Middle Grade Students' Perception of Their Connectedness to Nature: Application and Analysis of a Talking Circle Model

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To cite this article:

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ABSTRACT (Times New Roman typeface and 10 points)

The purpose of this study was to explore how middle grades students percived their connectedness to nature. This study identified a middle grades population in Southern Appalachia and analyzed how the percieved nature and their role in it. The exploratory question that guided this study was, under what conditions can a talking circle model help illuminate how middle grade students perceive their connectedness to nature? The methodolgy used is a case study (Janesick, 2004; Rubin & Rubin, 2005). The four competencies, as developed by the Center for Ecoliteracy (2009), are Head, Hand, Heart, and Spirit and were used in the organizatioin, coding, and analysis of the data. This study found that throughout the school year the students developed awareness of the role in the environement and what they can do to encourage sustainable practices.

Introduction

Rationale and Purpose of the Study

STEM programs are an important topic within the field of education research. An argument can be made that STEM has always dominated this field, and it is generally accepted that the importance of STEM was emphasized in the United States after the launch of the Russian satellite Sputnik. Since that time, science, technology, engineering, and math have been protected subject areas in regards to funding and testing. The Cold War encouraged the development of the field, but other critical areas can benefit from the STEM approach.

The environmental crisis facing the United States is another area where the STEM approach can assist with designing a curriculum that emphasis the real-world applications of science, technology, engineering, and math. While a global scale environmental crisis is too broad to cover, students can learn to think globally while acting locally. In order to this, student can work on urban gardening techniques that include raised bed gardens and composting with worms.

Throughout the United States, children are experiencing Nature Deficit Disorder. This study incorporates aspects of STEAM (science, technology, engineering, art, and math) curriculum, working with raised beds and worms for agricultural purposes, and combating Nature Deficit Disorder to create and test a curriculum that allows participants to identify the crisis and develop real world solutions.

Research Questions

The following exploratory questions guided this study:
1. How do middle grade students perceive their connectedness to nature?
2. Will exposure to an ecoliteracy program influence middle grade students' perception of their connectedness to nature?
3. Under what conditions can a talking circle model help illuminate how middle grade students perceive their connectedness to nature?

Definition of Terms

1. STEM: stands for Science, Technology, Engineering, and Math.
2. STEAM: stands for Science, Technology, Engineering, Arts, and Math. The addition of the arts to STEM came around in the late 2000s, as educators worried about the overemphasis on science and technology in the classroom, to the detriment of traditional liberal arts education.
3. Talking circle: To create a safe, non-judgmental place to discuss an issue or react to a speaker that allows the opportunity for each person to speak without interruption.
4. Middle grades: 4th grade through 8th grade
5. Ecoliteracy: an understanding of the principles of organization of ecosystems and their potential application to understanding how to build a sustainable human society
6. Ecopedagogy: a culturally relevant form of knowledge grounded in normative concepts such as sustainability, planetarity (i.e. identifying as an earthling) and biophilia (i.e. love of all life).

Significance of the Study

In the sixty-three years since the Soviet satellite Sputnik launched, school curriculums have focused on STEM and STEAM curriculums. While this curriculum included environmental study and observation, it has not included instruction that exposes students to, and grounds them in, the natural world. The curricular focus on STEM and STEAM was instituted without student feedback or input.

This study is useful in that it examines a STEM and STEAM curriculum from a unique viewpoint. Rather than utilizing a curriculum that potentially removes students from their environment, this study purposefully made use of a curriculum that sought to ground students in the natural world. This study

also sought to examine student perceptions, in their words. By making use of a talking circle, this study allowed students to not only examine their perceptions of their connectedness to nature, but to do so in their own words and their own terms.

Review of Related Literature

Introduction

In order to understand where one is going, one must first understand not only where one is, but also where one has been. The following visual schema was created to illustrate the relevant literature preceding and guiding this study. The visual schema corresponds to the talking circle method used to gather data from the middle grade students. All points on the circle are important, and all points on the circle contribute to the whole.

Figure 1
Review of Literature Schema
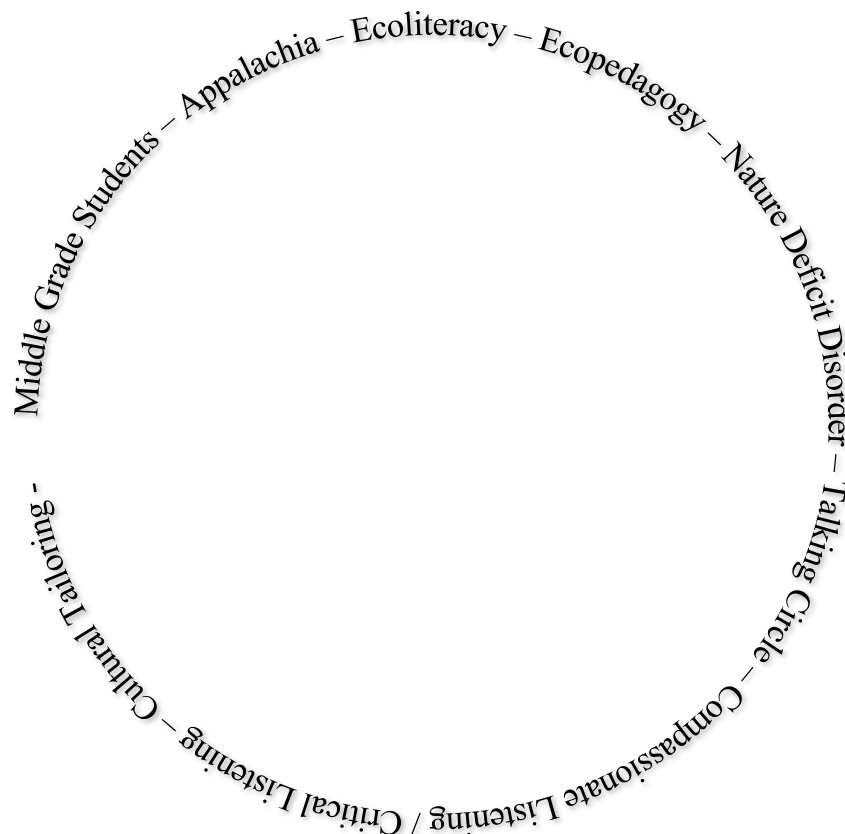
Middle Grade Students

The authors of this article identify as student centered educators, and while a circle has no beginning or end, this story, as presented by the authors, will always begin and end with the students. This study was conducted utilizing middle grade students. The middle grades are defined as the 4th through 8th grades. These are a challenging time for many students, and "Educators now widely recognize the middle grade years, from the ages of 10 to 15, as a special, critical period of adolescent development." (Duncan, 2011, para 6) This study focuses on the 4th grade, the earliest stage of the middle grades. Students' performance during their 4th grade year can serve as a predictor for their

performance and/or completion of high school. (Kieffer, Marinell, Stephenson, 2011) As an identified population with educational challenges that have the potential to impact their future educational status, fourth grade students were chosen for this study.

Appalachia

This study is conducted in, situated in, and concerns students from, Appalachia. According to the Appalachian Regional Commission, Appalachia "is a 205,000-square-mile region that follows the spine of the Appalachian Mountains from southern New York to northern Mississippi. It includes all of West Virginia and parts of 12 other states: Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, and Virginia."(ARC, 2020, para 1) Appalachia covers too large of an area for the purposes of this study. This study focuses on an area of Southern Appalachia in Northwest Alabama. This area, a mix of urban and rural, contains sections identified as food deserts. (USDA, 2011) Food deserts are defined as "an urban area in which it is difficult to buy affordable or good-quality fresh food." (Dictionary.com, 2020) Situating STEAM based agricultural products within food deserts of Southern Appalachia allows this study to take on a special significance for the authors of this study and the student participants.

Ecoliteracy

Ecological literacy, also known as ecoliteracy, is the foundation from which this study's STEAM based agricultural projects began. Ecoliteracy is "the ability to understand the natural systems that make life on earth possible." (Graham, 2018, para 5) The term for this understanding, ecoliteracy, was first used in the 1990s by David W. Orr and Fritjof Capra. According to the Center for Ecoliteracy, children need to learn five fundamental facts of life:

- "Matter cycles continually through the web of life.
- Most of the energy driving the ecological cycles flows from the sun.
- Diversity assures resilience.
- One species' waste is another species' food.
- Life did not take over the planet by combat but by networking"

(Stone, 2012, para 2)

This is further developed by Goleman, Bennett, and Barlow (2012) who developed five practices to help educators to develop ecoliteracy in their students. These five practices are as follows:

1. Develop empathy for all forms of life
2. Embrace sustainability as a community practice
3. Make the invisible visible
4. Anticipate unintended consequences
5. Understand how nature sustains life

Ecoliteracy cannot, however, be fully developed by just following the above mentioned steps. "Ecoliteracy is developed through knowledge and experiences. It cannot be taught in an environmental science class alone. Instead, it needs to be integrated into all areas of curriculum and students need to be provided with opportunities to experience the natural world first hand." (Schimek, 2016, pp. 34-35) A hands on approach, utilizing a multidisciplinary curriculum, was employed by study. This multidisciplinary approach provided students with an opportunity to explore social justice standards as well as science, math, history, and English language arts standards.

Ecopedagogy

When combining a multidisciplinary STEAM curriculum with social justice standards, the result is a curricular transformation from ecoliteracy to ecopedagogy. Ecopedagogy can be defined as transformative teaching rooted "in critical theories and Freirean popular education movements in Latin American…in which educators dialectically problem-pose the politics of socio-environmental connections through local, global, and planetary lenses." (Misiaszek, 2018, pp. 1) This philosophy was explored in 2018 when Padgett (2018) wrote, "With this in mind, a sustainable education system must care not only for the person, but also for that which surrounds the person". (Padgett, 2018, pp. 6) That

which surrounds the person, within the context of this study, is Southern Appalachia, a specific subregion of the United States. According to Kahn (2010), "these frameworks…are centered in, or are otherwise directed from relatively privileged institutional domains based in North America." Kahn goes on to write that the "ecopedagogy movement, by contrast, has coalesced largely within Latin America over the last two decades. Due in part to its being situated in the global south, the movement has thus provided focus and political action on the ways in which environmental degradation results from fundamental sociocultural, political, and economic inequalities." (Kahn, 2010, pp. 19) While not located in the "global south", Southern Appalachia faces many of the same issues of environmental degradation and sociocultural, political, and economic inequalities.

One of the originators of ecopedaogy, Freire, writes, "It is urgent that we assume the duty of fighting for the fundamental ethical principles, like respect for the life of human beings, the life of other animals, the life of birds, the life of rivers and forests. I do not believe in love between men and women, between human beings, if we are not able to love the world." (Freire, 2004) Situating this within the context of middle grades curriculum, this study seeks to analyze students' perceptions of, and connectedness to, nature.

Nature Deficit Disorder

The idea that children are spending more times indoors and less time outside is not a new concept. However, it was not until 2005 that this idea caught national attention. Richard Louv, an author journalist, interviewed parents and children over a ten year period about their experiences in nature. His findings led him to develop the concept of Nature Deficit Disorder. Louve writes, "I coined the phrase to serve as a description of the human costs of alienation from nature and it is not meant to be a medical diagnosis (although perhaps it should be), but as a way to talk about an urgent problem that many of us knew was growing, but had no language to describe it. The term caught on, and is now a rallying cry for an international movement to connect children to rest of nature. Since then, this New Nature Movement has broadened to include adults and whole communities." (Louv, 2011, para 2) For the purposes of this study, Nature Deficit Disorder guided the analysis of students' perceptions of their connectedness to nature.

Talking Circle

Talking circles are one of the traditions that originated with the indigenous people of what is now called North America. Within this tradition, "the process was used to ensure that all leaders in the tribal council were heard, and that those who were speaking were not interrupted." (Currie; Kaminski, 2009, para 2) For the purposes of this study, this format was used with 4th grade students but for the same purpose – to make sure everyone was heard and that those who were speaking were not interrupted (Campbell; Padgett, 2020). Researchers (Lowe,2006; Lowe 2012 Baldwin et al, 2020) have continuously demonstrated the effectiveness of utilizing talking circles when working with students. Organizations such as White Bison, Inc. and Wellbriety Training Institute have also demonstrated the effectiveness of talking circles in addressing community issues. While traditional talking circles are used within indigenous communities, they have also been adapted for use outside of indigenous communities and with non-indigenous or multicultural/multiracial audiences. Prison systems within the United States and Canada have made use of talking circles, also known as peacemaking circles or restorative justice circles, in their work with inmates of all races and ethnicities (Nowotny, Carrara, 2018; Pollack, 2016; Crocker, 2015; Thomas, Bilger, Wilson, Draine, 2019). Teachers have adopted these models for classroom management (edutopia, 2014) and listening strategies. This study draws on each of these models to work with the participating middle grades students.

Compassionate Listening/Critical Listening

In order to create an effective as possible talking circle, compassionate listening/critical listening was utilized. Compassionate listening is defined as "a quality of listening which creates a safe container for people to be free to express themselves and to go to the level of their deep concerns. It simply and profoundly means empathizing with the feelings and condition of people who have been affected by events and circumstances, sometimes of their own doing, and sometimes out of their control. It has everything to do with caring for the state of another human being."(Hwoschinsky, 2001, para 10)

When working with middle grades students, this was an important concept that helped to build rapport amongst the students and between the researchers and the students.

Cultural Tailoring

One issue with conducting a study such as this is cultural appropriateness and cultural appropriation. Careful attention was given to the topic of utilizing a talking circle model. The talking circle model was first developed by, and for, the use of indigenous communities. While the population of this study did include some students with indigenous ancestry, it should not be considered an indigenous community. The other issue was to create a talking circle model that was culturally appropriate and meaningful to the students that would participate in it. Researchers such as Lowe (2020) and Patchel (2012) utilize a format of creating a culturally appropriate models called the Circular Model of Cultural Tailoring. This study utilizes this strategy to create a culturally appropriate and meaningful talking circle model for middle grades students in Southern Appalachia.

Research Design and Methodology

Introduction

The research design for this study was a case study based on the three qualities of exemplary case studies as defined by Janesick (2004):

1. The case study must be significant to the researcher
2. The case study must be complete
3. The case study must be composed in an engaging manner

This study also follows Janesick's format of answering the questions who, why, how, and where. Janesick (2004) explains this by writing:

Who: Explain who the individual is and what the immediate setting looks like.

Why: Describe why you chose that particular student, why you are doing the study, and what changes you propose making at the conclusion of the study.

How: Discuss how and where you are going to conduct the study, what questions you will use, and how you are going to develop some assumptions that you will interpret.

Where: Describe the political context of the classroom, the school, the family, and the immediate community. (Janesick, 2004, pp. 36-37)

Utilizing Janesick's approach allowed the researchers to conduct the case study in accordance with established qualitative methods. In addition to using an established methodology, interview transcripts were provided for member checks and used triangulation during the coding process to assure credibility and validity.

Who

The first of Janesick's (2004) questions in regards to a case study is, Who? This study was conducted using a purpose sample. A purposeful sample was utilized in order to work with a population that met the following criteria:

1. Middle grades students
2. Located in Southern Appalachia
3. Teacher willingness to implement STEAM based curriculum

In order to meet this criteria, a fourth grade class was selected to be the participant population. This population was selected because the study was focused on middle grades students, which are students in grades 4th-8th. The selected fourth grade class is part of a laboratory school, providing access to the researchers and a faculty that was receptive to implementing new ideas. The laboratory school is also located in Southern Appalachia, fulfilling all of the requirements set forth in the criteria.

Why

Every researcher should answer the second question posed by Janesick (2004), which is Why? The authors look to their own lives to answer this question. Janesick (2004) goes on to write that "the case study must be significant to the researcher." This study is of particular personal significance to the authors. Both authors reside in the area in which the study is conducted and have personal connections to students attending the selected laboratory school. The authors have cultural and ancestral ties to Southern Appalachia, providing a personal reason for wanting to conduct research in, and tell the story of, a region not often written about.

Where

Janesick (2004), calls on the researcher conducting a case study to answer the question, Where? This study was conducted in a sub region of Appalachia. This region, known as Southern Appalachia, is of not only personal significance to the authors, but is also of interest to the United States as a whole. In 2010, Southern Appalachia's population was 7,798,620 people. This indicates an increase of over 16 percent. During the same census year, 25 percent of Southern Appalachia's population was under the age of 18. (Pollard, 2011) This study's population is situated squarely within a significantly growing population within a region known for its poverty rates, 15.8% compared to the national average of 14.1%, and unemployment, 4.2% compared to the national average of 3.9%. (ARC, 2019) Southern Appalachia has a growing population, a significant portion of which is under the age of 18, and has higher rates of poverty and unemployment when compared to the national average. These numbers help to highlight the significance of conducting research into how STEAM education can influence middle grades students' perception of their connectedness to nature.

How

In order to gather data and analyze it for this case study, the authors answered Janesick's (2004) question, How? This study utilized a talking circle model created for this project but modeled on that of Lowe (2006, 2012, 2020), White Bison, Inc., and the Wellbriety Training Institute. Talking circles for this studied were culturally tailored for the participant population and conducted four times over the 2019-2020 school year.

Data Collection

Creation of the Talking Circle

The circle allowed participants/students to explore outwardly and inwardly without any barriers or fears of being ridiculed. The way to do this was to chart students' progress made through the Cherokee Talking Circle Method created by Dr. John Lowe. This model focuses on "two cultural themes: (a) being true to oneself and (b) being connected (Lowe, 2006). Thus, the creation of the talking circle began to draw a correlation between being connected to nature is being true to oneself. Using these two cultural themes as a backbone, students were scaffolded into thinking about their own individual role in nature through Lowe's conceptualization of self-reliance of these two cultural themes. Lowe's self-reliance definition is applied to students' role and identity in nature: "(a) being responsible, (b) being disciplined, and (c) being confident" (Lowe, 2006). As a result, goals were created for students to not only see nature, but for students to see nature, connect to it, and see their role in the circle that is nature.

Implementation of the Talking Circle

After hands-on experiences with nature, students were asked to participate in a Connectedness to Nature Survey. From the students' responses, the Talking Circle Facilitator (TCF) examined the responses in order to tailor questions to foster growth and connectedness to nature during the Talking Circle sessions. With the goals of the circle in mind, a path was developed to guide students by using the Connectedness to Nature Survey questions and creating others for students to relate and connect. Outlined below is each Talking Circle Session with goals, questions, and student takeaways from the session. Circle One is an introduction to the Talking Circle Model along with gauging students'

impression about nature and observer of nature. Circle Two focuses on the student's role as nature. Circle Three charts the growth of students' responses of their connectedness to nature. Circle Four reinforces the students' connectedness to nature by observing their big and small roles in nature, and is a call to arms for action to help preserve and protect nature.

Circle #1

There were two major goals of the first talking circle with students. The first goal was to scaffold the students into the protocols and procedures of the Talking Circle Method. The circle was built on trust and community. As a result, the circle began with the introduction of the TCF, and it highlighted the TCF's love of nature and favorite things to do in nature to try to build community and trust with the TCF and the students, who knew each other well. The circle began with a series of questions created by the TCF to help foster contemplative responses based on the Connectedness to Nature Survey and begin building a foundation to observe our part in nature. The foundation questions for students are as follows:

1. What is your favorite hobby in nature?
2. What do you appreciate the most about the nature around you?
3. Do you feel connected to nature?
4. Why should we appreciate nature?

All questions were tailored for students to explore their role in nature and listen to others' roles in nature.

Circle #2

In the first circle, students looked at nature as something to enjoy, and they began to look inward at how they are a part of nature. The major goal of Talking Circle 2 was for students to realize that their role or existence in nature can not only help nature, but it can destroy nature too. Students were briefly reminded of the procedures of the circle before beginning the circle. The Talking Circle 2 questions were as follows:

1. How can we appreciate nature? What activities can we do to appreciate it?
2. How can our actions and your actions affect nature? How do you affect it negatively and positively?
3. In our everyday living, water is important to us. We use it throughout the day. How can we make sure we are not using too much water?

These questions built on how and why students should appreciate nature, and it gave them an avenue to explore their role as humans and nature.

Circle #3

Talking Circle 3 looked at the specifics of the build up of The Talking Circle Method. Since students had been scaffolded into thinking about nature and the cyclic patterns of nature, this talking circle dove deeper into what they learned to build up to the discussions. The first main goal of Talking Circle 3 was to examine an aspect of nature that is small and seemingly unimportant, but this aspect plays a vital role in the students' daily lives and in nature as a whole. The second goal was to chart their progress on becoming more aware and connected to nature since the beginning of the process. The Talking Circle 3 questions were created to chart their progress:

1. Tell me one thing about what you have learned about the worms since you have been working with them.
2. What do worms do? What is their role in nature? Are they good for nature? Are they bad for nature? Are they just kind of there? Why are they important to your garden?
3. Let's imagine that something has happened, some epidemic or something has happened and all the worms in the word are gone. What would the world look like? What would that do for us? How would our food source look?
4. Have you found that you're being more aware of nature? Are you noticing things about nature? If so, what are you noticing?

Circle #4

Talking Circle 4 was the last circle conducted. As a result, the Talking Circle 4 goals were to examine the types of roles people have as a part of nature, how big and small nature is, and how powerful nature is. This circle compares and contrasts how human beings can seem like they have a big role in nature, but compared to massive storms, what can a human do? The goal of this Talking Circle is to see the permanent changes humans can make on nature, but also explores how small humans can be when compared to nature. The questions formulated to achieve Talking Circle 4 questions were:

1. Have you ever thought about how powerful nature is? In what way have you even seen power in nature?
2. How big can nature be? How small can nature be?
3. Let's think about our role in nature as a human and part of nature. Is it big? Is it small? Do we have one in the middle? What role do you play as a human being?

By implementing this model, students were able to grasp the importance of connectedness to nature because they are a part of nature, whether they realized it or not. As a result, students ended the talking circle process with a heightened sense of their role in nature and how to connect to it by observing it from other perspectives. The process pointed students to more sustainable habits from growing crops, reducing their waste of water and recyclable products, and understanding their small and big role in nature as they grow with the nature around them.

IRB Protocols

The steps of the IRB protocols began with obtaining consent from the school site and superintendent to work with their student body. After permission was granted, parental consent was obtained for students to participate in the study along with permission to be audio recorded for the student. After parental consent, student consent was obtained. Student consent was the most important in making sure that the students felt safe and protected. Some students did not choose to participate, and they were allowed to leave the classroom.

Coding and Analysis

The audio recordings of the talking circles were transcribed verbatim and provided to the talking circle facilitator to review and check for accuracy. The transcripts were then coded and analyzed using the five steps identified by Rubin and Rubin (2005) and illustrated in Table 1:

Table 1. *Rubin & Rubin Steps toward Data Analysis*

Step	Action	Purpose
1	Recognize	Find the concepts, themes, events, and topical markers in the interviews.
2	Examine	Clarify what is meant by specific concepts and themes and synthesize different events in order to put together my understanding of the overall narrative. This leads to elaboration.
3	Code	Figure out a brief label to designate each concept/ theme and mark the text where they are found. This allows for the easy retrieval and examination of the data units.
4	Sort	Group all of the data units with the same label together. Then, look for how the concept was seen overall and examine for nuances.
5	Synthesize	Put the concepts and themes together and show how they answer my research questions and produce broader implications.

(Rubin & Rubin, 2005, pp. 206-208).

Each talking circle transcript analyzed for common themes by both authors. The four competencies developed by the Center for Ecoliteracy (Stone, Zenobia, 2009) guided the development of themes. The four competencies are:

1. Head (learning to know)
2. Heart (learning to be)
3. Hands (learning to do)
4. Spirit (learning to live together)

The common themes were then organized in order to create a narrative according to the individual researcher. The researchers then coded their lists, assigning labels and names to each theme. The researchers then organized the themes into larger groups based on the four competencies developed by the Center for Ecoliteracy (Stone, Zenobia, 2009). The individual researches then came together to synthesize the two lists into one list of common themes. This list was then utilized to answer the research questions put forth by the researchers.

Assumptions of the Researchers

The authors acknowledge their own assumptions and biases. As residents with cultural and ancestral ties to the region of the study, the authors acknowledge their personal connection to area and students being studied. As student centered educators, the authors acknowledge that a curriculum that encourages students to connect what they have learned to the world of their lived experiences is of vital importance. The authors also enjoy being active and participating in outdoor activities, and acknowledge that as a motivation for this study.

Presentation of Data

Introduction

The authors utilized the format developed by Rubin&Rubin (2005) in order to gather and analyze the data from the talking circle transcripts. This method provided the authors with a list of themes from which to code according to the four competencies developed by the Center for Ecoliteracy (Stone, Zenobia 2009.) Andriani, Hartati, and Kurniawan (2017) used the four competencies to conduct a narrative analysis of science textbooks. This study utilized their format to present the data collected from the talking circles.

All four themes are based on parts of the body, and the first of these are those related to the head. According to Andriani, Hartati, and Kurniawan (2017), the first competency is demonstrated like this:

Competency 1: Head (Cognitive)
    a. Approaching the issues and situations from a systems perspective
    b. Understanding the fundamental of ecological principles
    c. Thinking critically, solving the problems creatively, and applying knowledge to new situations
    d. Assessing the impacts and ethical effects of human technologies and actions
    e. Envision the long-term consequences of decisions

After analyzing and coding the transcripts, the authors found examples of statements that fall under the first competency, the head. Examples of these statements are as follows:

"So, the reason I appreciate nature is, well, without it, we wouldn't survive for three reasons. One of them, destroying the plants would take away oxygen so we couldn't breathe. Two, without water, we couldn't drink. So that's one of the things that you need. The last one, food. Because there would be no plants to eat. You might say you could eat meat, but, the animals you get the meat from eat plants or other animals."

"*Yes, I know stuff grows back, but, if all the grass is gone, then no grass seeds will be around. So you can't just put water in the ground without any grass seeds for it to grow.*"

"*If we didn't have worms, we wouldn't have really good soil. Yes you could buy soil, but the best soil we have would be worm soil. If we didn't have good soil, then we wouldn't have plants and I don't think you'd have really good all your vitamins and you need vitamins to stay healthy, so then you'd just be eating protein and sweets.*"

The second theme is based on the heart, or an emotional response. According to Andriani, Hartati, and Kurniawan (2017), the second competency is demonstrated like this:

Competency 2: Heart (Emotional)
   a. Feeling concern, empathy, and respect for other people and living things
   b. Seeing from and appreciate multiple perspectives; work with and value others with different backgrounds, motivations, and intentions
   c. Commit to equity, justice, inclusivity, and respect for all people

After analyzing and coding the transcripts, the authors found examples of statements that corresponded to the heart, or demonstrated an emotional connection. A few examples of these statements are as follows:

"*I feel really connected to it because it just kind of, it's just kind of everywhere everything is made up of and we can't get all this without nature and that's why I feel very connected to it.*"

"*Since we've had these talking circles, I just started appreciating nature more.*"

"*Nature is like the reality. Nature is like infinite.*"

The third theme corresponds to the hands and activities that are related to sustainable activity. According to Andriani, Hartati, and Kurniawan (2017), the third competency is demonstrated like this:

Competency 3: Hands (Active)
   a. Creating and use tools, objects, and procedures required by sustainable communities
   b. Turning convictions into practical and effective action, and apply ecological knowledge to the practice of ecological design
   c. Assessing and adjust uses of energy and resources

"*A way you could destroy nature, which no one would unless they were absolutely evil, light a match and chunk it at a tree. So, yeah don't do that.*"

"*A way to not use as much water daily, maybe like only taking two minute showers.*"

"*Sometimes I used to like rip up stuff and like my dad would put down mulch or something and I would just throw it back into the yard. I used to do that but now I don't do that.*"

"*I usually used to just throw it away, but now I tell the teachers if it can be recycled, and if it can, I always recycle.*"

The fourth and final theme is described as corresponding to the spirit, or to a person's connection to the environment. According to Andriani, Hartati, and Kurniawan (2017), the fourth competency is demonstrated like this:

Competency 4: Spirit (Connectional)
    a. Experiencing the wonder and awe toward nature
    b. Revering the Earth and all living things
    c. Feeling a strong bond with and deep appreciation of place
    d. Feeling a kinship with the natural world and invoke that feeling in others

The authors analyzed and coded the transcripts, during which time they found examples of statements that corresponded to the spirit, or expressed a connection to the natural world. Examples of statements the correspond to the fourth competency are as follows:

"The thing that I like about nature the most is probably because it's my friend and I make friends with the animals very quickly."

"You know how people are like, there's no snowflake alike? Also, like no tree alike, exactly alike. There's no fruit exactly alike I don't think, so I've noticed that."

"But also like metaphoric power or whatever which is like it's pretty much like everything started with just nature. The world at first, when it was created, nature was everywhere. There was nothing that wasn't nature on earth."

Analysis of Data

Circle 1
The major takeaways and goals from this circle was the establishment to the correlation of the never-ending circle that was the talking circle in the room to the never-ending circle of nature. Students jokingly referred to the "Circle of Life" from the movie, The Lion King. However, this funny reference applied perfectly to what the TCF wanted the students to realize. The focus of the students centered on how nature feeds off everything, and how they, themselves, are nature. Thus, they further built upon the correlation of how they are nature and nature is them.

Circle 2
Students reflected on the destructive acts towards nature, and how nature is underappreciated because of littering. One student expressed that even eating junk food is littering nature because it litters their own bodies, and as a result, students were becoming more cognitive of their choices not only as themselves but as a part of the circle that is nature. Other students discussed how they could help build up and support nature such as planting a garden. Within this circle, students explored examples of ways to destroy and build nature as themselves and as a part of nature. Students achieved their goal of exploring both their role of helping and hurting nature as they explored actions of their own beings and actions of other beings.

Circle 3
The students reached both goals and reflected on the importance of the worms. One student reflected that each little worm matters because they create and help replenish the soil. As a result, this helps crops and plants grow, and this affects them as beings in nature. Students reflected that, without worms, their food supply would change. In addition, students highlighted that not only would their food supply change, but animals and other aspects in nature would have a changed food supply too. As a result, students achieved goal one in Talking Circle 3 by looking inwardly and outwardly at their role of nature and other roles in nature. They made the correlation that one small, seemingly insignificant worm can make all the difference. Students achieved goal number two by not only stating what activities they enjoy in nature like the first circle, but they discussed what they had stopped doing that harmed nature. Students showed growth by becoming more cognitive of their role in nature.

Circle 4

Students reflected that nature has a lot of power from lighting to natural disasters. However, within these major events, a student reflected that nature can be the size of an electron which forms something. His example was the solar system that works together as a team just like nature, and it begins with a single atom. Many students reflected on how the small aspects of nature make up and create the big aspects in nature. Perhaps summed up the best by a quote from a student saying, "Nature is reality. Nature is infinite." As a result, students discussed their role in nature is just like these atoms. Their roles can be small or big based on their actions as they build up. Students agreed that their actions can either build up to help nature or build up to destroy nature.

Recommendations for Future Research

A review of the data raises questions that require more attention. The coding of the transcripts demonstrates that more statements were related to the hand than to the spirit. More research is needed to explore the causes behind this. This may be a result of the curriculum focusing on the causes and effects of environmental actions rather than encouraging students to reflect on their role within the larger world.

This study was conducted as a qualitative study with fourth grade students. The focus on concrete examples of what they can do to help or harm the environment may be due to that age group's ability to utilize abstract thinking. More research is needed to determine if this trend continues across age groups or if this changes as students are better able to think abstractly.

Conclusion

Throughout the process, students became more aware of nature, and they made connections to the cyclical process that is nature. What started as a simple question of "What is your favorite hobby in nature" turned into "Let's think about our role in nature as a human and part of nature. Is it big? Is it small? Do we have one in the middle? What role do you play as a human being?" Students explored everything from nature's complex circle to the smallest features that create the circle. Students learned their place in nature as a part of nature itself, and that as a part of nature, they have the responsibility to be connected and to help the cycle progress in more sustainable ways. The talking circle reinforced being true to oneself and being connected by understanding their responsibility in nature, being disciplined in that responsibility, and being confident in that role.

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