International Journal of Teaching and Learning in Higher Education 2018, Volume 30, Number 3, 412-422
http://www.isetl.org/ijtlhe/ ISSN 1812-9129

Exploring the Intersections of Interdisciplinary Teaching, Experiential Learning, and Community Engagement: A Case Study of Service Learning in Practice

Jennifer Culhane, Kim Niewolny, Susan Clark, and Sarah Misyak
Virginia Tech

In 2009, the National Academy of Sciences (NAS) called for more interdisciplinary and community-engaged approaches to teaching and learning in the agricultural and life sciences to better respond to the food system challenges of the 21st century. As a result, institutions from across the nation have responded with a number of experiential learning and service-learning frameworks and practices aimed to enhance the academic experience for both student and community stakeholders. Sustainable agriculture education, with its explicit focus on experiential learning, interdisciplinarity, and values-based programming, has emerged as a promising approach to strengthen the fabric of agriculture and life sciences education. The purpose of this paper is to illustrate the complex role of service learning as a central approach to undergraduate teaching and learning where interdisciplinary teaching, experiential learning, and community engagement are core goals. Specifically, we conducted a single embedded case study of a sustainable agriculture education program at a land grant university to explore how this triad was organized and possible service learning outcomes. Our case study was informed by semi-structured interviews of faculty and community partner stakeholders, participant observations of faculty and students, and secondary data analysis of course syllabi and other programmatic artifacts. Despite different understandings and practices of service learning by faculty within this, we found a common core of best practices. We conclude with criteria and best practices to guide teaching and learning from this triad perspective.

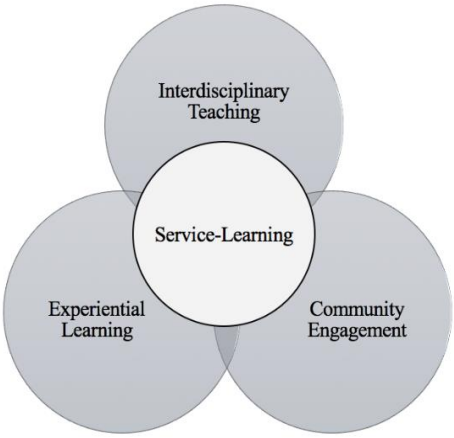
The collegiate experience is an ever-moving target where administrators and faculty attempt to enhance teaching and learning to ensure the highest competency of graduates to attain employment or pursue a graduate degree. Teaching and learning invariably cycles through new and innovative approaches, while the core of the practice remains historically the same. The National Academies of Science (2009) and The Association of American Colleges and Universities (AAC&U) prime the conversation toward the need for engaged, student centered pedagogy and high impact practices identified by George Kuh (2010). Evidence-based high impact practices that when designed, implemented, and assessed effectively have been found to help student persistence and increase learning gains are first-year seminars and experiences, common intellectual experiences, learning communities, writing-intensive courses, collaborative assignments and projects, undergraduate research, diversity and global learning, service and community-based learning, internships, and capstone courses and projects (Kuh & O'Donnell, 2013).

High impact practices across college campuses continue to advance student success. Service learning is one high impact educational practice (Kuh, 2010) that engages the student, university, and community in learning through authentic situated experiences where individuals learn through participation and engagement (Fenwick, 2003). However, ensuring that the authentic experiences are occurring with full participation and meaningful engagement is frequently challenging. Often, the mark is missed with experiences situated on the periphery of complex community organizations, as Jacoby (2003) describes, a kaleidoscope lens where all of the facets of service learning collide. We introduce a framework and best practices for exploring the practice of service learning through interdisciplinary teaching, experiential learning and community engagement as a core to situate the student, university and community in a reciprocal and authentic experience. We posit that service learning as a pedagogical practice fosters experiential, interdisciplinary and community-engaged curricula. An in-depth discussion of the literature sets the conceptual and programmatic stage for this case of service learning in practice. The discussion of the literature is then followed by the design and results of a single-embedded case study which explored an interdisciplinary sustainable agriculture education (SAE) minor in which the practice of service learning is central to the student experience. The centrality of experiential, interdisciplinary, and community-engaged curricula within this case study sets the stage for broader conversation of implications across disciplines.

Experiential Learning as Foundation

Experiential learning historically is defined as "learning by doing" in the most practical sense and as connecting education to personal experience in the most organic, and it is informed by the work of John Dewey (1938). If experiential learning is understood as values-based, then all education is created within experience, but not all experiences are equally educational (Dewey, 1938). Creating a dualistic view of experiential learning, Dewey (1938) describes the traditional structure of education as disjointed experiences where the connectivity is lost upon the student and further

Figure 1
Triad model for service-learning pedagogy



growth hindered due to the lack of quality within the experience. A clear conceptual view of experiential learning takes into account the embeddedness of mind and body in experience which is shaped by previous and future experiences (Dewey, 1938). Fenwick (2003) cautions the philosophical beliefs of experience in everyday life where experiential learning must have clear boundaries established before all experience becomes coopted as experiential learning. Dewey (1938) spoke of philosophy in his seminal work "Experience and Education," making transparent the need to state philosophical underpinnings of experiential learning as methodology. Translating experiential learning to a widely used model, Kolb (1984) suggests that learning happens when meaning making of experiences occurs. The experiential cycle depicts meaning making consisting of having concrete experiences, reflecting on those experiences, conceptualizing, and experimenting (Kolb, 1984). These conceptual starting points guide a large literature base on experiential education; however, there are aspects missing from these frameworks that are being further discussed in conversations on the changing needs of undergraduate curriculum.

Focus on the split of mind and body introduced by Fenwick (2003) as a place of contention, with the experience of learning being broken down into measurable parts. Experience in a holistic sense should be addressed by taking into account the temporal, spatial, and historical context of the learning environment interwoven with behavior, choice, language, culture, and society (Fenwick, 2003). "Accepting the moment of experiential learning as occurring within action, within and among bodies…understands the body as a site of learning itself, rather than as a raw producer of data that the mind will fashion into knowledge formations" (Fenwick, 2003, p. 129).

Sustainable agriculture education addresses many complex issues facing society today, including "ecological or environmental health benefits; economic viability and a policy resource use that does not compromise the lives of future generations; and social benefits including social justice, human empowerment, and human health and safety" (Delate, 2006, p. 445). Incorporation of multiple disciplinary perspectives relevant to interdisciplinary exploration, a triad approach to teaching and learning (Figure 1), exemplifying experiential, interdisciplinary, and community-engaged approaches and frameworks has emerged as a best practice (Clark, Byker, Niewolny, & Helms, 2013; Hammer, 2004; Jacobsen et al., 2012; Niewolny et al., 2012; Parr, Trexler, Khanna, & Battisti, 2007; Parr & VanHorn, 2006). SAE represents an emerging field in agriculture and life sciences in which experiential learning is a core component (Clark et al., 2013; Grossman, Sherard, Prohn, Bradley, Goodell & Andrew, 2012; Hammer, 2004; Niewolny et al., 2012; Parr et al., 2007; Parr & VanHorn, 2006). Parr and Van Horn (2006) developed seven guiding principles to describe the practice of teaching and learning within SAE programs: 1) interdisciplinarity, i.e., integration of natural and social sciences; 2) experiential learning, i.e., learning tied to purposeful activity with integration of theory and practice; 3) systems thinking, i.e., holistic understanding of complex systems; 4) skill development, i.e., practical and social skills; 5) linking of the real world with classroom, context, and real-world problem solving; 6) community building with students, staff, and faculty;

and 7) adaptive curriculum management, constant feedback, and change of innovative curriculum. Furthermore, when examining the need for curriculum in SAE through the participation of stakeholders in a Delphi study, the concepts of content knowledge, experiences, and skills were addressed as necessary to prepare students for transition to the career field (Parr & Van Horn, 2006). Parr and Van Horn (2006) found that experiential learning helps students develop lifelong learning capacity, attitudes, conscious awareness, and applicable skills (Parr & Van Horn, 2006). Hands-on experience, holistic views of teaching and learning, transformative change, and the importance of the context/environment in which learning occurs is central to curricular design (Battisti & Passmore, 2008; Francis, Jordan et al., 2011; Galt, Parr, Van Soelen Kim, Beckett, Lickter, & Ballard, 2012; Hammer, 2010; Parr & Trexler, 2011; Parr & Van Horn, 2006).

Parr and Trexler (2011) recently evaluated hands-on programs and observed the use of experiential learning theories in practice "where horizontal co-construction of knowledge, rather than simply privileging faculty expert transmission" of knowledge, occurred (Parr & Trexler, p. 178). The researchers suggest the most effective learning approaches share certain commonalities in which experiential learning components stand out: 1) the integration of theory and practice into coursework and fieldwork; 2) incorporation of learner-centered activities that emphasize peer-to-peer social relations, and 3) the application of facilitation and mentoring as core instructional methods. Examples of experiential learning in practice range from short-term and long-term service-learning opportunities and capstone projects. Service learning incorporated into a semester long course or spanning the students' progress through an academic program can vary greatly. For example, a semester long service-learning experience could include 20 hours of fieldwork with a community partner and a tangible outcome, such as a project presentation or proposal paper (Clark et al., 2013).

Interdisciplinary Teaching and Multiple Knowledge Perspectives

Conceptualizing interdisciplinarity is a mode of inquiry that relies on multiple knowledge perspectives and methods of inquiry that embodies activity within social interactions and includes a continuum of actions that start with a communication of ideas and spans to a formal collaboration of ideas (Lattuca, 2001). Interdisciplinarity, when viewed through a sociocultural lens, recognizes disciplines as cultural tools where individual thinking and activity are influenced by the discipline that the individual is situated within (Lattuca, 2001). Interdisciplinary teaching requires the blending of different "disciplinary languages," which Lattuca and Creamer (2005) equated with: 1) expanding or increasing the fluency in disciplinary languages, 2) learning new methods of inquiry and new concepts and understanding of a phenomenon, 3) connecting with different scholarly communities, and 4) enhancing practices and beliefs. Further, Lattuca and Creamer (2005) found that when faculty respond to challenges to their own discipline-based understandings, their professional identity and epistemological views shift.

Academic work traditionally segments knowledge into specific disciplines, as exemplified by the longstanding separation of the natural and social sciences. The danger of continuing this segmented model is losing understanding of how all of the pieces and parts interact (Lattuca, 2001). Godemann (2006) described the complexities of generating knowledge that can solve today's complex problems as requiring know-how that spans society and educational contexts and surpasses the scientific community and disciplinary methodology. Conceptualizing interdisciplinarity as a mode of inquiry that relies on multiple knowledge perspectives and methods, as well as embodies activity within social interactions, offers guidance to practice. Godemann (2006) also communicates a clear definition: interdisciplinarity seeks to answer complex problems that span multiple disciplines where "new knowledge structures are established by the integration of different disciplinary perspectives theories and methods" (Godemann, 2006, p. 52). Important to note is the distinction between multi- and interdisciplinarity. Multidisciplinarity takes into account multiple disciplinary perspectives but does not integrate these to create an interdisciplinary understanding of a problem (Zalanga, 2009).

Faculty involved in interdisciplinary research and teaching reflect on their own and other disciplines, thus gaining new knowledge and perspectives. Moreover, considering faculty work as learning through a sociocultural lens in a collaborative and interdisciplinary manner can create space for new approaches to research, teaching, and extension/service in higher education. Enhancing curriculum in higher education through partnerships between institutions, colleges, governmental and non-governmental organizations, and the community would be the first step toward an interdisciplinary education.

Community Engagement and Social Change

Community engagement is evolving as a practice that academics, practitioners, and community stakeholders use to incorporate a wide array of efforts to connect *local* and *civic* initiatives. This emerging paradigm supports these initiatives in higher education by emphasizing community-based

learning opportunities and experiential approaches to engaged campuses. One important way of fostering a civically and politically engaged and socially responsible undergraduate is through service learning and volunteerism opportunities that result in true educational engagement (Strand, Marullo, Cutforth, Stoecker, & Donohue, 2003). Similarly, Butin (2010) described an ideal scholarship of engagement reflecting the mission and/or vision of universities, with service-learning and/or community engagement being everyday threads to faculty-student interactions. Therefore, engagement is an essential component to SAE curricula, connecting students, faculty, and community together in a mutually beneficial learning process and providing "an opportunity for all, faculty, staff, students, and public, to learn together in seeking solutions to real problems" (Byrne, 2000, p.17).

The scholarship of engagement is a movement in academia toward revitalizing teaching, research, and service (Austin, 2010). Votruba (2010) emphasized the important role of engagement in higher education, suggesting that engagement should be institutionalized as a core area academic concern the same way that research and scholarship are prioritized. Glass and Fitzgerald (2010) listed three qualities that should be inherent in an engaged campus and in engaged scholarship overall for social change. Engagement should: 1) have a scholarly goal with resulting knowledge benefitting both academia and society; 2) cut across the mission of teaching, research and service and cannot be separated from the core mission of institutions; and 3) be reciprocal, be mutually beneficial, and represent a systematic relationship between university and community partners. Engaged scholarship should focus on connecting the intellectual assets of the institution to public service through community development, with faculty expertise fulfilling the institutional mission (Glass & Fitzgerald, 2010).

Reciprocity and mutual benefit between the university and community are essential for building civic community/university engagement. Community members engaged in research and education as *community intellectuals* enhance the engagement of campuses by embedding grassroots knowledge and practice into curricula (Wynne, 2006). Establishing trust, respect, and appreciation between faculty, students, and community partners foster social relationships that are mutually beneficial. These academic-community partnerships have the potential to enhance academic scholarship via the development of civically-engaged curricula. Moreover, communities benefit from such partnerships, which result in greater problem-solving and decision-making capacity that can be applied in their daily lives (Wynn, 2006).

Service Learning: Bringing Together Theory and Practice

Following Fenwick's (2003) explanation of learning as a sociocultural experience and Lattuca's (2001; 2002) interdisciplinary approach to sociocultural learning, we explore and understand learning in this study to emphasize the importance of "cognition and the social activity embedded...through interactions with others, with the tools of different communities of practice, and in a variety of contexts" (Lattuca, 2002, p. 719). Specifically, we draw upon Lattuca's (2002) interdisciplinary approach as a way to highlight how disciplinary positions frame assumptions, practices, processes, values, and relations to other disciplinary perspectives. Lattuca (2001) provides insight into interdisciplinary teaching as a sociocultural practice where faculty gain new teaching strategies and insights, are intellectually stimulated, and are more reflective on both their own learning and their students' learning. This pedagogical orientation views learning as both integral and inseparable from social practice and thereby promulgating mutually constitutive associations between and among activity, agent, and world. Third, Lattuca's sociocultural approach to interdisciplinary teaching, scholarship, and research reinforced how the work of faculty and community partners can and should inform interdisciplinary practice.

Service learning can be utilized to facilitate community-engaged scholarship by engaging students in complex world problems for the benefit of the local community while connecting the experience to knowledge gained in the classroom through readings, discussion, and other learning activities. Galt, Clark and Parr (2012) focus on service learning as a practice to enhance integrated learning, making connections between "course work and community and theory and practice" (p. 5). Service-oriented fieldwork is a way for students to experience working toward answering complex questions while meeting the needs of the community partner and their own (Galt et al., 2012).

When understanding service learning as a pedagogical practice, the importance of the objectives and desired outcomes of the learning activity cannot be overstated. The facilitator and student must be able to clearly define steps that need to be taken to achieve desired goals, provide opportunities for student reflection on the service experience, and measure outcomes to assess student learning and community benefits (Duncan & Kopperund, 2008). According to Kendall (1990), "Service-learning programs emphasize the accomplishment of tasks which meet human needs, in combination with conscious educational growth" (p. 40).

Duncan and Kopperund (2008) stated that all service learning must occur within a meaningful

community-based setting to become meaningful to the students participating in the program. The researchers further defined three essential criteria for service-learning, it must: 1) promote learning and academic rigor, 2) require the student to engage in reflective thinking, and 3) advance a student's sense of civic responsibility. Also important is the application of knowledge learned within classroom walls to the real world so that "*thinking…leads to action*" (Duncan & Kopperund, 2008, p. 44). Incorporating the practice of service learning into curricula also addresses problems in education identified by Rogers (2004): "[E]spoused theory is what we *say* we are doing, often with complete faith in our ability to fulfill these aims and ambitions. Theory in use is what in fact underpins the actions which we take, what we actually *do*. There is frequently a considerable gap between these two" (p. 6). The following single, embedded case study explores service learning as a concrete example of the triad approach to teaching that bridges the gap between espoused theory and practice.

Methods

Introduction of the Case: Civic Agriculture and Food Systems (CAFS) Program

The Civic Agriculture and Food Systems (CAFS) minor program within the College of Agriculture and Life Sciences at a land-grant university spearheaded an approach to community engagement through service learning by involving students, community partners, and faculty in interdisciplinary, collaborative teaching and learning. Collaborative teaching teams in the minor were comprised of faculty and graduate students from multiple disciplines and departments including agricultural education, horticulture, animal science, plant science, and nutrition, and it also included a community member serving as a community-partner liaison and an educator in the four core courses (Clark et al., 2013). This one intimately involved community partner was engaged in course design, management, and assessment, as well as leadership in the larger decision-making body for the minor while representing other community partners involved in each of the four core courses. The interdisciplinary nature and draw of the minor was further reflected in that the undergraduate student population enrolled in the minor were from all eight colleges of the university (Clark et al., 2013).

The CAFS taskforce—a decision-making body of faculty members, the community-partner liaison, institution administration, and graduate students—collaboratively developed overall programmatic core values, goals, and student learning outcomes for the minor. Undergraduates minoring in CAFS were required to take four core courses designed to build upon one another: 1) Introduction to Civic Agriculture; 2) Ecological Agriculture; 3) Concepts in Community Food Systems; and 4) Capstone in Civic Agriculture and Food Systems. The minor integrated service learning into credit-earning courses, thereby helping students to meet university requirements while at the same time strengthening community/university relationships that serve as a seedbed for community engagement in higher education (Clark et al., 2013; Galt et al., 2012; Niewolny et al., 2012).

Single Embedded Case Study: Purpose, Design and Analysis

The purpose of this study is to illustrate the complex role of service-learning as a central approach to undergraduate teaching and learning where interdisciplinary teaching, experiential learning, and community engagement are core goals. Because the study investigated a sociological phenomenon, a qualitative approach was appropriate in that the researcher was seeking to explain how things worked in context and with specific people engaged in the experience. Careful attention was paid to underlying philosophical and epistemological beliefs affecting the overall research design and process. Yin addresses some overarching themes that should be given ample attention when using the case study approach to data collection. In particular, he posed three overarching themes connecting different philosophies of case study research: (1) the triangulation of multiple sources of evidence, (2) the study of the phenomenon in the context giving attention to rich depth of detail, and (3) the process of analytic generalization as opposed to statistical methods of generalization. Using a single case study methodology also requires an in-depth understanding of the context of the particular case, which includes its social, historical, and political dynamics. This potentially complex environment requires the researcher to interpret the collected data in a way that enables him or her to extract deep meaning, i.e., knowledge that goes beyond information that can be tallied, charted, and correlated. A common use of case studies in educational psychology is for explanatory purposes such as, for example, the outcomes of a curricular approach needing to be evaluated for effectiveness (Yin, 2012). A case study approach would appropriately be used to explain how learning took place in context, using descriptive and explanatory measures in the assessment process. Furthering the usefulness of the case study, applying qualitative methods to the evaluation of an academic program would lend itself to a description of the "context, evolution, and operations of the program" (Yin, 2012, p. 144).

This study implemented a single embedded case study framework informed by Yin (2012), utilizing semi-structured interviews during the Fall 2013

Table 1
Terms that Faculty Used to Describe Service-Learning

Reciprocity	Engagement	Trust	Partners	Time	Model
Dialogue	Expectations	Observation	Community	Commitment	Scholarship
Reflection	Relationships	Purpose	Planning	Process	Value
Experience	Communicate	Connection	Problem-solving	Needs	Equity
Important	Contribute	Reality	Social	Identify	Intentionality
Participation	Citizen	Development	Optimism	Critical	Coordination
Practice	Civic	Consistency	Overwhelming	Transparency	Understanding

semester involving seven faculty members and one community partner liaison (n=8), all of whom taught in a core course and were members of the CAFS taskforce used for this study. The faculty represented six departments within the College of Agriculture and Life Sciences with disciplinary backgrounds spanning the social and natural sciences. The community partner liaison, who met selection criteria for this study due to the unique role that has been established within the organizational structure of the university, served as a collaborative teaching team member in the minor by connecting the needs and experiences of the multiple community partners engaged in facilitating student service-learning experiences in the field that ranged from brief semester long assignments to comprehensive capstone projects. The community partner liaison also functioned as the collective voice of community partners within the CAFS Taskforce. This function allowed for community partner collaboration as co-educators without impeding time burdens on the multiple partners. Selection of the community partner liaison for interviews was directly informed by the selection criteria of membership in the CAFS taskforce as well as membership in one of the four core course collaborative teaching teams.

Field observations were conducted during the Fall 2013 semester during (1) an introductory core course involving a collaborative teaching team, (2) weekly teaching team planning meetings, and (3) CAFS taskforce monthly planning meetings. The observed collaborative teaching team was comprised of two faculty from two departments, one community partner liaison, and one graduate teaching assistant (GTA), namely the researcher for this study who acted as participant-observer. The CAFS Taskforce meetings included faculty collaboratively teaching in one of the four core courses, a community partner liaison, institutional partners, college administration, one graduate student, and an administrator from the College of Agriculture and Life Sciences. It should be noted that not every member attended each monthly meeting.

Constant comparative methodology (Charmaz, 2006) was conducted using Atlas ti, the qualitative analysis software. Open coding of field notes, memos, interview transcripts and course artifacts were conducted simultaneously with data collection. Embedded and analytic memos were included in the open coding process to inform future analytic memos. Coding, using the constant comparative method, involved attaching labels to observations, interactions and collected materials that were sorted and synthesized forming tentative categories. Analytic memos synthesized data, creating a logic trail that can be traced to the individual primary documents and field notes that informed the process.

Results

When describing a framework for service learning, the triad of experiential, interdisciplinary and community-engaged curriculum was emphasized. Through an analysis of participant interviews, observational field notes and course documents (e.g., syllabi and assignment guidelines), we described the process and characteristics of an interdisciplinary minor that embeds service learning as an experiential and community engaged pedagogical practice to achieve student learning outcomes and programmatic goals. Additionally, integrating service learning at the level of a college minor rather than individual courses or short-term campus-based experiences created opportunity for recognition of community-university partnerships and service-learning curricula as academically rigorous practice. We share findings that explore best practices and challenges to implementing the triad.

The Multiple Meanings of Service Learning: An Interdisciplinary Perspective

As reported by faculty and the community partner liaison, service learning represented an essential component of the minor because it enabled students to have the experience of learning in community-based settings and, therefore, was incorporated in all core courses in the minor. However, it should be noted that the definition of service learning was not universally understood by faculty. See Table 1 for different terms

used by faculty to describe service learning. Their descriptions varied from field trips facilitated by faculty and community partners with a group service and tours done on site to the incorporation of critical reflective classroom activities connecting experiences in the field with concepts learned in the classroom.

This difference in understanding was of significance when developing a framework implemented by faculty of different disciplinary backgrounds working toward the same trajectory of problem solving complex issues while building upon student learning through the core courses toward a capstone project where the student incorporates all of the learned concepts and the experiences. For example, one faculty member shared his confusion about what service learning meant: "I get confused, what's service learning and what's experiential learning...[]There needs to be structure there, an explicit understanding of what this is meant to do."

Each core course integrated multiple community partners who volunteer to participate as educators in the field. Matching community partner interest with specific courses and students happens in conversation, further facilitated by the community partner liaison, where mutual needs and benefits were recognized and a "good fit" was established. In the introductory course, students were assigned to a community partner and then went through three steps of the service-learning approach: 1) developing a learning contract, 2) participating in group discussion, and 3) undertaking written assignments related to their service-learning experience. For the learning contract, students developed their learning goals in collaboration with their assigned community partner.

Critical and reflective thinking and writing were practiced throughout all the courses in the minor, which raised questions for faculty when they spoke about the service-learning component. While most classroom-based learning activities have well defined objectives and desired outcomes, transferring this structure to field-based activities was challenging for some faculty. Thus, faculty spoke of the importance of clearly defining steps to achieve formalizing the service-learning process and measuring the outcomes of the service-learning experiences (Duncan & Kopperund, 2008). An example of how this goal was implemented for this minor was the inclusion of input of the community partner liaison in evaluating student participation and formalized grading criteria for Fall 2013 courses.

Challenges Incorporating Service Learning for Community-Engagement

Although service learning is a potentially powerful teaching tool, faculty faced a number of challenges in implementing that component in their classes. These challenges included keeping students engaged in the process, identifying and incorporating "good" community partners in the experience, and enlisting the participation of collaborating faculty. Faculty accepted the challenges of including a service-learning component since it afforded important learning opportunities and, in some cases, professional benefits for faculty. While the incorporation of service into scholarship and teaching practice had the potential to enhance and bring community engagement to the forefront of faculty work, prior to the development of the minor there was little support for faculty to include service learning.

One participant explained the addition of the institution to the list of benefactors in service-learning curricula: "We would not be getting the support for pulling off things like this if it wasn't going to benefit the larger institution." She expanded her understanding of service-learning from a historical perspective:

> ...[T]his is the first time I have felt comfortable enough to say I think [service- learning] is worth academic credit. That doesn't mean that we haven't done service before this, but it's been through extracurricular clubs...where there is no academic credit and I would not want to take that away from the environment at all, it is very important. To actually set up a formal course and give academic credit, it's got to be more than just doing the service. And so it takes a while to say, Okay, I feel comfortable with this now and I think that it works.

Best Practices for Service-Learning for Experiential Education

The use of criteria for best practices to establish a common educational experience raises service learning to a level of academic rigor that can be fully appreciated by faculty across the institution. Through implementation of these criteria the triad approach to teaching and learning is emphasized in practice and a scaffold approach to student learning is realized. A scaffold approach here is used to describe the process of building competencies as the students progress through the courses in the minor toward the capstone project. A best practice for service learning in the classroom (Table 2) was developed through analysis of interview transcripts and observational field notes.

Faculty also spoke to the specifics of designing a curriculum that includes a service-learning component. In particular, they cited three critical considerations: 1) the number of hours students must spend outside the classroom at the community-partner location, 2) the limited number of students that can be managed per semester in the field, and 3) help for students to make meaningful connections between the service learning and academic content. In terms of that third consideration, a faculty member stated that students "get the meat of what

Table 2
Best Practices for Service Learning in the Classroom

1. Introduce Service-Learning
   a. Service-Learning Assignments Embedded in Curriculum
   b. Service-Learning Discussions Embedded in Curriculum
2. Community Partner Liaison: Participation in Course Planning
3. Student-Community Partner Relationship Building
   a. In-Class Introductions/Guest Speakers
   b. Field Trips to Community Partner Locations
4. Learning Contracts: Student-Community Partner Locations
5. In-Class Discussion Groups: Reflection & Dialogue
6. Written Critical Reflections: Connecting Course Concepts to Experience
7. Evaluation: Community Partner Evaluates Student Performance
   a. Course Grade Associated with Performance
8. Capstone Project or Undergraduate Research
   a. High Impact Practices
   b. Connect to Institutional Practice
   c. Participation Builds Toward Project or Outcome

we teach in the class...we're kind of the toolbox...open it up... [they] explore by going out to their service-learning site. That's really for some students the most valuable experience at [institution]." The best practices for service learning in the classroom are established as a planning tool whereby the triad approach to teaching and learning—experiential, interdisciplinary and community-engaged—are both recognized and implemented through a high impact practice. Service learning, incorporated into individual courses and larger programs such as minors and majors, should be a priority in higher education to achieve student learning outcomes and connect campus to community.

Although service learning is a potentially powerful teaching tool, faculty faced a number of challenges in implementing that component in their classes. These challenges include keeping students engaged in the process, identifying and incorporating "good" community partners in the experience, and enlisting the participation of collaborating faculty. Chris, for example, had this to say about facilitating service learning: "[You take] baby steps...no need to make yourself crazy..." Humor is connected also with the challenges. Nonetheless, faculty accepted the challenges of including a service-learning component since it afforded important learning and, in some cases, professional benefits.

Discussion & Conclusion

Reflection is a core component in best practices found in this study for creating an effective service-learning curriculum. Kolb (1984) views the process of reflection as the process of learning from experience after the learner first engages in an experience (actual or simulated) and then reflects on that experience and forms an abstract conceptualization of it. In the final stage of the process, the learner engages in an experimental activity that tests the learned concept. Reflection is seen as an essential part of the experiential learning cycle. The concept of reflection was later emphasized by Schon (1987), who differentiated between reflection in action (reflection and action occur simultaneously), and reflection on action (when the learner reflects on the experience after the fact). Schon's assertion that reflection occurs both in action and after has implications for practitioners and researchers of experiential learning. For practitioners of experiential learning, the practice of incorporating reflection in curriculum design—either through discussion, written assignments such as journals and critical reflection responses, creative multimedia sources such as blogs, websites, or e-portfolios—is of importance whether facilitating informal experiences in the field or in a formalized classroom environment.

The transformative potential of experiential learning is also a consideration when facilitating educational experiences. Critical reflection, which surpasses the view of reflection in and on action, has been suggested as the pathway to transformative learning (Brookfield, 1987; Mezirow, 1991; Schon, 1987). Understanding that critical reflection is necessary for connecting experience to knowledge in a meaningful manner will go far in reinforcing the educational experience. Brookfield described three stages in the process of critical reflection: 1) identifying the assumptions of the learner, 2) creating

a critical view of assumptions and their relationship to learner's experience, and 3) reorganizing assumptions to make them integrative of experience. Learners, through their desire to search for meaning in experience, will subject their beliefs to the transformative potential of critical reflection in the progress of self-development (Fenwick, 2003).

Within the framework of this study, service learning was viewed as an experiential and community engaged approach to facilitating an interdisciplinary minor. Incorporation of a service-learning component in courses that aim to bridge theory with practice and incorporate an experiential, interdisciplinary, and community-engaged curriculum, insofar as this program, appeared to be evolving. Common standards for an effective service-learning curriculum can be addressed through implementing the best practices for service learning in the classroom (Table 2). Furthermore, establishing course practices and assignments that focus on connecting the course content to student experiences and expanding the concepts to include complex world issues relevant to the community spaces students are learning within create opportunity for critical reflection. Critical reflection and intensive writing are practices to identify needs and create comprehensive capstone projects at the end of the service-learning experience where the student works with the community partner to create lasting artifacts and relationships. Through service learning, as practiced in this program, faculty strived to include a reciprocal process, beneficial to the student, community, faculty, and institution. For faculty looking to include service learning as a practice in their programs, service learning should be clearly defined for the faculty, students and community partners involved. Training on facilitation should be offered to faculty teaching in programs that are designed with service learning as core to the curricula to ensure a common understanding of service learning and incorporation of the triad approach.

A way to enhance service learning in a course is to incorporate the community partner into the teaching team as a co-educator in the process. This incorporation was shown to be instrumental in achieving student learning outcomes in the core courses of the program. The literature is currently lacking in studies that target community partners who are engaged in service learning as community educators and who facilitate the student experience in the field. Thus, a suggested avenue for future research would be to investigate the roles and outcomes of a community partner as a co-educator.

References

Austin, A. E. (2010). The emerging movement. In H. E. Fitzgerald, C. Burack, & S. D. Siefer (Eds.), *Engaged scholarship: Contemporary landscapes, future directions* (pp. 3-8). Lansing, MI: Michigan State University Press.

Battisti, B. T., Passmore, C., & Sipos, Y. (2008). Action learning for sustainable agriculture: Transformation through guided reflection. *NACTA*, *52*, 23-31.

Brookfield, S. D. (1987). *Developing critical thinkers: Challenging adults to explore alternative ways of thinking and acting*. San Francisco, CA: Jossey Bass.

Butin, D. W. (2010). *Service-learning in theory and practice*. New York, NY: Palgrave Macmillan.

Byrne, J. V. (2000). Engagement: A Defining Characteristic of the University of Tomorrow. *Journal of Higher Education Outreach and Engagement, 6*(1), 13.

Clark, S., Byker, C., Niewolny, K., & Helms, J. (2013). Framing an undergraduate minor through the civic agriculture and food systems curriculum. *North American Colleges and Teachers of Agriculture, 57*(2), 56-67.

Delate, K. (2006). Incorporating organic and agroecological approaches into the university curricula: The Iowa State University graduate program in sustainable agriculture. *Horttechnology, 16*(3), 445-448.

Dewey, J. (1938). *Experience and education*. New York, NY: Simon and Schuster.

Duncan, D., & Kopperud, J., (2008). *Service-learning companion.* Boston, MA: Houghton Mifflin Company.

Fenwick, T. (2003). *Learning through experience: Troubling orthodoxies and intersecting questions*. Malabar, FL: Krieger Publishing Co.

Francis, C. A., Jordan, N., Porter, P., Breland, T.A., Lieblein, G., Salomonsson, L., Sriskandarajah, N., Wiedenhoeft, M., DeHaan, R., Braden, I., & Langer, V. (2011). Innovative education in agroecology: Experiential learning for a sustainable agriculture. *Critical Reviews in Plant Sciences, 30*(1-2), 226-237

Galt, R. E., Parr, D., Van Soelen Kim, J., Beckett, J., Lickter, M., & Ballard, H. (2012). Transformative food systems education in a land-grant college of agriculture: The importance of learner-centered inquiries. *Agriculture and Human Values, 30*(1), 129-142. doi:10.1007/s10460-012-9384-8.

Galt, R. E., Clark, S. F., & Parr, D. (2012). Engaging values in sustainable agriculture and food systems education: Toward an explicitly values-based pedagogical approach. *Journal of Agriculture, Food Systems, and Community Development, 2*(3), 43-54.

Glass, C. R., & Fitzgerald, H. E. (2010). Engaged scholarship: Historical roots, contemporary challenges. In H. E. Fitzgerald, C., Burack, & S. D. Siefer (Eds.), *Engaged scholarship: Contemporary landscapes, future directions* (pp. 3-8). Lansing, MI: Michigan State University Press.

Godemann, J. (2006). Promotion of interdisciplinary competence as a challenge for

higher education. *Journal of Social Science Education, 5*(2), 51-56.

Grossman, J., Sherard, M., Prohn, S. M., Bradley, L., Goodell, L. S. & Andrew, K. (2012). An exploratory analysis of student-community interactions in urban agriculture. *Journal of Higher Education Outreach and Engagement, 16*(2), 179-196.

Hammer, J. (2004). Community food systems and planning curricula. *Journal of Planning Education and Research, 23*(4), 424. doi: 10.1177/0739456X04264907

Hilimire, K., Gillon, S., McLaughlin, B. C., Dowd-Uribe, B., & Monsen, K. L. (2014). Food for thought: Developing curricula for sustainable food systems education programs. *Agroecology and Sustainable Food, 38*(6), 1-36. doi: 10.1080/21683565.2014.881456

Jacobsen, K. L., Niewolny, K. L., Schroeder-Moreno, M. S., Van Horn, M., Harmon, A. H., Chen Fasnslow, Y. H., Williams, M. A., & Parr, D. (2012). Sustainable agriculture undergraduate degree programs: a land-grant university mission. *Journal of Agriculture, Food Systems, and Community Development, 2*(3), 13-26.

Jacoby, B. (2003). *Building partnerships for service learning.* San Fransico, CA: Jossey-Bass.

Kendall, J. (1990). Principles of good practice in combining service and learning. In *Combining service and learning: A resource book for community and public service Vol. I*, National Society for Internships and Experiential Education, Raleigh, NC: NSIEE.

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning development*. Englewood Cliffs, NJ: Prentice Hall.

Kuh, G. D. (2010). *Five high impact practices: Research on learning outcomes, completion, and quality*. Washington, DC: Association of American Colleges and Universities.

Kuh, G. D., & O'Donnell, K. (2013). *Ensuring quality and taking high-impact practices to scale.* Washington, DC: Association of American Colleges and Universities.

Lattuca, L. R. (2001). *Creating interdisciplinarity*. Nashville, TN: Vanderbilt University Press.

Lattuca, L. R. (2002). Learning interdisciplinarity: Sociocultural perspectives on academic work. *The Journal of Higher Education,* 73(6), 711.

Lattuca, L., & Creamer, E. G. (2005). Learning as professional practice. *New Directions forTeaching and Learning, 102*, 3-11.

Mezirow, J. (1991). *Transformative dimensions of adult learning.* San Francisco, CA: Jossey Bass.

National Academy of Sciences. (2009). *Transforming agricultural education for a changing world.* Washington, DC: The National Academies Press.

Niewolny, K. L. Grossman, J. M., Byker, C. B., Helms, J. L., Clark, S. F., Cotton, J. A., & Jacobsen, K. L. (2012). Sustainable agriculture education and civic engagement: The significance of community-university partnerships in the new agricultural paradigm. *Journal of Agriculture, Food Systems and Community Development, 2*(3), 27–42.

Parr, D. M., & Van Horn, M. (2006). Development of organic and sustainable agriculture education at the University of California, Davis: A closer look at practice and theory. *Horticulture Technology, 16*(3), 426-431.

Parr, D., & Trexler, C. J. (2011). Student's experiential learning and use of student farms in sustainable agriculture education. *Journal of Natural Resources & Life Sciences, 40,* 172-180.

Parr, D., Trexler, C. J., Khanna, N. R., & Battisti, B. T. (2007). Designing sustainable agriculture education: academics' suggestions for an undergraduate curriculum at a land grant university. *Agriculture and Human Values, 24*, 523-533.

Parr, D. M., & Van Horn, M. (2006). Development of organic and sustainable agriculture education at the university of California, Davis: A closer look at practice and theory. *Horticulture Technology, 16*(3), 426-431.

Rogers, A. (2004). *Non-Formal education: Flexible schooling or participatory education*? Dayton, OH: The Kettering Foundation Press (Preface and Introduction). New York, NY: Springer.

Schon, D. A. (1987). *Educating the reflective practitioner.* New York, NY: Basic Books.

Strand, K., Marullo, S., Cutforth, R., Stoecker, N., & Donohue, P. (2003). *Community-based research in higher education: Principles and practice.* San Fransico, CA: Jossey-Bass.

Votruba, J. (2010). Forward. In H. E. Fitzgerald, C. Burack, & S. D. Siefer (Eds.), *Engaged scholarship: Contemporary landscapes, future directions* (3-8). Lansing, MI: Michigan State University Press.

Wynne, W. D. (2006). Civic engagement through civic agriculture: Using food to link classroom and community. *Teaching Sociology, 34*, 244. doi:10.1177/0092055X0603400302

Yin, R. Y. (2012). Case study methods. In H. Cooper (Ed.), *APA handbook of research methods in psychology: Vol. 2 research designs* (pp. 141-155). Washington, DC: American Psychological Association.

Zalanga, S. (2009). Interdisciplinary studies and scholarship: Issues, challenges, and implications for third world development and social change. *Human Architecture: Journal of the Sociology of Self-Knowledge, 7*(3), article 6.

JENNIFER HELMS CULHANE is an assistant professor and graduate program director in the

Department of Agricultural, Leadership, and Community Education in the College of Agricultural and Life Sciences at Virginia Tech, where she leads the design, implementation and assessment of a first-year experience program. Her teaching focus is community development and education and civic agriculture and foodsystems. Her research spans teaching and learning, with focus on experiential learning and faculty development.

KIM NIEWOLNY is an associate professor in the Department of Agricultural, Leadership, and Community Education in the College of Agriculture and Life Sciences at Virginia Tech. Her scholarship centers on the role of power and equity in community education and development with a focus on food systems change. Her work is grounded in cultural and participatory community development; critical pedagogy; action research; and sociocultural, transformative, and social movement frameworks. With an emphasis on service learning, Niewolny provides teaching leadership in Virginia Tech's undergraduate minor in Civic Agriculture and Food Systems (CAFS).

SUSAN CLARK is an associate professor and director of the interdisciplinary, experiential-based civic agriculture and food systems curriculum at Virginia Tech in the Department of Horticulture. Her teaching and research scholarship relates to civic and sustainable agriculture, food systems, and community development practices within the food systems. Her pedagogical strategies cultivate a dynamic, cohesive learning community inside and outside the classroom to allow space for co-creation of knowledge via active learning and critical reflection. The assessment of high impact practices such as community-based capstone experiences and embedded service learning opportunities is prioritized via embedded assessment of student learning.

SARAH MISYAK is the Integrated Research-Extension, Food Systems and Policy Evaluator for the Virginia Cooperative Extension Family Nutrition Program. She is housed in the Department of Human Nutrition, Foods and Exercise at Virginia Tech where she teaches Community Nutrition. Her recent relevant publications include: Misyak, S., Culhane, J.L., McConnell, K., & Serrano, E.L. (2016). Assessment for learning: Integration of assessment in a nutrition course with a service-learning component. NACTA, 60(4), 358-364.