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The *Oikos* of Rural Children[1]: A Lesson for the Adults in Experiential Education

Karim-Aly S. Kassam, Department of Natural Resources & American Indian Program, College of Agriculture and Life Sciences, Cornell University

Leanne M. Avery, Department of Elementary Education and Reading, State University of New York College at Oneonta

Abstract: Change demands systematic and critical interrogation of 'dearly held truths'. This paper will contend that experiential education devoid of epistemological and ontological pluralism will be vacant and ineffective. Our research suggests that multiple ways of knowing drawn from diverse sociocultural and ecological contexts contributes to conservation values which ultimately must inform effective sustainability practices. Using interviews with fifth and sixth grade students (N= 84) from two rural schools in upstate New York and photodocumentation by these children, we illustrate that connectivity to habitat is central to a sense of place and conservation values. These students, when describing science and engineering in their community, illustrate a complex connectivity with their environment. Their sense of being emerges from their engagement with their environment revealing an understanding of complex, diverse, and co-existing relationships to their habitat. This suggests that the starting point for experiential education should be situated and valued in the idea of *oikos*. If children get it, why don't we?

Key words: Anthropocene, connectivity, science, engineering, habitat, community

Karim-Aly S. Kassam is International Associate Professor of Environmental and Indigenous Studies. His research focuses on the complex connectivity of human and environmental relations, addressing multiple ways of knowing, food sovereignty, sustainable livelihoods, and climate change. This research is conducted in partnership with indigenous communities in the Alaskan, Canadian, and Russian Arctic and Sub-Arctic; the Pamir Mountains in Afghanistan and Tajikistan; and the rain forest in the south of India. By investigating the relationship between biological and cultural diversity, Dr. Kassam seeks to expand the foundations of the notion of pluralism. Email: karim-aly.kassam@cornell.edu

Leanne M. Avery is an Associate Professor in Science Education. Her research focuses on science and engineering photodocumentation work with rural children. Her research provides key insights into how these children learn, where they learn, and from whom they learn. Via place-based teacher development in collaboration with other university faculty, teachers, students and families, she also works to promote ways in which to value this knowledge base in the classroom. By anchoring student learning to the local rural context as well as connecting this knowledge to global science and 21st century skills, her work enables rural children to navigate and succeed in a rapidly changing world. Email: Leanne.Avery@oneonta.edu

Introduction

Geologists have proposed that humanity has marshaled the age of the Anthropocene resulting from humankind's mass impact at a planetary scale (Crutzen & Stoermer 2000). The term is often not celebratory but an admission of culpability in terms of mass extinction and climatic variation spearheaded by a single species. Beginning with industrial development in the late eighteenth century, humanity has been altering its habitat at planetary scale which hitherto was not possible. It is not that anthropogenic influence is a new phenomenon on the planet (Cronon 1983; Mann 2005; Sayre 2012; Smith 1980). For example, we have strong evidence that the Amazon has not been so 'pristine' and in fact, there is archeological evidence of continuous human presence for thousand years which has had substantial influence on landscape and forest cover. Furthermore, this influence was abetted by a dense population and highly complex built environment in what we formerly considered a virgin forest (Hekenberger et al. 2003). This begets the question: what is new about the anthropocene given that the word is literally made of two parts *anthropos* referring to man and *cene* denoting recent? It is the simultaneous compression of the dimensions of space and time on a global scale where the scale and speed of human impact is staggering. This age is also characterized by myopia of human impact or willful blindness to the death of birth in which extinction outstrips the pace of evolution and is accompanied by the absence of a global consensus on an ethical code to guide humanity in its behavior. The anthropocene is acknowledgment that the planet is currently operating in a *no-analogue state* (Crutzen & Steffen 2003: 253). In other words, novel realities imply past experiences may no longer inform a response to the imminent. Furthermore, it involves the recognition that the Earth system includes human societies and that these humans are an integral component of the planet. Therefore, humanity can no longer sustain the delusion perpetuated by industrial society that it is operating in two separate systems—one natural or ecological and the other a human sociocultural construct (Steffen et al. 2007; Kassam 2009; Sayre 2012). One way of gauging how detached industrial society is from its novel reality would be to see how school-age children understand the relation between themselves and the ecological communities where they live.

Given this understanding, it is important for us to probe the sensitivity of this human ecological consciousness among grade five and six students as they engage science and engineering in their community. Specifically, from their own perspective using visual images and accompanied by oral explanation, we sought to probe the relationships between students and their environment – including the relations with other humans, other animals, plants, and their habitat. Without leading the witness in a manner of speaking, but ascertaining how they view themselves within their habitat, we asked grade five and six students in high to medium needs rural schools in upstate New York: how do you use science and engineering knowledge at home and in your community? Using photodocumentation, 84 students provided us with visual as well as oral description of their perception. Our research indicates that rural children do not perceive a separation between themselves and their habitat, while recognizing their own individuality, they situate it as a part of a greater whole.

The three Es of sustainability: namely equity or Earth care, economics or economies of nurture, and ecology[2] are not mere abstract values that children derive from their home and classroom but are reinforced through the experience of living in their habitat (*oikos*). In a sense, these three Es emerge from behavioral *norms* which simultaneously inform action within sociocultural and ecological systems. Here we use the word *norm* to convey action that is habitual, where each act is informed by previous experience, as well as values that guide the deed. Quotes from grade five and six students convey this most effectively. A student describes his photodocumentation project: "It was almost like we blended what we learned from him [teacher], what we already knew and what our parents taught us". Furthermore, another student explains: "Well I know a lot of stuff just from living on a farm because I've been living there my whole life."

The objectives of this paper are to demonstrate the idea of *oikos* or habitat as described by photos taken by, and in the interviews with the grade five and six students. Using these data, we then outline the complex connectivity that informs their sense of community. First, the notions of *oikos* and connectivity will be presented as pertaining to place-based education. Second, our research findings will be discussed. Finally, we will conclude with implications of the research for experiential and sustainability education.

Epistemological and Ontological Moorings: *Oikos* as habitat and Connectivity as Community

The way children know, their epistemological grounding, is related to how they situate their own existence into the greater whole, their ontological positioning. Therefore, their sense of connectivity to their *oikos* becomes central. The meaning of the word *oikos* often translates as household; however, the notion includes the dwelling as well as the habitat that contains it. In this sense it is a living space. The same Greek word is the root for the scientific field of ecology as well as the branch of social science called economics.

Ecology views the earth as dwelling or a whole system. In 1905 Frederick Clements, American plant ecologist (botanist), defined ecology as "the science of community" (Kormondy & Brown 1998: 29). From the beginning ecologists have sought to express the science of ecology in lyrical terms, using metaphors to convey its meaning. Twentieth-century ecological thinking viewed nature holistically as an organism. This concept of holism maintains that all things are connected and that these connections form a wider whole. By the 1920s ecology became increasingly recognized as a science (Nepstad & Nielsen 1993). However, it was not until the 1960s that ecology drew wide interest from both scientists and the average citizen. Viewing the earth from the moon shifted humanity's perspective. Metaphors of the Earth as an island with finite resources worthy of wise stewardship, as expressed by astronaut Neil Armstrong, or Earth as a spaceship requiring careful utilization of life support systems, as expressed by writer and economic thinker Kenneth Boulding, galvanized the public imagination (Juzek & Mehrtens 1974). Odum (1989) argues that the role of the ecologist in the future will be to promote a holistic approach. "Ecology is now" he maintains "more and more a discipline that emphasizes a holistic study of both parts and wholes. While the concept of the whole being greater than the sum of the parts is widely recognized, it tends to be overlooked by modern science and technology, which emphasize the detailed study of smaller and smaller units on the theory that specialization is the way to deal with complex matters" (Odum 1997: 34).

Ironically, Odum's observation is equally relevant to economics. While economics and ecology derive from the same term *oikos*, economics examines relations derived by exchange value and is limited to concerns for efficiency, maximization, and the price system. Aristotle distinguished between *chrematistics* and *oikonomia*. *Chrematistics* is "defined as the branch of political economy relating to the manipulation of property and wealth so as to maximize short-term monetary exchange value to the owner," whereas *oikonomia* "is the management of the

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household (or community) so as to increase its use value to all members of the household (or community) over the long run" (Daly & Cobb 1990: 138). *Chrematistics* is short-term oriented, focuses on individuals, maximizes exchange or market value, seeks unlimited accumulation and therefore through instrumental actions, detaches the participant in the economic process from their habitat. *Oikonomia* is long-term oriented, considers the whole community, focuses on use value, and seeks to meet concrete needs and therefore, has a strong sense of attachment to place. Neo-liberal economic policy, which is the current operating paradigm, bears a startling resemblance to chrematistics (Kassam 2009), as does the policy of *No Child Left Behind* which focuses on standardized curricula – dettached from place – that utilizes multiple-choice testing as the means to measure learning (Schafft & Jackson 2011).

Children express complex connectivity with their habitat or *oikos*. It is connectivity within localities; that is, at the level of local life. This type of connectivity views the parts as an assemblage of a greater whole or community. It is context or place-based. It recognizes that cultural and social processes are connected to the habitat. This type of connectivity has a strong sense of consequentiality, that is, consequences arising from actions (Tomlinson 1999). It is contrasted with instrumental connectivity which objectifies the environment for extraction of valuable natural resources and detaches the individual from context (not unlike chrematistics). Complex connectivity, in contrast, also acknowledges the dependence on habitat for sustaining life and sees the utilizer as a participant within the habitat. This sociocultural and ecological interconnectedness gives rise to a greater whole.

Place-based education (PBE) embodies *oikos* and complex connectivity. Furthermore, it focuses on structuring learning around local history, culture, language, economy and environment:

> It uses the local environment as a starting point to teach [numerous] subjects. Emphasizing hands-on, real-world learning experiences, this approach increases academic achievement, strengthens students' ties to their community, enhances students' appreciation for the natural world, and creates a heightened commitment to serving as contributing citizens. (Sobel 2005: 7)

Smith (2002) maintains that place-based education: 1) Emerges from a specific place and includes indigenous cultural and nature studies; 2) Is multidisciplinary and experiential; 3) Includes local internships/entrepreneurial opportunities; 4) Connects students with the community involving them in decision making and real-world problem solving; and 5) Reflects a much wider-ranging learning paradigm than simply learning to take a test. The legitimization of local knowledge through place-conscious pedagogies bridges the gaps between context-specific knowledge of children and more generalized science curriculum at school.

Methodology

Two schools participated in this study located in upstate New York. A statewide report classified these two K-12 school districts as "High or average Need/Resource Capacity - Rural" (NYSED 2011). Participants were drawn from upper elementary school classrooms, namely grades five and six. School number one will be referred to as the Rockville Central School District (high need) and school number two will be referred to as the Owen Valley Central School District (average need).

Two tenured elementary school teachers volunteered to participate in the study. All of the children in the Rockville combined fifth-sixth grade teacher's classroom were invited to take part in the study. As part of a project (related to summer teacher professional development program with Author 2) with the teacher from Owen Valley, all of the grade six children were invited to participate. In both cases, we obtained permission for students to participate from their parents/caregivers and from the teachers. Institutional Review Board approval for the project was also granted. All names used in this paper are pseudonyms (chosen by the student) to maintain confidentiality[3]. Twenty students from the Rockville and 64 students from the Owen districts elected to participate resulting in a participant total number of 84 grades five and six students.

To ascertain students' local science and engineering knowledge, we gave disposable cameras to the children (see figure 1) and with an instruction sheet that asked them to take pictures of what they perceived to be examples of science and engineering taking place in their home, communities and local environments (see Appendix 1). After the pictures were developed and electronic copies were made, the children were interviewed. Two sets of pictures (CD format) were made for every participant so that the children were able to keep the pictures that they took and the researchers were also able to keep a copy of the photos taken by the children.

Furthermore, some children as a part of their class assignment at the Owen school engaged in creating a photostory using the pictures they had taken. Students worked in teams of two, using Microsoft's Photostory program. Together they created a project that included their photographs with voice over, music, and a theme that represented how the perceived science and or engineering taking place in their community.

Figure 1: Grade Five and Six students Engaging in Photodocumentation

Semi-structured interviews with children (Avery 2013; Avery & Kassam 2011) were held to discuss their photodocumentation. Open-ended interview questions enabled researchers to elicit students' responses to the photographs and probe deeper into some of their comments. We were interested in learning why the students chose to take specific pictures and what they knew about the items in the photographs. Author 2 interviewed the children at their schools. The interviews, which ranged in length from 20 to 50 minutes, were video- and audio-taped, and notes were also

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taken. The interviews were transcribed, coded, and analyzed (Avery & Kassam 2011; Meyer & Avery 2009; Avery & Meyer2007) using the Constant Comparative Analysis Method (Glaser 1969) and Content Analysis (Patton 1990). Author 1 also analyzed the transcripts separately from Author 2. Author 1 retained a distance from direct contact with students and teacher in order to double-check biases that we might have built into our interpretation of findings. The combined approach complemented our research, and we believe it contributed to a more robust interpretation of findings without biases. The data were then organized in the emergent and thematic human ecological framework of *oikos* and complex connectivity.

Findings and Discussion

Grasping the conceptual significance of *oikos* is central to our understanding of the milieu in which grade five and six students are receiving their education in rural upstate New York. Their parents operate within a *chrematistic* economic system that simultaneously detaches them from their habitat, as described above, and that also supports a science curriculum that informs the children about their ecology. Therefore, how students perceive science and engineering in their *oikos* or habitat is revealing. To return to Odum's prediction of the ecologist of the future, our research seeks to tease out if the proto-ecologist that comprise the grade five and six show any signs of holism in their perception of their habitat. Are these children are able to focus on specific parts and then see it as a component of a greater whole? Is their perception pluralistic by being attentive to detail and concurrently not losing site of the emerging whole?

Our research indicates the children's knowledge of science and engineering emerged with respect to their habitat or *oikos* rather than just the household in terms of nuclear family or bricks and mortar of the building (see figure 2). It is about both the parts and the whole. It speaks to the idea of dwelling within their environment. Jeremiah describes this outlook in the photostory that he made with his grade 6 classmate, Raineer: "Well we didn't want to say this is Jeremiah's story or this is Raineer's story, this is our story and this is our neighborhood, our nature around the community." In a different photostory project, Pablo and Watermelonisha worked together using the many pictures they took of their local environment. In the interview, Pablo described the creek behind his house as "my creek" but not in the sense of private property rather from a sense of home. He also explains how he uses a nearby tree as a phenological marker of the changing seasons. A visually more effective way of describing the relationship to the habitat is through the emergent wheel of *oikos* based on the qualitative responses of the students (see figure 2).

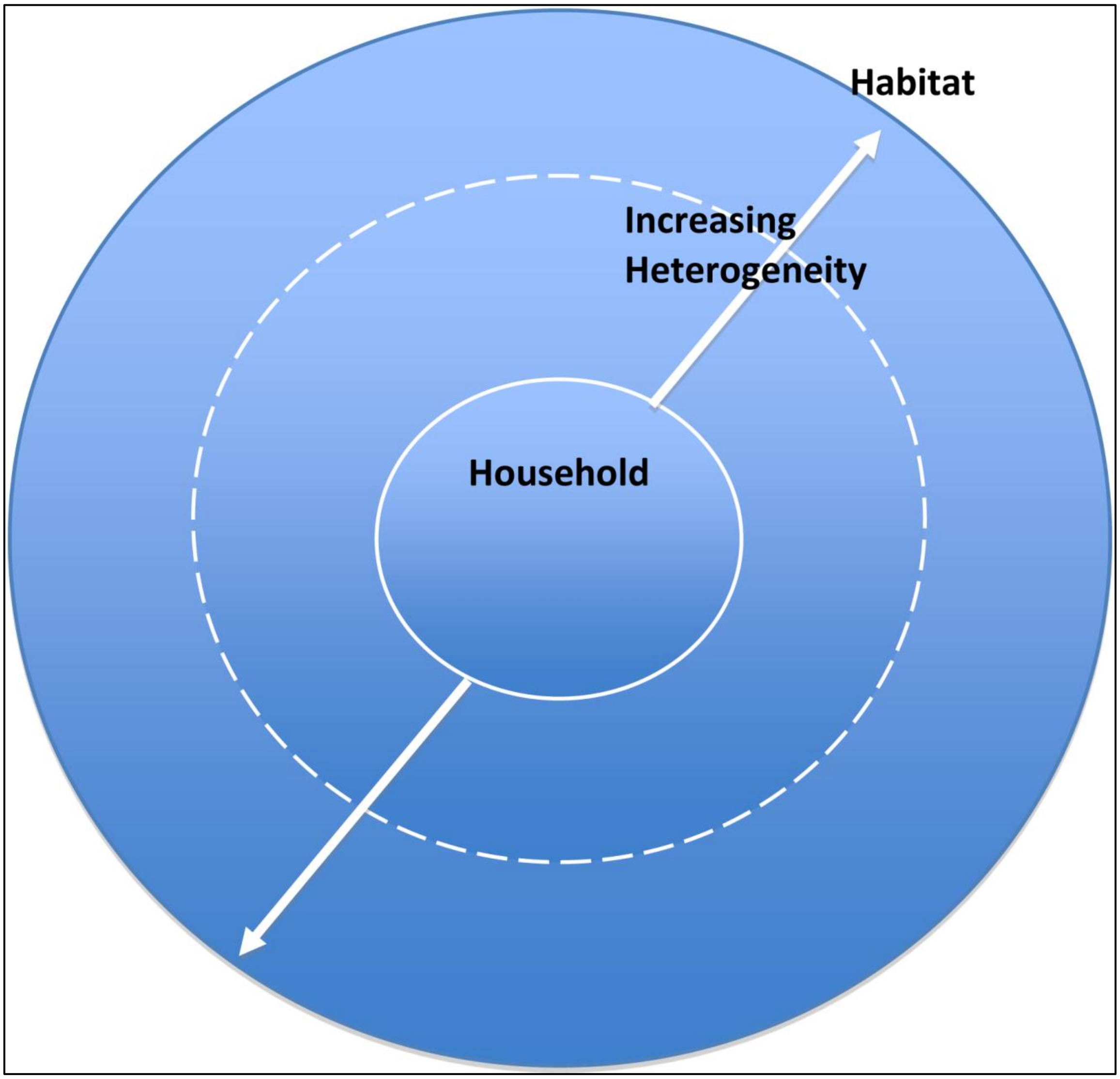

Figure 2: the Wheel of *Oikos* as Represented by Student Responses

The students did not use words like habitat or *oikos* but the sense they conveyed clearly reflected this awareness. For instance, the dialogue below is from Pablo's and Watermelonisha's photostory interview.

W: In our photostory, we kind of focused on outdoor things and things that help with the outdoors and we tried to make sure it all fit so we had a bunch of trees.

P: Yeah we tried to make it towards renewable and non-renewable idea basically.

P And I thought it worked very well because trees, fields, lakes; they all kind of like fit together. And with the tractors that cut down trees, it works because cutting down trees helps warm your house that's why they cut them down. And without the tractors you wouldn't be able to either get the wood or get to the fields, make the fields clear or accessible.

Pablo concludes with the following explanation: "In our rural area, like this, you'll know a lot about 'cause you'll say: oh what's that? And your parents might know and they'll tell you and

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then you get more interested in it and you want to learn more about it and it just gets you more focused on how things work."

Arguably, the grade five and six students reflect the characterization of the ecologist of the twenty-first century, as described by Odum, who retain a pluralistic mindset by having a greater understanding of the parts while not losing sight of the greater whole.

Specifically, we noted that there was a range of science and engineering knowledge centered around the household and expanding outwards towards the wider habitat. From among the respondents, 13 (15.5%) limited themselves to the household, while 50 pupils (59.5%) the largest group, described their wider habitat. The middle group, which comprised 21 students (25%), occupied the continuum of space between the household and the larger habitat (see figure 3).

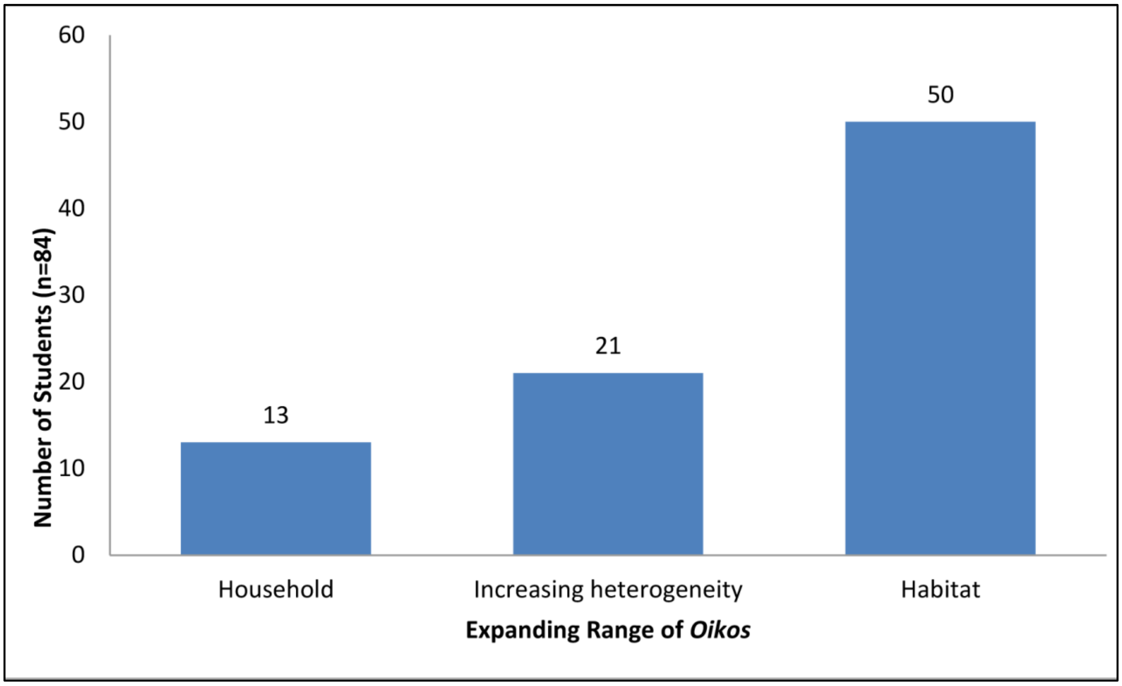

Figure 3: Situating Science and Engineering Knowledge by Grade Five and Six Students

The children that were positioned in the innermost core of the wheel interact within a frame of *oikos* situated at the household level. Using Bloom's taxonomy hierarchy of educational objectives (Anderson & Krathwohl 2001: 67-68), students in this group articulate their science and engineering knowledge by remembering (retrieving, recognizing, and recalling relevant knowledge from long-term memory), understanding (constructing meaning from oral, written, and graphic messages through interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining), and applying (carrying out or using a procedure through executing, or implementing) levels (see figure 4). For example, Silverado explains: "I took picture of my gutter because gravity pulling the water down the gutter from the top, that's the drain but pulling the water from the gutter down to the bottom so I took that for science."

The children positioned within the middle level of the wheel, demonstrate a more expansive expression of *oikos* that moves beyond the household to include the broader habitat, and they illustrate a sophisticated understanding of how ecological parts function and interact with the larger whole. According to Bloom's taxonomy, these children would be roughly located at analyzing (breaking material into constituent parts, determining how the parts relate to one another and to an overall structure or purpose through differentiating, organizing, and attributing) and evaluating (making judgments based on criteria and standards through checking and critiquing) levels (Ibid). For instance the description Bubbelena gives of her immediate surroundings is representative of this level: "This is my lawn and I was over on the porch. There are trees that must have been planted there but maybe just made there naturally … This is the porch and the patio walkway and I took a picture of this because someone planted the flowers, someone grew the pumpkins, someone built the porch and someone cut the stone and put it there. My mom planted the flowers so that was engineering. This is the garage area and the path to go up my house, the satellite dish right there was made like so we could watch TV, and over there the woodpile so trees made naturally or manmade were chopped down so we could have like the firewood and then the garage was manmade so it's engineering because someone made the garage."

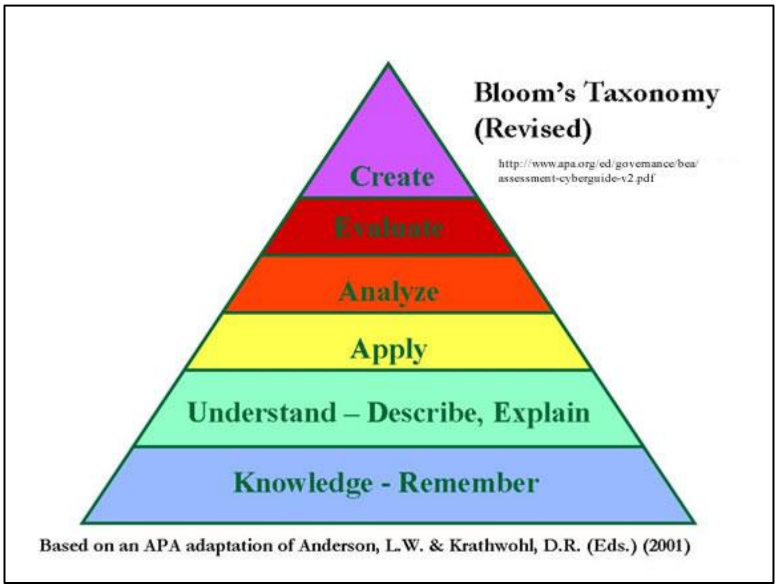

Figure 4: Bloom's Taxonomy

Finally, students positioned in the outermost quadrant of wheel, illustrate a complex connectivity of understanding of *oikos* and they are able to focus on specific parts without losing sight of the whole. This corresponds to creating (putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure through generating, planning, or producing) level of Bloom's Taxonomy (Ibid), which is the highest level in the pyramid (see figure 4). The quotes from the photostories described above are examples of the creative process of pattern recognition and generation. Furthermore, a series of photographs taken by Twizzler express this creative process. She describes how the tree and the telephone pole are linked and then how the power line and electrical fence are connected. In essence, the tree is fabricated or modified and is also present in all three images (see figure 5). Trees, a telephone pole, a power line, and an electrical fence constitute the same phenomenal space.

Figure 5: The essence of the tree transformed and yet present.

Twizzler goes onto explain water gets direction from rocks in the rivers, followed by weather vanes getting direction from winds, and compass taking direction from magnetic poles. She conveys the complex connectivity of her habitat.

Habitat is the relational field where life is experienced. Experience of the world does not separate science and engineering from nature. Science for the majority of the students is explanation of their habitat and engineering is action within that habitat. In other words, birds make nests, creeks filter, and humans build. Pablo explains the threesome character of the creek: "Right over here is the point, the opening to where the creek filters in and I took this because of all the trees, it's really giving air to the atmosphere and hydropower. So I thought it was like a threesome." Furthermore, he situates himself firmly within *oikos* in its broadest sense as living space: "I go outside all the time because I live right on a lake, a creek and I have a basketball hoop and stuff. During the summer all I do is fish, and when it's hunting season, I hunt, I grew up into this."

Grade five and six students' total sensory involvement in their habitat is intrinsic to the ongoing process of being alive to the world in which they live. Children perceive themselves not as detached observers of nature but participate from within the continuum of life that comprises their environment. Even human built environments constitute this vital element of community and carry life-like qualities. For instance, Justin Timberlake, a young girl in a wheelchair, describes the photographs she took of the local fire station in her community: "I've put things in different perspectives and you know some other people just might look at a fire department as just a building and not think about what it really is… the whole community helps with it and if it weren't for those fire fighters you know where would we be today?" In an explanation of another photograph of the local train station, she said: "It inspires me because when I look at a train station from a different point of view … I look at it as a building with many, many memories". Through explanation of her photographs, Justin Timberlake was conscious of how her perspective was facilitated by her need for a wheel chair; and therefore, she had a deep appreciation of the human role in science and engineering. This was a natural way of being for her – as a spider weaves a web, humans also build. Hence, a fire station engenders community and a train station retains memories.

Similarly, children related in a mature manner with other animals and acknowledged the learning they gained from the process. For instance, in their photostory, Greta and Zelda focused on their common interest: a love of animals. Below, Greta shares her experiences working with llamas, alpacas, and horses on a neighbor's farm and the relationship she cultivated by interacting with them: "You've got to earn their trust, that's what you got to do…Like me and Mac, that's my llama. I just picked him to train and show him in the State fair. Mac's just closer to me, and he used to spit at me and they usually go for the hair. Mac would sit there and try to spit at me and I said "come on Mac now leave me alone." I'd have to keep going with him, keep walking him around, keep trying… I'd clean his stall to make sure he knows that I'm doing it and just earn his trust to make him stop spitting at me. I learned so much from them. I really worked hard by getting to know them and the llamas actually probably wouldn't think this but they actually taught me all of it because just being with them, learning how they work and what they do -- it's pretty cool just to get to see llamas, alpacas and horses and the difference between them. I thought they just ate, slept and pooped but they actually come to do a lot more than that…They're actually really smart animals."

These grades five and six students relate to other humans, and non-human agencies such as plant and animal life, as well as inanimate entities in their environment. Therefore, in their spheres of connectivity there is no separation, but contextually delimited segments of a single ecological system or *oikos* or community. Their existence 'is' not because of a certain property contained within themselves individually, but by their relationship to a continuum of beings within their *oikos* or habitat or community (Ingold 2000; Kassam 2009).

Implications and Reflections

There is a growing body of evidence in environmental psychology that indicates 'interaction with nature' improves attention, memory, cognitive functioning and overall is restorative for human mental health (Berman et al. 2008; Cervinka et al. 2012; Hartig et al. 1991; Kaplan 1995; Moore 1981; Tennessen & Cimprich 1995). There are also equally persuasive studies that suggest that children living in high urban density and low-income areas suffer from deleterious effects to their well-being (Saegert 1982). Hence, the issue is not merely about a rural–urban divide but also regarding socio-economic injustice. In any case, when urban children are exposed to green-spaces (trees and gardens) the result is greater social contact with each other as well as adults, reduced stress levels, and better mental health as well as cognitive function (Coley et al. 1997; Taylor et al. 1998; Sebba 1991; Wells 2000; Wells & Evans 2003). The lack of engagement with green-spaces among mostly urban children is described as a 'nature-deficit disorder' (Louv 2005, 2008, 2009, 2011). The language of deficit is noteworthy; because it is

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evocative of the prevalent economic paradigm in terms of balance of payments deficit, terms of trade deficit, budget deficit, all of which refer to a shortfall. For effective experiential learning pedagogies, education policy-makers must focus on strengths, or to use an economic term, assets. Viewing children from the lens of victimhood is ultimately disempowering. Children, like their adult counter-parts, have agency — they possess the ability to change not only their behavior but the behavior of future generations.

In our research, the majority of students interviewed (84.5%) view themselves as embedded in their habitat beyond the physical boundaries of their household. Therefore, they do not conceive of a dichotomy between the natural and the man-made. They perceive themselves as part of the greater whole. Furthermore, these children are attending schools designated as high to average need; which is a euphemism for rural poor schools. Still these children effectively understand science and engineering within their habitat. They are the exception to the growing pandemic of the nature-deficit disorder. In fact, the language of nature versus culture or deficit versus surplus is not relevant to their experiential context.

How does our research contribute to experiential learning for sustainability education? First in the age of the Anthropocene, where the planet is at a critical juncture and survival of many species including our own is at stake, the starting pedagogical premise of curricula must abandon the dichotomy between nature and culture. Like the understanding of these grade five and six students, curricula must begin with acknowledgement of the much ignored but ubiquitous fact that humanity is embedded in *oikos*. This habitat consciousness must embrace the planetary scale without losing sight of the local as described by Odum. Second, according to these grades five and six students, the very notions of science and engineering are manifested in their habitat. Science is an explanation of the habitat and engineering is an aspect of the activities undertaken in that habitat. These children perceive that creeks filter, birds construct nests, and humans make buildings. While conceptually distinct, science and engineering are not separate from the functioning of the ecosystem in which humans exist. Therefore, curricula must reflect the complex connectivity embedded in ecological understanding. Third, knowledge itself is emergent from the experiential environment (Avery & Kassam 2011; Kassam 2010; Kassam 2009). It is not found in the heads of teachers or students per se, but within day-to-day interactions with the ecological space that they engage. Sustainability education seeks to build upon this fundamental aspect of experiential learning[4]. Children's understanding of *oikos* provides the foundation for teaching and learning through place-conscious pedagogies bridging the gap between children's local knowledge and global science, technology, engineering, and mathematics (STEM) education. As exemplified by these children, this research suggests that the starting point for experiential education should be situated and valued in the idea of *oikos*.

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[1] Preliminary findings from this research were presented by Karim-Aly Kassam at The Second Emerging Issues Conference of the Ecological Society of America, February 28th, 2012. National Conservation Training Center Shepherdstown, West Virginia. Valuable comments from the presentation inform this paper.

[2] As described in the call for papers for this special issue.

[3] Given that the children chose their own pseudonyms, the reader will find them creative, amusing, and memorable.

[4] This conceptualization of ecologically based experiential knowledge giving rise to practical wisdom (or *phronesis*) as described by Aristotle is elaborated upon in greater detail with respect

to rural elementary school children in Avery & Kassam 2011, with respect to undergraduate students in Kassam 2010; and indigenous peoples of the Arctic in Kassam 2009.

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Appendix 1: Science and Engineering in My Home and Neighborhood

Dear (Owen and Rockville) Students,

We think that you use a lot of science and engineering knowledge in your daily life at home. In fact, we think that you know a lot about science and engineering.

We would like you to help us figure out how you use science and engineering knowledge at home and in your community.

For example:

- Have you ever helped a family member, friend or neighbor fix a lawnmower, car or a broken fence?
- Have you ever built a toy out of scraps or things that were lying around the house or yard? Have you ever taken your toys apart and put them back together again?
- Have you ever helped your parents, grandparents, a friend or neighbor fix something within or around the house?
- Do your parents/family members teach you things about science like how to plant a garden, do chores on the farm, take care of the pets, how to repair a car, or any other things like that?

Your task: Take a walk/ride around your home, yard, and community and look for ways in which you think science or engineering has been used.
Use the camera to take at **LEAST 10** pictures of everything you see that you think may be an example of how science and engineering are applied in your community and in your everyday life.

When we see you again, we are going to show you the pictures you took and ask you to tell us WHY and HOW you think the pictures are examples of science and engineering around your home and in your community. Please show us all that you know! Have fun! We are so excited to see your pictures and to learn from you! Thank You!

Sincerely,

- Dr. Leanne Avery, Associate Professor, Science Education, Dept. of Elementary Education & Reading, SUNY Oneonta, phone: 607-592-7566, email: averylm@oneonta.edu
- Teacher

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