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Achieving Next Generation Science Standards Through Agricultural Contexts: A Delphi Study of Outdoor Education Experts

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Abstract

A Delphi survey was conducted with 30 outdoor education experts in Kansas. Participant responses helped frame a Kansas definition of outdoor education and identified essential educational goals and outcomes, critical components for effective outdoor education programming, and barriers facing outdoor education in Kansas. The study highlights contributions outdoor education could have for implementation of the Next Generation Science Standards (NGSS) curriculum framework in Kansas through agricultural education.

Keywords: outdoor education; Next Generation Science Standards; agricultural education

A recent Outdoor Foundation report indicates youth participation in outdoor experiences has been in decline for the past decade, with a slight rebound in the past two years (The Outdoor Foundation, 2013). A number of studies have linked the lack of outdoor experiences as a cause of higher rates of obesity, attention disorders, and emotional distress (Gustafsson, Szczepanski, Nelson, & Gustafsson, 2011; Lopes, Lopes, & Pereira, 2009). Agricultural education is placed in a unique position within the school curriculum to easily include outdoor experiences. Shoulders & Myers (2012) investigated the usage of 16 different agricultural laboratory spaces, ten of which could be found in an outdoor space. A few examples of these outdoor spaces included a landscaping area, garden, forestry plot, and a turf grass management area. The field of outdoor education has value as a resource to inform agricultural educators of the best practices within these educational contexts. The field of outdoor education bases its theoretical foundation upon experiential education (Priest, 1986). Baker, Robinson, and Kolb (2012) posited that experiential education has been a foundational tenant of agricultural education since its beginnings. Building upon this tradition, agricultural education has the potential to engage an even greater number of students in experiential outdoor activities.

Today's students and teachers are experiencing instructional changes due to the implementation of Next Generation Science Standards (NGSS) which have created the framework for more student-based inquiry into science topics such as environmental concepts. NGSS have been supported by 26 lead states who participated in the development process of these standards (Achieve, 2013). As NGSS are phased in as the new science standards for over half the country, new curriculum designs have been created to meet these standards. Recent research has demonstrated the commitment that agricultural educators have in advancing the integration of science concepts into the agricultural education curriculum. During this transition to NGSS Agricultural educators have the potential to lead education in all fields in thinking about experiential and inquiry oriented instructional approaches (Myers & Washburn, 2008; Myers, Thoron, & Thompson, 2009; Shoulders, Blythe, & Myers, 2012).

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Recently, environmental topics highlighting agricultural practices have been an area of focus during development of hands-on activities within the environmental science curriculum (Poudel, Vincent, Anzalone, Huner, Wollard, Clement, & Blakewood, 2005). Outdoor education's emphasis on environmental topics is well suited for both the NGSS framework and advancing the foundational tenets of agricultural education. In addition, due to outdoor education's nature as an investigative approach to environmental concepts, it could assist in meeting the call for more inquiry-based learning (Detra & Pease, 1999).

In an extensive review of the literature, five commonly accepted definitions of "environmental education" were identified. The most common definition was developed from the Belgrade Working Conference on Environmental Education in 1975 and the Tbilisi Intergovernmental Conference on Environmental Education in 1977. After these conferences, a combined definition was presented including five major goals; developing awareness, knowledge, attitudes, skills, and participation to confront current and future environmental issues (Parkin, 1998; Myron, 2006).

Multiple definitions for "outdoor education" were also presented in the literature. In 1986, Priest offered a definition that has since been cited frequently:

"An experiential process of learning by doing, which takes place primarily through exposure to the out-of-doors. In outdoor education the emphasis for the subject of learning is placed on relationships, relationships concerning people and natural resources" (p.13).

Using this definition, Priest developed the Tree Model (Figure 1) which has served as the theoretical frame for the study in examining educational goals and outcomes, and program components and barriers facing outdoor education programming.

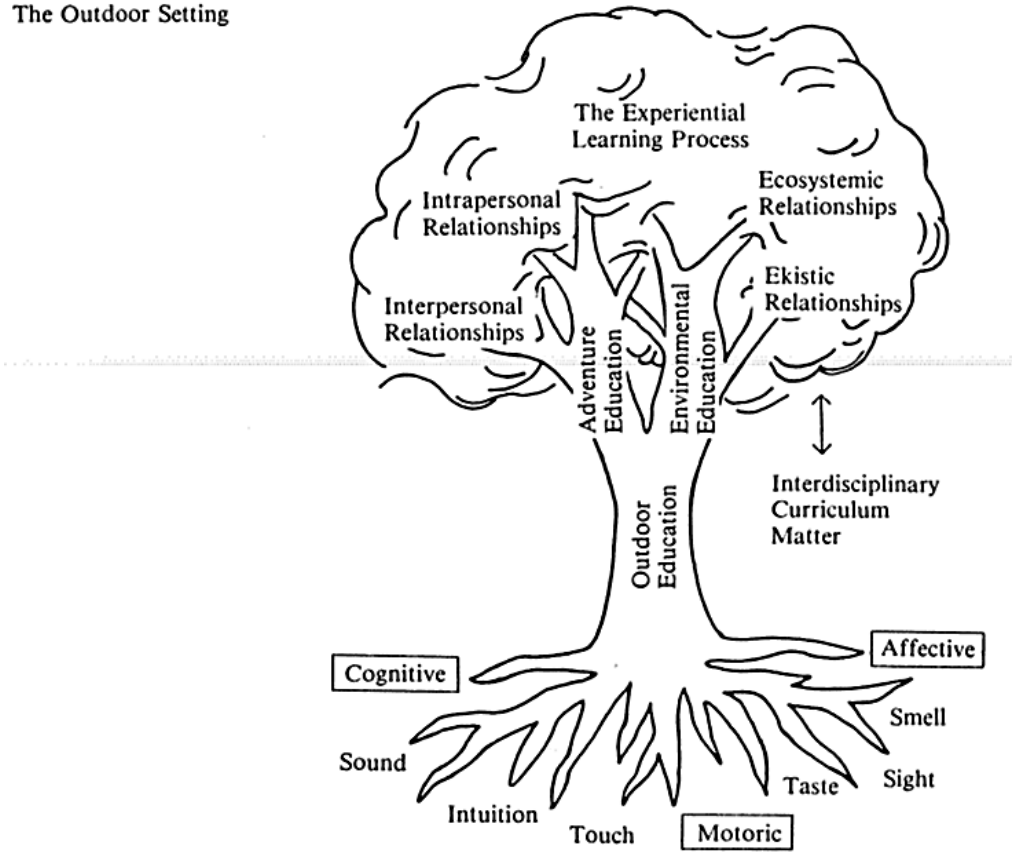

FIGURE 1. The Outdoor Education Tree

The tree canopy of Priest's model describes educational goals and outcomes. Two goals/outcomes found above adventure education are interpersonal and intrapersonal relationships. The two goals/outcomes above environmental education are ecosystemic and ekistic relationships. The exploration of these goals and outcomes will further clarify the relationship between outdoor education and NGSS.

Interpersonal skills as an educational goal encompass the ability to interact with others, lead others, and navigate challenges and opportunities with others. This is an important aspect in the agricultural education accomplished through the incorporation of FFA (Dormody & Seevers, 1994). These social realms were analyzed in an outdoor education context by Neill's (2008) Life Effectiveness Questionnaire (LEQ) which was designed to measure changes in both interpersonal and intrapersonal skills. The LEQ was administered as a part of a longitudinal study consisting of 3,640 participants. Neill found that participants who experienced the largest interpersonal skill changes were in social competence and task leadership. McKenzie (2000) added to the importance of interpersonal skills that the group concept within outdoor education has a spillover effect in achievement of other program goals and outcomes.

Intrapersonal skills, in contrast to interpersonal skills, serve to improve one's wellbeing and were found in programs focused on mental and physical health. Neill (2008) suggested that along with the improvement of wellbeing, outdoor education programs seek to improve participants' self-concept and attitudes of themselves. The study found outdoor education programs achieved moderately positive short-term changes with all participants and small to moderate long-term changes in 663 participants in the intrapersonal realm. The largest intrapersonal skill changes were seen in emotional control, self-confidence, and time management (Neill, 2008).

An additional example of intrapersonal skill advancement in an outdoor education setting was found in Gustafsson (2011). This study was conducted in Sweden, where 230 students took part in an outdoor education experience to improve the students' mental health. The study was successful in improving all students' mental health, but male students saw a more significant effect versus female students (Gustafsson et al., 2011).

The term ecosystemic describes the interaction of natural relationships that create the world's environment. Priest suggested an understanding of these natural relationships would provide students a window through which to better comprehend the complexity of the environment. Agricultural education has shown that it can serve as the contextual frame to support student knowledge acquisition of scientific concepts by allowing students to derive meaning through application (Myers & Washburn, 2008). The Next Generation Science standards contain three major topics that include discussions of ecosystemic relationships: Interdependent Relationships in Ecosystems, Earth Systems and Weather and Climate (Achieve, 2013).

The term ekistic takes the interaction of natural relationships and adds the influence of human actions. Priest (1986) asserted that the ekistic relationship is foundational for humans in developing their reverence for life through ecological exploration and in illustrating their stewardship of natural resources. Since the early 1990's, agricultural education has been developing and implementing curriculum focused on the study of natural resources and its relationship to agriculture (Connors & Elliot, 1994). The ekistic relationship also appears in the Next Generation Science standards under the topics of Human Sustainability and Human Impacts (Achieve, 2013).

The program components frequently found in outdoor education literature play important roles in achieving desired educational outcomes. Whether those program components be outdoor activities or ecological interactions in the environment to complement knowledge gained in the classroom (Lugg & Slattery, 2003), the overarching goals of outdoor education as Priest (1986) stated can be achieved by both means.

The eco-focus components are aimed to accomplish such educational goals as gaining environmental knowledge, creating connections with the environment, and instilling a desire to become environmental stewards. A program component found to be beneficial for gaining environmental knowledge was field studies (Detra & Pease, 1999; Dresner, 2002; Martin, 2003;

Carrier, 2009; Angelini, Ferreira, Araújo, & Carvalho, 2011). Detra & Pease (1999) utilized 697 students to serve as the experimental group that conducted field studies; while another 666 remained in the classroom as a control group. The study found significant gains during the post-test in positive feelings towards wildlife for students who participated in the field study versus students who did not. The goal of instilling a desire to become environmental stewards was also enhanced through resident programming. A variety of studies showed that when students stayed in a location for a week or longer they began developing a connection to the surrounding environment that led to a desire to protect it (Zint, Covitt, & Dowd, (2011)).

School grounds served special purposes in outdoor education programs. One such purpose was gardening (Dillon, Morris, O'Donnell, Reid, Rickinson, & Scott, 2005; Skinner & Chi, 2012). Outdoor education programs that emphasized environmental education were found to use the school grounds as an extension of the classroom to conduct field studies and demonstrate environmental ethics (Martin, 2003; Bartlett, 2011). Shoulders and Myers (2012) found that nine of the 16 reported types of agricultural education laboratories were located in an outdoor setting. Some of these outdoor laboratories included: field crops, a forestry plot, a turf grass management area, and a vineyard.

Reflection and journaling was used in outdoor education programming to solidify participants' experience and create meaning. This was demonstrated in Bartlett's (2011) riparian classroom study. The journals and reflections helped students express their learning and/or changing attitudes. Bartlett found that through reflection, her students came to a deeper understanding of the importance of Riparian buffers. She even had a student ask if the local golf course knew the impact they had when they mowed all the way to the creek.

Though Priest's Outdoor Education Tree Model did not explicitly identify barriers facing outdoor education programs, barriers inhibiting the growth and further development of outdoor education do exist. The list of barriers found in the literature include: lack of training (Lugg & Martin, 2001; Carrier, 2009; Munge, 2009), lack of resources (Nicol, Higgins & Ross, 2006), risk and liability (Comishin, Dyment, Potter, & Russell, 2004; Harper, 2007; Jones, 2011), classroom and program crossover (Dillon et al., 2005), time constraints (Lugg & Martin, 2001; Gunn, 2006; Nicol et al., 2006) and unsupportive environment (Gunn, 2006).

The present study focused on the concept and process of outdoor education through agricultural education and its relationship to the growing field of literature of NGSS. An exploration of what outdoor education and agricultural education may contribute to the NGSS curriculum framework comes at an important juncture as NGSS are phased in.

Purpose and Objectives

The purpose of this study was to conceptualize the role of outdoor education in agricultural education through the development of a new definition and description of goals, components, and barriers. The objectives of this study were to identify current views of outdoor education practitioner experts on:

1. The definition of outdoor education
2. The educational goals and outcomes of outdoor education programming
3. The essential program components
4. The barriers facing the implementation of outdoor education in Kansas

Methodology

A Delphi study method was chosen to facilitate the identification of consensus among outdoor education practitioners in four topics: a definition of outdoor education, educational goals and objectives, program components, and barriers facing outdoor education. The Delphi method is defined as ''a method of systematic solicitation and collection of judgments on a particular topic

through a set of carefully designed sequential questionnaires, interspersed with summarized information and feedback of opinions derived from earlier responses'' (Delbecq, Van de Ven, & Gustafson, 1975). The Delphi method has four distinct advantages: the study group is comprised of experts in the field (Brooks, 1979), the anonymity of participant responses avoids problems commonly associated with group interviews (Martorella, 1991), forces participants to logically consider the items under each topic making the consensus reached reflective of reasoned opinions (Murray & Hammons, 1995), and opinions can be gathered from experts who are geographically separated (Murray & Hammons, 1995). The main disadvantages associated with a Delphi study are: the influence of the researcher on synthesizing questionnaires based on responses and never having the participants meet face-to-face (Murray & Hammons, 1995).

The Delphi study concludes when either an established consensus has been reached or stability in responses has been reached. Brooks (1979) identified consensus as ''a gathering of individual evaluations around a median response, with minimal divergence,'' and stability or convergence is said to be reached when ''it becomes apparent that little, if any, further shifting of positions will occur''.

Normally, a minimum of ten participants are suggested to successfully conduct a Delphi study (Cochran, 1983). However, Delbecq et al. (1975) found that once the number of participants exceeded thirty, few new ideas would be generated. For this study, thirty outdoor education experts were chosen to serve as participants in the study. We defined 'expert' as: having no less than five years of experience, actively involved in a professional organization in their field, and interacts primarily with secondary education students. The thirty experts for the study were identified by the current Executive Secretary of the Kansas Association of Conservation and Environmental Education (KACEE). The study's respondents each came from different backgrounds within outdoor educational programming. Six respondents came from current science teachers, two came from the school district administration, and the remainder of respondents are outdoor education specialists who came from organizations that conduct programming with schools such as zoos, botanical gardens, and nature centers. As the purpose of this study was to conceptualize the role of outdoor education in agricultural education, we made the choice to select respondents with whom agricultural educators could work to enhance outdoor education opportunities.

Of the thirty experts, two declined to participate in the study. Thirteen experts completed all three-rounds of the survey process with participation in the study increasing in the last round. Round participation was as follows: 1st Round-19 experts, 2nd Round-18 experts, and 3rd Round-22 experts. As is standard in all Delphi studies, participants were unaware of the identities of fellow participants. Participants completed the first two rounds by a paper survey that was mailed to their work address. The third round was completed as an online survey. Results from the three rounds went through a pre-defined data analysis process established by the researchers. This data analysis process is further detailed in the results section.

Results

The goal of the first round was to consolidate participants' thoughts on the four areas of study. The first round consisted of four open-ended questions: (1) What is your definition of outdoor education for school-based students? (2) What goals do you deem essential in an outdoor education program for school-based students? (3) What components do you consider important in an outdoor education program for school-based students? (4) What barriers confront outdoor education programs for school-based students in Kansas? The first question generated 31 unique items, the second question generated 34 unique items, the third question generated 29 unique items and the fourth question generated 32 unique items. Duplicate items were consolidated so only unique single items remained for round two.

The goal of round two was to determine which items would be deemed essential within each of the categories. Respondents were asked to rate the importance of each item on a 5-point

Likert-type scale, with 5 representing the highest degree of importance. The researchers determined a priori that those scores averaging a 4 or higher on the 5 point scale would be retained for round three.

The goal of round three was to determine acceptance of an item to be included as essential within the stated questions. Respondents answered Yes or No for each of the items. For this round the first question contained 11 items (Table 1), the second question contained 21 items (Table 2), the third question contained 30 items (Table 3), and the fourth question contained 10 items (Table 4). The researchers determined a priori that to be considered an essential item, 80% of respondent agreement was considered consensus. Results presented in Tables 1-4 include those items that met the 80% agreement threshold. This round found more agreement than was anticipated due to the diversity of panel experts and many items resulted in complete group consensus.

Individual items were grouped into cohesive themes for the purpose of organization and clarity. Themes generated from the responses relating to "Definition of Outdoor Education" (Table 1) were Experiments and Observations, Connection to Nature, Engaged Learning and Conserving our Natural Resources.

Table 1

Definition of Outdoor Education Themes

Theme	Item	Percent Agreement
Experiments and Observations		
	Making observations in nature	95%
	Non-biased and factual	90%
	Experiments and studies	81%
Connection to Nature		
	Students connect with natural world	95%
	Being outdoors	86%
	Human relationship with nature	86%
Engaged Learning		
	Hands-on learning	95%
	Practical real-world application for students	95%
	Engage all learning styles	86%
Conserving Natural Resources		
	Addresses conserving natural resources	90%
	Students learn to care for the natural world	81%

Note. $n = 22$

Themes generated from responses pertaining to "Educational Goals and Outcomes" (Table 2) were Students Desire the Outdoors, Students Develop Higher Order Thinking Skills, Students Develop Scientific Literacy, Meets State Standards, and Increase Teacher Comfort.

Table 2

Educational Goals/Outcomes of Outdoor Education Themes

Theme	Item	Percent Agreement
Students Desire the		
	Getting students outside and increasing activity level	100%
	Students see nature working independently	95%
	Students realize our dependence on nature	95%
	Students learn to conserve natural resources	90%
	Learn simple outdoor activities	85%
	Students learn to appreciate, enjoy, and feel safe in the outdoors	85%
Students Develop Higher Order Thinking Skills		
	Student led discovery	100%
	Students develop inquiry learning	95%
	Students learn critical thinking skills	95%
	Make learning outdoors connect to classrooms	90%
	Students able to explain their learning	90%
	Students learn discussion skills	85%
	Emphasize cooperative learning	80%
Students Develop Scientific Literacy		
	Environmentally literate students	95%
	More informed on water and land use	95%
	Understand basic science concepts	90%
	Students achieve literacy in outdoor	90%
	Students familiarize themselves with local wildlife	85%
	Students familiarize themselves with local plants	85%
Meets State Standards		
	Meets state environmental education standards	95%
Increase Teacher Comfort		
	Increase teacher comfort outdoors	90%

Note. $n = 22$

Themes generated from responses related to "Components within Outdoor Education Programming" (Table 3) were: Connection to Nature, Use Investigative Skills, Competent Teacher, Resources, Engaging for Students, and External Support.

Table 3

Program Components of Outdoor Education Themes

Theme	Item	Percent Agreement
Connection to Nature		
	Expose students to nature	100%
	Teach ethical practices in exploring nature	100%
	Develops respect for the environment	90%
	Students see what shapes the	90%
	Students see their place in the natural world	90%
	Ignite a passion for nature	85%
Use Investigative Skills		
	Discovery and questioning encouraged	100%
	Critical thinking and problem solving	95%
	Time to explore alone or in a group	95%
	Investigate environmental issues	95%
	Using data-gathering techniques	90%
	Students develop skills to address issues	90%
Competent Teacher		
	Trained teachers	95%
	Enthusiastic and willing teacher	95%
	An instructor comfortable outside	95%
	Teacher can manage students outdoors	90%
	Teacher knowledge of environment	80%
Resources		
	Tools to enhance the experiences	95%
	Activities relate to state standards	90%
	Complete, current, and fact-based curriculum	90%
	Equipment for outdoor classroom	90%
	Materials to give background	90%
	Funding for outdoor education program	85%
	Plants to attract wildlife	80%
Engaging for Students		
	Activities/hands-on	100%
	Activities are fun and engaging	95%
	Students have buy-in	90%
External Support		
	Administration and parent support	95%
	Connect with groundskeeping staff for outdoor classroom	85%
	Assistance from specialists	85%

Note. $n = 22$

Themes generated from responses regarding the "Barriers Facing Outdoor Education" (Table 4) were Lack of Knowledge or Desire from Teacher, Current Educational Priorities, Cultural Factors, Misunderstanding 'What is Outdoor Education,' Lack of Support, and Lack of Time.

Table 4

Barriers Facing Outdoor Education Themes

Theme	Item	Percent Agreement
Lack of Knowledge or Desire from Teacher		
	Teachers lack of basic outdoor knowledge	100%
	Teacher lacks comfort or training	95%
	Teachers are unwilling to do something new	90%
Current Educational		
	Curriculum demands	95%
	Testing requirements	95%
Cultural Factors		
	Media replacing outdoor play	95%
	Hesitancy to go outside and get dirty	95%
Misunderstanding 'What is Outdoor Education'		
	Lack understanding of what outdoor education is	95%
Lack of Support (School		
	School district buy-in	85%
Lack of Time		
	Lack of time	80%

Note. $n = 22$

Conclusions, Implications, and Recommendations

Definition of Outdoor Education

The first objective of this study was to help formulate a definition for outdoor education for use in Kansas agriculture education curriculum. This definition was built from integrating respondent accepted items into broad themes that could be written into a coherent definition. Themes had been devised ensuring that the essence of the respondent generated items remained. These items had been accepted through a three round vetting process that lends credibility to the components of the definition. Based on the themes generated by respondents, we developed the following definition: "Outdoor education is engaged learning in the outdoors that utilizes experiments and observations to create a connection to nature and instill a desire to conserve natural resources."

Several points of similarity exist between the definition that emerged and Priest's (1986) definition: "An experiential process of learning by doing, which takes place primarily through

exposure to the out-of-doors. In outdoor education the emphasis for the subject of learning is placed on relationships, relationships concerning people and natural resources" (p.13).

The only substantive differences between the definitions are the focus on experimentation in the proposed definition and the absence of developing relationships with others. Dependent upon the context of utilization both definitions are appropriate for agricultural education. Priest's definition is best suited for an outdoor leadership camp that may be hosted though FFA. Meanwhile, the definition generated through this study would best be suited for defining current trends in educational instructional strategies. As NGSS continues to be implemented the new definition would be best in articulating the valuable role that agricultural education will play in integrating more inquiry-based investigations into the classroom setting. An additional point of distinction concerning the proposed definition is the focus on conservation. Priest (1986) made the case that the most defining feature of outdoor education is its emphasis on conservation. That the proposed definition should contain a reference to conservation among experts living twenty-seven years later is powerful support of Priest's findings.

Educational Goals of Outdoor Education

The second objective of this study was to identify essential educational goals and outcomes of outdoor education programming. In the literature review Priest's Outdoor Education Tree Model was used to establish an understanding of the educational goals of outdoor education. The model laid out four goals: interpersonal, intrapersonal, ecosystemic, and ekistic. All, but one of these educational goals are reflected in the results of our Delphi study.

Interpersonal was the goal that was not directly reflected in our results. In the first round of the survey there was items submitted by participants that focused on interpersonal development. Those items however, did not achieve the needed consensus to move into the later rounds. A possible reason for the lack of consensus on those specific items could be the make-up of the thirteen survey participants who took part in all three rounds. The majority of those participants came from an environmental education context, which could have trended consensus items more towards environmentally focused items.

The remaining three educational goals each saw consensus items. Items that reflected the Intrapersonal goal included: Students learn discussion skills and Emphasize cooperative learning. Ecosystemic goal was seen in the theme, Students Develop Scientific Literacy. The items within that theme emphasized students understanding of the natural world. Finally, the Ekistic goal was seen within the theme, Students Desire the Outdoors. Items within the theme focused on students realizing the importance of nature in their daily lives, which would lead to deeper appreciation and a desire to conserve the natural resources. The results of the study do not just reinforce earlier models of outdoor education, but also allow us a clearer view outdoor education will play in the future of the education landscape.

Next Generation Science Standards (NGSS) will soon become the state science standards for Kansas and at least 25 other states. The importance of meeting NGSS through the utilization of outdoor education was an item that reached consensus. Potential partnering between outdoor education specialists, science educators, agricultural educators and school districts may help accomplish meeting NGSS as these parties see meeting these standards as a priority. Another major goal of NGSS is to enhance student's critical thinking, problem solving and understanding of scientific principles (Achieve, 2013). These were all found to be consensus items participants identified as goals of outdoor education.

The educational goals of outdoor education, agricultural education and NGSS are aligned in such a way that they are all equally benefited. NGSS provide a needed framework for outdoor education experiences (OEE) through using agricultural applications that may help in resolving three items identified as barriers. These three barriers are curriculum demands, testing requirements and school district buy-in. By also having NGSS serve as the framework for OEE, curriculum

demands could be met in at least three major topics outlined by NGSS Interdependent Relationships in Ecosystems, Earth Systems and Weather and Climate. Additional research is needed to determine whether a link exists between OEE and student performance on state tests, such evidence may provide further incentive for school district buy-in.

In turn NGSS are supported by OEE and agricultural education through providing real-life applications and scenarios to support the standards. These real-life applications and scenarios that could be completed in the outdoors hold the potential to further support the cultivation of higher order thinking skills that are desired outcomes of NGSS. Outdoor education experiences using agricultural applications also support NGSS's goal of fostering discussion of human sustainability through the items assigned to the theme "Students Desire the Outdoors." Under this theme, items such as Students Learn to Conserve Natural Resources and Students Realize our Dependence Upon Nature could help draw students into developing personal convictions and values of their place in nature and humanity's role to conserve its finite resources.

Outdoor Education Programming Components. The third objective of this study was to identify essential program components involved in outdoor education programming. Items found in "Components within Outdoor Education Programming" highlighted partnerships as a crucial facet of an effective outdoor education program. The theme "External Support" contained items that emphasized the need for partnership by calling for school administrator support and assistance of outdoor education specialists. In the "Resources" theme the need for partnerships was further advanced as resources needed to run an effective outdoor education program were either held by the school district or outdoor education specialists, but neither had all resources available by themselves.

It is recommended that education decision-makers invest in the continual development of resources for outdoor education purposes. These resources could come in the form of curriculum materials, funding sources, and/or equipment needs. An additional resource available to school sites is the Outdoor Wildlife Learning Sites (OWLS) program. They are Kansas Department of Wildlife, Parks and Tourism certified outdoor learning laboratories. The purpose of the sites as described by the department is, "to help prepare children for eventually assuming responsibility for the environment." OWLS can contain a variety of features ranging from native grass stands to feeding stations to attract wildlife. Currently, there are 150 certified sites of which 35 are operated by high schools. The further development of these sites could help open an affordable route for school districts to provide outdoor educational opportunities, as the Chickadee Checkoff provides an initial $2,000 grant to help in the construction of OWLS sites.

Barriers Facing Outdoor Education. The fourth objective of this study was to identify barriers facing outdoor education programming. The items identified in the barriers section provide additional support for the cultivation of partnerships between outdoor education specialists, science educators, agricultural educators and school districts. These items in particular relate to teacher training and comfort which also appeared in the educational goals/outcomes and program component sections. Trained teachers were considered an essential component for effective outdoor education programming, but the lack of trained teachers was considered to be a barrier. Currently, training opportunities are available for instructors through the Kansas Association of Conservation and Environmental Educators (KACEE). Further growth and investment in these training opportunities could help minimize the impact of the teacher training, knowledge and comfort barrier items identified by respondents. An additional avenue of training could be accomplished through teacher preparation programs. The programs could emphasize how to create effective outdoor education integrated lesson plans and how to confront potential student management and instructional strategy issues that are not considered in the traditional classroom.

An important finding offered by Shoulders and Myers (2012) was that agricultural educators have a wide availability of laboratory settings and also utilize these spaces with a high frequency. This finding supports the idea that usage of agricultural laboratories is to some extent a part of the basic philosophy of secondary agricultural education. Agricultural educators have a high

level of comfort in instructing out of class experiences which could allow them to work with less experienced educators within their school districts. Another opportunity is to have other educators collaborate with agricultural educators in sharing outdoor laboratory spaces that could enhance cross-curricular learning. Agricultural educators are well positioned to serve as valuable resources in addressing the barriers identified by the panel of experts.

Future Research. Potential questions to consider for future research in the area of outdoor education programming in Kansas are: How many schools are actively practicing outdoor education programming? What are the characteristics of effective outdoor education educators? What partnerships currently exist between outdoor education specialists and agriculture teachers? How can those partnerships be enhanced? How many of the identified program components and education goals are actually occurring in practice within Kansas? What steps are being taken or could potentially be taken to reduce the effect of the identified barriers? What is the current level of collaboration between science and agricultural educators?

Linking back to this study's primary framework of experiential education, questions that should be considered for future research include: What are the attitudes concerning experiential learning among Kansas agricultural instructors? How many agricultural programs utilize best practices of experiential learning in their instruction? What learning gaps exist for novice instructors that are preventing further utilization of experiential learning? How might certain program facilities influence the occurrence experiential learning?

In addition, a further investigation should be conducted examining the Outdoor Wildlife Laboratory Sites (OWLS) program in Kansas specifically: What is the current state of existing sites? How often are the sites used? How does student knowledge of environmental concepts compare to students who do not have access to OWLS and those who do? What features of the sites are most helpful in achieving expert identified educational goals and outcomes?

Kansas outdoor education experts have provided insight into the role outdoor education could play in the implementation of NGSS and advancing the integration of outdoor scientific inquiry in the agricultural education curriculum. Further examination of these developing relationships and expansion of literature will serve to benefit specialists, educators, administrators and ultimately students.

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