

## Complementary curriculum: the work of ecologically minded teachers

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Myriad international efforts exist to infuse and reform schools with ecological perspectives, but in the US those efforts remain largely on the fringes of schooling. The purpose of this study is to offer a perspective on this issue from inside schools. If one looks to the future success of environmental education, one must consider the work of teachers. To that end, this qualitative study explores the intentions and practices of three ecologically-minded teachers in traditional public high schools in the US. The research methodology used was eco-educational criticism, an arts-based inquiry method with an ecological lens. The teachers were interviewed about their intentions for their students, and then observed to see how those intentions were manifested in the classroom. A follow-up interview then synthesized the connection between their ecological beliefs and their general intentions for students.

Keywords: curriculum research; environmental education; teacher beliefs; teacher education

### Introduction

Public interest in global environmental issues has surged. From newspaper cover stories to political causes to sitcom story-lines, ‘green’ perspectives and conversations are becoming more commonplace. Both formal and non-formal education has, since the 1970s, been asked to respond to this growing concern (International Union for the Conservation of Nature and Natural Resources/UNESCO 1970, United Nations Conference on Environment and Development 1992), and, to that end, researchers, practitioners, government agencies, and communities have worked to implement environmental and ecological education models. However, these initiatives remain largely on the fringes of schooling, particularly in the US. The purpose of this study is not to elaborate on why environmental education remains on the ‘outside’, but rather to offer another perspective—from inside the schools themselves. That perspective comes from ecologically-minded teachers who work in traditional US public schools and who teach ‘non-environmental’ curricula,<sup>1</sup> that is, teachers who are not explicitly engaged in teaching about the environment or in environmental education programmes.

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Environmental education is a collective, broad term encompassing many facets of earth-inclusive education. 'Traditional' environmental education has roots in nature study, conservation education, and outdoor education, and is often found in supplementary programmes and activities that occur in addition to the 'regular' curriculum (Heimlich 2002). A more recent movement has emerged toward 'ecological education' (see Orr 1992, Jardine 2000), which Smith and Williams (1999: 3) define as 'an emphasis on the inescapable embeddedness of human beings in natural systems'. Other models include place-based education (Sobel 2004, Noddings 2005, Smith 2007), eco-justice education (Bowers 2001, Martusewicz 2005), education for sustainability (Sterling 2001), and education for sustainable development (Jickling and Wals 2007), to name a few. Jickling and Wals (2007) point out that this last model, education for sustainable development, while somewhat contested, 'has become widely seen as a new and improved version of environmental education, most visibly at the national policy level of many countries' (p. 4), although such policies remain absent in the US. While myriad models exist, Gruenewald and Manteaw (2007: 173) note that environmental education continues to be 'marginalized, misunderstood as mainly about science, and in many places totally neglected'.

There may be many reasons for environmental education's neglect or 'failure' (Blumstein and Saylan 2007), but certainly, if we look to the future success of environmental education in any of the above models, we must consider the work of teachers. To that end, many researchers have investigated a variety of aspects of the roles of teachers in environmental education. Cutter-Mackenzie and Smith (2001) looked at teachers' environmental knowledge or 'eco-literacy', and their related beliefs about the importance of attitudes toward, rather than knowledge about, the environment. Robertson and Krugly-Smolkska (1997) report on three sources of the 'gap' between environmental education theory and practice: (1) 'the practical', in terms of variables such as time, materials, and schedules, (2) 'the conceptual', referring to 'conflicting ideas and resources that (make it difficult) for teachers to understand what the task of environmental education really is'; and (3) 'teacher responsibility', referring to the idea that 'teachers are not completely certain that they are permitted to do many of the things that are necessary to accomplish the lofty social and political goals of environmental education' (p. 316). Other studies (Dillon and Gayford 1997, Cotton 2006a, b) discuss teachers' beliefs and actions related to controversial environmental issues in the curricula. These and other studies illustrate that environmental education is no easy task for teachers.

While other studies, such as the ones described above, have focused on teachers in sanctioned environmental education settings, I focus on teachers in traditional US public schools who happen to be ecologically-minded, but whose curricular responsibilities do not necessarily include environmental topics. I selected teachers in social studies and English/language arts for two reasons. First, social studies and language arts are largely unexplored environmental education territory (Heimlich 2002). Secondly, while environmental science and technology may play an important role in mediating the environmental crises we face, many suggest that cultural values play at least an equal part (see, e.g. Bowers 1993, Blumstein and Saylan 2007,

Gruenewald and Manteaw 2007). Subject areas like English/language arts and social studies, which contribute to transmitting and transforming cultural values, may have an important role in environmental and ecological education reform.<sup>2</sup>

By studying the intentions and actions of ecologically-minded teachers in public schools, I was able to discern themes that emerged naturally as a result of teachers' strongly held beliefs. One such theme is a new term I argue for as an addition to the curricular lexicon, the *complementary curriculum*. This is not an attempt to redefine curriculum—it already has many definitions (see Connelly *et al.* 2008); instead, it is an attempt to call attention to a particular type of curriculum and, by so doing, offer the potential for expanding ecological perspectives in schools. I start, therefore, with the broad definition of curriculum offered by He *et al.* (2008: 223):

Curriculum for us is a dynamic interplay between experiences of students, teachers, parents, administrators, policy-makers, and other stakeholders; content knowledge and pedagogical premises and practices; and cultural, linguistic, sociopolitical, and geographical contexts.

Within this definition the complementary curriculum is situated in the kinds of experiences teachers provide for students, as well as in the 'pedagogical premises and practices' that result from the teachers' beliefs.

In his discussion of the 'curriculum shadow', Uhrmacher (1997) argues for the use of a variety of terms to specify different curricula. He distinguishes, for example, the shadow curriculum and the null and hidden curricula. The *shadow curriculum* identifies a 'disdained' or neglected curriculum that could in fact improve the pedagogy at hand (Uhrmacher 1997). As an example Uhrmacher points to a social studies teacher who, in the name of order and efficiency, lectured on the US Constitution rather than encouraging discussion, which could be considered a more democratic means of learning.

The *null curriculum* (Flinders *et al.* 1986, Eisner 2002) describes what is missing. It includes intellectual processes and subject matter (Eisner 2002), as well as affect (Flinders *et al.* 1986). The null curriculum might include singular topics or perspectives as well as entire fields of study.<sup>3</sup> The *hidden curriculum* identifies the norms of schooling. Thus, Jackson (1968) distinguishes the official curriculum from the associated skills required to master it, skills such as putting forth effort, completing homework, and understanding and operating within institutional norms. Together these and other 'unofficial' aspects of what is taught in schools constitute the hidden curriculum.

Of the three terms discussed here, the *complementary curriculum* is most closely associated with the hidden curriculum. However, there are at least two key differences between the two. First, the hidden curriculum has its origins in something more ominous, or at the very least more negative; that is, in Jackson's original definition, it referred to the processes of schooling that were not explicitly taught but were required for success. In contrast, the complementary curriculum is an addition that may enhance or hinder the school experience, and students are not required to master any related skills. The second difference between the hidden and the complementary curriculum is the source. The hidden curriculum emerges from a variety of places,

such as the school structure, the bell schedule, furniture, administrative decisions, textbooks, paint colours, etc. The complementary curriculum has one source: the teacher.

These (and other) terms, Uhrmacher (1997) argues, help curricularists make distinctions that may otherwise go unnoticed. This is, I believe, the case with complementary curriculum, which I describe as the embedded and often unconscious expression of a teacher's beliefs. In the study described here, focused upon ecological beliefs, it may include the teacher's use of examples, personal stories, vocabulary, and pedagogical practices that relate to or emerge from ecological ideas, even though the curriculum does not necessarily include information *about* an earth-based idea like watershed or ecosystem health. Adding this term to our curricular lexicon, I argue, brings to light pathways to understanding and improving curriculum and instruction, particularly from an ecological standpoint.

### Method of inquiry

The study was designed to respond to two questions:

- What are the intentions of ecologically minded teachers? and
- How are those intentions realized (or not realized) in a teacher's practice?

In order to describe and interpret the potentially subtle manifestations of the participants' beliefs and intentions, I used the methods of educational connoisseurship and criticism (Flinders 1996, Eisner 1998, 2002, see also Barone 2000, Uhrmacher and Matthews 2005).<sup>4</sup>

This study has a particular focus on ecological themes, and, while educational criticism is a broad term defining the research methodology, *eco-educational criticism* is the term I use to specify the particular ecological lens through which I filtered my observations and interpretations. By 'ecological' I mean situations, ideas, and issues that address the inescapable embeddedness between and among humans and the natural environment including but not limited to issues of relationship (Smith and Williams 1999), care (Noddings 2005), decision-making (Heimlich 2002), and sustainability and global equity (Smith and Williams 1999). I was specifically seeking to understand how ecological concepts and themes emerged in non-ecological<sup>5</sup> contexts.

In this paper I provide educational criticisms in the form of vignettes with the intention to bring to light the manifestations of teachers' ecological beliefs in the classroom. In a previous study (Moroye 2005) I also used eco-educational criticism to describe teachers who did not necessarily hold to ecological beliefs, but whose practices could be described by ecological themes. In future studies this method could be used to draw forth additional ecological themes, as well as to analyse a variety of educational contexts and models for their ecological implications.

Two large US public high schools, Seneca Lake High School<sup>6</sup> (SLHS) and Highline High School (HHS),<sup>7</sup> served as the sites for my research. The three participants discussed here are US public high school teachers; two of

the three teach English, and one teaches social studies. I first conducted an individual formal interview using a protocol in which the questions referred to the teachers' intentions, their ecological beliefs, and their educational practice in general. Next, I observed each teacher for 3–6 weeks. I concluded with a follow-up interview, which often synthesized the connection between the teachers' ecological beliefs and their practices. Working with one teacher at a time afforded me the opportunity to immerse myself in their work and to better understand the architecture of their practice. I then wrote accounts of each teacher that included the four aspects of an educational criticism: description, interpretation, evaluation, and thematics (Eisner 2002). Portions of those criticisms are included here in the form of vignettes.

### Findings

As stated above, two questions guided this study: What are the intentions of ecologically minded teachers? How are those intentions realized in a teachers practice? As Eisner (1988) points out, the intentional dimension of schooling is important because intentions 'influence the kind of opportunities students will have to develop their minds... and intentions tell the young what adults think is important for them to learn; they convey our values' (p. 25). While Eisner was speaking about the school's intentions, the idea works for teachers as well. Intentions guide, among other things, curricular choices, emphases, and omissions. Here I look at the intentions of individuals with common values that were not directly related to schooling and I explore how, if at all, their practice was affected by these values. It is important to note that I asked teachers about their ecological beliefs, as well as their intentions for their students. I was seeking to understand the teachers' ways of connecting the two.

To that end, I interviewed each participant both prior to and after conducting classroom observations. One purpose of the interview was to understand the teachers' intentions for their students and whether or not they thought their ecological beliefs were linked to those intentions. Mr Rye, the first participant, explained the connection in this way:

I can't walk in and give daily lessons on drilling in the [Arctic National Wildlife] Refuge, and I can't walk in and talk on a daily basis about treatment of animals or of the natural world. But I can talk about [students'] treatment of other human beings, their view of their own lives, and the values and principles upon which they base their own lives.

As Mr Rye points out, his ecological beliefs are somewhat at odds with his teaching. As an English teacher he is not charged with the role of teaching environmental education. However, including ecological ideas in the classroom is important to him, so he chooses to infuse his practice with a broader principle that, for him, is connected to an ecological ethic. That principle is *integrity*:

I think that, at the core of environmental issues is personal integrity, [which guides whether] we exploit something or choose not to exploit something. And

what I want to do with my students on a daily basis is to have them examine and, hopefully, develop their integrity.

Mr Rye also alludes to his own sense of integrity and that he tries to live his personal and professional lives in such a way that they are in alignment with his beliefs. He does so, however, with awareness that he does not want to alienate his students. 'I try not to project myself as an environmentalist as much as just a human being who loves nature and who considers [the environment in making decisions].' Furthermore, he wants his students to live 'authentic' lives: 'My deep concern is about the type of lives these guys are going to live, and are they going to live lives that are individual and interesting and somehow sacred, or... lives that are frighteningly generic?'

Mr Rye appears sensitive to either the real or perceived limits imposed upon him by the formal curriculum, as well as by the potential negative reactions of his students. Therefore, he discusses his intentions for his students in broad terms with 'integrity' and 'authenticity' at the heart of his goals for them. So how do these ideals play out in practice? Consider the following vignette and notice how his beliefs are woven into the lesson:

'I want this project to rock!' Mr Rye shouts in a pep talk to his senior [i.e. Year 12] English class. He is preparing them to write their autobiographies as their final senior paper. This class is considered 'remedial' for students performing below grade level, and many in the class are staffed in special education.

'You need AT LEAST four sheets of paper. Not very environmental, I know.' Mr Rye roars at his students, 'HOORAY! You don't have to write essays!' A student asks if they will have assignments that tell them what to write about. 'You are prophetic! We're gonna break it down—b-b-b break it down!' Mr Rye and the class erupt in laughter at his failed attempt at rap music.

Mr Rye then begins to explain the first writing assignment. 'FOOD in 2005 is fascinating! Why am I asking you to write about food? This isn't health class. But studies show that food is the single most determining factor about how long you will live and the quality of your life.' Mr Rye explains that writing about food is really writing about their lives. He talks about the history of humankind and how it is easy to predict what people would eat based upon where they lived. 'What would people in Colorado eat? Buffalo, corn, wheat, potatoes, carrots. They didn't go to Whole Foods to pick up sushi. If you weren't able to import everything you wanted, you lived with what the land gave you.

'In our era it is unparalleled! You can choose to be a vegan and still have variety. You can choose to be a vegetarian. In this day and age it is fascinating to explore individuality because you have so much choice! You can go to a 7-11 [i.e. a convenience store] and get lunch. Now you can even get stuffed sausages—kinda scary! It's a crazy world. In 10 minutes from SLHS you can get Thai and Chinese.' He continues noting that within minutes of their school students can taste the world.

Mr Rye gives students 8 minutes to write about food as he buzzes about from student to student helping them brainstorm and encouraging their writing. 'Have some fun. Be spontaneous! Believe it or not, the power of life is in the details. If you want to stay on the surface with this project, I can't stop you. But this is your life and it's so much more interesting than that!' Mr Rye cheers as he hands out skinny slips of blue paper that say the following:

*Life Signifiers: Uncovering the Reality of You*

You and...

1. Food—what you eat and why where you eat; what you cook yourself; what your parents cook for you; guilty pleasures—stuff you eat but know you should not eat; what you will not eat and why; your typical day:... your food philosophy: what food means to you.

A student asks, ‘Can I just list my allergies?’

‘Yes! What a great feature!’ he says again. Mr Rye puts a few strong student examples up on the overhead and discusses how interesting they are. One example deals with a student’s Jewish religion and culture and their implications on the food she eats. As each student shares his or her responses, Mr Rye calls each by name, affirms his or her answer, and finds humour in almost every statement.

Remember that Mr Rye has two overarching intentions for his students: integrity and authenticity. These intentions come to life in several ways. The writing prompt itself values self-awareness, which for Mr Rye is connected to integrity and authenticity. So in that regard, his intentions are manifested in the explicit or stated curriculum. However, we may also see a more complex force, Mr Rye’s beliefs, permeating the lesson.

First, the written handout details the first of several writing prompts for the students’ autobiographies. The handout is a thin slip of paper that signifies reduced paper consumption. Secondly, Mr Rye remarks on the number of sheets of paper (four) students will need saying, ‘Not very environmental, I know’. Thirdly, Mr Rye’s elaboration on the history of food indicates his own understanding of the relationship between food and human existence, which did not always include a quick stop at a convenience store for a hot dog.

Separately, these three examples may not mean much. However, taken together they form a subtle curriculum. That subtle curriculum is the manifestation of Mr Rye’s ecological beliefs. Throughout my observations of all participants, I noticed that their beliefs often emerged in understated ways, such as in the examples they used, personal stories about their lives, certain emphases, and even in their common vocabulary. While they were often not explicitly ‘teaching’ an ecological concept or idea, they were simply showing that their ecological beliefs are just below the surface, that they are part of who they are and how they teach. Because their beliefs are not separate from their practice, are not compartmentalized into a different section of their lives, are integral to who they are in the classroom, I refer to this type of subtle curriculum as the *complementary curriculum*.

A second and related vignette further illustrates the complementary curriculum in Mr Rye’s practice. His ecological beliefs again emerge in his explanation of the written curriculum. In particular, Mr Rye asks students to consider the history of humans’ need for drinking liquids, and he takes them through a brief story contrasting the use of local resources to the present-day beverage industry. Another teacher could simply ask students to think about their favourite beverages; Mr Rye offers a more ecological perspective in which he urges students to think about what humans really need, not just what they desire.

After the students list their favourite foods and other food quirks, Mr Rye launches into the next topic—beverages. The next writing prompt he distributes, which is again on a small slip of blue paper, prompts students to explore the drinks they consume.

‘What was “drink” for the history of humankind? WATER! Wine if you were lucky enough to live near grapes. Milk if you were lucky enough to have a willing cow. But check out a 7–11 [convenience store]! What drink options do you have? Five varieties of Slurpees, Gatorade—like 20 varieties, Powerade, Energy drinks—at least 10 of those, bottled water, sparkling water—what *is* that? How do they make it sparkle? Iced tea, soda—which doesn’t quench your thirst—juice, and so on! And how do they get things to taste like that? This is the only culture in which we drink more liquids *other* than water, and we pay more money for bottled water even though [tap water in the US] is cleaner than water in almost any other country—even in toilets it’s cleaner! Now we have flavoured water—no—it’s *INFUSED*, not just flavoured!

‘I want you to see how completely foreign this is to humankind—drink has never been a factor of individuality before. Maybe you choose different drink for different reasons—your concern for your health, your concern for the environment. That is what makes *you* interesting!’

As class time draws to a close, Mr Rye prepares them for the next day by discussing 12 signifiers of individuality. ‘This is how we measure and show and understand individuality. The next signifier is clothing—you’ll find this interesting at SLHS. We see clothes and they say something. For example, look at girls with tie dyes. Does she love the earth? Does she love animals? Did she have a paint explosion? Your clothing is a great measure of who you are, at least in this country. Did you know that the average world citizen owns FIVE items of clothing—TODAY! So tomorrow we will talk about your clothing and you.

In the previous two vignettes, we might apply several different curricular terms, each revealing something different about this teacher’s practice. We could analyse the formal or written curriculum, which is exhibited in Mr Rye’s writing activity, and determine if such an activity were useful to his students and perhaps to others. We could also comment on the null curricula, what is missing, and note that perhaps Mr Rye did not place enough emphasis on editing or grammar. Selecting from a variety of terms provides us with a starting point for analysis and potential improvement. Additional terms such as complementary curriculum may provide additional and useful points of analysis.

In the second scenario, the complementary curriculum is expressed in Mr Rye’s explanation of the assignment. He emphasizes to students that beverages have not always come from refrigerated coolers at convenience stores. He draws the connection between what the land could provide and what humans could consume. He notes for students that not only are they able to get drinks from around the world regardless of local agricultural limits, but also that the beverages now available have an air of absurdity about them. In a sense, he points out how far away from ‘natural’ the beverage industry has strayed. However, Mr Rye doesn’t simply point out the state of this industry; he connects it to student choice. He is helping them to see that they do have choices that express their individuality, and that those

choices say something about how they live in the world. He does not condemn them for drinking ‘infused’ water, but points to a perspective they may want to consider, and that perspective requires that they consider the origins of the products they consume. This consideration is a new paradigm for many students (and adults) comfortable with their present consumption patterns. Then at the close of class, Mr Rye tells them that the average world citizen owns only five pieces of clothing. He again includes a broad global perspective, albeit brief, that students may consider as they write their own autobiographies.

Is the complementary ecological curriculum here valuable? From an ecological perspective, we might wonder if Mr Rye’s comments in the first vignette about the use of paper will have any meaning to students. Does merely mentioning the environmental insensitivity of using too much paper result in environmental stewardship in his students? Probably not. Perhaps Mr Rye’s comments merely show his students that environmental ideas are on his mind, and that may lead them to ask him questions about the environment later. Mr Rye notes that while his students don’t often bring this up, he is ‘deeply gratified by the fact that it does occur’. However, perhaps his discussion of food and drink provides his students with a different perspective, one which allows them a window into a kind of ecological thinking, one that considers the origins of the products we consume. Considering consumption patterns is a key cultural component to addressing the ecological crisis, so in this regard, the complementary curriculum supplements the formal curriculum with a much needed focus on connections between consumption and production.

However, some environmental education scholars might question whether Mr Rye’s attention to individuality is actually counterproductive to certain ecological ideas (see Bowers 1993). A more ecological perspective might focus more on the balance of individual and community needs (see Bowers 2003). This critique points to a difficult issue when discussing complementary curriculum; it may lead to an evaluation of teachers’ personally held beliefs. This difficulty is compounded by Mr Rye’s sensitivity to his students. He says, ‘I’m aware... as a teacher not to alienate some of my kids because if they see me “an environmentalist” will they tune out [other lessons]?’ Mr Rye therefore chooses to focus on self-awareness and personal integrity instead of other potential ecological ideas. These two areas of focus also serve as a proxy for explicit ecological perspectives in Ms Snow’s practice.

While Mr Rye’s ecological beliefs as expressed through the complementary curriculum are apparent in the way he explains and elaborates upon the explicit curriculum, it is much more behind the scenes for Ms Snow, an English teacher at Highline High School. Outside of school Ms Snow is a Native American minister,<sup>8</sup> and therefore she talks about spiritual beliefs in connection with ecological principles. She explains her ecological beliefs and related intentions for her students in this way:

The core of my ecological beliefs has to do with relationship... relationship with self, relationship with others, [and] respect for self and respect for others... It also has to do with taking responsibility. We take responsibility for how we conduct ourselves in relationship to how we use resources on the earth, for instance. And because I believe that we must act with the spirit of integrity

to preserve those resources for seven generations on down, then I think that learning things about the self and individuation and alchemy and the archetypes and all of those things really *is* in deep alignment [with my ecological beliefs].

Ms Snow feels constrained by the requirements of the courses she teaches; the English curriculum does not allow for reading environmental writing and in-depth discussion of issues. As Robertson and Krugly-Smolka (1997) point out, teachers—even in sanctioned environmental education settings—share similar concerns about what they are ‘allowed’ to do because they feel limited by what is expected in the formal curriculum. Instead, through studying texts like *Demian*, Ms Snow is addressing ecological ideas as she defines them. ‘*Demian*, Jungian psychology, [the] search for self and individualization, and being true to an inner voice... [all] have to do with relationships. Relationship with self, relationship with others.’

Ms Snow’s discussion of her beliefs and intentions for students has a similar ring to that of Mr Rye. Each seeks to develop self-awareness and integrity in students. Ms Snow’s intentions are apparent in the following vignette as she guides her students to think about what makes them unique and how they will share that uniqueness with the world. We also see how she addresses each student with care and respect, which facilitates thoughtful discussion in the class.

The humming overhead reads, ‘Most men lead lives of quiet desperation and go to the grave with the song still in them’. Respond to this famous quote by Henry David Thoreau. Do you think that this is a true assessment?’ Ms Snow looks out over her senior [i.e. year 12] Humanities seminar class... They lean over notebooks occasionally glancing up at the overhead to reread Thoreau’s words.

‘Looks like you all had a lot to say about this one’, Ms Snow smiles. ‘Let’s pick up with *Zelig*<sup>9</sup> and connect the ideas’, she suggests, referring to a Woody Allen film they had recently viewed. They discuss the fear of being seen for whom we truly are and the risk we take when we allow ourselves to be real with others. ‘Let’s keep building on this. I know you’re more awake than I am.’

‘I think a lot of people might do that because they are afraid of what society might brand them. Like Martin Luther King, Jr. He took a risk,’ one female student offers.

‘Do you think he died with a song still in him?’ Ms Snow asks.

‘No. He lived it’, she responds.

‘A lot of it has to do with fear. Like if you let your true self out’, another student says.

‘Yeah. Isn’t it about taking risks?’ Ms Snow asks as she sits down in a chair in the front of the room. ‘What if you do sing your song and people don’t accept it?’

‘No one expects anything more than mediocrity’, a third student says.

‘I don’t agree with that’, replies another.

‘Okay. Good. Let’s come back to that. I want to hear what Tracy has to say.’

Tracy says, ‘I think society wants you to strive. They want you to be the best. WE have to run this world.’

‘Okay!’ Ms Snow praises. ‘We are getting some great responses here. Let’s hear from Stacy, then Sarah.’

‘The simplest things can be made so hard. It’s like they expect you to work at a fast-food restaurant. Especially minorities. It’s like minorities are still looked down upon—since you’re Native American, you’re just going to be a drunk. So just go back to the reservation’, Stacy, an African American girl says.

‘Stacy’s goin’!’ Ms Snow cheers. ‘Let’s hear from Sarah.’

‘I think fear of society is only half of it. People are lazy. They have that quiet desperation in themselves, but they don’t do anything about it. They just watch TV.’

Ms Snow wraps up the conversation and then addresses the whole class:

I want to ask you a question, but I don’t want you to answer it. We are reading Socrates and watching *Pleasantville* to find out who you are in the world. The question I want to ask you is—what is your song and how will you sing it? You are about to walk across a bridge—many of you into higher education. I am going to show you something; it’s called ‘An Invitation’ written by a white woman. You don’t have to be trapped in that moment of quiet desperation. Those moments can make us fight to sing that song. You are going to write a senior credo. You will like it!

Students read ‘The Invitation’ and consider it silently. The first stanza reads, ‘It doesn’t interest me what you do for a living. I want to know what you ache for, and if you dare to dream of meeting your heart’s longing.’ Then, in silence, Ms Snow puts on the video of *Pleasantville*, a story of a teenager who wants to break out of his black-and-white sit-com world.

While the natural world and consumption patterns do not filter into this discussion as they did in Mr Rye’s classroom, Ms Snow’s stated intentions, which emanate from her ecological beliefs, include helping students examine their lives in order to take responsibility for their relationships. While it is apparent that the above vignette is in alignment with Ms Snow’s intentions for students, it also shows that to Ms Snow, as well as to Mr Rye, self-awareness is a building block of integrity, and one who has consciously developed integrity, they believe, will be more likely to consider ecological perspectives. They do not include explicit ecological curriculum, but instead focus on what they consider to be a related ecological principle.

In contrast, the third participant, Mrs Avila, does tend to include more explicit ecological ideas, and she, like Mr Rye, does so through her elaboration of the written or stated curriculum. Mrs Avila’s beliefs lead her to cover some subjects in more depth and with a particular perspective; for her it is a matter of emphasis. However, unlike Mr Rye, Mrs Avila feels very comfortable infusing her ecological beliefs:

In geography, we talk about population, which is a pretty common topic, ... [but] I feel totally comfortable deciding ... to talk about not just where does population grow, where does it shrink and why, but also the impact of population growth, depending on whether it is a society that is resource-intense ... I feel totally comfortable choosing to introduce the kids to that.

The following vignette illustrates this ecological emphasis as well as an extended, spontaneous discussion with her students about recycling. Notice

the stated agenda and what actually occurs. Although lengthy, the vignette does illustrate a real situation in which the teacher uses questioning to guide the students' understanding away from a common line of thinking that ecological responsibility is inconvenient toward a more connected way of thinking about personal choice and action.

Mrs Avila's 9<sup>th</sup> grade World Geography students are greeted by her friendly demeanour and an overhead that has the Geography Agenda with the Colorado state geography standards for the day:

- 6.1. Students know how to apply geography to understand the past.
- 6.2. Students know how to apply geography to understand the present and plan for the future.

*Today's activities*

1. Complete presentations.
2. Discuss population's impact.
3. What causes population to grow or shrink?
4. Population pyramids in Lab A.

The starter has a picture of a population pyramid, which looks like an isosceles triangle with horizontal stripes. The starter tells them that this is a population pyramid and asks students to explain what it might mean. 'Guessing is okay!' Mrs Avila tells them.

Mrs Avila takes responses, and one student surmises that those at the bottom of the pyramid don't have a lot of money. 'Good thinking!' Mrs Avila responds. 'Ian, what did you put?'

'Nothing', Ian replies.

'What *will* you be writing down?' Mrs Avila asks again.

'I think maybe the bars show age.'

'Terrific thinking!' Mrs Avila praises. They then move on to student presentations. 'Who's the environment group?'

The group of four students makes their way to the front, and they discuss how we need clean air and water to live. They say that we as humans take more for ourselves, leaving little for other species, and they give specific examples about deforestation.

'Pause there,' Mrs Avila interjects. 'What was Brad talking about with BIODIVERSITY? What are we using up? Where are we getting 50% of our prescription drugs?'

'The Rainforest', a student in the audience answers.

'So biodiversity refers to plants and animals that exist. So do we benefit from biodiversity?'

'Yes, like with prescription drugs', another student responds.

'But what was Alice talking about? It's not only about us, is it?'

'No.'

'It is about the plants and animals—they become extinct! For example, let's think about eggshells. In order for them to be made of what they need—'

calcium—birds eat snails; snails eat plants; and plants get calcium from soil. But why is calcium not in soil anymore?’

‘ACID RAIN!’ a student shouts.

‘Acid rain caused by?’

‘Burning of fossil fuels’, the student responds.

Mrs Avila moves to stand near two talkative boys, but does not scold them. ‘So when we get in our cars, do we say, “We’re going to kill some birds today!”? No! But the unintended consequences are just as serious as the intended consequences.’ As the discussion unfolds, Mrs Avila questions individual students about resource-use and -consumption patterns, and eventually turns to a discussion of waste.

‘Where is this place called trash? Has anyone ever visited this place called trash?’ Mrs Avila asks.

‘You mean like a landfill?’

‘Yeah. How long does the toothpaste tube stay there?’

‘Forever?’ one student guesses.

Mrs Avila prompts, ‘How long are you planning to live? 100 years? I’m planning on 105, so you’ll be taking care of me when I’m old. Will the tube be there when Armando is 100 years old?’ Students shrug, and some say no, some yes. ‘The tube I use is metal—it’s recyclable.’

‘What kind do you use?’

‘Tom’s of Maine.’ [i.e. brand name]

‘Oh. That organic stuff.’

‘Yeah. So how long does it take for the toothpaste tube to dissolve? Thousands of years! Students gasp. ‘The vast majority of my furniture is used—from the 1930s and 1950s. I make a conscious effort to recycle and to buy things that can be recycled.’

‘Why?’ a student asks.

‘Because it’s not just about me. I think about you guys when you are 105. I want you to have a planet worth living on. What we’re talking about with global warming—300 scientists, the top in their field—say the earth’s temperature is rising a couple degrees. Glaciers that have been in Greenland for thousands of years are melting. Penguins and polar bears are dying because they can’t get their food. So guys, are these [population pyramids] just about the number of people growing?’

‘No’, several students respond.

‘NO. It’s about what?’

‘How we use our resources and create junk and stuff,’ one student says.

Mrs Avila then addresses a student with a plastic Coke bottle. ‘Evan, what will you do with that Coke bottle?’

‘Throw it away,’ Evan says.

‘Why? Why won’t you recycle it?’ Mrs. Avila asks.

'No recycle bins.'

'Okay! Why at HHS do we not have many recycle bins? There is an area of the school with recycle bins, but students can't go there. Is that a problem? Shana is drinking juice—and we're glad because juice is far better than Coke, no offence, Evan. But when you're done, will you ask me to recycle it for you?'

'No. You should have a recycle bin in here', Shana says.

'So it's up to me?' Mrs Avila asks.

'We should have a recycle day. All the students who get in trouble should pick up trash and recycling,' another student offers.

'They should have recycle bins,' another student says.

'Who is this "they"? Do *you* care?'

'It's more of a habit,' Shana says.

'How could we get you to change that habit? Do you all agree that if more recycle bins were available, you would recycle?' About eight students raise their hands to say yes.

'But we have to overcome laziness!' Shana says.

'Who needs to organize this movement?' Mrs Avila asks Shana.

'Everybody. Students.'

'Why students? Would some people listen to *you*? *You* personally? Armando, would you be willing to work with other students to increase the number of recycling bins?'

'Maybe.'

'What would make you more likely?'

'To know that students will use them,' Armando says.

'Did you know we used to have a recycling club?' Mrs Avila asks.

'No!' many students respond, shocked.

'It faded away because students stopped coming. Mr Hepner might be willing to do this again, but could this be student-driven?'

'Yes,' many respond.

'What would need to happen?'

'Talk to Ms Wright,' Shana says referring to the activities director.

'Is anyone willing?'

'Yes! I will!' Shana volunteers.

'Is this a big change in the scheme of things?'

'No. We are only one school', a student says.

'But maybe it will encourage other schools!' Shana offers.

Class is ending, and Mrs Avila encourages students to think about their conversation today. 'Who will follow through?' she asks as they leave. Several students stay after the bell to talk further with her about the recycling club and various other ideas.

The written curriculum as evidenced by the agenda does not accurately reflect what actually occurred in the classroom.<sup>10</sup> While Mrs Avila certainly did ‘discuss population’s impact’, she did so in a way that elicited thinking in her students that, for some, led to action and for others to increased overall engagement in the class. I asked Mrs Avila in our second interview if anyone had followed up on offering more recycling in the building.<sup>11</sup>

They haven’t had action yet, but they are still talking about it. And, actually Shana, one of the girls who volunteered, is talking to me more in class now and even turned in some late work... She was certainly not doing well [before this lesson], but I am hoping that she is feeling a little more tied in.

I asked Mrs Avila why she thinks that the lesson resonated in particular with Shana:

I have some ideas that maybe it was because I totally trusted that she would do it and that I was very enthusiastic when she volunteered. I am hoping that she at least sees that I do believe in her. I am not sure that she believes in herself a whole bunch.

The complementary curriculum in Mrs Avila’s case is not only expressed in the stories and examples of her own life, but also in the types of thinking she elicited in students through a series of questions and statements in the impromptu discussion about recycling. To elicit that thinking, she employed a pedagogical technique of questioning which is similar to strategies discussed by Cotton (2006b) in her study of three geography teachers in the UK. Cotton identified three strategies teachers use to discuss controversial environmental education topics: ‘Strategy 1: Eliciting students’ personal views...; Strategy 2: Enabling students to discuss their own views...; and Strategy 3: Challenging students’ views’ (p. 227).

Cotton’s study and this study are similar in that both identify ‘real’, not ‘ideal’ practices. However, the contexts are different in that all three of Cotton’s participants were actively engaged in teaching environmental issues as part of the formal curriculum. Still, the strategies discussed (and in particular Strategies 1 and 3) are evident in Mrs Avila’s practice and offer another example of this pedagogy at work.

Furthermore, Mrs Avila appears more focused on uncovering the origins of students’ individual behaviours. She spends a lot of time eliciting students’ rationales for their own behaviour. (‘Evan, what will you do with that bottle when you are done with it?’). This fourth strategy of considering the rationale for one’s own behaviour could be considered useful in contexts in which teachers are focused on action, or in which the focus is on habits of mind that affect behaviour (‘Why won’t you recycle it?’). While the teachers in Cotton’s study were more engaged in debating complex and abstract issues (such as the governance of Antarctica), Mrs Avila and her students were dealing with seemingly simple and concrete behavior—recycling. Discussing this immediate and daily behaviour highlighted the locality and immediacy of personal choice for students. This strategy, or pedagogical practice, emerged from deeply-held beliefs and the lifestyle of Mrs Avila, and it took place in the context of the caring classroom community she consciously orchestrated. It may be difficult for other teachers to emulate, but in this case, the pedagogical practice that characterizes the complementary curriculum in Mrs Avila’s

work led some students to reflect upon their own behaviour and to ultimately reorganize the Environment Club at Highline.

### **Implications for teaching: toward an ‘environmentally-sustainable pedagogy’**

Mrs Avila’s pedagogical choices help her to guide students to a more ecological frame of mind; she does so by expanding upon the formal social-studies curriculum. However, many ecological curriculum theorists suggest that environmentally-sustainable education should be characterized by a trans-disciplinary curriculum (Van Kannel-Ray 2006). This kind of curriculum requires a communal effort and, I would argue, a whole-school reform effort.<sup>12</sup> The participants in the present study, however, did not have the benefit of working within whole-school curriculum framework, or even with like-minded others. Indeed, each teacher worked alone and in a single discipline. Therefore, to ask whether or not they are realizing a new model of ecological education is neither fair nor appropriate, but we may perhaps glean some aspects of what *environmentally-sustainable pedagogy* could look like:

environmentally sustainable pedagogy as a theory of teaching can inform how to hold the individual and the community in relationship... It can offer a new identity to teachers as teaching with a moral imperative, as helping students to become more responsibly embedded in the natural world. (Van Kannel-Ray 2006: 122)

She suggests that pedagogical practices should emerge from the overarching ecological principles of ‘intergenerational responsibility’, ‘organic perception’, and ‘sustainable outcomes’ (p. 117). Each teacher from the present study contributes to a vision of these pedagogical practices through either intergenerational responsibility or organic perception (the present study is limited in understanding the effects on sustainable outcomes).

*Intergenerational responsibility* deals with balancing the individual’s needs with the needs of the past and the future. Mr Rye begins to help weave this tale of balance in his writing exercises with students. He urges them to write in detail about their own individuality, but couches that uniqueness and related consumption in a broader perspective so as to avoid seeing ‘the individual as the epicentre of the universe’ (Bowers 1995: 7). Furthermore, this type of focus seems to be in line with Bonnett’s (2002) discussion of education for sustainability as a frame of mind which seeks to ‘reconnect people with their origins and what sustains them *and* to develop their love of themselves’ (p. 271). Reminding them that until recently water was the predominant drink for humankind, and that also until recently humankind relied upon local food sources, Mr Rye brings a deeper awareness of the connections between humans and their environments to his students and highlights students’ understandings of their own choices. Mr Rye does not, however, ask students to change their behaviours or to even consider the environmental or social ramifications of their choices. On the other hand, Mrs Avila does urge students to consider the effects of their choices, particularly the ways

they handle trash and recycling. Her efforts seem particularly fruitful in that the Recycling Club gained renewed membership and activity.

*Organic perception* is an indication of an individual's perceived connection with the natural world (Van Kannel-Ray 2006). Seeing oneself as connected, or as Ms Snow puts it 'in relationship', limits our tendencies to exploit others, both human and other-than-human. Therefore, Ms Snow's work may also make a contribution to environmentally-sustainable pedagogy in her cultivation of a caring community. Not only does Ms Snow have a deep commitment to fostering relationships with her students, she facilitates students' relationships with each other through encouragement, creating space for students to have their voices heard, and by making it safe for them to discuss different ideas with each other, even in a very diverse setting. This is done in the context of individual purpose and a discussion of each student's 'song'. The learning community becomes a place that fosters organic perception.

Complementary curriculum, the embedded and often unconscious expression of one's beliefs, is the manifestation of a teacher's wholeness or completeness, of his or her integrity.<sup>13</sup> In his essay 'The heart of a teacher: identity and integrity in teaching', Palmer (1997) discusses the importance of teachers' awareness and development of identity and integrity in teaching. By identity Palmer means 'an evolving nexus where all the forces that constitute my life converge in the mystery of self... Identity is a moving intersection of the inner and outer forces that make me who I am' (p. 17). By integrity Palmer means 'whatever wholeness I am able to find within that nexus as its vectors form and re-form the pattern of my life. Integrity requires that I discern what is integral to my selfhood, what fits and what does not' (p. 17). For Palmer, a teacher's identity and integrity—not technique and method—are what make them great teachers:

My ability to connect with my students, and to connect them with the subject, depends less on the methods I use than on the degree to which I know and trust my selfhood—and am willing to make it available and vulnerable in the service of learning. (p. 16)

Complementary curriculum is the expression of this identity and integrity, of what Palmer (1997: 16) calls the 'integral and undivided self'. As illustrated in the vignettes presented above, this expression might emerge in a variety of planned or spontaneous ways, often dependent upon the particular moment and context as orchestrated by the teacher. This is what makes complementary curriculum different from the myriad of other terms in our curricular lexicon: the source of complementary curriculum comes uniquely from the teacher and her personal passions and beliefs.

While the focus of this study is on the expression of ecological beliefs and therefore complementary *ecological* curriculum, this idea might be applied to other beliefs or passions, such as an artistic sensibility or commitment to social justice. In order to explore and understand the complementary curriculum of such beliefs, the researcher would need to first interview the teacher so that she may articulate her beliefs and passions. Next, the researcher would observe the teacher's work to see how if at all the beliefs are infused in practice. For example, these passions might be expressed through the use

of music or stories of artistic encounters, or through a biographical study of social activists, or first-hand accounts of participating in social change. It is important to note that the teachers' beliefs may emerge intentionally or unintentionally, consciously or not. Therefore, a follow-up interview with the teacher can foster a discussion of the teacher's intentions and beliefs with the researcher's observations. The researcher is then better able to evaluate how the expression of that teacher's beliefs—the complementary curriculum—influences pedagogy, curriculum, assessment, class structure, or other dimensions of schooling.

In addition to conducting a follow-up interview, sharing the educational criticisms (or observations) with the teachers may illuminate for them previously unseen connections between their beliefs and practice. Such was the case in the present study, and after I shared the educational criticisms with each teacher, I was struck by their responses. Ms Snow writes:

I learned about how our internal belief systems shape the teaching process. Before I understood the nature of [your] study, I could not accurately articulate why I had sometimes been very happy and other times very unhappy with teaching. Now I understand the very necessary and intrinsic core of how our ecological belief systems and (for me, at least) a corresponding spiritual belief system shapes the art of our relationships with our wonderful students. (Personal communication, 8 September 2006)

While this study looks particularly at ecological beliefs, having a similar dialogue with teachers about their particular beliefs and then illustrating for them how those beliefs come to light in their practice may lead to a more developed sense of their teaching integrity, and further research could also explore how the complementary curriculum affects students directly.

### **Implications for ecological teacher education**

Because of the skills, beliefs, and knowledge required to implement environmental education curricula, many point to the importance of ecological perspectives in teacher education programmes (Tilbury 1996, Oulton and Scott 1997, Corcoran 1999b). Some teacher educators have investigated the lives of ecologically-minded teachers and what factors caused them to become ecologically aware. Corcoran (1999b) details the process of writing an environmental autobiography, through which he guides his undergraduate pre-service teachers. Corcoran affirms the belief that environmental education in teacher education is the 'priority of priorities' (Tilbury 1996, cited in Corcoran 1999b: 179).

Corcoran says that environmental autobiographies can help us identify what makes humans want to live sustainably, an issue at the heart of environmental education. Corcoran says, 'A desire to protect the natural world arises from a deep sense of affinity with the land and nonhuman beings' (p.179). He terms this '*biophilia*', or a love for other living beings, which Corcoran believes is 'central to our nature as humans' (p. 180). This is where he begins with environmental educators—with this innate sense of connection explored through environmental autobiography.

Corcoran (1999a) also completed a study of environmental educators in which he sought to understand the significant childhood life-experiences that led environmental educators to feel a strong connection with the natural world. Mirroring a previous study in the UK by Palmer (1993), he surveyed 510 US teachers about their experiences in nature as children. The narratives have recurring themes such as parents and grandparents as environmental educators and role models; fear of the effects of environmental problems; world-view, faith, and spirituality; childhood time outside; and hope (Corcoran 1999a: 211–217). Corcoran believes that teachers who have had these significant life experiences will provide similar opportunities for their students to develop their own affinity for the natural world. The present study, in combination with those discussed and cited above, builds evidence that attention to the ecological beliefs of pre-service and in-service teachers may play an important role in the expansion of environmental and ecological education, whatever form they may take.

Complementary ecological curriculum also may have import for students. In the case of ecological education, Corcoran (1999a) notes that many who hold ecological beliefs trace the origins of those beliefs to a role model they had in childhood. Perhaps ecologically-minded teachers may become one of those role models as they demonstrate to students through the complementary curriculum that their ecological beliefs are just below the surface and guide their decisions and ways of being. It illustrates to students that ecological issues and ideas are connected to a variety of aspects of our lives, and that they are integral in the minds of the ecologically-minded teachers. These issues and ideas comprise parts of the teachers' identities, and they inform aspects of personal and global decisions. Complementary ecological curriculum reinforces the notion that the environment and ecological issues are not separate or supplemental; they are part and parcel of our everyday lives. Smith (2004) notes a similar phenomenon in his study of the Environmental Middle School. Teachers did not 'check their ideals at the door. They instead brought those ideals into every dimension of their work' (p. 77). Both studies indicate that teachers' ecological beliefs inform their practice, and therefore what students may experience.

### **Conclusion**

In his discussion of educational criticism, Eisner (2002) considers whether or not we can generalize from such research. While criticism cannot predict outcomes, it can, Eisner argues, create 'forms of anticipation by functioning as a kind of road map for the future' (p. 243):

Once having found that such and such exists in a classroom, we learn to anticipate it in other classrooms that we visit. Through our experience we build up a repertoire of anticipatory images that makes our search patterns more efficient. (p. 243)

This is the case, I believe, with complementary curriculum, ecological or otherwise. As critics, teacher educators, curricularists, and researchers, we can enter a classroom anticipating various expressions of teachers' personal

beliefs. This recognition adds a layer to our understanding and evaluation of what is happening in a classroom, or to what could or should be happening. In this way, identifying, understanding, and evaluating the complementary curriculum is not only useful to teachers themselves, but also to those who aim to support teachers and schools in their efforts, particularly those important and difficult efforts to ‘green’ our schools.

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### Notes

1. By ‘non-environmental’ I simply mean educational contexts and models that are not explicitly focused on teaching environmental themes and ideas, such as a traditional school or an English classroom focused on the Western canon. Certainly all contexts can be considered ecological, although Orr (1992: 90) has said that ‘all education is environmental education.’. In other words, it is impossible to separate humans and our constructed worlds from the planet on which we live.
2. It is important to note that many environmental education reforms call for integration of disciplines (see Orr 1992, Smith and Williams 1999, Jardine 2000). While this may indeed be an appropriate and necessary recommendation, the current reality of public schooling is that most US secondary schools are structured with disciplinary separation.
3. The current war in Iraq (Flinders 2006), some religious concepts, and in some cases evolution are all examples of what is not taught in US schools.
4. Eisner (1998) developed educational connoisseurship and criticism (henceforth called educational criticism) as method of qualitative inquiry intended to improve education. Connoisseurship is the art of appreciation and criticism the art of disclosure (Eisner 2002). Therefore, connoisseurship requires that the researcher have enough educational knowledge to be able to observe the subtleties and intricacies of the educational setting. The criticism, then, illuminates the connoisseur’s perspective with the aim of educational improvement in mind.
5. See note 1.
6. The campus of SLHS boasts a collegiate setting with four separate buildings, three cafeterias, a variety of outdoor spaces to congregate, and extensive sports facilities. The school is situated on 80 acres adjacent to a large state park, and several of its classrooms overlook the reservoir. Students have a generous amount of autonomy. Of the 3700 students, approximately 86% are White, 2% are African American, 7% are Asian, and 5% are Hispanic.
7. HHS lies on 32 acres near a large public park and wetlands refuge. The single, more traditional high-school building has been recently remodelled to include an Academic Success Centre, a new athletic area, and refurbished entrances. Of the approximately 2000 students at Highline, 1% is Native American, 32% are African American, 6% are Asian, 16% are Hispanic, and 45% are White. Furthermore, students speak 52 home languages and come from 110 countries. Both schools have an average class size of about 25 students. SLHS and HHS participate in their district’s large-scale curriculum implementation project in which all classes provide an opportunity to learn certain essential components in the core areas (English, mathematics, social studies, and science). Teachers are provided with extensive curriculum binders, but in most cases are not directed how to teach the essential core content. The formal curriculum is a compilation of the state of Colorado’s standards as well as university-preparatory skills, and a major focus of the district is to improve performance on standardized state tests.

8. Ms Snow was trained by Native American teachers in various ceremonies for a number of years. For purposes of confidentiality, I have eliminated all other identifying details.
9. *Zelig* is the story of a man who transforms himself to be like those who surround him in order to gain approval.
10. Eisner (2002: 32–34) described that which actually happens in a classroom as the ‘operationalized curriculum’.
11. After the conclusion of this study, HHS did resurrect the Environment Club. Many members came from Mrs Avila’s class.
12. See, for example, the Portland Environmental Middle School (Smith 2004).
13. ‘Complementary’ literally means ‘forming a complement, completing, perfecting’ or ‘of two (or more) things: mutually complementing or completing each other’s deficiencies’ (*Oxford English Dictionary* 1989). We might think of complementary angles, which when paired together make a right angle. We might also think of complementary colours, ‘which, in combination, produce white or colourless light’ (*Oxford English Dictionary* 1989).

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