ▪ Action Research^f 	
Experiential Teaching Activities	<p><i>Major</i></p> <ul style="list-style-type: none"> ▪ Competency development^g 	<p><i>Minor</i></p> <ul style="list-style-type: none"> ▪ Value-based model^h ▪ Appreciative Inquiryⁱ ▪ Community capitals^j
Evaluation	<ul style="list-style-type: none"> ▪ Competency self-assessments ▪ Peer reviews of team performance ▪ Reflective essays ▪ Portfolios 	<ul style="list-style-type: none"> ▪ Critical reflection statements ▪ Assignment-based assessment ▪ Peer/self-assessments ▪ Assessment-based portfolios ▪ Faculty-student-community partner evaluation

^aVygotsky, 1978; ^bKolb 1984; ^cMezirow 2000; ^dHabermas 1987; ^ePretty 1995; ^fBawden 1990; ^gRaven & Stevenson 2001; Weik et al. 2011; ^hAkers 2007; ⁱCooperrider et al. 2008; ^jEmery et al. 2006

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