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Community as Context and Content: A Land-Based Learning Primer for Agriculture, Food, and Natural Resources Education

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Abstract

Mitigating socio-ecological problems like pollution, climate change, and environmental degradation is increasingly essential to sustaining life on Earth. The urgency required to address these challenges throughout Agriculture, Food, and Natural Resources (AFNR) Education while simultaneously enhancing the quality of educational experiences offered at the local level requires members of the AFNR Education community continuously identify, critique, implement, and evaluate potentially transformative pedagogical methods. This white paper serves as a primer for a new pedagogical approach to be considered throughout all levels of AFNR Education, land-based learning – defined as a pedagogical approach in which students collaborate with community members to implement place-based interventions within AFNR to increase the sustainability of their community. As an introduction to land-based learning, this review (a) explores the foundations of land-based learning by introducing place-based and land-based education, (b) outlines a four-step approach (i.e., identification, understanding, intervention, and evaluation) to implementing land-based learning within AFNR Education, and (c) illuminates empirically-identified outcomes of land-based learning. As land-based learning is explored, its potential to pragmatically equip communities to empower future generations of learners with the knowledge, skills, and commitment to solve socio-ecological problems is highlighted.

Keywords: experiential learning; sustainability; transdisciplinary; systems-thinking; problem-based; land-based learning

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Introduction and Need

Agriculture, Food, and Natural Resource (AFNR) educators, defined as any individual who formally or informally facilitates AFNR learning experiences for others, have the responsibility to

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educate in ways which prepare individuals to improve communities and the world (Andenoro, Baker, Stedman, & Weeks, 2016). Achieving a better world is urgently dependent on individuals who acknowledge the presence of, and develop solutions to, socio-ecological problems like mass pollution, climate change, and environmental degradation (Webber, 2017). The scale and complexity of socio-ecological problems requires, to paraphrase Albert Einstein, rethinking the educational methods used when the problems were created.

Current research has not illuminated a definitive educational approach which holistically prepares individuals to solve complex, socio-ecological problems. Instead, the burgeoning conversation focuses on characteristics of educational environments thought to enhance the capacity to recognize, understand, and develop solutions to these complex problems. Included in this conversation are concepts that highlight the agency of learners to problem-solve: *transdisciplinary* – learning focused on a phenomenon unbound by traditional disciplines; *systems-focused* – learning to recognize and understand the interactions of systems at varying scales related to specific phenomenon; and *problem-based* – learning by understanding, and applying solutions to, problems (Andenoro et al., 2016; Smith & Sobel, 2010). A missing component of this conversation and its application among AFNR educators, are *practice-based approaches* to constructing transdisciplinary, problem-based learning experiences which develop systems-thinking and the capacity to address complex, socio-ecological problems. In the absence of such knowledge, AFNR educators may rely on tradition when innovation is urgently required.

The current white paper seeks to address this gap by proposing *land-based learning* as a new, transdisciplinary, problem-based, educational approach which develops localized systems thinking and the capacity to address complex, socio-ecological problems (Hill, 2013; Jennings, Swidler, & Koliba, 2005; McInerney, Smyth, & Down, 2011; Tooth & Renshaw, 2009; Webber, 2017). This argument is constructed by introducing the origins of land-based learning, discussing its potential application throughout AFNR Education, and evaluating empirically-identified outcomes associated with this educational method. The benefits of this "primer" on land-based learning are substantial, but none more important than offering scholars, educators, teacher educators, and disciplinary leaders a pragmatic approach for leveraging AFNR Education to prepare individuals to enact changes which improve our world. However, the importance of this work stretches beyond those directly engaged in AFNR Education. Land-based learning is a pedagogical approach which dynamically connects learners to those directly engaged in AFNR within their community; therefore, all individuals engaged in AFNR could benefit from understanding their role in supporting AFNR Education through land-based learning. In fact, without understanding and support among individuals engaged in AFNR, initiatives to link learners and their communities will be ineffective.

Purpose, Objectives, and Method

The current manuscript is framed as a "white paper," with the purpose of establishing an argument for the use of land-based learning within AFNR Education. Of particular interest is the application of land-based learning within school-based AFNR Education programs (i.e., secondary school programs developing knowledge and skills within AFNR contexts). However, land-based learning can also occur in non-formal AFNR Education settings (e.g., Extension, community education). Given this intent and using existing literature related to land-based learning, the objectives of this white paper are to: (a) describe the origins of land-based learning, (b) evaluate the potential application of land-based learning within AFNR Education, and (c) identify outcomes associated with past research on land-based learning.

Established objectives were achieved through a *systematic literature review* (Gough, Thomas, & Oliver, 2012; Khan, Kunz, Kleijnen, & Antes, 2003). This approach, common in medical and information systems research, is aimed at "[aggregating] the experiences gained from a range of different studies in order to answer a specific research question" (Budgen & Brereton, 2006, p. 1052). The systematic review was operationalized by gathering existing research via an academic database (i.e., EBSCO) keyword search using "place-based education," "land-based education," and "land-based learning." In so doing, research was gathered across myriad research traditions (e.g., critical analyses, case studies, books, survey research, web resources, philosophical research) published in a variety of outlets, including the *Journal of Experiential Education*; *Decolonization: Indigeneity, Education, and Society Journal*; *American Journal of Education*; *Journal of Environmental Education*; *Phi Delta Kappan*; *Action Learning: Research and Practice*; *Environmental Education Research*; and *Journal of Environmental Studies and Sciences*. Once collected, research artifacts were sorted by their relevance to the three identified research objectives. Within each collection of research artifacts, authors conducted a content analysis (Leedy & Ormrod, 2013) in which emergent, overlapping themes were identified.

Land-Based Learning Origins

The origins of land-based learning can be traced to the environmental education movement in the United States, which occurred in tandem with increased social concern for the environment in the 1970s (Powers, 2004). The original objective of environmental education was to prepare learners to use scientific approaches to solve global, biophysical problems (Ardoin, 2006). The movement represented a shifting focus toward pro-environmental education; however, it received criticism due to a lack of focus on the impact of social systems on the environment (Webber, 2017) as well as its emphasis on global problems over local challenges (Smith, 2002; Sobel, 2004). In the 1990s, place-based education gained traction as a new approach to extending environmental education by addressing established limitations (Webber, 2017). Place-based education is one of two approaches which form the foundation of land-based learning; therefore, an in-depth description of this approach is provided.

A key characteristic of place-based education, defined as a "pedagogy of community" (Sobel, 2004, p. ii), is transitioning teaching and learning from the classroom to the local community where students experientially learn by collaborating with community members to address local concerns. As an approach, place-based education seeks to extend learning beyond the decontextualized and global by engaging students in hands-on encounters with local phenomena (Smith, 2002; Sobel, 2004). Importantly, however, place-based education does not ignore global challenges, but instead promotes the idea of "enlightened localism – a local/global dialectic that is sensitive to broader ecological and social relationships" (Sobel, 2004, p. ii). By acknowledging global challenges whilst focusing on local issues, place-based education provides an opportunity to recognize interactions among psychological, sociocultural, environmental, political, and economic systems at a level more discernable, especially for novice learners (Ardoin, 2006). In this way, place-based education is transdisciplinary, experiential, action-oriented, problem-based, and beneficial to the community (Webber, 2017; Woodhouse & Knapp, 2000).

Uniquely, place-based education challenges the authority of mandated or standardized curriculum and opts, instead, for locally-produced knowledge (McInerney et al., 2011). By engaging knowledge-building opportunities "that [lie] just beyond the schoolhouse gate" (Curtiss & Theobald, 2000, p. 107), place-based education addresses two gaps in the current educational landscape: (a) a lack of learner interactions with their environment and (b) a lack of learner interactions with their community (Smith & Sobel, 2010). Inherent in this approach is the importance of *place* to individuals and education. Grounding learning in lived experiences of place

(e.g., community, nature), as opposed to abstractions of place (e.g., textbooks), lends itself to transformative education (Cannatella, 2007). Importantly, transformative experiences require personal investment and engagement. For younger learners, community is where "[they] begin to make sense of themselves and their surroundings…form relationships and social networks, develop a sense of community and learn to live with others" (McInerney et al., 2011, p. 5). As community is used as the context for learning, *place identity*, defined as the degree to which an individual connects sense of self to a place, is developed among learners (Webber, 2017). Fostering the connection between learners and community through pedagogy forms the foundation of personal investment and engagement necessary for transformative learning.

The concept of place-based education provides a direct stepping stone to land-based learning; however, important critiques have been made to place-based education which require exploration. Emerging out of critical theory, the majority of critiques illuminate the continuation of settler-colonialism over an appreciation of indigenous knowledge (Calderon, 2014; Wildcat, McDonald, Irlbacher-Fox, & Coulthard, 2014). Systematically, "settler colonialism seeks to eradicate Indigenous histories and presence by denying and destroying the intersection of Indigenous rights and culture… [destroying] Indigenous people's relationship to land" (Webber, 2017, p. 53). Initially, place-based education failed to acknowledge methods and approaches utilized by Indigenous cultures, emerging from their intimate connection to the land, that were both ecological and socially sustainable (Calderon, 2014). Recognizing these critiques, scholars forwarded *land-based education*, which sought to pair the community-centered, problem-based, transdisciplinary experiences of place-based education with direct challenges to dominant cultures and traditional, Western Eurocentric educational models (McInerney et al., 2011). Foremost were calls to abandon "assumptions that education should mainly support individualistic and nationalistic competition in the global economy and that an educational competition of winners and losers is in the best interest of public lives in diverse societies" (McInerney et al., 2011, p. 11). Pairing the community engagement principles of place-based education with the critical arguments made for land-based education yields the distinct concept of *land-based learning,* which is a new pedagogical approach described in this white paper.

Application of Land-Based Learning within AFNR Education

As a distinct concept, land-based learning is a pedagogical approach in which learners collaborate with community members to implement place-based interventions within AFNR to increase the sustainability of their community. Within this definition, *place-based* refers to experiences which occur outside of the classroom, within the community (e.g., on farms, in recreational sites, within AFNR businesses). *Interventions* represents a shift in the way place-based experiences (e.g., field trips) are often utilized; specifically, shifting from learning about a system as if it were static to learning by creating change within a system. Finally, *sustainability* illustrates a commitment to challenging the environmentally-damaging, growth-economy ideology and replacing it with a focus on achieving triple-bottom line sustainability (i.e., environmental and economic sustainability in combination with promoting social equity) through experiential engagement within the community. The emphasis on sustainability within AFNR contexts differentiates land-based learning from place-based education and land-based education.

As a new concept, land-based learning is not readily used in literature. Therefore, principles of place-based and land-based education provide the foundation for describing the application of land-based learning within AFNR Education. Like place-based and land-based education, land-based learning is characterized by learners valuing locally-produced knowledge and participating in the creation of local knowledge, as opposed to consuming standardized curriculum (Smith, 2002). In this model, educators "act as experienced guides, co-learners, and brokers of community

resources and learning possibilities" (Smith, 2002, p. 593). This shift challenges models of education which rely on educators as the source and supplier of information and supports, instead, a model in which learners are empowered to discover autonomy in the learning process. Land-based learning builds upon the philosophical foundation of constructivism based on the teachings of John Dewey as well as the Problem-Solving Approach (PSA) to teaching (Dewey, 1938). The PSA was a fundamental approach in formal classroom settings when students in AFNR Education were a homogenous population of white males coming from farming backgrounds (Newcomb, McCracken, Warmbrod, & Whittington, 2004). This is no longer the case; consequently, the concept of land-based learning has the potential to be more efficacious when dealing with heterogenous populations of learners.

Process and Critical Checkpoints

Like any educational approach rejecting standardization and educator-centered delivery, land-based learning lacks a required "formula" for its application. However, review of successful applications of place-based and land-based education illuminate critical checkpoints to be achieved as this pedagogical approach is implemented (see Figure 1).

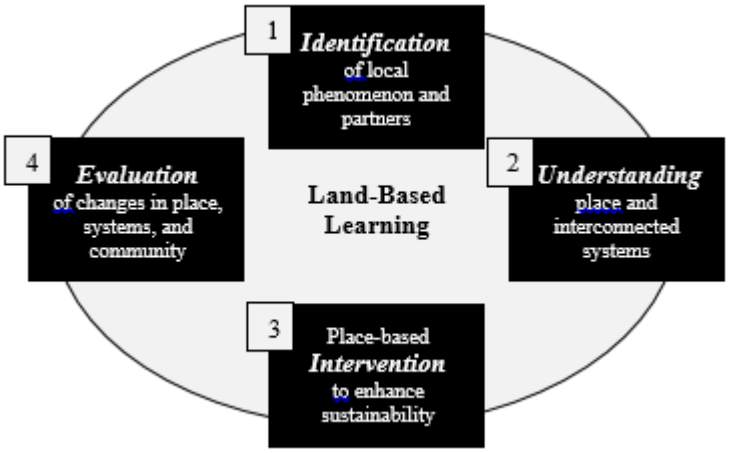

Figure 1. Four critical checkpoints of land-based learning.

The first checkpoint is *identification* and refers to learners and educator(s) identifying a local AFNR phenomenon in which to engage as well as identifying salient community members (Jennings et al., 2005; Smith, 2002; Powers, 2004). Importantly, community members should be selected to represent "diverse viewpoints, access to resources, facilities, and financial support as well as a broader base of skills and knowledge" (Powers, 2004, p. 21). Within AFNR, myriad options exist for identification within a community; however, locations should be selected based on their ability to (a) clearly illuminate multiple systems (e.g., social, ecological, economic); (b) provide clear opportunities to enhance the sustainability of the selected AFNR phenomenon (e.g., monoculture farm); and (c) connect learners with community members eager to engage in interventions to increase the sustainability of their AFNR phenomenon.

Following identification, learners and educator(s) should engage in place-based *understanding*. Within this checkpoint, learners are to be experientially immersed within the local AFNR phenomenon with the intent of learning about the place and its relationship to associated systems (e.g., environment, cultural history, geology, geography) and exploring, but not selecting, potential interventions in coordination with community members (Harrison, 2010). Negotiations

among learners, educator(s), and community members should narrow interventions based on their potential to increase the sustainability of the AFNR phenomenon as well as shared curiosity, learning objectives, and commitment as well as any logistical constraints (Powers, 2004). Importantly, achieving understanding of place often requires multiple visits and opportunities for learners to experience the location and learn from, and with, relevant community members (Harrison, 2010).

The next critical checkpoint in offering land-based learning experiences is *intervention*. In this checkpoint, the team of learners, educator(s), and community members select and enact an intervention to increase the environmental and economic sustainability as well as increase the social equity of a local AFNR phenomenon. In this checkpoint, the work of the learners transitions from acquiring locally-produced knowledge to becoming participants in action research, in which "students direct and shape their own learning, contributing to the place in various immediate or long-term ways" (Harrison, 2010, p. 415). Acting as facilitators of the land-based learning experience, educator(s) and community members allow learner questions, curiosity, and capacity for knowledge creation to guide the intervention, only re-directing learner action when their work no longer adds real value to the community. Further, educators should be purposeful in continuously linking for learners the activities of land-based learning to local, state, and national AFNR and associated core-curriculum performance standards as well as the global systems (e.g., environmental, economic, social) represented at the local scale, as suggested in place-based education research (Smith, 2002).

The final, and potentially most critical, checkpoint is *evaluation*. Importantly, intervening within a local AFNR phenomenon not only changes the point of intervention; it also creates changes within interrelated systems that reach throughout the community. Therefore, mirroring the understanding checkpoint, place-based evaluations require learners consider the network of interrelated systems to identify the holistic impacts of their intervention within the community. Evaluation of these systems should be completed with a focus on sustainability; specifically, how the intervention increased, or decreased, the environmental and economic sustainability as well as social equity of the community. Importantly, the evaluation process must occur longitudinally to evaluate the impacts of the intervention across spatial and temporal domains. Given the longitudinal emphasis of the evaluation stage, educators and community members must continue their collaboration, as well as expand their network of relationships, affording learners access to evaluate all systems potentially impacted by the intervention.

Throughout the application of land-based learning, community support is essential. Land-based learning both requires and fosters community members' identity as integral elements of the education process (Smith, 2002). Developing this perspective is dependent on community members and businesses "[seeing] themselves as partners…willing to accept [learners] and provide multiple learning opportunities" (Smith, 2002, p. 594). Not only are community members and organizations responsible for making their place available and providing opportunities, but established community members must also be committed to respecting that younger community members have the capacity to enact community change. Given these shifts in established norms, land-based learning may be challenging to establish but, as trust and relationships grow, will become easier as barriers between school and community are deconstructed (Powers, 2004).

Outcomes of Land-Based Learning

A dearth of research has explored land-based learning; therefore, potential outcomes associated with land-based learning were synthesized from place-based and land-based education research. Existing research frames place-based and land-based education as having "great potential

to bring about conceptual and behavior changes concerning learning, teaching, and education" (Glassner & Eran-Zoran, 2016, p. 34). In the following sections, empirical research illuminating specific conceptual and behavioral changes associated with place-based and land-based education are distilled into four thematic groups: (a) increased engagement and academic learning; (b) development of leadership skills; (c) building environmental awareness, value, and sustainability; and (d) improved communities.

Increased Engagement and Academic Learning

Like place-based and land-based education, land-based learning offers educators a pragmatic way of teaching in transdisciplinary and interdisciplinary ways (Jennings et al., 2005; Powers, 2004). Reviewing an application of place-based education, Jennings et al. (2005) identified educators leveraged hands-on experiences with community phenomena to illuminate learning across multiple subject matter areas, indicating the interdisciplinary (i.e., learning which encourages the development, and application, of knowledge and skills within multiple disciplines) potential of land-based learning.

Combining hands-on engagement, interdisciplinary learning, and learner-directed inquiry within the context of AFNR, land-based learning has tremendous potential, based on research on place-based education, to increase student engagement in the learning process (Webber, 2017). Past research supports the potential for increased engagement, as studies evaluating place-based and land-based education link these pedagogical approaches to increased engagement among learners (Jennings et al., 2005; Lieberman & Hoody, 1998; McInerney et al., 2011; Powers, 2004; Takako, 2006). As an outcome of increased engagement, research has identified increased academic performance associated with place-based and land-based education (Powers, 2004; Takako, 2006). Increased engagement and achievement have been identified across learner demographics; however, research has highlighted special needs learners do particularly well in these community-based, engaged learning opportunities. Powers observed special needs learners "working more independently…engaging more enthusiastically with adult community mentors, and gaining the respect of their 'nonspecial education' peers" (2004, p. 26).

Increases in engagement and academic achievement have been attributed to the relevance of curriculum to learners (Takako, 2006). This relevance is a product of transitioning curriculum away from abstract knowledge to real-world, community-based phenomena (Powers, 2004; Takako, 2006). Contrasting place-based and land-based education approaches to learning from "abstract textbooks," Powers concluded, learners engaged in "real-world learning are more likely to succeed" (2004, p. 18). In addition to relevance, research suggests place-based and land-based education strengthen the connection between school and community, casting the opportunity and responsibility to educate from a subset of the community (i.e., teachers) to all community members (Takako, 2006). In so doing, the location of learning perceived among learners broadens to include any, and potentially all, interactions within their community. Further, research posits community-engaged pedagogies (i.e., place-based education and land-based education), from which land-based learning emerges, encourage learners to view educators as co-constructors of knowledge, partially deconstructing the power dynamics of traditional classrooms and fostering a stronger relationship between educator and learner (Takako, 2006).

Development of Leadership Skills

Establishing learning environments which prepare learners to address complex, socio-ecological challenges (e.g., pollution, climate change, environmental degradation) requires the development of leadership skills (McKim, Pauley, Velez, & Sorensen, 2017). Leadership skill

development is a complex endeavor made more complex by a lack of consistent definition for leadership. In this white paper, we operationalize a *sustainability leadership* perspective and define leadership as the facilitation of change within a system to increase the ecological, economic, and social sustainability of that system whilst supporting the sustainability of interrelated systems (Ferdig, 2007). Given this definition, leadership skill development requires building, among other attributes, social responsibility, problem solving skills, and the ability to collaborate. A review of research on place-based and land-based education illuminates relationships between learner engagement in these pedagogical experiences and development of identified leadership skills.

With regard to social responsibility, research identifies place-based and land-based education engage learners as agents of change within their community. Developing a change agent identity among learners increases agency, responsibility, and commitment to identifying and addressing community issues (Jennings et al., 2005; Rodriguez, 2008; Sobel, 2005). Further, community-based experiences provide a foundation of community knowledge, connection, and action critical to sustained engagement in democratic processes at the local level with potential for transfer to engagement in state and national processes (Smith, 2002; Smith & Sobel, 2010; Sobel, 2005). In addition to social responsibility, place-based and land-based education are inherently connected to solving problems. Providing students with the opportunity, agency, and resources to solve real, community-based challenges develops the skills and identity needed to engage in problem solving outside the learning experience (Smith, 2002; Smith & Sobel, 2010).

The ability to collaborate is also critical to addressing complex, socio-ecological problems that require diverse perspectives, knowledge, and resources. Increasingly, collaboration is dependent on emotional intelligence, the ability to recognize, empathize, and adjust emotions within yourself and others (Goleman, Boyatzis, & McKee, 2013; Salovey & Mayer, 1990). Research on place-based and land-based education link participation to empathy development (Webber, 2017), noting participants build interdependence and self-regulation (Simpson, 2014). Further, participation provides learners opportunities to collaborate and "experience the value they hold for others" (Smith, 2002, p. 594). Uniquely, the development of leadership skills is not reserved for learners; research suggests educators and community members also develop identified leadership skills as they employ place-based and land-based education (Powers, 2004).

Building Environmental Awareness, Value, and Sustainability

Developing the *ability* to create change within systems is not enough, preparing learners to address socio-ecological challenges requires developing *value* for, and *motivation* to sustain, the environment. As stated by Sobel, "if we want children to flourish, to become truly empowered, then let us allow them to love the earth before we ask them to save it" (1996, p. 39). Research into the application of place-based and land-based education, in which learners were engaged in nature, identified established connections between learners and the environment (Takako, 2006; Webber, 2017). As Gruenewald stated, these educational approaches offer "spaces and places that teach us how to live well in our total environments" (2003, p. 9). The connection fostered between learner and nature established both an appreciation toward, and commitment to care for, the environment (Jennings et al., 2005; Sobel, 2005; Webber, 2017).

The globally relevant potential of place-based and land-based education (i.e., to develop individuals with the knowledge, value, and commitment to sustaining the environment) has led scholars to recommend these as the premier educational approaches for a sustainable future (Hill, 2013; McInerney et al., 2011; Tooth & Renshaw, 2009; Webber, 2017; Woodhouse & Knapp, 2000). In discussing place-based and land-based education, scholars highlight the opportunity to identify ecologically destructive practices, question these practices, and implement transformative

interventions (Gruenewald, 2003). The potential to address destructive environmental practices is especially important within an AFNR context, as food and fiber production have been identified as among the most significant contributors to environmental degradation (Foley et al., 2011; West et al., 2014). Leveraging a learner-directed, inquiry-based approach to understanding an AFNR system, intervening within that system, and evaluating changes in sustainability throughout the system-embedded community could empower a new generation of AFNR professionals with the knowledge, skills, and commitment to position production agriculture as the global leader in sustaining the environment.

Improved Communities

Within the final identified outcome, focus transitions from internal outcomes (i.e., development of the individual) to community-based outcomes. Existing research has identified three general themes of community benefit: (a) improved environmental quality through sustainability interventions (Powers, 2004; Sobel, 2005), (b) increased social vitality (Curtiss & Theobald, 2000; Powers, 2004; Sobel, 2005; Webber, 2017), and (c) strengthened relationships between community and school, leading to the community, as a whole, taking ownership for education (Takako, 2006). Community realization of these benefits aids in the continuation, expansion, and quality of opportunities available to learners. Further, relationships between key community members and educators, strengthened by past success, reduces challenges experienced by educators in identifying and establishing new opportunities (Powers, 2004).

The benefits of place-based and land-based education have been realized in various community types (Alfred, 2014; Beames, Higgins, & Nicol, 2012; Center for Land-Based Learning, n.d.; Jennnings et al., 2005; Takako, 2006); however, research suggests rural communities experience unique benefits as a product of these educational approaches. Traditionally, rural schools and communities benefit from autonomy in curricular decisions and resist standards-based, decontextualized education (Jennings et al., 2005). Therefore, an educational approach which lauds the community as content and context and empowers community members as important stakeholders in the educational experience of learners is particularly relevant to rural settings (Jennings et al., 2005). Further, rural communities can leverage place-based and land-based educational approaches as opportunities to build among young people an appreciation for rural livelihoods and commitment to solving the critical problems found within these communities (Shamah & MacTavish, 2009). Consequently, learners with an appreciation for and commitment to their community are more likely to remain within their community (Corbett, 2009). The retention of young people within rural communities is especially salient within AFNR and AFNR Education contexts. Within rural communities, there exists a critical need for young people with an interest in managing agricultural operations whose current managers are nearing retirement (Lobley, Baker, & Whitehead, 2010). Therefore, application of land-based learning within AFNR Education, which is predominately found in rural communities (McKim, Velez, Lambert, & Balschweid, 2017), can increase awareness of, and interest in, rural professions, thereby helping to sustain AFNR in rural settings.

Conclusions and Implications

The impetus for a primer on land-based learning was to empower stakeholders throughout AFNR to envision their role in an educational approach which links learners and their community and develops among learners the ability to solve complex, socio-ecological problems. By challenging standardized curriculum, engaging learners in community change, and evaluating efforts through the standard of sustainability, land-based learning represents a potentially transformative step in the way AFNR learning is facilitated, especially within secondary school

programs. Importantly, however, land-based learning does not require a complete abandonment of the principles core to AFNR Education. In fact, land-based learning builds upon, and extends, foundational principles like hands-on learning, community engagement, leadership development, and problem-based learning (McInerney et al., 2011). Commonalities provide a bridge to adoption; however, essential to illuminating the transformative potential of land-based learning is a focus on how this approach differs from past and current practices.

Three differences between land-based learning and traditional AFNR Education approaches are identified: (a) introduction of AFNR as dynamic systems in need of change, (b) class-based community engagement, and (c) transdisciplinary learning. First, land-based learning challenges teaching and learning AFNR as systems in need of *advocacy* and, instead, facilitates learning about AFNR as systems in need of *change*. Inherent in this approach is training learners to recognize where current AFNR systems fall short on the criteria of ecological, economic, and/or social sustainability and, rather than ignore or rationalize these shortcomings, develop interventions to transform the system. Second, land-based learning intentionally extends community engagement, operationalized in school-based programs as Supervised Agricultural Experience (SAE) projects (i.e., student-directed placement, entrepreneurship, or research experiences which typically occur outside of the classroom) and participation in FFA (i.e., student leadership organization associated with school-based AFNR Education, previously called the "Future Farmers of America"), into the classroom domain. In so doing, land-based learning encourages community engagement to occur as a class, supporting development of team leadership skills (e.g., emotional intelligence), and shifts learning outcomes from knowledge of AFNR systems to the ability to create sustainable change within AFNR systems. Third, land-based learning challenges the claim AFNR Education has on interdisciplinary learning being the integration of core academic areas (e.g., science, technology, engineering, mathematics) and, instead, supports interdisciplinary learning being the acknowledgement, understanding, and evaluation of environmental, economic, and social systems within the context of AFNR. Additionally, land-based learning encourages educators to facilitate transdisciplinary learning experiences, in which the focus is solely on localized phenomena (e.g., community problems) without constraining student experiences to standardized disciplinary content and skills.

Adoption of land-based learning requires a shift from the status quo: educators need to forge new community partnerships (Powers, 2004) and the discipline must re-envision its role in developing socio-ecological problem solvers. However, the identified outcomes of this educational approach (i.e., increased learner engagement; increased learning; development of leadership skills; increased environmental awareness, value, and sustainability; and positive community changes) compel collective efforts. These collective efforts are not reserved for individuals within AFNR Education; in fact, all members of the AFNR community (e.g., producers, professionals, businesses) must recognize their roles (e.g., initiating, supporting, collaborating) within land-based learning. As always, new opportunities bring about the same question: do we remain the same or do we change? The ever-more-complex network of socio-ecological challenges facing our world suggests the time for change is now.

Recommendations

First, and foremost, we recommend the adoption of land-based learning throughout all levels of AFNR Education. Recognizing adoption of this pedagogical approach requires significant initial investment (Powers, 2004), we recommend educators scale up implementation from an initial use of one land-based learning opportunity within their educational offerings. Scaling up implementation will reduce educator stress associated with using the new approach and allow for educators and community members to forge relationships to be leveraged for additional and

expanded opportunities. To support the adoption of land-based learning within AFNR Education, teacher educators and state leaders are encouraged to offer professional development detailing the application of this approach to teachers and community members. Furthermore, teacher educators are encouraged to introduce this pedagogical approach as teaching methods are explored by preservice educators. Further, if possible, teacher education programs should explore opportunities to engage students in land-based learning throughout their coursework to provide future teachers with first-hand experiences.

From the research perspective, evaluations of land-based learning interventions should be conducted to explore the efficacy of this approach among diverse communities and learner populations. Within these investigations, independent variables should include, among others, duration of land-based learning experiences, community types, educator experience with land-based learning, learner demographics, educator demographics, and specific types of sustainability interventions. Dependent variables should include, among others, learner engagement, AFNR learning, systems thinking, leadership skills, environmental awareness, ability to enact sustainable change, civic engagement, interest in AFNR careers, and changes within the community (e.g., community sustainability, community vitality, community-school relationship). Importantly, control groups should be utilized to gain a realistic understanding of the impacts of land-based learning in comparison with traditional approaches. Further, the evolution of land-based learning within AFNR education must be informed by empirical evaluations, creating a cycle of increased positive impact among educators, learners, and communities.

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