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USING ART TO ENHANCE ENVIRONMENTAL EDUCATION

By

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A capstone submitted in partial fulfillment of the requirements for the degree of
Master of Arts in Education: Natural Science and Environmental Education.

Hamline University

Saint Paul, Minnesota

December 2017

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CHAPTER ONE

Introduction

In the increasingly tumultuous political environment of the United States, less emphasis is being put on protecting the resources of our planet while important regulations are being cut back. We have come to the point where our own government has taken to eliminating vital environmental statistics and data from public record. At times, the outlook of our country from an environmental perspective can seem bleak, to say the least. However, communities nation-wide can fight back against this divisive rhetoric by investing in our most valuable natural resource- our students. Yet, when the rhetoric surrounding the environment is more divisive than ever, how can educators promote unity and improved understanding around environmental attitudes?

Surprisingly, art is the ideal venue by which teachers can enhance environmental education.

How can educators use art to enhance the way students learn about the environment? This has become an increasingly political conversation, as the atmosphere surrounding both the arts and environmental education has become more of a hinderance than a help when it comes to highlighting the shortcomings of the way people interact with the various ecological spheres they inhabit. However, this unique pairing can serve to enhance both topics as students work to learn about the arts and the environment in conjunction. While history can be rewritten, art endures.

My Story

I grew up in the city; the colloquialism “city boy” applies to me quite suitably. My youth was spent in Indianapolis, where I lived during my formative years. I went to school close to downtown, and walked past row after row of buildings and houses on my way each morning. I give credit to the vibrant arts community in the arts epicenter of my neighborhood, called Broad Ripple, for first bolstering my love of creativity. There was always a fun concert, exhibit, or art festival going on somewhere in the city, particularly during the balmy summer days. My family was great about exposing myself and my siblings to all sorts of artistic endeavors, and instilled a love of color and form in the three of us from an early age. I participated in sculpture, writing, and acting camps as a young boy, and never felt any trepidation towards expressing myself. I think that played a major role in how I regard art as a necessary and meaningful facet of anyone’s life. Without a creative outlet, people are really just going through the motions, not experiencing all that life has to offer.

While we lived in Indiana, my family always made a point to go on our annual pilgrimage to Park Rapids, Minnesota to get in some quality lake time each year. My father’s family has had land on Big Sand Lake in Hubbard County for more than seventy years. Over time, other relatives have purchased nearby land, and now there is a nearly 150 acre wilderness for us to wander through that is totally protected and private. Thanks to this accumulated wealth of woodland, our lake time has become more than just an opportunity to reconnect with the Hilgers scattered across the Midwest; trips to Park Rapids are a chance to reconnect with nature on our own terms. My father and I used to go on daily hikes while at our cabin, a memory I recall fondly. Sometimes we went out to hunt for strange mushrooms, other times to seek rare migrating birds. Often we didn’t have any objective at all but to enjoy the silence and take in the

natural wonders around us.

On many days we would spend the whole day taking advantage of the lake-- sailing on the waves, digging in the sand, and, most importantly, fishing. I still remember, and have pictures of, my first catch. It was a small perch, but it might as well have been a whale to me. The day I started catching fish opened my eyes to a world of biodiversity that I never previously knew existed. That may have been my first experience realizing that the world was bigger than myself, and that there is a whole unseen ecosystem that exists despite people. The fish that came up on my hook was not only beautiful, but also a piece of a system rooted in natural interactions. These themes show up in both environmental education and the arts on a frequent basis.

During high school, I temporarily lost touch with the outdoors, as any time I had outside was focused on sports like rugby and tennis. Summers were spent honing my overhead serve and travelling to small towns for rugby tournaments, always sticking close to the highway. Though sports are an important part of a young person's development, they didn't really enhance my journey towards becoming an environmentalist except that I realized I missed the days I got to spend in the woods. That is not to say that I didn't love these trips. The issue was that while I got closer to my peers through sport, I lost touch with a part of myself; I sought out socializing with teammates in lieu of exploring outdoors.

Even as I got my first car, I rarely- if ever- ventured out into the proverbial woods. "What's the point," I would think to myself? I was within close range of my high school, the movie theatre, and the mall- basically anything I could want or need as a teenager. Everything, that is, except the satisfying ennui that comes from recentering one's self in the forest. A crossroads of sorts was developing inside me. If I never actually went out and experience the

environment and all it had to offer, how could I possibly understand what was at stake for those wild places? In many ways I think that is a natural part of teenage life for all kids. Socializing takes priority over self-recognition for a significant portion of one's teenage years. High school is about fitting in and college is about finding your own way, something I would soon come to realize.

It wasn't until I attended St. John's University for my undergraduate degree that I had daily access to the outdoors. Like many high schoolers, I had the desire to leave the state to go to college somewhere new and exciting. I also wanted to go somewhere that had a nice outdoor space, and Saint John's certainly has that. Even as one takes the exit towards the university off of I-94, the roads give way to flowing grasses, small lakes, and the fabled "pine curtain" that flanks the football stadium (which, in turn, sits in a natural bowl in the hills around the university). Their beautiful arboretum inspired me to take a path that I otherwise perhaps would not have taken. It was only after I left the city life in Indianapolis for college in Minnesota that I realized what so many environmentalists were getting on about in terms of global warming and the effects people have on their surroundings, for better and worse.

After I graduated from college I moved to Saint Paul, and currently reside in Lowertown, which has a thriving arts scene. Both of the Twin Cities have moderate access to green spaces. However, outdoor recreation areas within reach of public transportation are relatively few and far between. I have a car, so it was never really an issue for me, but it did get me thinking about how many children don't have the same access to wild places. It is by no means unusual for public transportation to be limited almost entirely to the metropolitan area in discussion.

So how are students living in cities, particularly those without the same resources as

higher-income students, supposed to address this issue? After all, isn't it more difficult to learn about our wild places and the threats that face them when we're stuck in a concrete jungle? The simple answer is that students cannot access nature in the traditional sense- woodland hikes, skiing, etc. Bussing students out to outdoor spaces is not always practical, especially as schools are experiencing budget cuts and bussing is becoming more expensive than ever. Environmental educators must figure out a way to bring that experience to students in a way they can understand and afford. Luckily, what urban areas lack in access to the outdoors, they make up for with their thriving arts communities (although funding cuts are an issue here as well). That aspect lends well to my intended project, which is to create an environmental education unit that uses art and creative group work to address local climate issues.

After working in the medical device industry for a few years, I decided that I'd had enough. I was becoming more and more distant from my passion of working outside, and I decided to do something about it. A major turning point for me was the time I got to travel to San Francisco to conduct a training at a few podiatry offices around the bay area. I had a few hours to spare before my flight back to the Twin Cities, and I wanted to do something unique and memorable after an arduous week of work. I decided to go to Muir Woods, a National Monument just forty-five minutes north of the city.

When I arrived, I was positively blown away by the sheer size of the redwoods in that forest. I gazed upward like a kid in a candy shop, and was moved by the stillness and solitude of the place. As these thoughts crossed my mind a tour went by, and I couldn't help but become absorbed by the naturalist leading the group. They told us about the trees, how one can hear water dripping through their massive trunks if you only put your ear close, how there is almost

no redwood forest left in the United States, and how government inaction could lead to their eventual demise. I left Muir Woods on cloud nine, enlightened and ready to begin my transition from a directionless college graduate to a full-fledged naturalist.

Since my undergraduate degree was in English, I started working towards obtaining my Masters degree in Natural Science and Environmental Education at Hamline University- a natural first step since my background was in an entirely different discipline. Hamline has really opened doors for me in various environmental spheres, whether that be through networking, expeditions, or job and internship opportunities. Thanks in large part to the resources afforded to me by Hamline, this past year I got a job at Carpenter Nature Center in Hastings, Minnesota as an Environmental Education Intern.

My time at Carpenter was informative and inspirational. We organized lesson plans, took students on naturalist hikes, and educated the public about environmental issues like sustainability, biodiversity, and bird banding. We also had an assortment of animals that were on display such as snakes, turtles, and raptors. The staff frequently refers to Carpenter as a gem in the Saint Croix River Valley, and it isn't difficult to see why. With over 250 acres of protected land, one could walk the St. Croix river for miles without seeing another person. We did host a few small-scale art festivals on our separate Wisconsin campus, but those were limited to the works of local residents of surrounding farm towns.

That leads to the only downside to Carpenter Nature Center- its distance from the Twin Cities. It sits about half an hour from Saint Paul, and about forty-five minutes to an hour from Minneapolis, depending on traffic. There are certainly closer nature centers students can visit, but none of those have nearly the acreage and solitude of Carpenter. This has resulted in the

nature center doing extensive outreach and spending significant resources getting a naturalist or two out into the community to do classes and lectures. The only reason that cost isn't transferred onto students is due to grants that help defer that expense.

While students from the city readily have access to the arts, many almost never have the opportunity to walk in remote woodlands. We were all slightly taken aback when, at the start of one inner-city student got off the bus and immediately said to us, "I've never seen so many trees!" We were really quite moved, as we worked and lived in the woods around Carpenter, and took our surroundings for granted. This was one occasion where the teachers learned as much from their students as the students had garnered from the teachers.

I am impressed by the degree to which Carpenter Nature Center uses art to help educate k-12 students. Each month, they host a "Story Time" in which they read a story about nature to young children and then do a small art project either about nature or using things found in nature. From a young age, these students are taught that there is a link between the arts and our environment. I think this is beneficial because it teaches children that our world has legitimate value as a resource in and of itself, and that the environment can be creative, fun, and educational, all at the same time. Art and the environment are by no means mutually exclusive, and in fact, they complement each other. The fact that such young children were able to make connections between the outdoors and art was a major factor in my desire to create an art-based environmental unit for teachers.

One of the most interesting things that I experienced during my time working at Carpenter was the summer camp directed at inner city students that we created. We started a week-long "pioneers" camp where inner-city students would spend time going around to

interesting urban and rural areas and meeting those who worked in environmental fields. In our inaugural season, we had about a dozen kids who were interested in the program. A few of these students had never even been outside of the Twin Cities, and were awestruck when they got to our campus in Hastings. I was taken aback by their reaction to being in such an expansive stretch of woods; I realized that although the physical distance between the city and the country isn't massive, large nature preserves might as well be a world away from some students. Again, a major benefit of living in a big city is the access to the arts. Experiences ranging from dance, to theater, to art museums are, at most, a short bus or train ride away. The Twin Cities are famous for their ability to draw talented artists from around the country. This is manifested through local community events like festivals, classes, and even artistic protest. Due to the highly expressive nature of art and its frequently politically charged nature, it makes the perfect template by which we can impress upon students the issues of sustainability and ecological awareness, and show them that the fight for sustainability is their fight, too.

Environmental art, or "eco-art," can be expressed intentionally or unintentionally. Every year around my neighborhood in Saint Paul, residents flock to Mears Park to take in the Saint Paul Winter Carnival to ice-skate, listen to music, and view ice sculptures created by artisans from around the state. However, the past few years have been too warm for the sculptures to remain intact for more than a few hours. This year, the awards section was akin to a soggy graveyard, with the 1st place placard in front of a sad mound of melted slush. It is highly irregular for an outdoor event in Minnesota to be this warm in early February, and what was intended to be a simple sculpture was transformed into something entirely different- a major statement as to the current state of our climate. Art isn't always pretty, and can have entirely

different reactions than were originally intended.

Conclusion

My hypothesis is that educators can enhance the quality of a traditional environmental education by including components found in art education and theory. My background has given me an appreciation for the benefits of the arts and a strong desire to educate students on issues that face the ecology of our planet. I believe that these two seemingly dissimilar subjects actually lend to bolster each other nicely. In the following chapter, I will highlight the inherent benefits of an arts-based environmental education.

CHAPTER TWO

Introduction

On the surface, art and the environment may seem unrelated. The environment is usually associated with science and data, while art is generally regarded as fluffy and overly subjective. What does something very visceral and tangible like the degradation of our planet have to do with something often considered “aloof” and superfluous like art? In chapter two, I will work to establish the value associated with this pairing. I will present information intended to link these subjects into one cohesive means of obtaining a more valid and holistic environmental education. What issues can arise when environmental education is taught using artistic methods and mindsets? In chapter two, I will be dealing with the intersection of Environmental Education, place-based pedagogy, art as a social influence, and “eco-art.” Perhaps the greatest advances in environmental education have occurred over the past few decades.

Conversely, there have never been more outspoken opponents to science-based environmental education than there are right now; even the leader of our nation has made it apparent that he stands with corporate interests in mind rather than the health of our planet. Educating the future protectors of our planet is pivotal if we wish for our world to remain healthy for generations to come. The process of teaching students about our environment needs to take

priority in current school lessons as these issues will have affect future generations significantly more than on our own. How does the way we educate students on environmental issues change from place to place? It is certainly easy to convey sustainability and ecological viewpoints out in the woods on a hike, but how does that change when we teach students in cities? Just because we are surrounded by concrete does not mean there are no options by which we can teach with just as much influence.

Art has been a unifying social catalyst since the dawn of recorded history. It has also led to and influenced scandal and shocking historical moments. Archaeologists have found cave paintings documenting the drama of prehistoric life around the world; even these rudimentary examples show that art has been used to express complicated interactions since man was capable of complex thought. It has catalogued the highest and lowest points in human existence through diverse forms of media, from paintings to performances. How is art used to convey information in the modern day?

The environment is frequently used in all forms of art as both muse and medium. Some of the earliest classic artists used art to convey the beauty and majesty of nature. That practice has also been used to convey the harsh realities of the damage that has been done to our planet. This is not limited to the canvas- urban environmental art has also experienced something of a boon recently. While art can certainly be censored by those in control, the arts are a reflection of the actions and thoughts of the people in our world. Through art, the general public can come to appreciate the attitudes of the artist in question, as well as that of their community and the various spheres they inhabit.

Environmental Education: Successes and Shortcomings

Traditional environmental education certainly has its place in the modern classroom. Its primary function is to inform, and the data in question is just as apparent as that of astronomy or physics. Teachers have access to a litany of information not only on the way our planet functions, but also on what factors could benefit the ecology of our world or lead to its downfall. There is no shortage of research on the importance of environmental education Bjorkland (2001) has found that, if anything, ignoring this topic in schools only serves to exacerbate the very things that its opponents strive to preserve- our culture and economic viability. If we aren't able to properly teach students about the reality of our damaged world, future generations are doomed to repeat our same mistakes.

The biggest shortcoming of traditional environmental education is not in its content, but in its presentation. Schleicher points out that the main issue lies in a lack of context socially and politically (Schleicher, 1989). If information is presented without any real sense of its place in society, it exists in a vacuum; no real change can come of presenting raw data. He states that educators fail in focusing only on the residual effects of man's influence on our world without really diving into the reasons why and how environmental degradation happened. This is one reason why art acts as a solid launching-off point for enhancing the approach to environmental education; its highly political nature and knack for highlighting significant social issues ties in perfectly with the gravity of impending environmental tragedy. Art is sincerely reactive, and tends to directly mirror societal concerns and priorities.

Urban vs. Rural: Examining Place-Based Environmental Pedagogy

On the surface level, it is apparent that ideological differences vary dramatically depending on whether one is in the country or in a city. Typically, populations based in urban

areas have a more liberal disposition than those who reside outside city limits. There are many reasons for this phenomenon, although most of the onus falls on economic perspective. Jobs usually associated with “blue-collar” workers like producing food and maintaining livestock are located in more remote areas, where people can acquire the land necessary to facilitate large-scale operations like food production. These groups prefer fewer regulations on their livelihood, as it can get expensive trying to meet the needs of both the government and the demand of the general population. Many of these jobs can be performed without a secondary or post-secondary degree.

On the other hand, jobs located in cities are usually less tangible, performed on computers in high-rises. Usually, one needs a higher education to be able to obtain these jobs and live in such areas. Along with that education comes environmental awareness, as this group can basically “afford” to learn about climate change and then detrimental environmental impacts that come from agricultural practices. In the end, socioeconomic constraints and privileges sometimes lead to vast differences in regard to environmental action.

Education is commonly the difference between a population working to sustain its ecological space or exploit it. Graham (2007) explains that, by educating rural populations, we are able to better establish a sense of belonging between these people and the world they live in. Establishing that link is the first step to move a population’s attitude from “we need to exploit this land for its resources,” to, “we need to preserve this land for future generations. This mindset will be difficult to achieve while rural economies remain resource-based. It is never easy to wean someone off of what is essentially their sole source of income.

We need to give our rural places social value, a task that is often maligned by the

upper-class of big cities. Graham points out that we cannot blindly begin implementing environmental or art education practices without first considering three things: power, privilege, and culture (Garber, 2004). From the environmental lense, the power is in cities. Our culture maligns “the other,” which in this case is the farmers of our country. The culture of rural areas emphasizes family and religion, while that of cities focuses more on wealth and independence. It would then be highly beneficial to consider all of these factors when creating an environmental, art-based lesson plan that is beneficial to groups across the social strata of America.

As my intended student audience for this unit is living in the Saint Paul metro, I will work to reinforce that all places and populations have social value. The whole purpose of using art as a determinant factor in the work of these students is to encourage open expression and dialogue, something that cannot be achieved until students at least temporarily dispel their preconceived notions of how people think around the country. In the world of environmental education and by extension climate change, there is no “other.” Climate issues affect everyone, whether they can afford to mitigate those effects or not.

The Social Role of Art

Perhaps the single greatest benefit art can bring to a given community is unification. There are so many variations and possibilities when it comes to art; dance, theater performance, spoken word, poetry, painting, and sculpture start a list that only begins to scratch the surface of the number of potential venues by which artists can convey their message. All cultures use art to some degree to highlight an important aspect of their communities.

Inwood (2010) describes art as “dialogic,” which is why it effortlessly enhances any environmental education curriculum. If the primary purpose of teaching students about the

environment is to encourage understanding and action, we must equip students with the means to present an argument supporting their position. Raw data is good, but presenting a situation in the right social context must be done through less formulaic and rigid means. A lecture on the intricacies of recycling and sustainability by a brilliant scientist is a nice introduction, but real social impact frequently comes from the social byproduct of information and action.

Written context is not necessary for encouraging environmental awareness through art. It is helpful in presenting context, but art can be used to convey attitudes and emotions that develop as a result of a strong environmental education. I will be covering the affective nature of art and its correlation with the environment later in this chapter.

Social Justice

One of the more linear connections between art and environmental education is the presence of social justice as a major contextual force for both subjects. In teaching students about the links between social justice and the world they live in, educators are encouraging active participation in students' communities. By emphasizing right and wrong as it pertains to the treatment of all people, teachers are helping emphasize how ideal a just, free, and equal community can be (Garber, 2004).

Garber (2004) argues that art ought to be not simply visually pleasing, but useful. She claims that art should help students not only grow in their knowledge of their subject, but help them find their place in the world around them. Students will spend time examining case studies to begin formulating their own opinions regarding environmental issues. We will be discussing the Flint, Michigan water crisis throughout the course of the lesson plan. In 2015, officials discovered that the public drinking water was seriously tainted with lead. This crisis occurred in

the Midwest in a community that could have just as well been in Minnesota, and I believe it will present an interesting foil by which the students will be able to compare their own lives. In Flint, the lead-tainted water has affected poor people more than anyone else. Those that couldn't afford (and still cannot afford- the issue is ongoing) to obtain more pure water sources have been forced to suffer the consequences of adolescent lead poisoning. The symptoms include lower IQ, slower growth, and difficulty paying attention (Shank, 2016).

Case studies like this one give young children an insight into a world that they might have never experienced before. I want students to examine their own local water supply quality and compare that with existing data from the Flint water crisis to examine discrepancies between communities. It would be of additional benefit if we were able to write to students at a school in Flint, but that would add an extra dimension as far as ethics goes- I don't want my class to be patronizing or rude to students undergoing hardship.

Examining Art Through Filters

A major component of art education is the propensity to display works of art through various and diverse filters. Filters may include everything from politics to religion (Blandy, Congdon & Krug, 1998). Art allows the artist and the audience to examine abstract attitudes, feelings and events from a number of different perspectives. If a poor fisherman creates a painting of, perhaps, an overfished ocean, the audience would be diligent to view the work through that lense; the viewer must put themselves in the artist's shoes to obtain the full impression of the work. By examining the historical, cultural, and economic issues of the day, people get a more well-rounded sense of why that work is important.

Similarly, I will challenge my students to examine their local water supply through

different lenses. How would water quality and availability affect them if they were very wealthy? How about if they were extremely poor? What if they owned a business that used the river for energy? What if they were using the river as their primary food and water source? These and other questions help students grow with respect to their place in the world around them.

Affective Expression in Art Education

An important art theory piece that I am using to enhance my environmental education is the ability of art to convey emotions and experiences into the art itself, otherwise known as “affective expression” (Henley, 1991). This theory emphasizes that the experiences and very nature of the artist significantly impact the feel of the creator’s influence on a work. Henley uses a case study of a young visually impaired boy and his painting of the apartment buildings around his home. The details are not clear because of his impairment. However, the size and intimidating nature of the buildings are readily apparent despite his handicap. The viewer also gets a sense of how grim the artist’s neighborhood must be, as the mood of the work is dark and gloomy.

In this way I will create a curriculum designed to encourage students to affect the moods and implications of environmental problems. By working with students based on their own individual spheres like their neighborhoods and social groups, the effectiveness of the lesson plan will come to fruition. I hope to work with students on their terms and on their level in order to encourage deeper affective examination of their world.

The Mindset Behind Eco-Art Education

One interesting aspect of eco-art education is the implicit necessity of the practice itself.

Perceptions and education vary significantly across the country, and no two people go through the exact same trials and tribulations in life. This presents a difficulty in getting everyone to the same mindset, as that is truly the first major hurdle in successful eco-art education. Bonnett makes this quite apparent as he explains the difficulty in effectively educating students about education for sustainability:

“...Our relationship with nature, whatever its kind, is an important aspect of our own identity, and thus of our self-knowledge. The way we regard and treat nature- the whole which sustains us and of which we are a part- says a lot about the sort of beings we are as well as the sort of beings we regard everything else to be.” (Bonnett, 2006)

Illeris (2012) maintains that in order to foster this frame of mind we need to change the way we educate our students and consider the transformative aspects of group-work as opposed to the traditional memorization and regurgitation of information. By simply asking groups to come to a consensus for direction on their own, group work helps to open up a dialogue that leads to real learning and development, thus contributing to a deeper and more thorough understanding of each other's place in our environment.

Initiating this conversation is not always easy when it comes to young students. It is difficult for a young child to understand the magnitude of man's influence on the environment for a number of reasons pertaining to scale. A Greek kindergarten class was noted as having issues comprehending climate issues that were occurring outside their everyday spheres,

navigating the debate between climate criers and deniers, and obtaining clean information; almost all information pertaining to environmental problems comes from variably credible media sources (Daskolia, Flogaitis & Papageorgiou, 2006). While public sentiment has largely transitioned to accepting climate change as influenced by people, the degree to which humans have an impact differs wildly from source to source.

This is all to say that educators need to think hard about how they contextualize environmental education for their students. Art makes a natural foil by which students can digest the information before them on their own terms. They can convey difficult reactions to upsetting or challenging material by utilizing paints, mixed media, and creative writing to express how they understand environmental issues impact themselves and their families. Highlighting issues as they pertain directly to students' lives will greatly assist with making environmental education relevant to them. It is also important to remember that the younger a student is, the more sensitive they may be to the frequently tragic effects of climate change.

As climate change intensifies, so too does the severity of associated natural disasters. Kousky (2016) points out that these disasters have a disproportionately larger effect on kids due to elevated fear in children, potentially disrupted support systems (who takes Billy to school, feeds him, and keeps a roof over his head?), and being more susceptible to health problems. The goal of environmental education is not to scare children into learning. Rather, the issue needs to be approached gently so as to develop an informed, prepared, and open- minded student. Educators need to help students find their own identities in relation to both their individual lives and the greater world around them if they are to grow in support of our environment.

Art and the Environment: A Conservation Imperative

If environmental education lacks for anything, it would be enthusiasm and zeal.

Discussing the state of our planet can oftentimes be depressing and glum, as humanity hasn't exactly lived with its health in mind in the past several hundred years. In fact, even the head of the United Nations Environment Programme has argued that there is nothing in environmental education that reaches people emotionally to the point that they exhibit passionate ties to environmental protection (Branagan, 2005). The arts are the ideal catalyst to help light that much-needed fire. In 1870, the artist Thomas Moran travelled to the Grand Canyon with a surveyor and geologists to the uncharted wilds of Yellowstone. At that time, the outdoors were usually something to be avoided. Predators, rough terrain, violent Indians and disease were about the only things anyone expected by venturing into such remote areas. Most people were afraid of these wild places, and thought of them as more of a nuisance than anything particularly beautiful or interesting. It was the popular opinion at the time that the land was meant for one thing and one thing only: as harvested resources for settlers and trappers (Boag, 1998).

Moran sought to alter this mindset. He had a knack for capturing natural light and sense of scale in a way that few other artists were able to imitate during his lifetime. Nowhere is this better displayed than in his opus, *The Grand Canyon of the Yellowstone*, which he painted in 1872. Through his art, Moran was able to portray his environment in an entirely different frame. No longer was nature something scary and avoidable. Now it had become grand and almost spiritual in the minds of everyday people, and spurred a new era of environmentalism across the board.



Image: Thomas Moran, The Grand Canyon of the Yellowstone, 1872

Even politicians had a visceral reaction to witnessing Moran's work. In the debate over public lands, his paintings were so powerful that they helped sway Congress into declaring Yellowstone America's first National Park. Moran continued the tradition of painting our country's monumental outdoor spaces throughout his life, a practice that was a major catalyst in declaring dozens of other parks as protected across the United States. To this day, Moran is internationally recognized as "The Father of America's National Parks System (Boag, 1998).

How was Moran's art able to impact so many people? The answer lies in the disconnect between what people thought they knew to be true and what was actually true. Moran's contemporaries were afraid of the wilderness because they only knew it in a threatening sense. It took just one man to portray the beauty and grandiosity of the place to help people realize that there was something there not only to enjoy, but to protect. It is this attitude that I hope to instill

in future students with my lesson plan. I want them to bring their predispositions to the table for discussion and then give them the tools to reframe the subject matter in a way that promotes a positive message about the environment.

For the purpose of continuity, I will be using Inwood's term "eco-art education" to define the means by which my lesson plan will function. She defines eco-art education as, "integrating environmental education and art education as a means of developing awareness of and engagement with concepts such as interdependence, biodiversity, conservation, restoration, and sustainability (Inwood, 2010, p?). While art is often subjective and abstract, it has an interesting knack for conveying the very real issues confronting the problems our society has caused through environmental degradation.

Art is not limited by expectations or constraints, and is thereby able to tackle social issues in any number of ways. It also encourages critical analysis and sympathetic awareness of one's own sense of place (Inwood, 2010). This can be highly beneficial when paired with environmental education for obvious reasons; art can bring attention to the environmental issues immediately relevant to students' ecological spheres, in the neighborhoods, towns, and cities in which they operate on a daily basis. It is through this connection that growth most easily takes place.

According to Hicks (2007), eco-art education is beneficial because it addresses a very specific kind of problem, one that exists between our environment, our social spheres, and our social issues and lives. Because it spans both categories- environmentalism and art- eco-art education has a unique opportunity to fill an important educational void. With this in mind, I am creating a lesson plan that addresses the sensitivities presented by our current world-state.

Weintraub (2006) designates an interesting framework for presenting environmental understanding through art, referencing, “eco-time.” She explains that concepts like evolution, migration and natural cycles are all linked in terms of the ecological development of our planet. This is, as one would expect, a complicated and amorphous timeline, but can be presented through a frequently abstract medium like art.

For students still learning their own role in our world, allowing them to explore how environmental issues have played any may play out over time could allow them to find their place in the vast ecological timeline of our planet. I am presenting the students with only facts and case-studies, and I will allow them to come to their own conclusions. It is important that I remain sensitive to the diverse backgrounds of students and avoid any bias, as this needs to be transformative. I want students to come to a conclusion on their own terms, as this could be a legitimate catalyst for change. Growth occurs during introspection, and that is crucial to cultivating a productive mindset and a rational point of view.

Conclusion

There is so much science behind environmental education that the bigger picture can often get lost in the mire of technicalities. Because of this, educators would be well-served to adapt their teaching methodology to account for artistic allowances. By helping students express what they have learned about our planet and humans’ role in its current state, teachers are encouraging a deeper sense of place and opening a much-needed dialogue across the social spectrum. Environmental education is missing something, and art can fill that void. In chapter three, I will introduce the ways by which art can be used to enhance the creation and execution of science curricula.

CHAPTER THREE

Introduction

The Twin Cities are heavily influenced by the massive river upon which they sit, the mighty Mississippi River. Many residents rarely see or even consider its influence on their lives, and vice versa. While my capstone question is, “How can educators use art to enhance environmental education,” the topic I wish to help students address through the project is: How does human activity impact the river and the surrounding waterways? Students will be focusing on the ways in which ecological understanding can be displayed through artistic means to convey a positive message about our planet.

While I believe that the influence of art on an environmental lesson plan must allow for some flexibility, I still want to ensure that the overall unit adheres to known science standards. I will be regularly discussing climate change with my students, but the unit will use water systems as a base from which we can expand our exploration. Therefore, I intend to unify specific principles of art-based education with that of existing scientific education for 4th grade students.

Methodology

This unit will be 10 hours long over the course of about two weeks, and is heavily influenced by the increasingly popular use of the Science, Technology, Engineering, Math & Art/Design approach, known as STEAM. This approach is similar to STEM, except with a greater emphasis of demonstrated knowledge of science, technology, engineering and math through artistic applications (What is Steam?, 2014). This framework serves to enhance the knowledge of the above subjects by utilizing tools provided by the arts in the pursuit of

proficiency. My students will be adhering to the Minnesota State Science standards, but will be demonstrating proficiency of these standards through artistic expression.

The primary resource I will be utilizing to I am relying significantly on the logic of Backward Design as described by Wiggins and McTighe in *Understanding by Design*. This technique emphasizes something that may seem counterproductive at first glance- coming up with the overlying important question first, and only then building a lesson plan. Wiggins and McTighe believe that desired results can be achieved by highlighting “big questions,” prompts that guide students and educators through a curriculum using key questions that lead the student to a more thorough understanding of a given subject (Wiggins, 2008).

For instance, in this capacity I will be asking students the following “big questions”:

1. How does the water cycle function?
2. -How does water impact our daily lives?
3. -How do people influence the quality and quantity of water in Minnesota?
4. -What issues do Minnesota communities face when it comes to water?

Because we already know where we are trying to lead students, the creation of the curriculum has a more deliberate direction. We are now able to produce activities and select readings and assignments based on a more organic learning stream. While I do intend to use traditional methods of scoring when it comes to individual assignments and projects, the evaluation of each student’s education experience will be based not simply on whether or not they memorize information, but how they regard the learning in the context of true learning.

Using their template, I am staging the purpose of my unit as follows:

Stage 1: The desired result is for learners to meet the standards of...

A.) Learning about society's influence on technology

And

B.) Learning about water systems

Stage 2: You need evidence of the student's ability to understand...

A.) That innovation has had positive and negative effects on our waterways

And

B.) The structure of the water cycle

Stage 3: And the learning activities need to...

A.) Link society's activities to the water system

and

B.) Help learners understand how the water cycle can impact our planet

I do not plan to stick entirely to Williams and Mctighe. Rather, I plan to use pieces of their curriculum and assessment guides to help direct this unit. By using science standards in conjunction with the templates and learning structure supported in Understanding by Design, I will create a flexible and fair curriculum that encourages additional thought and understanding while staying relevant to the traditional fourth grade classroom.

Setting

My audience for this unit will be a diverse 4th grade class situated in the Saint Paul metro. While I do not currently work as a formal educator, I hope to someday utilize the contents

of this unit in conjunction with a unit on the Nature of Science & Engineering class. I anticipate using this lesson plan for a class of 20 students at a time. Various aspects of this lesson plan can be altered and adapted to suit the needs of an informal education facility as well.

One interesting facet in deciding on the setting for this lesson is whether it is best presented in a rural or urban environment. There could potentially be more pushback were the unit to be presented in a rural school, as there is sizeable contingent of people in these areas that remain skeptical of the effects of climate change. I plan to utilize this unit primarily in urban areas, as existing infrastructure will be helpful in presenting content. For example, in Saint Paul, many storm drains already have small paintings or illustrations on the street in front of them, stating, "This water drains to the river" (Vianna & Aragao, 2013). This makes it very apparent to anyone potentially littering in the area that they are directly affecting not only their local environment, but that of everyone down river.

My goal is that students question their own behavior because of the content of our discussions, activities and investigations. By shining a light on the difficulties surrounding the way people interact with the environment in various socioeconomic spheres, I hope to challenge students to examine what is right and wrong in the context of their own lives.

Audience

The students who will be using this unit will be middle-to-lower class, so all necessary materials will be covered by the school administration. We will stick to the Minnesota State Science Standards 4.1.3.3 and 4.3.2.3. Another audience to consider is that which will see the students' final projects, which will be publicly displayed environmental art. While this unit will primarily be designed for the students themselves, I need to take into consideration that, by

extension, others may see what the students are doing and learn a bit themselves.

I have a number of connections at Carpenter Nature Center, and they would certainly be able to present this plan to the local teachers around Hastings Minnesota. They could even offer pieces of the unit at Carpenter in increments. Currently, I work at the Bakken Museum in Minneapolis. We frequently interact with a number of teachers and schools who could use the lesson plan I'm developing in their individual classrooms. Someday I hope to be a science teacher, and I would certainly work to implement my lesson with that class when the time arises.

Procedure

In order to maintain adherence to science standards, our class will be examining water systems through the lens of climate change on the base level. While we will use art to help illustrate the degree of students' understanding, they will use the following standards in their course work:

Standard 1:

4.1.3.3- Society's Influence. The needs of any society influence the technologies that are developed and how they are used.

Benchmarks:

4.1.3.3.1- Describe a situation in which one invention lead to new inventions.

Big Idea: Many social practices and products of technology are shaped by scientific knowledge.

Standard 2:

4.3.2.3- The Water Cycle. Water circulates through the earth's crust, ocean and atmosphere in

what is known as the water cycle.

Benchmarks:

4.3.2.3.1- The water cycle.

Big Idea: Water is a limited resource.

Our unit will contain a combination of in-classroom instruction, group discussion, (appropriately) critical analysis of case studies wherein people have influenced our water systems and a final small-group project. Students will have many options by which to artistically express what they have learned through our case studies and discussions, but I plan to at least address one particular tactic referenced in “Cleaning Our World Through Reverse Graffiti.” This creative approach involves cleaning dirty segments of brick or concrete in specific patterns and phrases so that art and messages are conveyed through cleaning rather than defacing or vandalizing property (Randazzo, 2013). This will be done as a group project at the culmination of the course. Students will be responsible for creating the stencils that are used to power-wash environmental art that conveys a message about our water system, and the instructor can power-wash the designs, as that piece is a bit more dangerous.

What I hope to have the students get out of this practice is for them to understand what it means to take action on an issue. Creating art in view of the public sends a message, and encourages active community involvement in a way that many students may not have participated in before. We will only be doing this particular piece in an area around school where permission has been given. However, even the gaze of the student’s fellow classmates qualifies as an audience by which art can be used to impress positive environmental messages.

Evaluation

My evaluation process will be a combination of existing suggestions from Williams and McTighe's Understanding by design and grading rubrics I have created to address the expectations of the various assignments and projects. Because my curriculum focuses on using art to express understanding, many evaluation sheets must be custom made to suit the material in question. For example, students are expected to create a tool out of recycled materials that addresses a need when it comes to water use in the state of Minnesota. There is no existing template for this, so I have gone through and selected criteria that I believe is necessary to achieve understanding while addressing the "big questions" of the unit.

The unit culminates in a small group project that directly addresses one of the students' most important "big questions"- how does water impact our daily lives? In this instance, the curriculum continually builds towards answering this question. The lesson plan progresses from the science behind water to its role in our lives. This highlights exactly how I wish to utilize the principles covered in Understanding by Design in that students will be learning, through the course of the class, how water impacts humans and vice versa. They will then work together to produce visible results explaining why that is.

Ethical Considerations

When teaching a group of young, impressionable students about climate change, there are a few considerations regarding ethics that must be addressed and carefully navigated. The added artistic dimension, while beneficial to the overall lesson, can also serve to complicate how ethical dilemmas are dealt with. The most significant all- encompassing ethical consideration is simply

to approach these topics with respect.

After that, I hope for students to take the following considerations into regard:

1. The first ethical issue is with the topic of climate change itself. While it has been scientifically proven that climate change is not only real but largely influenced by human involvement and pollution, there are still some throughout the country that disagree with one or multiple points in that statement. Sensitivity must be taken to avoid upsetting students who have been raised to the contrary.
2. It is very important that my class understands that a good cause does not validate vandalism. Part of my lesson plan may involve power-washing positive environmental messages into grimy surfaces in public spaces, so explicit permission must be obtained to alter the appearance of basically any space in the city, even if it is only temporary. Power-washing may only remove dirt from a given surface, but doing so to create an image still warrants obtaining permission from relevant authorities and property owners.
3. I want to remain as objective as possible with the students artistic direction with their water system project. I will not grade on artistic talent, but rather on content understanding and effort when it comes to the creative portion. I will encourage this mindset when it comes to their peer assessments as well. My desire is for their student's work to propel a dialogue. As long as that is accomplished, I will be satisfied.
4. All sides of the climate change "debate" will be presented so that the students are able to come to their own conclusions regarding human influence on our water systems and, by extension, the greater global environment. It is enticing as a teacher to push a pro-science narrative, but

students often come from a diverse set of backgrounds. It is important to obtain all manner of opinions so that everyone is aware of the greater societal perception of climate change and the role people play in it.

5. If we are able to establish a “pen pal” type situation with students living in Flint, I want to ensure that my students are respectful of the circumstances at hand. I think it would be beneficial for both sides to understand where the other is coming from, but the last thing I want is for students to feel that they are higher up or more entitled than students in Flint due to something like water quality. The citizens of Flint are dealing with a very real problem with severe consequences that isn’t their fault, and I don’t wish for them to feel bad because of the words of my students.

6. Due to the art theory of affective expression, some of my students’ work may highlight personal aspects of their lives that are sensitive to address. I will need to take extreme caution that students are aware that others will see what they produce, but emphasize that the classroom is a judgement-free zone when it comes to personal expression.

Conclusion

My unit will be a hybrid science and arts based system for 4th grade Minnesota students in a highly populated urban area (Saint Paul). Students will be expected to demonstrate understanding of the subject matter to the degree stated in Williams and McTighe’s Understanding By Design. The art component will provide a unique variable aimed at encouraging a discourse on environmental issues. Still, it is important that educators are sensitive to the variable degrees to which students are willing and even capable of transferring complex

thoughts and emotions onto the canvas (should that be their medium of choice).

CHAPTER FOUR

Reflection and Conclusion

During this process, I have learned that there is a very real difference between being a good writer and a good researcher. I have always enjoyed writing, and have spent the bulk of my academic career reflecting on various novels, poems, and literary figures. I think that I possess a knack for storytelling and am capable of conveying complicated ideas in a concise and clear manner. However, this was by far the most significant piece of writing and planning I have completed in my career as a student thus far. The idea of not being able to simply complete a paper in one fell swoop is something new to me. I usually push through assignments all at once. Forcing one's self to really go through the paces and trust the process of research paper writing helps develop a heretofore unprecedented amount of work discipline.

I've learned that researching equates to so much more than a quick google search when it comes to writing a research paper. Combining ideas in unique ways can help hone in on specific search topics when the same tired words lead to the same source results over and over. One cannot truly appreciate the utility of their local library until they begin writing a research assignment. The help from everyone from the front desk workers to the research librarians to the IT staff are necessary to become a more thorough researcher.

Throughout my life I have always thought that learning is essentially a passive experience when it boils down to it. Certainly there is a time for group work and a time for independent study, but learning usually manifests itself by the passing of information from one party to another. Writing this research paper was an entirely different beast. The knowledge isn't laid out before you like it tends to be in lower level courses. Instead, it is up to the researcher to

formulate their own questions from which they may determine a suitable answer, or set of answers. I feel that, in this class, I have finally passed the point where I trust myself to declare with strength that which I know to be true.

The idea of a place-based pedagogy is crucial to the validity of my capstone. This allows for learning in the context of one's own spheres, be they social, political, or geographical in their consideration. Students will be much more likely to absorb and retain information if it pertains to their own environment, a major reason why I selected Minnesota DNR resources for my supporting activity readings and documents. This has made me aware of a major need when it comes to environmental learning- regionally developed resources. The lesson will be much more effective because of its immediate relevance to the students' lives.

Literature Review Influence

When creating this project, I could not ignore what I read about the necessity for rural populations' participation in establishing healthy new environmental practices (Graham, 2007). While much study and politicking around the environment occurs in urban areas and huge cities, the actual act of environmental preservation has to take place at the front lines of ecological influence. The rivers, forests, and lakes that still retain their dignity exist at the fringes of society, and there can be dispute as to why urban populations make decisions for the periphery. I believe that this is a crucial point to establish when educating urban populations; while urban students learn about these issues, the consequences often affect those whose livelihood depends on exploiting those resources. This debate is a sensitive one, and cannot be taken lightly when considering environmental impacts.

This carries over into the conversation surrounding power, privilege, and culture as

referenced by Garber (Garber, 2007). I must acknowledge my bias in writing about environmental education from a diverse cultural city like Saint Paul, where the problems of the primary populations seemingly outweigh those of secondary populations outside the city. This bias is extremely harmful in establishing dialogue between the two parties, as those who reside outside the city must not be made to think that their decisions are being made for them.

Because of this, I was mindful to create a curriculum wherein students are primarily assessing their immediate spheres rather than those of populations whose lives were distant from their own. While it is true that Minnesota shares the responsibility of its environmental issues across the board, I want students to think from a local perspective, addressing the role they play in their own spheres before dealing with others. This is also why place-based pedagogy played such a large influence in creating this curriculum. Power, privilege, and culture are frequently taken to equate to urban influence (Garber, 2007). This curriculum is designed just as much to ensure that urban students reflect on the frightful state of their own ecological circumstances before they take a stance on their own predicaments (pollution, overpopulation, waste) before those of rural citizens.

Finally, it was pivotally important that I encouraged conversation. Through their individual and group art activities, I wanted to ensure that students keep the conversation dialogic as Inwood recommends (Inwood, 2010). Art is supposed to encourage conversation, so even with a topic as contentious as the environment, I made certain that things like collective artwork was assigned. That way, even if students are from opposing viewpoints ecologically, they are forced to speak and interact. It is my hope that the students are able to come to terms with their state from an environmental perspective and learn to speak to solve problems rather

than shut down and act only in self-interest.

Implications

I believe that one major implication of this capstone project is that I will go about building curricula and lesson plans with a more all-encompassing view of the endgame in question. Much of the learning I've done throughout my life centers around the regurgitation of information; in mathematics, remember the formula. In English, one must not forget conjugations. However, the environment is so fragile and the influencing factors so numerous and nuanced that

A definite policy implication that I've found through my research is that learning needs to be less structured in the traditional sense and be more open to alternative means of education. Science and art are typically unrelated, as one is often perceived as a hindrance for embracing the other. Facts and statistics mar creativity, and creativity limits the validity of factual pursuits. However, I've found that these two ideas actually compliment each other rather beautifully. The bones of these two ideas- structure vs. free-flow- can and should both be used to influence policy so that it caters to a broader set of abilities and encourages thinking outside the box.

I am also led to consider how policy works between schools and informal educators. My curriculum is based on existing state standards, which are fairly rigid and don't allow for the time or flexibility needed to pair with informal educators in many cases. I don't know how much will change in this regard, and I think that is primarily due to the art component. While I certainly have benchmarks and goals in mind for this lesson, I don't know how eager teachers would be to use my curriculum in conjunction with their existing lessons. In fact, I think that if I were to restart this research project, I would have it cater to more flexible college or graduate

level students rather than elementary students. I think somewhere around that level alternative ways of learning become more prevalent.

Limitations

The single biggest limitation of my project has to do with my career taking me on a different path than I expected at the beginning of this journey. When I began, I was dead-set on spending my life seeking work at a nature center, or as a naturalist in a renowned National Park. My whole ethos revolved around working outside, and for a long time I intended to make that my one and only goal. An eco-art curriculum made perfect sense; I would be able to tap into the outdoor classroom through which I already conveyed so many lessons and bring an intriguing and unfamiliar aspect forward for my rural students- art. However, as is so often the case, life had other plans. I now work at a science museum, which I love. However, I'm on the opposite end of the same problem with which I was initially trying to deal. Now I have access to the cultural side (there are numerous museums all over the Twin Cities) but not the right environmental conditions- at least not the ones I initially intended to work with.

Another significant limitation of my project is that I don't necessarily have the means by which I can present the material to formal educators. While it is true that I have met several teachers through Hamline who would be capable of and happy to use the curriculum, I am somewhat set aside from that world. My world is now all museums all the time. I really love that, but I need to figure out a way where I can reach students on my terms in a limited amount of time. Were I to start from the beginning, I would reframe my material so that it could be digested in smaller chunks with just as much influence rather than go the route of in-school use.

Related Paths

This curriculum project has opened my mind to the potential for a few ideas in the future. I would love to work in an established art museum, and I think it would be unique and useful to bring environmental art into the museum, so to speak. I would love creating a curriculum for environmental science students to bring into art museums so that they can seek out parallels and influential ideas that cross over into the art realm. That way students would be able to enjoy the museum, but by viewing art through a specific environmental lense like global warming or the socioeconomics of the environment. I was recently at the San Jose Museum of Art and they had an exhibit called, “The Darkened Mirror: Global Perspectives on Water.” One fascinating component was the contribution from the Cambodian artist Khvay Samnang. His untitled performance art showed Samnang standing in various water sources around Cambodia about chest deep. He would dump a bucket of sand on his head in public view, expressing protest against the displacement of Cambodians for development purposes. This intersection between art and the environment is one of the most direct and moving that I have seen in recent months. I would love to encourage student exploration centering around themes like this.

On the flip side, there could be a way to alter the curriculum to suit an audience at my current place of work, The Bakken Museum. We are a small science museum, so the intent would be the opposite- to encourage art students to come and seek parallels between their art background and our museum. One of our displays illustrates the disparities between races when electricity was first available in the twin cities. The data shows that there was a period of multiple decades before black people had similar access to electricity as white populations. This data means something entirely different to a scientist than it does to an artist, and that disconnect

would be fascinating to examine from the art student's perspective. I would hope that more attention is given to the economic, environmental, and sociological factors than the science itself, something that I believe would be presented beautifully through art.

Based on my findings, I think that the physical location in which my curriculum is used has a significant influence on how effective it can be. I think that presenting this curriculum entirely in a rural setting wouldn't work unless the community is familiar with the arts. Rather, I think this curriculum would work best in urban/suburban schools, where there is easy access to more diverse culture and more prevalent art resources.

Communicating Results

I still have connections in the nature center world, so that is where I will start. Those who work in the education department at Carpenter Nature Center have close ties with the local teachers, and have some sway in the material that is presented to them. Additionally, Hastings, Minnesota has a small but thriving arts scene, and would be a nice starting point for this kind of curriculum. It's not my ideal scenario as I'd love to work the curriculum into city schools, but it would certainly be a good testing ground. Between teachers, naturalists, and museum workers, I think my network is large enough where I could have real conversations about where I could begin to implement my curriculum.

As a museum educator, I will certainly take the lessons I have learned from this research project and use those to ask visitors and students more big-picture questions. We have a large exhibit on Frankenstein that gets not only into the science of bioelectricity, but also into heavier life questions like, "just because people can do something, should they?" I think my curriculum lends itself nicely to discussions like that, and I will certainly express the ideas within to willing

museum patrons.

This project is a benefit to professions in both the arts and sciences. Artists will be encouraged to utilize critical observation and scientific skills to enhance their craft, while scientists/ teachers will be challenged to use a less concrete means of conveying understanding. I believe that my lesson plan encourages well-rounded and open-minded learning. All people are lifelong students, whether they think so or not. The aim is that they will be able to use those life skills to succeed outside the realm of formal education.

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