



JOURNAL OF LITERACY INNOVATION

RETHINKING LITERACY INSTRUCTION



VOLUME FOUR, ISSUE ONE

SPRING 2019

SEAN RUDAY, EDITOR

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EDITOR'S INTRODUCTION

SEAN RUDAY, *JLI* FOUNDER AND EDITOR

LONGWOOD UNIVERSITY

The goal of the *Journal of Literacy Innovation* is to provide a venue for manuscripts that describe innovative and engaging ideas in ways that blend theory and practice. This desire stems from my work as a teacher, teacher-educator, and professional development consultant: many in-service and pre-service teachers I've met in these contexts have asked me how they can apply key research findings to their instruction. I'm thrilled to share two manuscripts in this issue that do excellent jobs of merging important theory and practice in education.

The first manuscript in this issue, "Educators Fostering Academic Rigor" by Kyle LaPaglia and Dr. Vickie Johnston of Florida Gulf Coast University, describes key research-based issues related to academic rigor and provides thoughtful suggestions for educators looking to implement this essential concept in their instruction. The ideas in this manuscript challenge educators to facilitate deep and complex thinking by their students. The authors describe specific ways to do this by sharing concrete recommendations for implementation that are classroom-ready and research-based. These instructional suggestions focus on complexity, student autonomy, strategic planning, instructional rounds, and questioning. As LaPaglia and Johnston explain, these recommendations "can help move students from a teacher-centered classroom to a student-centered classroom by increasing autonomy and giving them responsibility for their own learning."

The next manuscript you'll encounter, "Ecological Literacy in Teacher Preparation: Urgency, Affect, & Agency" by Bernadette Musetti, Ph.D., of Loyola Marymount University, describes an innovative "elementary grades teacher preparation capstone course on education and global issues, where the focus is on nature and the environment." This piece does a wonderful job of merging theory and practice related to a thoughtful and significant educational approach: it provides key information on ecological literacy, shares findings from students' experiences in the course, discusses the benefits of ecological literacy at the classroom and school levels, and provides concrete and thought-provoking instructional recommendations. Musetti explains, "this type of literacy expands awareness of our interdependence and cultivates caring about life, about self, and about others"; her work provides a perfect resource for educators who want to understand the theoretical background of this important approach and implement it in their instructional practices.

I am proud to share these excellent pieces. I hope you will consider adding your voice to this conversation by submitting your work for consideration for publication in a future issue of the *Journal of Literacy Innovation*. For more information on the journal, please visit www.journalofliteracyinnovation.weebly.com.

See you in October 2019 for *JLI*'s next issue!

Sean

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EDUCATORS FOSTERING ACADEMIC RIGOR

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Abstract

Rigor has become more of a common indicator of the instructional practice quality in elementary schools (Pierce Brown, Smith Feger, & Mowry, 2015). With standards being implemented in every state, school administrators, curriculum facilitators, and other educational leaders have become progressively infatuated with the idea of academic rigor (Maye, 2013). Schools all across the country implemented professional development to tackle rigor in the classroom. But, is it being implemented correctly? Do teachers understand what rigor means? Despite cute and engaging lessons, rigorous activities and teaching practices are not being implemented in the classroom. Follow one teacher as he shares research-based practices for implementing rigor in literacy education in a K12 classroom.

Educators Fostering Academic Rigor

Literature Review

What is rigor? It is not doing lots of homework, doing more, providing less support for students, providing more resources, or just one more thing to do (Blackburn, 2013). It is important to challenge our students and encourage them in reflective and critical thinking; however, we must do so in a way that encourages their success. According to Blackburn (2013), “the essence of rigor is ensuring that each student is given the opportunity to rise to higher levels and grow in ways they cannot imagine” (p. 9). Moore, Toth, and Marzano (2017) support this idea and have described rigor as having two components: complexity and autonomy.

The issue in classrooms is that most of the teaching and learning centralize around text books, and classroom teachers inadvertently discourage students from deep thinking because of non-complex questioning and engagement (Rashid & Qaisar, 2016). Moore et al. stated that “complexity refers to the cognitive load that is required by the standard” (p. 43). To work on questioning and complex tasks, lessons must incorporate more rigorous opportunities for

learning and teachers must plan for higher-level questioning which contain text-based and inferential questions.

Assor, Kaplan, and Roth (2002) suggested that choice needs to be provided by the teacher. Also, the teacher must not intrude and needs to tolerate criticism for students to understand their own goals and benefits. Many students do not feel like there is autonomy in the classroom because students do not connect what is happening in the classroom to their life. Autonomy can be achieved if the teacher is useful with autonomy while providing interesting and valuable teaching (Assor, Kaplan, and Roth, 2002). When it comes to autonomy, students are responsible for their learning while they value reflection and take an initiative to learn more (Moore et al., 2017). The responsibility for learning must move from the teacher to the student. The change centers on the teacher's capacity to move from teacher-supported education to peer-supported education. Students develop self-guided skills and take responsibility of their learning. They recognize when they have achieved their learning goals and how to pursue assistance when they do not understand. The educator correctly becomes an instructor and facilitator rather than a keeper of information. As a trainer, the teacher offers backing and direction, moving in when learning swerves off the road. As a facilitator, the educator probes guiding questions when pupils are stuck but at no time gives the students answers. The educator monitors the learning to decide how to guide and where to go next. Teachers recognize their students' abilities well enough to know when and how to support and guide when needed (Moore et al., 2017).

Maye relied heavily on the Revised Bloom's Taxonomy levels to gauge rigor in the classroom (2013). She used the Rigor/Relevance Framework® taken from the International Center for Leadership in Education. This Framework incorporated Bloom's Taxonomy with displayed cognitive process from the lowest to the highest order. Educators identified the knowledge students are expected to attain and the intellectual skills they are to perform. After all dimensions were identified, the facilitators plotted objectives in the Taxonomy table. Maye discovered that most teachers were focused on the lowest order, which was the acquisition of knowledge and capability to recall factual information within the subject (2013). Strategic planning was essential in incorporating rigor in the classroom. Maye (2013) observed many classrooms where students were supposed to know and do what was expected from the standard. Unfortunately, the lessons were not aligned firmly enough for students to exhibit achievement of the planned ability. Adams (2016) discussed rigorous teaching and activities not happening in the classroom despite cute and engaging lessons from teachers. It is vital that educators cautiously inspect the targeted standards first and then choose the reading materials, resources, and math manipulatives that provide outstanding resources for representing the targeted abilities (Maye, 2013).

Students do not have an exact, thorough understanding of the standards that are taught in the classroom (Adams, 2016). Teachers should be increasing rigor by critiquing, analyzing, and explaining their reasoning. Students are not just answering questions. They are participating in rigorous activities and instruction using constructive response testing, mastery of standards, and in-depth discussions to generate a stimulating setting that prepares all students for success. Every student, including regular education, gifted, and English language learners, faced with rigorous

work so they can increase a greater depth of knowledge of all the content taught in the classroom (Adams, 2016).

Student success grows when educators develop rigor of instruction while enthusiastically engaging the students with the lessons (Johnson, 2010). Johnson also stated that students must have a level of achievement that meets the demand of the twenty-first century through increased rigor. One way of measuring rigor and engagement in the classrooms was for teachers to collaborate and work together to study student exemplars by examining the level of assignments, evaluations, homework, and deliberations in the classroom. The teachers should visit each other's classrooms and meet with each other to review student work (Johnson, 2010).

Another issue in classrooms is questioning (Ness, 2017). Children are naturally curious and come to school ready to ask questions, but these types of questions disappear and gradually decrease. There is less time and room for student generated questions. Now, teachers are the ones generating questions. Students are answering questions that the teachers pose. Much of the teaching and learning of students centers around the text books (Rashid & Qaisar, 2016). Critical thinking happens when there is questioning. Many students are in classrooms where the teacher uses series of set factual, low level information built on questions that barely challenge individual critical thinking skills because the answers are easily found in the text (Rashid & Qaisar, 2016).

Dialogue is a piece of questioning. Wink (2011) described four phases of creative dialogue; descriptive, interpretive, critical/multicultural/antibias, and creative/transformational. Creative dialogue took the "passivity out of reading and transformed it into engagement and inquiry" (Wink, 2011, p. 65). Wink derived many ideas from three teachers, Socrates, Plato, and Aristotle, and stated that Socrates' legacy was the Socratic dialogue. She compared the Socratic dialogue to peeling the layers off an onion and the center of the onion was "filled with the complete meaning of truth, or love, or justice" (Wink, 2011, p. 94). Wink argued that Socratic dialogue did not cost anything, and it could not be bought. It required an expert teacher. Socratic seminar gave accountability to all students in the classroom. The next teacher that influenced Wink was Plato, who contributed through his longing for democracy to play a bigger role in public schools. Aristotle, the third teacher to be mentioned, believed that living forms were always seeking improvement and even perfection through his study of nature. Wink also reviewed Vygotsky in which he "served as a bridge to extend critical teaching and learning through dialogue to Dewey and the modern world of today" (Wink, 2011, p. 99).

According to all this research, using rigor in the classroom is a problem that needs to be addressed and administrators need to work with their staff to increase complexity in their schools. True rigor is the result of weaving together complexity, student autonomy, strategic planning, instructional rounds, and questioning in a way that maximizes the learning for each student.

Implementation

Schools can use many strategies to foster rigor in classrooms. Research has shown that complexity, student autonomy, strategic planning, instructional rounds, and questioning could

benefit a classroom significantly. Teachers need to use these strategies to further the students' learning and understand that they need to slowly change their classroom environment so it is conducive to more complex tasks. Every student can be challenged to their potential if only teachers would give them a chance. The following are recommendations to help foster rigor in schools.

Complexity

In order to enhance rigor, you must increase the complexity of the assignment. This shifts the attention from memorization of facts to application of the assignment. One activity I used with complexity in mind was expository writing. The students had to pick their favorite time of year. After they selected their favorite time of year, the students had to come up with three reasons and describe each of the reasons. The students used technology to research their favorite time of year. The students wrote a five-paragraph essay comprising of an introductory paragraph, three paragraphs for the body of the piece, and a conclusion. After the paper was finished, the students created a PowerPoint. Educational technology is critical to increasing rigor in the classroom; however, it is important to remember that technology is just a tool to differentiate your instruction.

Another activity for increasing complexity involves vocabulary. Using a graphic organizer, students can identify vocabulary words in their reading. As they begin reading, students should look for characteristics of new terms and should be given opportunities to discuss the terms as well as what they think about the information they record on the graphic organizer. Not all terms will lend themselves to an "example/non-example" examination of attributes and other terms do not have examples that are distinguishable from the characteristics. The implementation of discussion and writing provides an explicit multisensory approach to concepts and vocabulary and makes the vocabulary terms more contextual and pragmatic, making the words vivid and applicable, which helps students categorize new terms and gives meaning to concepts learned. After observing modeling for the first few weeks of school, students could find, define, use the word in a sentence, and describe an antonym or synonym using a graphic organizer. Creating an environment where students are expected to learn at high levels means moving beyond activities that require students to simply recall information. This project allows students to apply their knowledge in several different ways by differentiating instruction and embedding complexity at every level of the curriculum.

Student Autonomy

Student choice is a crucial element to engage students on a path toward lifelong learning. Autonomy is fostered when students see their perspectives valued, are encouraged to share their thoughts and feelings, and are encouraged to make choices in learning activities. One of the ways in which this vision plays out in my classroom is by honoring students' interests and creating a safe space in which to respect one another's voices. In order to encourage this with my students, I gave my students a survey at the beginning of the year about their interests and what they wanted to learn throughout the year. The students were able to choose their subject and research information about it. First, the students had to make a goal on what they wanted to

accomplish. Most students wanted to make a video or PowerPoint on their specific content chosen. The students had to brainstorm the criteria for their project; as the teacher, I was there to facilitate and answer questions. The students guided their own learning and some projects changed as the students researched and found other ideas. It was very powerful to see the excitement as they researched. This assignment was effective because it was designed to help gradually release the responsibility for learning to my students, giving them more autonomy. We know there is a link between motivation and engagement, and students respond more positively to rigor when they value what they are doing. While it is important for students to determine what is relevant to them, at times teachers need to scaffold students, making those connections to specific content or skills. Criteria, such as complexity, content depth, and critical thinking, communicate content and understanding that are important. These criteria become the main areas for the evaluation of learning tasks. As teachers work with students to develop rubrics that incorporate criteria and specify levels of proficiency for each criterion, they need to clarify the differences among student responses that meet grade-level expectations and content standards.

Teachers can incorporate student autonomy through learning goals. Creating and teaching about learning goals can empower students to want to do more. A teacher can give their students a voice by allowing them to create their own learning goals and content while the teacher ensures that their created goals reflect the required standards. The students will learn how to meet the standard and what work it takes to achieve mastery. The next step in the development of a learner-centered classroom would be to train students to identify their own preferred learning styles and strategies. Eventually this leads to students developing their own skills for setting objectives, planning their self-study, and even assessing themselves. Rigor without relevance can result in students who do well academically but seem to struggle in the real world.

Strategic Planning

Strategic planning provides learning experiences using effective research-based strategies that are embedded with best practices, including the use of technology. As schools implement new levels of rigor, we should be seeing much more evidence that teachers are strategically planning to gradually scaffolding student learning in order to help students reach the highest levels of critical thinking. Rigor involves high expectations for students, but it also requires educators to build the scaffolding and provide support and encouragement to students in their efforts to learn. An effective system that increases rigor includes personalized relationships between adults and students, effective scaffolds that bridge the gap between what is known and what needs to be learned, and strategic planning for students.

Each week, my instructional team would meet to discuss the next week's lessons and plans. At this meeting, we discussed questions to be asked during each lesson that would foster rigor in the classroom. When working with their colleagues, teachers can bring up questions by using the standards. Reviewing and preparing before the meeting can ensure constructive discussion on higher order questioning and activities. Question stems from Bloom's Taxonomy would be used. The idea was to foster inquisitiveness in the students. Not only would the teacher be directing questions, but there was always a time in the lesson where students could ask questions of the teacher or other classmates. The culture in my class was always nurturing and safe. The

students were able to ask questions if they did not understand without ridicule. The questions were scaffolded to provide support for struggling students and students who could go beyond the target for the day. It is effective only if the teacher provides a support for all students and holds students to high expectations.

Effective strategic planning enables classroom teachers to implement rigor purposefully. This includes providing intentional opportunities to consistently deliver instruction that is differentiated to meet all students' needs and integrates real-world, inquiry based, meaningful instruction. It can provide opportunities for extension and enrichment investigations for all students; consequently, this must happen regularly.

Instructional Rounds

According to City (2011), there were “three common elements of improvement: classroom observation, an improvement strategy, and a network of educators” (p. 36). Instructional rounds were not about correcting problems with teachers. Instructional rounds were about recognizing what is occurring in different classrooms, how a school community create those outcomes, and how the staff could create learning that they want to see. (City, 2011).

In my school, teachers were able to visit other classrooms for instructional rounds. The administrators would schedule different times throughout the day when teachers could view instruction of other teachers. Examples were classroom management, guided reading, and student grouping. The teachers and administrators would debrief after the instructional rounds and discussed what they could implement in their own classroom. Debriefing was important because it directs staff into recognizing the following level of work (City, 2011). Debriefing was never judgmental. I discussed the notes I took and what I saw that I liked most. There was always a discussion about parts of the lesson or layout of the class that I would want to implement. This was very beneficial and helped the staff not be isolated. This assisted in the entire staff understanding the school goals and what was expected of them in the classroom. It is important to work as an entire staff understanding what needs to be done as a cohesive school. Instructional rounds are not evaluative and can “build a common understanding of effective learning and teaching” (City, 2011, p. 41).

Instructional Rounds can be an effective part of learning how to implement rigor. Teachers should request to visit another classroom to see how they could improve. Taking initiative and discussing weaknesses with the administrator could open the communication and foster better teaching. There is nothing wrong with observing another teacher to gain valuable teaching experience. Instructional Rounds, if implemented effectively, can be one of the most valuable tools to establish a collaborative environment and enhance a teacher's pedagogical skills.

Questioning

Another way to implement rigor is through questioning. Implementing cognitive rigor is very different from teaching in traditional educational settings that are driven solely by objectives and outcomes. Cognitive rigor promotes and encourages students to think deeply and to express the depth of their learning by responding to questions that will be used as formative and summative

assessments; consequently, assessments set the instructional focus for learning. This can be accomplished by engaging students in extended conversations through open-ended questions and coincides with the emphasis in developing critical and higher-level thinking skills and depth of knowledge. Implementation in literacy requires that we do not simply encourage students to tell, retell, or describe events but give explicit guidance on vocabulary, syntax, and pronunciation. As Harvey and Goudvis (2007) stated:

... we peel back the layers of our thinking; show kids how we approach text and make visible how understanding happens in a variety of reading contexts. To demystify the comprehension process, we share the thoughts we have as we read, surfacing our own inner conversation with the text so kids can do so independently. (p.45)

Modeling by the teacher is very important so the students understand the comprehension process. At the beginning of the year, I would stop and ask questions about what I just read. The students would pick up on what the answers were as I read and would answer the questions. I modeled questions that were open ended, that did not have a right or wrong answer, or I knew would be further in the text. By the end of the year, it was hard to get through a book without many questions from the students.

The teacher purposefully asks questions with ascending cognitive complexity in order to help students deepen their critical thinking regarding the content and require students to justify their thinking or predictions by encouraging them to refer back to the text. Helping students process content systematically engages students in processing and generating conclusions about content, shifting the focus from the teacher to the student. Scaffolding and fostering metacognition, predictions based on the pictures or text, comprehension monitoring, retelling, summarizing, making connections, teaching vocabulary in context, rereading for clarity, inferring based on the text, and identifying author's purpose are all research-based strategies for literacy; but in a student-centered model, the students are expected to work with, summarize, and elaborate on content, not just listen as the teacher discusses or lectures.

Another important aspect of rigor is that it promotes cognitive involvement by challenging students to explain what they have learned in their own way. At the end of each lesson, I would ask the students what they learned during that lesson. At first, many students would just give one or two-word answers to just be done. However, I questioned them deeper with open-ended questions using how or why. To get them motivated, I would have the students pass a football around the room for students to share what they learned, and they would earn a prize. Another way to incorporate this in a classroom would be for teachers to have students answer questions and then have another student repeat what the first student answered. This ensures that every student is paying attention and learning rigorous answering techniques from their classmates.

Students must learn how to become deep critical thinkers who can sift through and process large amounts of information and then use the deeper knowledge they gain in a variety of contexts. It is the role of educators to provide learning experiences that encourage deep examination of knowledge. In this way, questioning increases the cognitive rigor and leads to a deeper comprehension for all students.

Conclusion

Based on research, increasing complexity and autonomy are the first steps to increasing rigor (Moore et al., 2017). To grasp the right intellectual complexity and autonomy, teachers need to slowly deliver accountability for learning to the students. The pupils will value reflection and knowledge and want to absorb more if they have true autonomy. The change centers on the teacher's talent to change from teacher-supported education to peer-supported education. Pupils develop self-guided skills and take responsibility for their education. The teacher will then really transform into a coach and implementer instead of the keeper of information. As a mentor, the teacher will guide and offer support when learners are off track or need guidance. Teachers can achieve this through intentional planning (Moore et al., 2017).

A great deal can happen in the life of a student when rigor is embedded in the foundation of the class. To accomplish classroom rigor, the educator will need to design teaching cautiously, starting with unpacking their standards and grouping learning goals on a scale aligned to the taxonomy. This will become the support and structure to their teaching. Then, teachers produce lessons using the instructional strategies appropriate with the goals and the taxonomy levels of the goals. This can be done through collaboration with other teachers to lessen the load of planning for rigor. My students always wanted to work on their own without me teaching. It would have been better for my students to be more peer-supported. I believe that getting these students to this point through intentional planning is important in turning a classroom around.

After the planning, Moore et al. discussed participating in instructional rounds (2017). They were one of the most valuable methods an organization or school could use to improve teachers' instruction and advance a culture of teamwork. Instructional rounds were when teachers opened their classrooms to their peers to see. The two goals of instructional rounds were to provide feedback to the teacher being visited and for teachers to compare and analyze their own practices in their classroom (Moore et al., 2017). I have participated in instructional rounds and found it was vital in my learning as an educator. It opened the isolation of my teaching profession and showed me different strategies that were working in the school. It made the teachers more open and helped the school culture.

Maye (2013) also believed in strategic planning. She called it Plan 5. Out of all of the questions during the lesson, educators had to propose at a minimum of five questions addressing the standards using Bloom's Question Stems. They precisely comprised questions for the cognitive domains of analyzing, evaluating, and creating. When there were responses from students, the teachers would have to give feedback by restating, rephrasing, and reinforcing students' responses to explain and authenticate responses for the whole class (Maye, 2013). This would be a great idea to use in planning. Too much of planning is used to come up with materials and discuss what teachers will use during lessons. Not a lot of planning, in my experience, is used to discuss what the teachers and students would say. It is so important to plan questioning so that the lesson is meaningful and rigorous and the students get what they need according to the standard.

Using questioning strategies will also help foster rigor in the classroom (Ness, 2017). When students examine and ask questions, they involve their higher-level thinking skills. They grow their knowledge in a self-directed way. Questioning is a practical and dynamic teaching approach in encouraging critical thinking of elementary students (Rashid & Qaisar, 2016). The clear impression of questioning strategies in encouraging critical thinking between students offers reinforcement to use questioning methods in elementary schools (Rashid & Qaisar, 2016).

In order to prepare students to develop the skills they need to succeed in life, teachers must provide experiences that are more challenging, and increasing rigor plays a vital role. Students must be expected to learn at high levels and teachers can foster this by creating more rigorous opportunities for learning. The teaching ideas listed above can help move students from a teacher-centered classroom to a student-centered classroom by increasing autonomy and giving them responsibility for their own learning. This creates an environment where students can practice their critical thinking skills in a positive learning environment.

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Author Bios

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ECOLOGICAL LITERACY IN TEACHER PREPARATION: URGENCY, AFFECT, & AGENCY

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Abstract

In this article I describe an elementary grades teacher preparation capstone course on education and global issues, where the focus is on nature and the environment. As part of this course students write a thesis paper, design a curriculum project, investigate and report on environmental advocacy, and read widely on the topic of ecological literacy. Additionally, they participate in an intensive study abroad trip to Costa Rica, where they are immersed in mangroves, rainforests and other natural settings, and visit several schools whose missions privilege environmental literacy. Student reflections on the entire course as well as on the immersion experience were collected and analyzed for emergent themes. Findings reveal that students were impacted primarily in terms of their knowledge, affect, and behaviors, and were inspired to promote ecological literacy and nature-based learning in their future classrooms. A primary means by which students (and instructor) were transformed and became further motivated to learn, experience, and teach others, was through the development of biophilia, which is our affinity for other life forms and our innate tendency to seek connection with nature.

Ecological Literacy in Teacher Preparation: Urgency, Affect & Agency

Introduction

When I was young, one of my favorites albums was Bob Marley's *Catch a Fire*. Decades later I have caught such a fire. For me it is slow burning and it burns from the inside out. It is also contagious—others catch it. This beautiful burning contagion is a growing biophilia, which E. O. Wilson (1984) hypothesized as our innate tendency to seek connection with nature. Biophilia allows for a deep love and reverence for all life forms, from fungi to the Earth herself. As a teacher educator I have been compelled to tell others about this new love, not unlike someone who has discovered her soul mate. It has fueled a passion to cultivate this love for the Earth among my students—future K-5 teachers, who in turn want to cultivate it among their elementary grades students, in order to create a better world and to live lives in greater harmony with nature.

This caring creates the motivation for wanting more knowledge and for wanting to become more literate about the Earth, her ecology, and our human place as nature, rather than as separate from or superior to nature. We live in a world in which with each passing day we are more inextricably linked—economically, socially and environmentally. This globalization requires us to be good global citizens if we are to survive and thrive. Learning about the Earth as our common home can promote more responsible local and global citizenship, greater well-being, sustainability, social justice, and ultimately the common good, where that is linked to stewardship of the Earth, which has its roots in education.

Education has as its Latin root the word *educere*, which translated means “to draw out” or to see the potential in something and then develop it. The preeminent ecologist David Orr (2004) suggests that what needs to be drawn out of us is our affinity for life, in order to build humane and sustainable societies. This paper is an attempt to describe how I was able, to some extent, to lead my students toward greater ecological literacy by seeing their potential for biophilia and by drawing out their affinity for life. The ultimate goal of my work with pre-service early grades educators is to develop ecological literacy, or “ecoliteracy,” which is “the ability to understand the basic principles of ecology—the processes by which the earth’s ecosystems sustain the web of life—and to live accordingly” (Stone, 2017, p. 36). A natural, authentic and efficacious path leading to this end is through developing social emotional intelligence, which begins with a budding biophilia, which has the power to transform the mind. This new mind, made possible through new awareness, often has as its starting point the recognition that we are of the Earth—oxygen, carbon, hydrogen, calcium, sodium and so on; we are wholly dependent upon the Earth’s elements and systems, a reality that now lives prominently in my consciousness.

The Study

In my current professional position I direct the undergraduate elementary grades teacher preparation program at my institution. As such, I have the privilege and responsibility to shape the program and to provide curricular leadership and intellectual guidance. I feel strongly that teachers need to know as much as possible about the complex world in which we are living. To this end, I recently added as program requirements a world geography course and a capstone course. The capstone course, which I developed and teach, is on Education & Global Issues, where our global issue focus is “Nature and the Environment.” I developed this course because I feel compelled to continually improve the program in order to graduate increasingly socially aware and ecologically conscious teachers, who will go into elementary schools, both public and private, able to promote ecological literacy, and thus our collective wellbeing. As part of this culminating teacher preparation capstone course we visit Costa Rica, a country known for its biodiversity and sustainable practices and policies. There we visit three schools, two of which are focused on teaching about the environment, and both do so in, through, and with nature. We learn a great deal about species interdependence, the importance of biodiversity to maintaining ecological balance, and about advocacy, including the establishment of the critically biodiverse Children’s Eternal Rainforest reserve in Monteverde, which my teacher preparation students

learn was originally funded largely through the efforts of elementary grades students in Sweden holding bake sales!

In this paper I describe findings from data gathered from my pre-service teachers across two contexts during their capstone course on the environment. Of the fourteen female students in the course, ten went on the Costa Rica immersion trip; four students had other commitments and were unable to participate. This course was one of the immersion abroad trips supported by the liberal arts college at my institution, through which all students with financial need are supported, such that no student is unable to participate due to financial constraints. Toward the end of the intensive eight day immersion trip, the students—all future teachers, were asked to reflect and comment verbally on what had most impacted them regarding their study abroad experience, which came half way through the semester-long course during the university spring break. Notes were taken during this debriefing session in which each student shared her reflections at the end of the trip, while still in Costa Rica, regarding what had most impacted her about the immersion experience. At the end of the course, these same teacher candidates wrote final reflections, where they were again asked to focus on what had the greatest impact, but this reflection encompassed the entirety of the course and all fourteen students. (In both reflections students were also asked what they would recommend or change to improve the course and the immersion experience.) A content analysis was done on both sets of student reflections, looking for themes within each set of reflections, as well as across both sets of students' comments. For the final written reflections, students were told they could put their names on their reflections or not, whichever they preferred. Many chose to attach their names to these final reflections. Findings from students' reflections are discussed below, following a review of relevant literature, which provides context for the study and the student experience.

Educational Approaches & (Eco)Literacies for a New Age: The Anthropocene

We are living in a new human dominated epoch and geological era—the Anthropocene, the Age of Man, in which Earth's systems will be under increased pressure to support approximately 10 billion people by 2050 (Ellis, 2018), a mere thirty-one years from the date of this writing. This fact, along with other realities, including the 2018 International Panel on Climate Change (IPCC) report creates “an urgency we ignore at our peril” (Assadourian, 2017, p. 5). The Anthropocene is characterized by

...corrosive spillages and frightening excess of broken ecological boundaries, damaged ecosystems, poisoned oceans, plastic landscapes, deforested landscapes, toxic multispecies exchanges, nuclear holocausts and mushroom clouds piercing the once sacred demarcation between ground and heaven, rising carbon emissions, rising sea levels, oil spillages, loss of biodiversity, and proliferation of the horrific, evinced not merely in terms of genetic mutation but in our evolving analyses and capacities to notice how bodies interpenetrate other bodies, often in monstrous and unpredictable ways. What the Anthropocene refers to is the stunning impact of human activity on a now damaged

planet; the very conditions of this epoch imperil both those who are blameworthy and those who are ‘innocent’ (Akomoalfe, 2018).

Given the realities of this age, we must help our students to be hopeful and inspired about the future, knowing they can persist and make a difference, rather than feeling defeated and powerless, through what Macy & Johnstone (2012) refer to as “active hope.” Jensen (2006) claims that hope alone, without real action keeps us chained to the same system that created the current reality and is causing the destruction of the Earth. And he adds, only false hope would allow us to think that the system is going to inexplicably change; hope is a secular way of keeping us in line. Rather, he urges us to realize the agency we have to protect the people, things, and places we love (and is so doing become dangerous to those in power).

While students in the capstone course studied difficult material and seemingly intractable problems, their approaches and their work, including their curriculum units, advocacy projects and theses were creative, solutions-based, and diverse. At the university and program levels we are preparing students to be “career ready,” but also to be stewards and advocates who are prepared attitudinally and pedagogically to create a healthier, safer, and a more just and sustainable world. Clearly “career ready” for all elementary grades educators must come to include the knowledge, skills, affect, dispositions, and behaviors associated with an ecologically literate person. Indeed, one wonders why, given what we know, this is not already the case, (beyond what is too often only a cursory teaching of discreet environmentally related science standards).

There is a growing body of research and knowledge about the importance of Earth Education. We see this evidenced by the U.S. Department of Education’s designation and recognition of Green Ribbon Schools, the nature-based early childhood education and forest schools movements, our recognition of concepts such as “nature deficit disorder” (Loev, 2013), the growing field of ecopsychology—the study of our relationship to the natural world, as well as the growing interest in ecotherapy to bring about more balance and to address numerous issues, stresses, and disorders. Many states have developed “blueprints” or other frameworks for environmental literacy. Across many disciplines there is an increased interest in ecology. However, the silos in which higher education often operates, do not promote the type and degree of interdisciplinarity and systems thinking needed, but elementary grades teacher preparation is a place where the possibility for integration and interdisciplinarity is natural and relatively achievable, where such a goal exists.

A systems approach is critical, not just for understanding ecology, but in order to see the connections of all things, including our buying habits and the interaction of human and natural systems (Goleman, 2010) and the connection between policies and irrevocable planetary disasters (Orr, 2017). Offering students practical, relatable ways to see these connections of all kinds is important in terms of understanding our interdependence, which can also promote a desire among students to be good stewards of our shared home. Across the grade levels teachers are required to meet standards and teach content linked to Earth education and the environment

(for example, food webs, water cycles, energy systems etc.). Skilled teachers at all grade levels, from preschool on have always made these types of lessons accessible and comprehensible in age appropriate ways. Asking students to go the extra step in their thinking regarding their knowledge and application of this content to their lives is important in terms of students being able to use their learning to understand their impact and to make decisions. For example, even young students can do a very simple survey that will give them an idea of their carbon footprint, or their impact on the environment. One tool shows this in the number of Earths it would take to sustain one's lifestyle. David Orr argues that students attending public schools at all levels, from elementary to university should study water, understand its meaning, and become involved with local watershed restoration projects. He suggests that as we come to understand the meaning of water, we may well come to understand the meaning of being human, as water is the mother of all life. He states poignantly "When the waters again run clear and their life is restored we might see ourselves reflected whole" (Orr, 2004, p. 59). Such understandings are part of what it means to be ecoliterate.

Ecoliteracy

Frameworks. The Center for Ecoliteracy has distilled years of research and experience on ecoliteracy down to four basic principles—nature is our teacher; sustainability is a community practice; the real world is the optimal learning environment; and sustainable living is rooted in deep knowledge of place. Embedded in each of these are numerous other principles (Stone, 2017, p. 37).

There are various definitions of environmental education, environmental literacy, and ecological literacy or ecoliteracy, as well as attempts to tease out the distinguishing features of the various frameworks and approaches, where for example, some consider ecological literacy a subset of environmental literacy, but most frameworks share some version of similar key components around affect, knowledge, cognitive skills and behaviors (McBride, Brewer, Berkowitz, and Borrie, 2013). These frameworks and their components have evolved over time to include the concepts of sustainable development, resilience, as well as a "common worlding" approach (Nelson, Pacini-Ketchabaw, & Nxumalo, 2018; Taylor, 2017b) in which humans and more than human species live well together with the earth. McBride et al. (2013), explain that what most differentiates ecoliteracy from environmental literacy

...is the clear emphasis on sustainability, and the introduction of the spiritual, holistic components, expressed in terms of 'celebration of Creation' (Orr, 1992), 'spirit,' and 'reverence for the Earth' (Capra 1997, 2002, Center for Ecoliteracy 2013), and 'expansion of the soul' (Wooltorton, 2006)....An ecoliterate person is prepared to be an effective member of sustainable society, with well-rounded abilities of head, hands, heart and spirit, comprising an organic understanding of the world and participatory action within and with the environment (p. 14).

McBride et al. further explain that Fritjof Capra and the Center for Ecoliteracy include in their framework the key components of most other frameworks, which are head (cognitive), heart (emotional-affective), hands (behaviors) and a fourth level being the spirit/connectional, which includes “experiencing wonder and awe toward nature, feeling reverence for the Earth and all living things, and a strong bond with and deep appreciation of place, *feel kinship with the natural world and invoke that feeling in others*” [emphasis added] (p. 15). Throughout my experience teaching the capstone course, it was the profound experience of this fourth feature that was radically transformational for myself, as well as for my students. Of course this spiritualism and experience with and of nature is not new and modern era Transcendentalists such as Emerson and Thoreau had written of these ideas well over a century prior. It is the explicit inclusion of them in different, less romantic and more dire contexts and as aspects of more recent educational models and ecological frameworks that has changed. A related and important key distinction in these various approaches is between those that are more human centric, versus those that are more ecologically inclusive and less anthropocentric, where the latter take into consideration the value of all life, sentience, and earth forms, beyond their primary usefulness for sustaining human life on the planet and where humans are perceived as primary, separate from, or superior to all other life forms.

A major organizational force doing important work in this area is the North American Association of Environmental Education, which has developed many resources, including the Environmental Issue Forum. In 2011 it published a framework for assessing environmental literacy, which details specific competencies, knowledge and dispositions, which lead to and allow for particular behaviors and “action competence,” as well as their definition of an environmentally literate person as

...someone who, both individually and together with others, makes informed decisions concerning the environment; is willing to act on these decisions to improve the well being of other individuals, societies, and the global environment; and participates in civic life. Those who are environmentally literate possess, to varying degrees particular knowledge and understandings of a wide range of environmental concepts, problems, and issues; a set of cognitive and affective dispositions; a set of cognitive skills and abilities; and the appropriate behavioral strategies to apply such knowledge and understanding in order to make sound and effective decisions in a range of environmental contexts. This definition treats the primary elements of environmental literacy—the cognitive (knowledge and skills), affective, and behavioral components—as both interactive and developmental in nature. That is, individuals develop along a continuum of literacy over time—they are not either environmentally literate or illiterate (Hollweg et al., 2011, p. 5-16).

As explained here, it is important to understand that environmental literacy, like all other types of literacy, is developmental. Students become literate over time—at no point is a student either fully literate or illiterate. Fundamentally, an ecoliterate person understands that as a species we are dependent upon the earth and have a deep need for nature, especially given the world of social media and technology in which most of our lives are situated. We are coming to better

understand the realities of nature deficit and our need to cultivate biophilia, as well as the many benefits of learning in and through nature. Students in the capstone course experienced learning in and with nature across multiple contexts, for example, as they did nature-based art in the rainforest as a form of personal expression, visual literacy, and reflections of lived experience, which included, for instance, a tribute to a deceased loved one and recognition of a life moving toward greater balance over time.

Provocations. However, even this approach of immersing students in nature is problematic in that it presupposes that we are outside of and separate from nature, and so needing to go ‘into’ or “back to nature” (and in the case of the capstone course this was achieved somewhat ironically by creating a large carbon footprint by flying to a foreign country to be in nature). Nelson et al. (2018) make this point regarding the concept of *returning to* nature and argue that nature-based education is often against a backdrop in which nature is “utilized” in an extractive, colonial, and anthropocentric approach characterized by human exceptionalism, where children are viewed as future fixers, rather than in a common world with all other humans, as well as the more than human.

Nelson and colleagues present this “common worlding” approach in which humans are not the “keepers” of this common world, but where human and the more than human attempt to live well together. She and her colleagues investigate a wide range of ideas and issues with young children in forest schools through exploration and inquiry, including concepts such as sentience and climate change, where for example students learn that trees “talk to each other” and also sweat, seed clouds, change weather patterns, and indeed are sentient beings. This work is important for several reasons, including the emphasis on indigenous presences and consciousness surrounding indigenous lands and ways of knowing (which have been appropriated quite literally, and physically, in the case of the former), resistance to human centered frames of reference, and questioning and problematizing of dominant assumptions regarding nature-based and environmental education. Learning to think and perceive outside of our usual paradigmatic prisms is fundamental to becoming more ecoliterate. Teacher preparation programs can promote this by guiding students to become cognizant of the frameworks within which they are operating—political, ethical, social, economic, and so on. One fundamental way in which the social and ethical come together meaningfully and in potentially powerful ways that can and do promote ecoliteracy is through cultivating social emotional learning and intelligence.

Pathways. Within the study and practice of ecological literacy, it is generally well understood that social emotional learning is a primary pathway toward becoming ecoliterate. New pathways become perceptible as we develop our ecoliterate consciousness and begin to question dominant paradigms and their consequences, including, for example, neoliberalism (Martínez-Rodríguez, Vilches Norat, and Fernández-Herrería, 2018). Becoming ecoliterate allows us to considering alternative philosophies and other ways of existing and interacting in the world, ways which may help to walk us back from the edge of ecocide, such as the African concept of *Ubuntu*, meaning “harmony,” but more broadly where everything in the cosmos is connected and we therefore have a moral obligation to care for other people, species, and the Earth (Rodenberg and Bell,

2017). *Ubuntu* embodies the combined essence of social emotional intelligence and ecological intelligence. For future elementary grades teachers in particular, their first step on an ecoliterate path can begin with the understanding that “all education is environmental education...by what is included or excluded we teach the young that they are part of or apart from the natural world” (Orr, 2005, p. xi).

Findings

Many of the components of ecological literacy described above, including understandings, dispositions, and behaviors emerged in various ways in students’ course reflections. A content analysis of the students’ final course reflections showed that they were impacted in three main ways, all of which intersected, where the main categories of themes that emerged were:

- Greater knowledge and awareness of ecological issues or ecoliteracy, and a desire to teach what they had learned to their future students;
- Affective changes and relationships, with self, others, nature, and the Earth—a growing biophilia and social emotional intelligence;
- Behavioral impacts and a sense of agency, which included inspiration and awareness of one’s ability to make a difference in the world and to promote social justice, as well as to reflect on one’s actions.

The following illustrative excerpts reveal ways in which these main themes emerged separately, as well as how they overlapped within students’ written statements. I underlined these main themes in the first quote below in order to illustrate this—how themes emerged separately and how they overlapped. One student wrote:

“This class exposed me to so much information regarding the environment. I was not aware of how much it would influence me as a future educator. I grew a love for nature. The relationships I made in this class, the immersion experience, and the research done truly changed my life for the better. I am so grateful for this class and cannot image my [college] experience without it or without all of you.”

Another student in the course, who did not go on the Costa Rica immersion trip, wrote:

“The most impactful part of the class was the environmental consciousness that I gained. This gave me a sense of purpose as a teacher and a student in that it made me passionate about being an advocate for environmental literacy and made me feel like I can make a difference. This class changed me in so many ways and brought new meaning and purpose to my life. For the first time in a long time I was excited and hopeful for a future where I can make a difference. This class made me want to get out of bed and plan for the future. It made me want to be alive, because there was something I felt I had to do.”

A second student who did not go on the immersion trip wrote:

“This class has taught me many things, not only as a future educator, but as a citizen of the Earth. As a teacher, learning about all of the benefits of outdoor and environmental education for young students, will help me integrate them into my teaching. As a person, learning about my impact on the world, all the little things I do and can do to help the environment, and ways to influence others, has altered my view of how I go through each day.”

Several students expressed similar sentiments around the issue of responsible local and global citizenship and reported that they felt a sense of responsibility to teach students about the Earth, how to be good stewards of it, to help them to develop a love of nature, as well as to have experiences in nature. Rather than feeling overwhelmed by the state of the environment, many used the word “excited” and described feeling ready and eager to teach Earth and environmental education to their students. Many students also wrote about how the course had inspired them to make changes in their own behavior, which included changing their diets, their daily practices to reduce their carbon footprint, and greater involvement with and advocacy around issues of ecology, sustainability and ecological justice. The following illustrative excerpt demonstrates that students understand that these issues (and the major themes that emerged in their writings) are interrelated. When writing about what was most important and impactful to her, one student wrote, “...*learning about all of the benefits of Earth Education and learning how beneficial it is to students—the social justice aspect, environmental literacy, social emotional intelligence and so forth.*”

This (anonymous) student’s writing was preceded by an ante script, written in cursive that read “Love you” followed by a heart. I note this not to show that I am loved by my students, but rather to highlight the affective relationship that developed among participants, including the instructor with the students. This is important because we cannot meaningfully separate out affect from cognition. How students feel about the instructor and each other and the quality of their relationships matters (Cozolino, 2017; Palmer, 2017). Our collective experience of a growing biophilia contributed to the positive affect we experienced, because we were transforming together—catching the fire and sharing it. Like many of my students, I grew up in a context in which nature and the Earth were to be used, and in many cases abused to promote human “progress,” convenience and even security. Many of us did not see ourselves deeply, clearly or authentically as nature. Through the semester long course and through spending eight days immersed in nature, we changed, myself as much as my students. Indeed, for me, this course was the most transformational experience of my decades-long career. Many students were moved to tears in explaining the impact and transformational nature of the Costa Rican immersion experience on them.

Immersion Abroad and in Nature

As we sat outside on the patio at our field station on the penultimate day of our trip, we each shared what we felt was most important about what we had learned and what had most impacted us. Student comments revolved largely around issues of environmental appreciation and being moved by their experiences, for example the night hike through the Children's Eternal Rainforest, the daylong exploration of the cloud forest, and our boat tour of the mangroves. Not surprisingly, many students talked about wanting to foreground environmental literacy in schools and to provide opportunities for their future students to learn in and through nature, to explore more, and to take risks. Several students spoke about having a greater sense of purpose and wanting to bring back home with them aspects of what they had observed and learned. Several students explained that they had become more passionate and this passion was shared with others throughout the experience. One student stated that she witnessed how important it is for the teacher to be passionate about the content and topics being taught (and in this case she was also referring to our in-country field guide, a highly passionate and deeply knowledgeable biologist and educator who views teaching as a form of philanthropy—giving freely of self). Students also commented on what they saw as positive aspects of Costa Rican society in general, such as the calmer pace of life and a “friendly vibe.” They also noted that there was an authenticity to the nature-based activities in Costa Rica, versus what some had experienced in the U.S., where for example a family hike might be undertaken in order to get exercise or as part of weight loss or fitness goal. In Costa Rica, one student “loved that every little thing had a story and that we stopped to appreciate them.”

As noted previously, the trip included visits to three schools—one public and two private, where both private schools had a stated environmentally focused mission and were bilingual. In the public school, where we also did a service project, the teacher preparation students were struck by the genuine care and affection teachers, all females in this case, showed to students, including playing soccer with the elementary grades students on a hard blacktop surface during recess. One student shared that her mother used to comment that it is “one thing to take kids to park, but it is another to actually play with them.” Students commented on how the schools visited were happy places “full of laughter.” One student said she was reminded to create learning in ways that make students think and to also allow students to learn at their own pace.

Many students commented on the Quaker Friends' school visit, where we spoke at length with the Director, observed in classrooms, and participated in the Friends' “meeting” in which the school's students, faculty, staff, and community members sit in silence, unless someone feels the need to share something. After a long silence, one student rose to speak about the Chinese artist and human rights activist he was learning about and shared with the group details of the oppression the artist activist had experienced. A visiting American woman rose to speak about how her adopted daughter could not get a visa to come to the U.S. with her, and how the U.S. had recently intervened in elections in the adopted girl's Central American nation. The woman later told me that her daughter is from what the U.S. President referred to as an ‘s’ hole nation, thus making obtaining a visa even more difficult. Several students commented on how the trip

had allowed them to become more spiritual and to practice mindfulness and how they admired the Quaker silence and mindfulness, as well as how at the meeting people greeted each other in peace. This was a minor theme in the students' written reflections as well. For example, one student wrote, "*...I also appreciated learning about mindfulness and making conscious choices to help to create a sustainable world....*" Our literacies do not remain separate—like real life, they are integrated, and inevitably learning about the earth extends into and overlaps with all other aspects of society—including politics. Students were focused on environmental literacy, but learned other literacies at the same time, in this case political and critical literacies. These also came together in the Quaker Friends' School visit by learning about the origins of this group, who as pacifists refused conscription in the U.S. military during the Korean War. Subsequently, they sought out a country with no military, where their peaceful orientation and respect extends quite literally into nature, where the school is nestled in a rural mountain forest.

Discussion: Biophilic & Ecoliterate Effects

The effects of social emotional intelligence, biophilia, and ecoliteracy are widespread and extend far beyond ecology. Consider the implications at the classroom and school levels on student behavior, on school culture and climate, inclusiveness, respect, even reverence for self, others, and all life forms. The impact of greater empathy, understanding, and becoming more aware of self and others is immense and growing, as reflected in the movements toward more mindfulness in education and nature-based learning, both of which promote social-emotional learning and have additional emotional, physical, and academic benefits for students. By the end of our capstone course, future teachers were able to thoughtfully address and respond to prompts such as:

- Discuss the value of elementary grades students studying the environment, developing biophilia, and becoming ecoliterate?
- Why is learning about and being in nature important in terms of developing respect for life, social-emotional intelligence and ecological literacy? What is the relationship among these?
- How can an education characterized as biophilic and ecoliterate better serve oneself and society?

Promoting our common good includes requiring students to think beyond their own immediacy and self-interest. The ability and opportunity for students to do so is critical not just for our wellness as individuals, but for our and other sentient beings' very survival on the planet. From the nation's inception, the dominant culture has promoted and rewarded individualism and self-interest. This has extended to a view of the Earth as a resource for us to use. Too few of us were ever taught to think of the Earth's resources as finite and to have a reciprocal relationship with the Earth. Our view of nature is often that we are separate from it, rather than that we *are* nature, a worldview indigenous peoples have always possessed. This dualistic worldview has had devastating consequences and we are seeing the effects in new realities such as "once in a century" hurricanes and other massive storms that are occurring on a regular basis, as well as

hugely devastating droughts, floods, fires, increasing numbers of climate refugees, and national security issues linked to environmental concerns. Being good local citizens is no longer sufficient; we are required to be and to teach our students to be good global citizens as well, where this includes understanding issues of environmental justice and the disproportionate effects of environmental devastation on the poor. Students need to be given opportunities to weigh the costs and benefits of their decisions. Developing critical consciousness, ecoliteracy, and the ability to think beyond the immediacy of one's self or one's gratification can begin at the youngest age, where a child would consider the impact of throwing a piece of plastic on the ground by understanding it will eventually end up in the ocean, or learning about the importance, indeed sacredness of water and not wasting or polluting it. We can enhance what may be our innate capacity for equity and justice, just as we can promote what may be an equal propensity for the opposite, where we have many centuries of evidence to support the latter.

Recommendations

The main assignments for the semester long course allowed students to connect what they were learning about Earth education and ecoliteracy to self, schools, and the larger community, while also connecting the local to the global. Primary assignments included readings and films on a wide variety of topics, a set of reflection papers on the readings and facilitation of a set of readings, knowledgeable interaction with a series of expert guest speakers, a group curriculum design project, a community based advocacy project, a thesis, and the immersion experience, which required them to share in deep reflection about the experience--both verbally and in writing. However, the following recommendations are applicable to any teacher preparation course focused on developing ecoliteracy.

- Begin with having students examine their own relationship to the Earth; ask them if they see themselves as separate from or *as* the Earth. Ask them to recall their favorite times in nature and to examine what messages they were given about nature throughout their lives. In my course this was coupled with students writing a modified 'Where I'm From Poem' and reading *Love Letter to the Earth*. Most students come very quickly to understand they are not separate from or superior to nature, rather, that they are in fact nature; a new understanding, which surprised many of them.
- Link theory with practice. Don't merely read about what a carbon footprint is and have students calculate theirs, but talk about how that might be linked to consumerism and our economic system and what can be done about it in our individual lives (where for example one student became very interested in the minimalist approach to living, which many of her generation have embraced). Discuss why knowing better does not always result in doing better, where developing new habits and ways of living our everyday lives requires consciousness and commitment.
- Go outdoors; learn in nature; explore (even if it is just the campus) while discussing readings. Ideally do site-based visits to waterways, forests, green spaces and notice

where life flourishes against the odds in largely urban and concrete settings. Encourage students to work collaboratively in project groups and to address real world issues and problems. During discussion sit in a circle; use the Socratic method and allow students to learn from one another through deep and sustained discourse.

- Give students responsibility for facilitating readings and allow them to construct their own learning experiences and meanings. As part of their facilitation of a set of readings, one pair of students had their classmates do a scavenger hunt of flora and fauna on our campus, where students discovered approximately 15 specific species within the same number of minutes as part of our discussion of *Last Child in the Woods*. They also shared a video of the author discussing nature deficit disorder, facilitated discussion of key quotes and passages from the reading, and led us in a guided meditation on yoga mats they had arranged under a tree on the lawn outside our classroom.
- Allow students to pursue their own passions and interests, which in our course meant choosing the focus of their curriculum project, capstone thesis paper, which set of readings to facilitate, and the advocacy organization with which they participated during the semester. Many students will choose to work in one area across these assignments, for example around the issue of food, which might involve work and study in a community-school garden in an urban school located in a food desert. In this way students build up expertise based in an area of personal interest to them.
- Require students to participate in and report on the work and impact of some local community-based environmental organization. In my course they have to research other organizations with a similar mission globally.
- Allow and require students to be creative and to apply what they are learning in collaboration with others, such as designing a curriculum project with authentic assessments (not focused on writing lesson plans) for a multi-week unit they could actually teach in the near future. In my course one of the requirements for this unit is that it must include nonfiction reading, where for example a unit on trees might feature reading one of the children's books written about the Nobel Peace Prize recipient Wangari Maathai, known as 'the woman who planted millions of trees'.

These examples are specific to the course described here; however, at a more macro level they are also aligned with the five primary principles for developing ecological literacy, which are Earth dependence, Interdependence, Creativity, Deep Learning, and Earth Centric Leadership. These constitute a set of core proficiencies schools must emphasize if humanity is to survive the next century (Assadourian, 2017, p. 8) and can be thought of as a kind of Common Core for ecoliteracy.

Conclusion

I developed the course on nature and the environment out of concern about the state of the planet. Importantly however, I approached this change making from a place of personal agency and optimism, rather than from a sense of desperation, which can be debilitating and prevent positive action, when it leads to feelings of fear, powerlessness and defeat, which is not uncommon when encountering seemingly unsolvable problems. When studying the environment in particular, students tend to focus on catastrophe rather than potential (Kervin, 2019). In teaching about nature and the environment (and other difficult current issues or historical events), as teachers we have to be careful to be realistic, yet allow students to remain hopeful and feel empowered. Indeed, how we teach is as important as what we teach. The students in my capstone course are 19-21 years old—still very young adults. They, like their future students are inundated by social media and are preoccupied with thinking about themselves. As preteens, then as adolescents, and now as young adults, even their biology is promoting a self-consciousness that mirrors and reinforces the social milieu of a “selfie” generation in a dominant culture that generally rewards egotism, individualism and self-interest. The most important thing we as educators can do is allow and indeed require students to consider not just their own, but others’ best interests and recognize that ultimately, these are the same thing, more often than not. We must help students to consider our collective wellbeing, the future of this beautiful planet, and to take meaningful action as aware, responsible, local and global citizens. As stated previously, one of the books my teacher preparation students read is *Love Letter to the Earth* by Thich Nhat Hanh. Asking all students to write such a letter addressed to “Dear Mother Earth,” might be a good place to start in terms of promoting biophilia and developing eco-consciousness and ecoliteracy. It is important for all of us, students and teachers alike, to develop greater biophilic consciousness and ecological literacy from a sustainability perspective, but also because they have the potential to transform us at the deepest levels--where we live, both literally and figuratively. “It is more than a ‘paradigm change’. It is a change first in our loyalties, affections and basic character, which subsequently changes our intellectual priorities and paradigms...and over time alters the character of our entire civilization” (Orr, 2004, p. 145).

Teachers across grade levels and subjects can play a key role in our collective wellness, indeed our very survival, through a greater focus on learning about the Earth and promoting ecological literacy. This type of literacy expands awareness of our interdependence and cultivates caring about life, about self, and about others. Earth education and ecological literacy can also cultivate responsible local and global citizenship, which in turn can promote sustainability, social justice, and ultimately the public good. Through Earth education students can cultivate biophilia and a desire to affiliate with all living forms and sentience and possibly come to perceive the animism in all Earth forms, from mountains and meadows to rivers and oceans. This affiliation can help students learn to think beyond themselves and can help to empower them to make decisions and take actions in their lives that have positive impacts. Helping students to cultivate biophilia and develop ecological literacy has academic and as well as social benefits for our individual and collective wellness, where the collective includes all forms of life, as well as the Earth herself.

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