Teaching sustainability as a social issue:

Learning from three teachers

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ABSTRACT

Teaching Sustainability as a Social Issue: Learning From Three Teachers

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Many researchers cite living more sustainably as humans' most pressing long- term challenge. Living sustainably can be defined as meeting one's needs without interfering with future generations ability to meet their needs. Engaging students with the social causes and effects of sustainability issues may help to address and create dialogue about our own needs and those of future generations. Unfortunately, no studies examine how teachers deliver this topic as a social issue in their classrooms. Through the research question, "What are the curricular, pedagogical, and assessment strategies of three teachers when they teach the social issues of sustainability education?" this qualitative case study seeks findings useful to the education field. For example, teachers might learn how peers plan, implement, and assess this sort of instruction. Teacher educators could create or update pre- service education sustainability frameworks. Or, researchers might study the findings' impact on existing educational paradigms. Thus, this study advances understanding within education on ways to sustain humanity's prosperity.

TABLE OF CONTENTS

III. RESEARCH METHODOLOGY

List of Tables

List of Figures

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I. INTRODUCTION

Purpose of the Study

I have organized this section in the following way:

Purpose of the study

Sustainability issues

Social studies education

Sustainability issues in social studies education

In this section, I seek to establish the purpose for investigating my research question: "What are the curricular, pedagogical, and assessment strategies of three teachers when they teach the social issues of sustainability education?" I chose this question for a few reasons. I was interested in learning how these teachers taught the social issues of sustainability (SIS) in the form of dialogical questions (for example, "Should restaurant owners fine customers for not eating all of their food?"). I wanted to understand how students engaged in dialogues about such issues, but I was not merely interested in discovering new SIS questions. For example, I sought to understand how the teachers crafted these questions as vehicles to deliver learning goals to their students. I aimed to learn how teachers embedded such questions into their lessons. I wondered what sort of scaffolding they employed to prepare students' skills and content-knowledge. Also, I was curious how teachers assessed this kind of teaching. Did their initial criteria for student outcomes change? Would they teach these lessons differently in the future? I desired a snapshot of the academic process involved in engaging students with SIS questions.

To answer my research question, I studied four teachers in three different classrooms (two of the teachers team- taught a course). One teacher taught in an elementary school, one

teacher taught in a middle school, and two teachers team- taught in a high school. Each teacher developed and implemented one's own curriculum. The elementary teacher taught in a private school, and the other three teachers taught in public schools. I observed each classroom over the course of a unit of instruction (each lasted about eight to nine weeks).

Sustainability issues

I based this study's importance -- it's "so-what" -- on the understanding that civilization's most pressing long-term challenge is addressing the causes and effects of humans' unsustainable consumption levels (Witthaus, MCandless, & Lambert, 2010). For example, as the human population increases toward a projected 9 billion people by mid-century (Farrell, 2011; Whitty, 2010), annual global food and water shortages may cause as many as six million children's deaths from starvation or complications from malnourishment (Fagan, 2008; Friedman, 2008; Kolbert, 2006). Political, social, and scientific groups cite humans' inability to live within the carrying capacity of the Earth's natural systems a critical challenge to humanity's long-term prosperity (Kostigen, 2008). Incoming generation will have to address how to live differently -- in this case, more sustainably -- than previous ones. They will need to figure out a way to live more within the means of the Earth's capacities. However, these "Millenials" are not expressing a sense of urgency toward such changes.

A recent study revealed that Millennials appear less concerned about environmental issues than any of the past three generations (Twenge, Campbell, & Freeman, 2012). These young people appear less confident about their ability to affect changes in their communities and beyond. Also, they are pessimistic about influencing the course of their *own lives*. If this

generation is heir apparent for these sustainability issues, one might wonder what society's next steps might be to improve such attitudes.

Education

Broadly speaking, "education is a crucial response" to addressing how young people interact with sustainability issues (Neeser, Natura, Jain, Taylor, & Lenglet, 2010). Many years ago, international organizations stressed the link between changing societal habits with increased education on the subject. For example, in 1987, the United Nations- appointed World Commission on Environment and Development called for "a vast campaign of education, debate, and public participation" and asserted that the "security, well-being and very survival of the planet" depends on immediate action (WCED, 1987, p. 23). More recently, UNESCO declared the years from 2005 to 2015 as the "Decade of Education for Sustainable Development." This declaration included the statement that to achieve more sustainable living around the world, "there has been a common consensus that education is a driving force for the change needed" (UNESCO, 2004, p. 11). Many in the education field share this sentiment.

For example, in response to increased damage caused by hurricanes along the eastern seaboard and gulf region of the United States, education researchers elevated the importance of studying sustainability in K-12 school settings. In the wake of Hurricane Katrina (but before Hurricanes Irene and Sandy) Mitchell (2009) posed the question, "How should we respond to these natural disasters?" (p. 134). His answer suggested that addressing the nearly $1 billion lost per week from natural disasters should begin in the K-12 classroom. Generally speaking, other education researchers focused increased attention in K-12 settings on determining what sort of action, if any, they should take. Ballantyne & Packer (2002) wrote, "General concern about

global environmental problems facing the world has led to an increasing emphasis on the importance of school environmental education programmes in preparing future citizens to address these issues" (p. 218). Orr (2004) concurred that educators must prepare the present generation to address this issue. He said,

> Those now being educated will have to do what we… have been unwilling to do: stabilize world population; stabilize and then reduce the emission of greenhouse gases… they must learn how to use energy and materials with great efficiency…they must begin the great work of repairing, as much as possible, the damage done to the earth in the past 200 years of industrialization… No generation has ever faced a more daunting agenda. (p. 26-27)

How to "repair" damage to the Earth may require dialogue about how to solve this "daunting agenda." Indeed, education researchers identify schools as the top source of knowledge on the environment, as well as "the most reliable" (Taylor, et al., 2007, p. 371; Velazquez, Munguia, & Sanchez, 2005; Onwueme & Borsari, 2007). If education has a significant role in preparing the world to live more sustainably, then a reasonable question is, "what kind of educational response is being called for?" (Chase & Rowland, 2004). In this study, I argue that such a "response" could be appropriately attempted by way of social studies education.

Social Studies education

Several individuals appear to agree on the importance of addressing SIS within the social studies education field. For example, Chandler (2009) argues that social studies educators are well-situated to help students address power dynamics creating environmental issues. Martusewicz & Edmundson (2005) note that the social studies classroom is an appropriate place

for students to deliberate about environmental public policies. Many education researchers argue that the social studies curriculum provides outstanding opportunities for student engagement about why environmental issues occur and how to solve them (Becker & Jahn, 1999; Fleury & Sheldon, 1996; Louv, 2008). Patrick (2003) and Sterling (1996) note that teaching about SIS seems appropriate to the aims of social studies through what Parker (2008) calls "democratic enlightenment." He defines this term as "the ability and commitment to deliberate public policy in cooperating with disagreeable others" (Parker, 2008, p. 68). The connection between "democratic enlightenment" and social studies education rests with the idea that engaging students with such deliberations may contribute to the development of valuable skill sets useful to civic participation. Thus, social studies educators may be in an appropriate position to develop students' engagement with SIS with a similar aim of developing skill sets for use in latter situations.

Also, several others in the social studies field appear to agree that sustainability could be effectively taught using a dialogue-based, issues- centered teaching approach (Fleury & Sheldon, 1996; Patrick, 2003). According to Evans, Newmann, & Saxe (1996), issues-centered teaching "focuses on problematic questions that need to be addressed and answered, at least provisionally. Problematic questions are those on which intelligent, well-informed people may disagree" (p. 2). Ochoa-Becker (2007) notes an example of such a question could be, "What should we do relative to nuclear waste or toxic waste?" (p. 194). Such an inquiry invites multiple perspectives and the potential for informed disagreement. In this context, multiple perspectives imply that SIS questions invite dialogue where informed participants could disagree. Thus, multiple responses to SIS questions may be correct. The presence of multiple answers indicates to participants the

complexity of the issue and the array of options they can consider when choosing a course of action.

The social studies field appears to accept sustainability education as a viable component. For example, the subject appears periodically in established publications. On behalf of the National Council for the Social Studies (NCSS), Evans & Saxe (1996) included a section on teaching "Environmentalism Issues" in their publication, *Handbook on Teaching Social Issues*. In her work, *Controversy in the Classroom: The democratic power of discussion*, Hess (2009) identified climate change as a viable option. For decades, NCSS presidents and board of directors emphasized the importance and potential of teaching this topic (McFarland, 1989; McCutchen, 1963; McGuire, 1991; Piburn, 1977; Riggle, 1989; Smith, 1970). However, social studies researchers admit they understand very little about what this kind of teaching looks like (Becker, Jahn, & Stiess, 1999; Dobson, 2004; Fleury & Sheldon, 1996; Martusiewicz & Edmundson, 2005).

In fact, they lament a half- century of cyclical interest in sustainability education ending in little accomplishment. For example, Piburn (1977) noted that "after twenty years of apparent interest in this subject, little progress has been made either in research or curriculum development" (p. 29). Many years later, Riggle (1989) made similar observations. He said, "Twenty-two years later, the notion remains intact, but undeveloped" (p. 297). Corney (2006) summed up this situation when he wrote that current understanding of this topic "is based on rhetoric and exhortation, and there is a lack of empirical, classroom-related studies which would provide evidence for professional development" (pp. 224-225). So, even if those in the social studies field profess the importance of learning more about sustainability education, they have not done much to advance understanding beyond postulation.

Sustainability issues in social studies education

Therefore, an emergent problem involves education researchers persistently trumpeting the importance of teaching SIS but reporting very little about that looks like. Almost every scholarly contribution in this regard mysteriously avoids investigating actual classroom practice (Gooch, et al., 2008). Instead, those in the field continue to write about SIS through a lens reliant on theory, speculation, or conjecture (Corney, 2000). In fact, the body of research in this regard curiously continues to grow.

Posing possibilities for teaching SIS without observing classroom instruction suggests an ongoing problem. Louv (2008) compares this phenomenon to ecologists who make models about populations or communities they "could not identify" and admittedly, "have never seen" (p. 225). Thus, theories about how SIS could be taught are incomplete when they chronically omit how this sort of instruction occurs.

Orr (2004) calls this disconnection a "fallacy of misplaced concreteness" (p. 88). He uses this term to relate the grand scale of theorizing about teaching sustainability education with a dearth of classroom understanding. By emphasizing theoretical writings, Orr writes that "words and theories take on a life of their own, independent of the reality they purport to mirror" (pp. 88-89). Thus, carefully crafted insights about what teaching SIS could be like may be minimally useful without complementary field observations. Smith (1990) describes this kind of scholarly writing a little less politely. He called it "busy-work on a vast and almost incomprehensible scale" (p. 7). Thus, imbalanced theoretical writing about SIS appears to have partially obstructed the goal it purports to elevate -- understanding about classroom applications.

Hopwood (2007) made a helpful assertion in finding one's way toward a more purposeful understanding of sustainability education. He writes:

> It seems that while academics construct and dissect arguments about what environmental education should be about, what ends it should serve, and how these ends it should serve, and how these ends might be met, pupils in classrooms are busy in a daily basis interpreting environmental learning experiences in terms of their own answers to perspectives on these issues. (p. 462)

His suggestions are clear. The usefulness of theorizing, without clearer understanding of how they apply to instruction, remains questionable. His assertion garners significance especially since he claims that teachers *do* attempt such instruction daily in K-12 learning environments. His argument fuels the assumption and motivation of this study: teachers may be teaching SIS already, and developing an understanding of their craft can begin with this study.

Research question

Thus my research question draws understanding from Hopwood's perspectives. I want to develop an understanding for how teaching SIS looks in the classroom. While I propose some modest theories about how SIS could be taught in Chapter V, I base those concepts in data gathered from my three case studies. However, I am not merely interested in what these SIS questions are. I hope to understand the broader process involved in their implementation. I want to learn about the teachers' learning goals for the instructional unit studies. I hope to observe how an SIS framework looks in their daily lessons. Also, I aim to peer into the teachers' assessment processes of this curriculum. For these goals, I frame my study with the research question: "What are the curricular, pedagogical, and assessment practices of three social studies

teachers when they teach the social issues of sustainability?" With this question in mind, my qualitative case study seeks to learn how teachers 1) prepare and plan curriculum about the social issue of sustainability, 2) implement such lessons, and 3) evaluate student engagement with the curriculum.

To guide my data gathering and analysis of these areas, I first examine how teachers crafted learning goals, materials, and lesson plans examining "significant social and controversial issues" (Ochoa-Becker, 2007, p. 162) associated with sustainability education. Next, I focus on the steps social studies teachers took before students began "reaching [and] justifying decisions" (Ochoa-Becker, 2007, p. 141). Shaver (1967) referred to such a process as a "jurisprudential framework:" a teacher introduces a "provocative message" so students may take a stance and defend it (pp. 114, 115, 177). Finally, I explore how social studies teachers evaluated this kind of curriculum. In this context, Brum, Bouldin, & White (2000) note that the teacher's goal could be to "empower the learner by giving her or him the intellectual capacity to address public issues" (p. 37). Thus, my study investigates why teachers chose certain goals, how they implemented them, and how they evaluated them.

Theoretical framework

Moving forward with the study's design, one should understand how I describe and define the components making up its theoretical framework -- the social issues of sustainability (SIS). I propose that SIS combines two existing educational frameworks: Sustainability Education (SE) and an Issues- Centered, Decision- Making approach (ICDM). Thus, I first investigate definitions of sustainability as a broad concept. Next, I discus understandings of SE and ICDM frameworks as separate concepts. Finally, I merge SE and ICDM to produce the SIS

framework and discuss its conceptualization. In conclusion, I discuss drawbacks to these frameworks. I also rationalize why an SIS framework is more appropriate for this study's aims than similar environmentally- oriented frameworks like eco- justice. Consider the following outline when reading this section on my theoretical framework:

Sustainability

Sustainability Education (SE)

Issues-Centered, Decision-Making (ICDM)

SIS framework (combination of SE & ICDM)

Eco-justice: Alternative framework not used

Critiques of an ICDM framework

Significance of the study.

Summary

Sustainability

A variety of organizations and agencies conceptualize sustainability as the interconnectedness of social, economic, and environmental needs of humans. This array includes federal and state education agencies (State of Washington Office of Superintendent of Public Instruction, 2011; The U. S. Partnership for Education for Sustainable Development, 2011), state government agencies (e. g., Minnesota Department of Transportation, 2011), and a multi-disciplinary representation from colleges and universities (Portland State University School of Business, 2011; Utah State University Sustainability Council, 2011). The diverse nature of these groups signals the cross- curricular nature of sustainability as a broad concept.

Education researchers define the relationship or interaction between these three concepts as interdependent (Nolet, 2009) or interconnected (Dobson, 2004). Dobson (2004) emphasized this relationship as an "interconnected" one instead of one that was "interdependent" because the latter suggests a parity among nations in a globalized economy. Interconnectedness, according to Dobson, at least addresses the "asymmetry" at work in globalization -- the notion that some nations exert a greater influence on the social, economic, and environmental systems of less powerful nations (p. 12). However, Nolet's understanding of interdependence does signal one of the goals of sustainability: establishing a symmetrical relationship between economic, social, and environmental needs. He described this relationship by saying, "An understanding of any of these systems requires simultaneous consideration of environmental, economic, and societal impacts" (p. 423).

Defining the three components of sustainability is helpful. Nolet (2009) describes the term "social" (as a component of sustainability) as "fair and equitable distribution of resources" and considerate of "social justice and equity as equal in importance to preservation of wilderness areas and biodiversity" (p. 425). Sustainability's inclusion of social justice distinguishes it from environmentalist and conservation movements of previous decades (Ageyman, 2005). Bickmore (2008) described teaching for social justice as addressing the role of power structures in creating bias, oppression, and marginalization. In this context, social justice within a sustainability framework addresses how power structures cause environmental degradation that disproportionately affects smaller segments of the population – notably poor, minority, and urban populations. To support this notion, one education researcher wrote, "social justice and equity are integral to current conceptions of sustainability… [It] considers social justice and equity in

importance to preservation of wilderness areas and biodiversity" (Nolet, 2009, p. 425). Inclusion of social justice here signals an attention to human needs, not just natural systems.

"Environment," as a component of sustainability, can be defined as the natural systems that provide services for humans (United Nations Statistics Division, 2005). Natural systems' ability to regenerate and continue to provide for other living things at a sustained rate refers to its biocapacity (World Wildlife Fund for Nature, 2006). If the earth's biocapacity depletes faster than it can regenerate, "overshoot" occurs (Meadows, Randers & Meadows, 2004). Thus, the environment's ability to regenerate while being utilized by humans assumes a critical distinction.

As a component of sustainability, "economy" has multiple components. It includes development toward maintaining or strengthening existing economies while operating within the environment's biocapacity. A key detail includes an aim to reduce gaps between rich and poor (Palmer, 1998). Thus "economy" refers to developing growth that allows for current generations to meet their financial needs while seeking to curb models that are "untenably exploitative" (Nolet, 2009, p. 424). Also, "economy," as a part of a sustainability framework, aims for "strong sustainability:" a state where analysts do not measure natural resources externally of traditional market indicators (Miller, 1993). Here, sustainability aims to correct economic models -- like gross national product -- that omit environmental costs.

A sustainability framework builds upon earlier environmentalists' goals on changing people's mindset toward commoditizing the Earth. For example, environmentalists readily critiqued unnatural and commercialized tourist attractions on public lands (Alinder, 1986). They also critiqued suburban development for causing a "wasteland scenario" where wilderness places gave way to a world "paved and poisoned" (Nash, 1982, p. 380). Finally, they argued that environmental change agents needed to embrace education's role. For example, Leopold (1966)

wrote that the purpose of ecological education was to change our "intellectual emphasis, loyalties, affections, and convictions" (p. 246).

However, celebrated writers like Adams, Leopold, and Nash failed to acknowledge how the social and economic components of environmental issues disproportionately affected groups like urban poor minorities, not just forests, vistas, and parks (Gruenewald, 2004). As Cronon (1996) noted, a fixation on wilderness preservation causes related human problems to become overlooked. He said, "If we set too high a stock on wilderness, too many other corners of the earth become less natural, and too many people become less human, thereby giving us permission not to care much about their suffering or their fate" (p. 84-5). Other sustainability writers highlighted this omission through their studies. For example, they reveal how environmental issues disproportionately affect women (Knopf-Newman, 2004), Native Americans (Lucas, 2004), and those living in urban environments (Sze, 2004). Others note how political and economic issues contribute toward the unequal distribution of environmental degradation (Kaalund, 2004).

With this understanding of sustainability as a broad concept, my next step links its tenets to a Sustainability Education (SE) framework. In this upcoming section, I aim to orient the reader with how knowledge via a SE framework could be presented in an educational setting. This forthcoming section also explains why I chose an SE framework instead of others.

Sustainability Education (SE)

A Sustainability Education (SE) framework posits that teaching about the interaction of humans and natural resources should factor humans' needs in conjunction with resource preservation. SE does not abandon the goal of preserving scenic areas. For example, places like

Yosemite National Park still maintain importance as cultural and scientific resources in an SE framework (Solow, 1992). However, an SE framework focuses more on learning how the present generation can meet its needs while not jeopardizing future generations' ability to meet their needs. As noted earlier, Anand & Sen (2000) define this sort of intergenerational perspective as "ethical universalism" (p. 2030) -- sustainability that places the needs of present and future peoples on a level plain. Nolet (2009) remarks that SE could create a sort of citizen who takes action on behalf of his community and future generations. He writes: "An underlying (as yet untested) assumption is that sustainability education will result in citizens who are more likely to engage in personal behaviors or contribute to public policy decisions in the best interest of the environmental commons and future generations" (p. 418). His definition suggests that an SE framework aims to empower student agency on behalf of their needs and of others' needs. It seeks to mitigate young people's declining interest in addressing environmental reported by Twenge (2006).

However, one should know that a SE framework often goes by different names. Education researchers suggest that the presence of such aliases is at the very least, a definitional problem (Disinger, 1983). At worst, it suggests a philosophical schism (Summers, Corney, & Childs, 2004). Some say that these varied titles created a framework with a "poorly defined mixture of philosophies" (Hungerford, 2010, pp. 1-2). Others say that such titular discrepancies are superficial, and differently- worded frameworks actually have identical or interchangeable aims (Filho, 2000; Newton, 2003; Nolet, 2009). The most commonly- referenced variations of sustainability frameworks are Sustainability Education (SE), Education for Sustainable Development (ESD), and Environmental Education (EE) (Edwards, 2006; Hopwood, 2007, Sterling, 2004; Steinberg, 2009).

At first glance, ESD and SE frameworks appear to diverge over *why* living standards should be maintained for current and future generations. For example, an ESD framework may prioritize economic development while a SE framework may elevate social or moral considerations. Note that "The crux of the debate [between these two frameworks]," explains Summers, Corney & Childs (2004), "appears to be between those who view economic priorities and outcomes as dominant compared with those who adopt a broader interpretation" (p. 165). Nolet (2009) described the differences between ESD and SE by saying that

> ...concern for the interconnectedness of environmental, economic, and social systems has become central to the idea of sustainability, but such an interactive systems approach has not always been associated with the idea of development. Indeed some consider the term *sustainable development* an oxymoron. (p. 413-414)

Therefore, ESD as a concept might indeed be oxymoronic, as "unlimited growth is by nature unsustainable (Nolet, 2009, p. 413; Filho, 2000; Newton, 2003; Orr, 2004). Overall, Nolet (2009) asserts that an ESD and an SE framework "represent quite different ideas that require some discussion" (Nolet, 2009, p. 413). However, such discussion may be unnecessary, as others appear to similarly define ESD and SE frameworks.

For example, both Repetto (1985) and Åkerman (2005) define ESD and SE frameworks in ways indicating a commodification of the natural world. Of an ESD framework, Repetto (1985) writes:

> …our economic systems should be managed so that we live off the dividend of our resources, maintaining and improving the asset base so that the generations that follow will be able to live equally well or better. This principle also has much in common with the ideal concept of income that accountants seek to determine: the greatest amount that

> can be consumed in the current period without reducing prospects for consumption in the future. (p. 10)

Åkerman (2005) seems to comparably define a SE framework. She writes, "The main criterion for sustainability is to keep the natural stock either intact or above a critical limit, i.e. to keep the critical natural capital intact -- they key concern being to maintain the stability of ecosystem processes" (Åkerman, 2005, p. 43). Between these two definitions, an ESD and an SE framework remain undifferentiated. In these cases, they diverge from views held by Nolet (2009) and Summers, Corney & Childs (2004) -- both frameworks appear as means to elevate the importance of sustaining economic growth.

Yet, others define ESD and SE frameworks by favoring broader moral and social dynamics. In fact, education researchers often define each framework with almost this same formula. For example, consider the philosophical congruity among definitions where both frameworks elevate the "quality of life" for current and future generations. For example, the Council for Environmental Education (CEE) defined ESD the following way:

> Education for sustainable development enables people to develop the knowledge, values and skills to participate in decisions about the way we do things individually and collectively, both globally and locally, that will improve the quality of life now without damaging the planet for the future. (Summers & Kruger, 2003, p. 161)

Compare the above definition with how Solow (1992) defined it. He said SE's goal was: "… to endow them with whatever it takes to achieve a standard of living at least as good as our own and to look after their next generation similarly" (p. 15). Thus, potential exists to define the core mission of ESD and SE frameworks in almost identical ways. In this case, one can define ESD

and SE without emphasizing economic imperatives found in definitions by Repetto (1985), Åkerman (2005), or others like Fricker (1998) or Summers & Kruger (2003).

Thus, no consensus exists about how to differentiate firmly between an ESD and an SE framework. Interestingly, despite efforts to distinguish them (e. g., Orr, 2004; Steinberg, 2009), these frameworks appear to be very similar. They gather much of their theoretical underpinning from the idea that meeting the needs or "interests" of current generations is as important as preserving the ability of future generations to meet their needs or "interests," too (Anand & Sen, 2000, p. 2030). Summers, Corney, & Childs (2004) say that differently named frameworks may indeed have the same aims. They write, "The point to be made here, perhaps, is that although the terminology may look new, any proposed distinction between ESD and environmental education is far from clear-cut" (p. 167). Nolet (2009) also notes that "Today, the term *sustainability* is often used interchangeably with *sustainable development*…" (pp. 413-414). Summers, Corney, & Childs (2003) offer similar sentiments when they say that distinctions between differently named sustainability inquiries "is far from clear-cut" (p. 334). Thus, for these and other reasons, many education researchers view ESD and SE frameworks interchangeably. They rely on a familiar formula where the needs of the present generation must be met in a way that allows future generations to also meet their needs. This conclusion might encourage those active in the SE field to seek descriptive unity.

At the very least, some education researchers argue that both ESD, SE, and Environmental Education (EE) (also referred to as "Environmental Studies" (ES) (Nash, 1976)) frameworks may represent a departure from earlier "nature studies" and "conservation studies" frameworks. For example, both ESD, SE, and EE represent a conscious inclusion of human needs within the context of natural systems (Summers, Childs, & Corney, 2005). Nature or

conservations studies did not (Edwards, 2006; Saylan & Blumstein, 2011). To understand how these frameworks differentiate themselves from these earlier ones, a brief examination of their goals may be helpful.

An ESD, SE, and EE framework bases itself as a departure from "nature studies" and "conservation studies" frameworks by adapting its needs to a changing American population. For example, conservation studies researchers note that their narrow focus on agricultural resource management lacked appeal or immediate relevance to urban or even suburban dwellers (Hone, 1959). Education researchers also attributed this shift to a new set of environmental pressures that conservation studies did not adequately address: overpopulation, energy shortages, and air and water pollution (Kirk, 1980).

Despite an ES framework's shift away from focusing on agricultural conservation, some education researchers again thought a titular change was superficial. Clark (1969) said that conservation studies and environmental studies were synonymous, but the latter was "in vogue" (p. 8). Stillman (1972) said that the new approach offered by environmental studies was "not new" and was perhaps just a fad of special interest lobbying (p. 1). Roth (1978) said that ES was merely a "social studies "twin" of conservation education" (p. 16). However, these opinions appear to be outliers and may not have been aware of changes occurring within the social studies education field. For example, many researchers identified that conservation studies was a matter confined mostly to agricultural resources, while an ES framework embraced a broader interpretation of resource management to include civic responsibility, democracy, and morals (Stapp, 1969). An ES framework signaled a shift toward a broader understanding of the interaction between natural resources and how their use influenced a larger network of human interests.

While an ES framework's departure from earlier paradigms appears clearly, precisely how it differs from a SE or ESD framework may hinge on a more narrow understanding: the latter two's development of an intergenerational perspective. In this way, the needs of present humans and future humans receive equal priority, where an ES framework typically asked students to solve problems on a more futures- based schema (Reilly, 1971). Much of this distinction centers around a report issued by the United Nations World Commission on Environment and Development (WCED) in 1987 entitled, *Our Common Future*. This report articulated that economic development must "…met the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p. 43). This intergenerational component distinguished SE and ESD frameworks from the earlier ES model (Gruenewald, 2003, 2004; Nolet, 2009).

For the sake of my study, I consider the terms, "education for sustainable development" and "environmental studies/environmental education" interchangeable with the term "sustainability education." Implications arising from these titles likely shall produce ongoing debate (Orr, 2004). However, a number of education researchers across disciplines agree that the titles may be only superficial differences in curricular instruction considering how humans' actions influence natural resources, and in turn, influence other humans (Filho, 2000; Newton, 2003: Nolet, 2009; Sterling, 2004; Summers, Corney, & Childs, 2004).

Considering the variety of definitions and terms for teaching this topic, I put forth a definition incorporating many of the aims previously mentioned (and avoid the apparent binary between either emphasizing *economic* well- being or not). From here, I shall refer to teaching about the natural environment in a social studies context (either through an issues- centered framework or not) and an ESD or EE/ES framework as sustainability education (SE). I base this

decision not only on the need to streamline the understanding of this chapter and future chapters, but I seek to avoid the controversy often accompanying the "development" connotations of an ESD framework (Nolet, 2009; Filho, 2000; Newton, 2003). For the purposes of this study, I shall consider sustainability education (SE) to be: education seeking dialogue about how the needs and interests of the present generation can command the same attention as the needs and interests of future generations. However, by articulating this definition, I also acknowledge that SE may already been taught in this way in other subjects or even within social studies in past years (but not specifically chronicled in an empirical study).

Now that I have explored definitions for the theoretical framework for this study, I want to shift attention to examining how a social studies teacher implements SE *via* deliberation. Social studies researchers report that merely learning about environmental issues does not lead to improved student attitudes about living more sustainably (Gratz, 1971; Hagens, 1980; Nolet, 2009). Therefore, I am interested in exploring a pedagogy emphasizing dialogue and action-taking. Social studies researchers say that instruction about sustainability education through an issues-centered approach might best address this challenge (Fleury & Sheldon, 1996).

Issues- Centered, Decision-Making Framework (ICDM)

Thus, my purpose in this section is to orient how SE can be taught as a social issue. Before moving forward, let us examine a few definitions of ICDM. Evans, Newmann, & Saxe (1996) say that "Issues-centered education focus on problematic questions that need to be answered at least provincially" (p. 2). Examples of such questions include "Should student newspapers have the same right to freedom of the press as other newspapers?" or "Should I write a letter to the principal to protest censorship?" (Evans, Newmann, & Saxe, 1996, p. 2).

Importantly, the objectives of teaching such questions include at least two parts. First, the dialogue does not aim for specific answers. Rather, it highlights "the need for students to learn how to examine significant questions and become more thoughtful decision makers about public life" (Ochoa-Becker, 1996, p. 6). Notably, such an examination does not aim merely at developing deliberation skills. Instead, it aims at "constructive change for the transformation of society" (Evans, Newmann, & Saxe, 1996, p. 2). Therefore an issues- centered education suggests that students may consider applying the skills and knowledge gained from these dialogues to situations outside the classroom now and later in life.

An important component in teaching social issues education includes an emphasis on students' process in reaching and *justifying* their decision. Social studies researchers refer to such a process as an "Issues- Centered, Decision- Making" (ICDM) framework. Ochoa-Becker (2007) says that an ICDM framework grounds itself "…around significant and sometimes controversial issues… [and] attempts to involve young citizens in contributing to the resolution of public issues in all their ramifications" (p. 163). This definition indicates that an appropriate way to teach SE may involve attempts to "involve young citizens in contributing to the resolution of public issues in all of their ramifications. Only in this way… can citizens learn to deal intelligently and responsibly with such issues" (Ochoa-Becker, 2007, p. 163). Therefore, the goals of an ICDM framework may usefully address SIS. Since teaching about sustainability issues may be among the most critical educational topic of the present day (Nolet, 2009), engaging students with real-life problem-solving curriculum seems like a good strategy (Dewey, 1916, Fenton, 1967; Shaver, 1967). Such real-life problems might involve dialogue about access to drinking water. Also, it could involve discussion about policies about timber harvesting (Fleury & Sheldon, 1996).

Other social studies researchers note an ICDM approach can develop useful skills for addressing public concerns about environmental issues. Lawrence, Terence, & White (2000) refer to such an approach as a "public issues model." They define this model as "based on the belief that complex issues within a democracy require citizens to negotiate their differences and compromise through analysis and public debate of those issues" (Lawrence, Terence, & White, 2000, p.104). Again, their emphasis places importance on students developing deliberation as a transferable skill for democratic participation.

The implication of teaching SE through deliberation sits at the crux of this study's theoretical framework. I seek to learn about how teachers use deliberation to teach SE. More specifically, I want to learn how they teach SE as a social issue. This next section examines how SE could be taught as a social issue (SIS).

Social Issues of Sustainability (SIS)

How a social studies teacher implements deliberation about sustainability is a critical detail. For example, some studies show that a gulf exists between students' knowledge of, and their willingness to take action on environmental issues (Gratz, 1971; Sterling, 2004). Therefore, social studies researchers argue that instruction about sustainability through an issues- centered approach might help to close this gap (Fleury & Sheldon, 1996).

An SIS framework assumes two components: a) an environmental issue (typically global in scope) and b) opportunities for student deliberation on a question aiming at a solution. Such deliberation keeps in mind the aims of an ICDM framework: discussion focusing on "problematic questions" which "well-informed people may disagree" (Evans, Newmann, & Saxe, 1996, p. 2). An environmental issue can be defined as topics about natural resources that

pose an urgent need for human correction. Examples could include air and water pollution (Reilly, 1971), garbage production (Chalmers, et al., 2007), the vulnerability of poor to climate change (Livingston, 2007), and long- term loss of land devoted to growing food (Louv, 2008, Steinberg, 2009, Snyder, 1990). Education researchers created SIS question examples for each of these issues. Regarding pollution, an SIS question could be "Water: how good is enough? Who is responsible?" (Hepburn, Shrum, and Simpson, 1978, p. 74). For garbage production, Reilly (1971) poses this possible SIS question, "Should people be fined for discarding materials which could be recycled?" (p. 9). Regarding climate change, in the aftermath of Hurricane Katrina's impact on poor residents, Livingston suggested asking "Who is responsible for the poor in society?" For farmland losses, Bowers (2004) offered this potential SIS question, "What needs to be conserved in this era of ecological uncertainties?" (pp. 50-51). Answers to these questions are not easily discovered; the purpose of such a dialogue is for students to begin interacting with the complexities associated with the many possible responses.

Each of these questions acts as the vehicle for the learning goals of a teacher using an SIS framework. For example, a teacher crafts these questions as a way to get students to deliberate about an environmental issue that he/she deems important to their curriculum. Thus, these questions can also drive delivery of curriculum and pedagogical goals. Also, how a teacher assesses student responses represents an important component of this inquiry.

More importantly, these sample SIS-oriented questions reveal their dialogical nature. Consider that these questions' compositions encourage discussion that may start "democratic dialogues." Crocco (2007) described democratic dialogues as: "…structured discussions designed to tackle tough issues" (p. 2). The purpose of such dialogues, she writes, is for its participants:

> …to take positions in light of evidence and competing perspectives, and to listen respectfully to opposing viewpoints. Democratic dialogues ideally empower participants to determine their own futures by encouraging them to take action to address social, communal, and personal challenges. (Crocco, 2007, p. 2)

Therefore, an SIS framework could be a version of democratic dialogue about environment-related topics. It aims to spur dialogue about potential solutions to some of the most pressing issues regarding humans and their impact on natural resources. Most importantly, it hopes that students will develop understandings and skill sets useful for application in real life situations, both current and future-oriented.

However, not all questions about environmental issues within the classroom fall within an SIS framework. For example, questions focused on facts of environmental issues do not necessarily include learning goal of spurring solutions. Consider an example from a study by Banaszak (1980). He suggested that social studies teachers should connect current energy crises to the whale annihilation of the mid 1700s (and the resultant lamp oil shortage): "In what ways are these two energy crises similar to the energy crisis we are in today?" (p. 284). Students might be able to raise effective comparisons to the two events, but the potential for disagreement or for solving the current problem seemed limited.

Also, some kinds of questions about environmental issues are not dialogical in nature. Consider a line of inquiry suggested by Reilly (1971) for use in New York City social studies classroom: "Should the United States have dumped 418 concrete "coffins" of nerve gas rockets into the Atlantic?" (p. 30). The answer to this question seems to be "no." Using an SIS framework, this question could be re-phrased for more effective dialogue in this way: "Who is responsible for the 418 dumped concrete "coffins" of nerve gas into the Atlantic?" However, this

somewhat leading-style of questioning also taps into a well-known problem associated with teaching about environmental issues with K-12 students. Social studies education researchers refer to this problem as the "Doomsday Approach."

Education researchers associate teaching a Doomsday Approach where teachers pose discussion about environmental issues in way to create a feeling of dread among students, or at the least, a feeling of powerlessness to effect change. Education researchers say that pressing students with questions that only seem to compound environmental problems "doesn't work" (Saylan & Blumstein, 2011, p. 6). Also, such an approach stifles the very goal of an SIS framework -- to get students to dialogue around difficult questions with the hopes of generating many possible answers or solutions. For example, a Doomsday Approach creates among students a "perceived powerlessness" and "pessimistic view of the future" (Connell, et al., 1999, pp. 12-13). It also causes what some education researchers refer to as "ecophobia:" the world appears to be so abused by humans, students do not know what to do about it (Louv, 2008; Sobel, 2005, 1996).

Perhaps most importantly, posing SIS questions through a Doomsday Approach is unlikely to spur action on behalf of students. Connell, et al. (1999) writes, "The young people seem to suffer from a sense of 'action paralysis' in that they… are unwilling to consider small activities such as letter writing, or are cynical about their effects" (p. 13). Considering that an SIS framework might aim to "prepare students with the ability to mitigate effects of environmental problems" (Lidstone, 2007, p. 94), framing questions in a proper dialogical formula is critical. Also important in this regard is for teachers to prepare students' skills for effective dialogue. Such preparation might involve scaffolding of skills useful for the dialogue as well as content-knowledge.

To conclude with the discussion about how an SIS framework could look, one might consider the importance of using self- reflective questions. For example, in a lesson examining 11 proposals to reduce gasoline consumption, Banaszak (1980) recommended asking students, "How practical is each of these proposals?" (p. 284). With this issues- oriented question, the author aimed for students to revisit the gap between what people know of environmental issues and what they are willing to do. The potential for dialogue regarding what "works" in light of human decision- making, instead of simply identifying what science says would work, seems at the heart of an SIS- inspired learning goal.

However, consider that my decision to use an SIS framework for this study was not automatic. Other sustainability- oriented frameworks do exist. For example, in my preparation for this study, I conducted a nine week pilot study with almost the same objectives as this one, but I framed it through an "eco-justice" framework. I conducted this study in one high school social studies class in the winter of 2010-2011. What I learned was that a SIS and eco-justice framework are similar, but their major difference reveals the latter's emphasis on far more critical and transformative thinking objectives. In my observations, I felt that an eco-justice framework was too challenging for students to grasp in an introductory course. This problem grew pronounced because most students were unfamiliar with many basic concepts important to higher- ordered thinking about sustainability. For example, one teacher's objectives included student deliberation about shifting U.S. subsidies for oil and gas companies toward renewable energy industries. However, many students did not know what a solar panel or subsidy was. So, asking them to deliberate about transforming something they just learned about was generally slow- going.

Yet, I did not choose an SIS framework because it was somehow the "easier" of the two frameworks. Rather, what I envisioned after completing this pilot study was that dialogue about SE seemed to be a helpful "first step" to orient students about the complexity of the issues. So, in this next section, I discuss what an eco- justice framework is and why I felt it was not going to be an appropriate theoretical guide for this study.

Eco-justice: Alternative framework not used

Like SIS, an eco- justice framework seeks to engage students with current environmental problems. Those associated with the sustainability field note that an eco- justice stance "involves an awareness of the essential interdependence among all life forms of life on the planet (Chandler, 2009, p. 10). Thus, its aims include not automatically privileging humans' needs above other living things. Additionally, the foundation of an eco- justice framework encourages researchers, teachers, and students to learn about environmental issues like climate change *and* how to take action on the societal circumstances allowing them to occur. Orr (2004) argued that this awareness is critical for present generations of students because "those now being educated will have to do what we, the present generation, have been unwilling to do: stabilize and then reduce the emission of greenhouse gases, which threaten to change the climate, perhaps disastrously…" (p. 26).

By identifying the complex social context of environmental degradation, Chandler (2009) described the appropriateness of using an eco- justice framework in the social studies classroom. He wrote, "What is called for here is thus a new approach in our understanding of nature, and the language we use to define it, based much more on educative efforts at sustainability rather than the traditional themes of viewing the Earth solely as a resource" (p.16). Therefore, this "new

approach" of an eco- justice mindset requires a fundamental shift in humans' perceptions and values toward the natural world (Orr, 2004). Perhaps most importantly, an eco- justice approach emphasizes that society needs to question the legitimacy of present public policies that have caused environmental issues (Martusewicz & Edmundson, 2005).

And if challenging public policies is a key component of an eco- justice framework, then education can be a way to mitigate environmental impacts (Shiva, 2005). In general, environmental writers emphasize the importance of education in improving students' understanding about the influence of their own lifestyle on the natural world's deterioration (Louv, 2008). They view this "educational challenge" as the lynchpin critical to society's gradual acceptance of an eco- justice outlook (Orr, 2004).

Thematically, an eco- justice framework aims for students to challenge how society's "underlying power structures" (Chandler, 2009, p. 11) contribute to environmental issues. The educational challenge of an eco- justice framework involves getting students to employ a variety of skills that they may have little or no experience in using. For example, these skills may require students to grapple with cognitive dissonance, a state of being where one has to adopt a viewpoint challenging or contradicting their views of the world (Gadamer, 2004). Although such a task may seem daunting, Kohlberg (1981) notes that students have high interest in subjects employing cognitive dissonance. These contradictions may include asking students to analyze how to "dismantle the mechanisms by which capital and the state disproportionately displace the social and ecological costs of production onto working-class families and oppressed people of color" (Faber, 1998, p. 13). Proponents of an eco- justice framework also urge students to consider how sustainable development "would require us to change from a consumer-oriented society of conspicuous consumption to one of environmental ethics" (Bryant, 1995, p. 28).

Ultimately, using an eco- justice framework encourages students to challenge much of the status quo in their personal and societal views of nature (Nolet, 2009; Sterling, 1996). Such views might include daily habits like their consumption of food and beverages.

Because an eco- justice framework asks students to challenge how the status quo contributes to environmental issues, social studies educators appear well- situated to implement such a perspective into their classroom. For example, Martusewicz & Edmundson (2005) argue for the need to question public policies leading to environmental degradation, and Patrick (2003) and Sterling (1996) note that such a task is an ideally- suited quality of social studies education. An eco- justice framework seems appropriate to the aims of social studies through what Parker (2008) calls "democratic enlightenment." He defines this term as "the ability to and commitment to deliberate public policy in cooperating with disagreeable others" (Parker, 2008, p. 68). Since an eco- justice framework aims to get students to consider personal and public civic responsibilities for sustainable living, its inclusion as a framework for this study had many merits.

However, in my previously mentioned pilot study, I determined that eco- justice learning objectives were simply too challenging for students in an introductory sustainability education course. In this study, I observed many students struggling with being able to transform their world in a way that an eco- justice pedagogy requires. For example, in an admirably planned string of lessons on how U.S. federal subsidies overwhelmingly favor oil and natural gas industries, the teachers aimed for students to consider how to level the competitive playing field for alternative energy companies. Yet, the conversation struggled for a few reasons. Among those included assumptions about what knowledge and skill sets the students already possessed. In the desire to get students to seek transformative solutions, teachers may have overshot

students' limited knowledge about the basics. In this case, students needed further understanding of subsidies and subsidy politics.

I felt an SIS framework could have succeeded in this particular situation if the teachers further scaffolded student understanding of the topic. For example, after a lesson on what subsidies were and who they favored, another lesson could focus around the SIS question, "Should the U. S. government give subsidies (to energy companies at all)?" From my perspective as an observer in the classroom, the eco- justice oriented learning goals could have benefitted from dialogue around these two questions. Presumably, if students discussed the merit of subsidies for the U.S. economy first, that strategy might ensure broader understanding when later asking them to discuss if subsidies should extend to energy firms (and if so, to whom). That approach might ease them into offering alternatives to well- established norms.

For students learning about sustainability for the first time, achieving consistently transformative- based responses may have been out of reach. Since I was planning to conduct research in classrooms teaching introductory sustainability education courses, I felt that an eco-justice framework was just too ambitious, particularly for students who had never had basic discussions about how their actions might influence the lives of other people (Shutleworth, 2011).

When I asked the teacher in my pilot study why she felt students struggled with the goals of an eco- justice framework, she suggested that they simply needed more practice with transformational thinking. She wanted to spend more time on discussions where students had to pose solutions to environmental issues, but she usually spent more time than she wanted on background knowledge. For example, in a lesson on recycling, Alana posed this learning objective to her students: "Is it our civic responsibility to stop making so much waste?" Even

though this question was written on the board for the duration of the 86-minute long class, a surprising number of students were not able to answer the question by period's end. I did not feel that students exhibited the sort of paralysis that Morris (1974) described when an environmental problem loomed too largely for comprehension. It seemed like a reasonable task: to assert whether sustainable behavior was a component of civic responsibility. Two students said yes, but further discussion remained limited until the bell rang, and class ended.

When I followed up with her about these student responses, she identified their unfamiliarity with necessary skills as inhibiting their ability to reach the critical levels of understandings in an eco- justice pedagogy (in this case, considering the relationship between citizenship and sustainability). For example, in a different lesson, Alana introduced a new skill (making inferences) alongside of a subject matter that was also new to the students (sorting garbage from recycling materials). I observed was that Alana wanted her students to be able to make inferences about an in-class activity (being able to identify garbage items from recyclable ones) with broader social issues (the politics associated with growing landfills). Her curricular goal aimed for her students to then be able to formulate a policy proposal addressing aspects of social responsibility or intergenerational responsibility (like considering the needs of the people living near the landfill or the needs of future residents of the area). However, as was often the case with other lessons, students in this lesson needed more time to prepare their background understanding before they could get to her more ambitious critical inquiries. An example of such an inquiry included if they should make alternative choices like not buying bottled water or bringing a mug to school. Of this situation, Alana said, "Right now, we're just skimming the alternatives…I wish we were focusing just as much on the alternatives as we were on what is

going on." Time to make more critically analyze these issues was often insufficient or simply unavailable.

When we talked further about this problem, Alana said getting students to think transformatively and critically about the connection between sustainability and citizenship was too complicated. I agreed. For example, her well- intentioned goal of getting students to formulate their own definition of sustainability (without parroting a definition cited simply by her) may have symbolized the struggle students had with completing the aims of this lesson as well as others. For example, in the above-mentioned lesson, I observed several students who were unable to define either a) citizenship or b) sustainability. Thus, any dialogue about recycling and civic responsibility was not going to be fruitful. An eco- justice framework in this classroom seemed better suited to an "advanced" course of this nature. Its rigorous learning objectives simply overshot the clientele of an introductory course.

Criticism of ICDM framework

Social studies researchers acknowledge using an ICDM curriculum can be controversial (Brum, Bouldin, & White, 2000). For example, Shaver (1967) suggested that teachers must be able to tolerate student-generated controversy possibly arising from using an issues- centered curriculum. He wrote that "it requires a certain type of teacher, open to the exploration of ideas, to the examination of the legal and ethical principles underlying policy decisions, able to think in other than categorical terms and to tolerate the conflict of ideas and ideals" (Shaver, 1967, p. 240). This viewpoint also suggests that teachers willing to implement an issues- centered curriculum must similarly possess a tolerance to the discomfort connected with changing long-held site traditions. He wrote, "It rests heavily on the willingness of public school personnel to

adopt new conceptualizations of the curriculum and to experiment with new curricular structures even though long-established patterns may be altered" (Shaver, 1967, p. 240). This perspective ties in to the well- documented concern among social studies researchers that educators avoid transforming school curriculum in light of accountability measures like No Child Left Behind (Gruenewald & Manteaw, 2007; Palmer, 1998).

However, consider that advocates of social issues education argue that the nature of this sort of teaching aims at meaningful and appropriate transformation of learning cultures. They stress that these transformations rely on contemporary and historical justifications. From a contemporary standpoint, Nelson (1996) argues that issues relevant to the students should be at least somewhat central to how they are taught. He writes, "The basic idea that human issues are the real focus of human interests and should be the focus of social studies schooling is not an extraordinary position" (Nelson, 1996, p. 21). For him, teaching in a way that engages students' critical thinking on topics of potential interest to them trumps more conservative models of teaching (which he refers to as a "static organization of knowledge with an overemphasis on testable information" (p. 21).). From a historical standpoint, an issues- centered approach appears to have a mandate. Nelson argues that: "For a society interested in civilizational and intellectual progress, we must require a level of skepticism and criticism and willingness to consider thoughtful alternative views (1996, p. 22). To teach in such a way seems appropriate for an ever-changing, increasingly complex society. To teach otherwise may incorrectly suggest a society with static norms and behaviors.

Significance of the study

In this study's investigation of teaching SIS, I acknowledge that teachers most regularly implement SE through its typical place in K-12 instruction: the science classroom (Van Kannel-Ray, 2006). Yet, scientists, education researchers, and politicians argue that teaching SE solely through a science education framework may be insufficient because it omits human dynamics like economics, politics, and social trends. (Remy, 1990; Borsari & Onwueme, 2007; Friedman, 2008). Science educators usually limit or omit focus on social or ethical issues, and thus, social studies educators may be much better situated to initiate an SIS framework (Summers, Corney, & Childs, 2003).

A member of the sustainability education community notes that this kind of omission or limitation appears to be well-documented. Gruenewald (2004) writes that centering SE in science education:

> …dilutes and disqualifies its political content…The assumption that science and its application through technology are leading human beings on a journey of constant progress is central to policies and attitudes that deny ecological crises as well as their social, political, and economic causes… [Science education] might measure water quality, but [it] fails to examine the cultural practices that cause and tolerate multiple forms of pollution as well as deny the seriousness of this ecological problem. (pp. 85-85)

In fact, Gruenewald's argument remains a familiar one articulated by social studies and sustainability education researchers. For example, Siegel (2006) studied a secondary course called "Science and Sustainability" and found that while the course did engage students in problem-solving, it

> …falls short in focusing on the scientific and technical solutions, rather than on social impacts or data…rather than on critiquing mainstream world views or taking action locally. The course was also limited on its instructional support for a process of decision making and a way to reflect on decisions (pp. 212-213)

Taking action on these decisions was also not something typical to a science education curriculum. Neither was considering one's responsibility in taking such action (Summer, Corney, & Childs, 2003, p. 334). To boot, science-centered SE curriculum rarely considers social impacts (Siegel, 2006), "negates holistic learning" (Borsari & Onwueme, 2007, p. 49), and focused on scientific literacy but scarcely referenced the associated civic competencies (Saylan & Blumstein, 2011).

Thus, SE researchers argue that teaching the scientific components of this curriculum is insufficient, and teaching its social dynamics more appropriate in a social studies curriculum (Gruenewald, 2004) is the needed direction. Research supporting this claim also points toward the responsibility of social studies educators in updating how a SE framework gets taught. Rye, Strong, & Rubba (2001) argue that social studies' teachers' role in applying "scientific knowledge and taking citizen action toward solving societal problems are integral to social studies education" (p. 93). Van Kannel-Ray (2006) argues that this approach cannot be taught without a social studies component, and Summers, Childs, & Corney (2005) argue that the social studies "are better situated" than science education to teach "social or ethical issues" (p. 630).

Thus, my study's aim approaches significance because SE may not be effectively situated solely within a science education setting. Teaching it within a *social studies* setting may be helpful in moving it towards full effectiveness. Saylan & Blumstein (2011) write,

> Although many consider environmental education to be a subheading of science education, it must be more than that. Not only must environmental education teach people about their physical environment, it must go further to teach how to live and flourish in sustainable ways…What is needed is a modern, practical redefinition of environmental education. One that encompasses multidisciplinary teaching approaches. One that seeks to cultivate scientific and civic literacy. (pp. 2-3)

The reasoning behind this argument rests with the idea that science education does not focus on the complex human- specific influences of SIS. For example, consider some of the outcomes of a 1990s meeting of the National Academy of Science to discuss the pros and cons of nuclear power. At the conclusion of the event, the scientists conceded: "The public will have to choose between energy sources based on individual values and beliefs about social ethics -- not on the advice from technical experts" (Remy, 1990, p. 204). This remark identified two problems that SE researchers have puzzled over. First, it revealed that humans are notorious for not utilizing available scientific data. Instead, they prefer to rely on their intuition (Carson, 2002). Second, it illuminates the weak relationship between what people know about environmental issues and their changes in behavior (Hicks & Holden, 2007, Nolet, 2009; Stevenson, 1987, Juker, 2002; Taylor, et al., 2007; Yencken, Fien, & Sykes, 2000; Connell, et al., 1999).

Summary

This chapter began by describing the purpose of the study and the research question, which inquired how three teachers taught SIS. The chapter continued by unpacking the theoretical framework of teaching SIS and discussing its component parts: sustainability as a broad concept, sustainability education (SE), issues-c entered, decision making instruction

(ICDM), and finally, how a theoretical SIS framework could work. This chapter concluded by discussing the significance of the study for teachers, teacher educators, and education researchers. This particular section also emphasized a potential significance of this study includes insights into how a SIS framework complements SE instruction in science education.

In the next chapter, I review the literature relevant to teaching within an SIS framework. It focuses specifically on literature that develops understanding of this study's research question ("What are the curricular, pedagogical, and assessment practices of three social studies teachers when they teach the social issues of sustainability?"). Thus, this next chapter reviews literature on how education researchers postulate about what *could* be A) learning goals, B) curricular and pedagogical methods, and C) assessment strategies for an SIS framework.

II. LITERATURE REVIEW

Introduction

My research question for this study is, "What are the curricular, pedagogical, and assessment practices of three social studies teachers when they teach the social issues of sustainability?" Therefore, I organized this literature review in ways that address each component. For example, the first section of the literature review focuses on how education researchers articulate how the learning goals for teaching sustainability education could be formed. In the second section, I examine how education researchers say the actual instruction of teaching this subject could be accomplished. Finally, in the last section of this literature review, I analyze the scant bit of writing regarding how teaching SIS could be assessed.

Learning Goals

I organized this section into four parts. Each of these parts represent a well-documented perspective on what the learning goals of teaching SIS *could* look like. These parts are:

Personal responsibility

Consideration of others and intergenerational perspective

Re- examining indigenous perspectives and bio- mimicry

Problem- solving, action-orientation.

Personal responsibility

Taking personal responsibility for environmental issues represents a frequent point of discussion when determining what an SIS approach could look like. Social studies researchers

note that curriculums aiming to develop "personally-responsible" people "hope to nurture compassion" for others and also emphasize behavior like "self-discipline," "obeying laws," or "recycling" (Westheimer & Kahne, 2004, p. 241). Thus, behaving in a personally responsible way appears to be a basic component of considering the well- being of one's community. Others in the social studies field similarly describe a personally- responsible person as engaging in behavior changes in consideration of others' needs. They write that a personally- responsible person exhibits "A willingness to drive a smaller car… use biodegradable soaps or reduce home energy consumption" (Hepburn, Shrum, & Simpson, 1978, p. 71). Ultimately, a personally-responsible person attempts to meet their needs while seeing that their actions do not impact the ability of others to meet their needs.

On the eve of the first Earth Day in the U. S., several prominent senators emphasized the importance of personal responsibility toward environmental issues. For example, when asked, "What can social studies teachers do to help combat environmental pollution," U. S. senators emphasized a personal responsibility stance to the teachers. Adding to South Dakota senator George McGovern's emphasis on responsibility from the first chapter of this study, West Virginia senator Jennings Randolph said, "Each individual must concede his part in solving the problem and take steps to eliminate the problem" (*Social Education*, p. 44). Their emphasis on teaching for personal responsibility represented a sort of opening remark in a dialogue about SE for the next 40 years.

Indeed, since the early 1970s, sustainability educators affirm personal responsibility's role as cornerstone of its learning goals (Nolet, 2009; Russo; 1972; Margolin, 1971; Steinberg, 2009; Steinbrink & Jones, 1980). First and foremost, an SIS framework suggests that people may want to make personal choices considerate of their environmental implications (Hepburn, Shrum,

& Simpson, 1978). This goal rests on the assumption that if current and future generations could develop an "appreciation of less damaging behavior" (Firth & Winter, 2007, p. 608), they might consider adopting a "respect for limits" (Nolet, 2009, p. 422) mitigating or even reversing some environmental issues.

But, are learning goals encouraging changes in student behavior appropriate, regardless of the subject matter? Of course, the answer is mixed. Some social studies researchers say the answer may be no. At least for Westheimer & Kahne (2004), teaching for personal responsibility invites problems because it may foster "obedience" among students, and thus, contradict democratic ideals (Westheimer & Kahne, 2004, p. 243). For those who say such a goal is appropriate, they suggest that teaching personal responsibility on behalf of the environment should be no different than teaching personal responsibility on behalf of the vitality of one's democratic process. Saylan & Blumstein (2011) write:

> It is a common opinion among educators and policy makers that education should not include any attempt to change or influence behavior, because doing so might constitute some form of political advocacy. But there is really no difference between the widespread practice of teaching people to follow the laws of our societies (an action or behavior generally accepted as cultural knowledge) and teaching respect and responsibility for the finite resources of earth on which our lives collectively depend. Learning about our life support system is a civic responsibility. (p. 28)

Thus, can one really deduce that teaching for personal responsibility on behalf of the environment is indeed similar to when one teaches personal responsibility for laws? The answer may lie in the extent to which one views SIS as controversial and open for debate. Note Hess (2009) asserts that teachers should teach climate change as a "closed issue:" it is a subject no

longer debated among the scientific community (p. 118). Then, the next step would be to ask students an apparently relevant SIS question: "Should you make personal changes to mitigate the effects of climate change?" Presumably students would disagree, but that is the point -- to get students to deliberate if personal change is required. And as the teachers who participated in this study reported (which I will share in Chapter IV), they assumed that personal change may or may not come from that sort of discussion; it almost certainly will not come from teachers telling students to change their ways.

In these dialogues, exactly what sort of things should students be taking more responsibility for? Education researchers suggest overwhelmingly that developing "a more responsible attitude" represents a key learning objective for SIS (Palmer, 1998, p. 143). Yet, being more specific seems important to others. They say that developing personal responsibility toward one's consumer behavior is critical (Saylan & Blumstein, 2011; Esser, 1971; Steinberg, 2009). Bowers (2004a) says that humans' inability to take responsibility for a "consumer-dependent lifestyle" is at the root of ecological crises (p. 53).

Thus, a key learning goal seems to be taking responsibility for adopting "alternative ways of living" (Connell, et al., 1999, p. 11) and a lifestyle that has "an appreciation of less damaging behavior" (Firth & Winter, 2007, p. 608). Bowers (2004a) recommends that classroom discussion for these goals should focus on "the nature of industrial culture" and getting students to understand that most of everyday life in the U. S. depends on "monetized relationships" (p. 57). Such dialogues are what Piburn (1977) and Cordier (1969) say are critical to addressing cultural habits ingrained by industrial systems.

While writers outside of education regularly identify consumption, *not* overpopulation as a critical part of environmental issues of past and present societies (Diamond 2005; Mann, 2004;

McKibben, 2007), education researchers still struggle with effective ways to engage students in minimizing their fixation on unchanging personal habits. For example, Chalmers, et al. (2007) notes that a Brazilian sustainability curriculum omits discussion about the need to reduce consumption and waste production. Taylor, et al. (2007) discovered Asian Pacific youth had "ambivalence" toward making lifestyle changes and "practicing civic responsibility" to attain it (p. 376). To address this problem, Chalmers et al. (2007) said teachers must explore the "relationship between consumerism and propaganda," to explain society's functioning (p. 571). For example, Dobson (2004) recommended that students take action on topics that offer no personal financial gain. Since students seem most reluctant to apply their knowledge of environmental issues when it impinges on their own lives (Lucas, 1991), a dialogue about how students perceive civic responsibilities to include sustainable living seems appropriate.

However, isolating this behavioral paradox to sustainability education would be misguided. After all, much of human behavior historically embraces what political historian Tuchman (1984) refers to as "wooden-headedness" (p. 7). She defines this term as "assessing a situation in terms of preconceived notions while ignoring or rejecting any contrary signs. It is acting according to wish while not allowing oneself to be deflected by the facts" (Tuchman, 1984, p. 7). To illustrate "wooden-headedness," or what she also calls "folly," she explores why leaders over the last 800 years made decisions without incorporating experience. For example, in a study of American policy- making in the Vietnam War, she inquires why politicians insisted on a course of action whose "goal was unattainable" (Tuchman, 1984, p. 235). In this case, she asks why American politicians insisted on pursuing policies that their intelligence- gathering agencies consistently negated.

So, “wooded-headedness” appears to be a phenomenon not limited to student behavior in context of SIS. In fact, other education programs reported similarly peculiar results. For example, the federal “Drug Abuse Resistance Education” program, according to Chandler (2009), appears to have been ineffective in reducing smoking and drug abuse usage. He wrote that the pitfall of this program may hinge on its assumption that if students received knowledge about smoking and drug use, they would avoid such behavior. For Chandler (2009), a cause of this problem may have been a pedagogical model lacking dialogue about subjects like industry manipulations through advertising, social pressures, and the occasionally contradictory behavior of teachers who delivered the curriculum but smoked on campus.

So, the challenge to teaching SIS appears to include addressing human nature as a component of the subject matter. Since researchers report that willingness to take responsibility for addressing environmental issues diminishes as it impinges on habits, then an SIS approach definitely has its challenges. Perhaps a useful consideration is the issues-centered teaching strategy known as the “jurisprudential framework” in the teaching of social and public issues (Shaver, 1967, p. 114). Shaver (1967) defines this issues-based approach as what the teacher “seeks to analyze is less the controversy-provoking message than the disputative discussion about the controversy that ensues” (p. 115). Teaching in this way, he argues, might develop “enlightened self-interest” in students. He defined this term as

> A policy whereby one acts for the highest good of the self, after reflection about the long-range consequences of one’s conduct for the whole community. It is this long-range reflective component that distinguishes it from simple individualism. The position argues that each man, if taught to reflect upon the total implications of his own acts for the self, including his reciprocal relationships with his fellowmen, will quite naturally conduct

> himself in the interests not only of the self but also of the community. It assumes that what is good for the individual is good in most cases for the community, and vice versa. (Shaver, 1967, p. 42)

Therefore, an issues- based approach might effectively address one of the longest standing challenges for sustainability educators: how to minimize the gulf between students' knowledge of environmental issues and their willingness to solve them. Interestingly, Shaver argued that through enlightened self-interest, social studies students should be able to address consumer habits posing problems to the community's well- being. He wrote,

> In arguments over the conservation of timber resources, for example, if one can demonstrate that the long-range consequences of overcutting is massive soil erosion, the policy may be seen to be destructive to the long-range interests of the community. The emphasis which the proponent of enlightened self-interest places on reflection about long-range consequences is worthy of note and is an important step in the clarification of almost any political controversy. (Shaver, 1967, p. 43)

By applying the jurisprudential and enlightened self- interest approach to SIS topics of local interest, he signals the importance of a particular social studies concept. First, he says that debating topics is an essential part of the social studies curriculum. As the logic goes, the more students debate social and public issues, the more likely they are to continue "to be active in public policy in their futures" (Lawrence, Terence, & White, 2000, p. 93). More importantly, he affirms that the issues to be debated (in this case, about a local environmental issue) should be of interest to students if students are to assume any sort of personal responsibility on its behalf (Dewey, 1916; Evans & Saxe, 1996; Ochoa-Becker, 1996, 2007). Ultimately, in this sort of

framework, the teacher centers his/ herself in a constructivist classroom; the teacher aims to help students find their own conclusions (Nikkel, 2007, p. 548).

Consideration of others and intergenerational perspective

As education researchers stress the importance of taking responsibility for one's consumer-oriented habits, they similarly stress considering how those habits may influence others' ability to live well. Such an outlook is called "stewardship" (Dean, 2001; Friedman, 2008) or an "intergenerational perspective" (terms that Van Kannel-Ray (2006) call interchangeable). An intergenerational perspective is a concept which "implies that decision-making about critical choices facing society must be guided by a long-term rather than a short-term view. This concept then encourages consideration of the impacts on subsequent generations" (Nolet, 2009, p. 424). Emphasizing the learning goal of personal responsibility, Saylan & Blumstein (2011) define an intergenerational perspective as "a moral responsibility to protect the resources that support life on our planet, not only for those we share the planet with, but also for those who will come after us" (p. 2). Other researchers define intergenerational perspective as an investment (Åkerman, 2005) or a skill addressing the "needs and rights" of future generations (Summers, Childs, & Corney, 2007, p. 629). Others define it as an "appreciation of everyone's fragility" (Snyder, 1990, p. 23). Thus, the learning goal outlined in an intergenerational perspective suggests the ability to analyze how one's actions might influence future generations. Thinking of others' needs is something Fenton (1967) referred to as the need to "prepare each student to live intelligently in the future" (p. 25). A specific example of such a learning goal could include current debates in New York and other states about the potential impact of hydrofracturing (a. k. a., "fracking") on municipal water supplies. In this

scenario, students would consider how short- term economic interests around natural gas supplies could impact the long- term quality of drinking water.

An intergenerational perspective also links to the themes suggested by the interchangeable terms, "systems-thinking" (Tydings, 1971; Esser, 1971) and "interdependence." Nolet (2009) defined "interdependence" as a way of understanding the world's inextricable interconnectedness. He wrote that it is about "Not only the ecological relationships among species and nature but also the inextricable links among ecological, economic, and social systems" (p. 423). The important distinction with this definition is that he included human systems as linked with other natural systems -- not placing humans as somehow separate from other living things. Capra (2005) defined systems-thinking as: "The properties of the parts are not intrinsic, but can be understood only within the context of the whole" (p. 21). These definitions are important distinguishing facets of learning goals for SIS because they avoid an anthropocentric view of the world. Also, they help to avoid creating the binary of the *human* world and the *natural* world, something Cronon (1996) called "the dualism that sets humanity and nature at opposite poles" (p. 81). A systems-thinking approach, he suggested, allows for an ethical and moral consideration of others. Therefore, examining what things are worthy of sustaining now and in the future may be important considerations within an SIS framework.

Sustainability education researchers agree most on the curricular importance of an intergenerational perspective, but they differ on *what* should be sustained. Some researchers do not articulate a specific thing for sustaining. In these cases, they only clarify the need to preserve the "world" for future generations (Van Kannel-Ray, 2006, p. 115). Others are similarly vague, simply referring to important "needs" of future generations (Summers, Childs, & Corney, 2005). One study says that the availability of natural resources needed to be sustained (Summers,

Corney, & Childs, 2004), while Bowers (2004b) argued that an environment capable of supporting a certain lifestyle was the necessary component of an intergenerational perspective. Tan & Chang (2008) also said that sustaining the environment allowed future generations to prosper.

With these definitions of intergenerational perspective in mind, a social studies teacher might organize a lesson around this subject by posing questions that get students to "enlist themselves in doing something sensible about them" (Ochoa-Becker, 2007, p. 195). Dobson (2004) posed this question for use in guiding an ICDM lesson: "what kind of a world do we want to pass on to future generations?" (p. 185). Therefore, students might dialogue about *what* in the natural world should be sustained and for what purposes. However, a better start to a dialogue might be, "*What* is worth preserving about the natural world?"

This issues- based approach to the intergenerational perspective bases itself somewhat on the future-based curricular philosophies of several social studies researchers. For example, posing the question, "what kind of a world do we want to pass on to future generations?" asks student to think deeply about the future. Fenton (1967) noted that the purpose of his "new" social studies was to consider what the needs of future generations might be. Marker (2006) also argued that an effective way to implement an issue- centered curriculum was through a futures- oriented perspective. He wrote, "[by] asking questions that can guide our curriculum planning – questions that will encourage us to examine who we are, and what we want our future to be, as citizens in a democratic society" (p. 91). He also stressed that an effective way to implement an issue-centered curriculum was by "asking questions that can guide our curriculum planning – questions that will encourage us to examine who we are, and what we want our future to be, as citizens in a democratic society" (p. 91). In the context of American politics, he posed the

question, “What kind of society do we want in the future?” He wrote that this kind of question helps people “challenge our cultural mindsets” about “inevitable challenges and changes” to society (Marker, 2006, p. 92, 94). With this specific question, he sought to challenge people’s perceptions on topics like the war in Iraq, on racially- insensitive remarks, and how technology may influence how politicians respond to each other.

Getting students to think in a futures- orientation might be helpful for SIS learning goals associated with an intergenerational perspective. Marker (2006) wrote, “What is certain is that if the social studies curriculum is not attentive to the future, its curriculum may become irrelevant and moribund, failing its citizens and the very democracy that we so deeply cherish” (p. 93). Here, he suggested using an issues- centered approach as an effective way to engage students about what responsibility they may feel -- if any -- to future students, family and/or community members. However, a trend in SIS thinking includes not just looking forward and asking students what kind of society they want to live and ultimately, pass along to others. According to many in the SE field, asking students to re- examine ancient ways of living may be just as important of a learning goal as conceptualizing future scenarios.

Re- examining indigenous perspectives and bio- mimicry

In this perspective, students investigate what solutions might help align society’s consumer habits with natural systems. Here, they could look for potential antidotes to ingrained consumer tendencies by simply re- considering the assumption of western culture’s superiority. Such a reconsideration may involve looking at how indigenous cultures lived (or did or not live) sustainably in their natural environments.

Some members of the sustainability field argue that native cultures are useful knowledge sources for sustainable living choices. For example, in pre- service teacher education programs, Nolet (2009) calls for "the integration of indigenous knowledge and Western scientific methods" as a primary aim of sustainability education" (p. 426). Longboat, Kulnieks, & Young (2008) advance a similar argument through what they call "Indigenous Environmental Knowledge" (IEK). They define the concept as "the necessity to look at other ways of knowing and relating to the environment in a return to the origins of environmental studies, namely a naturalist view [leading] to direct connection with Indigenous Knowledge" (p. 6). Cajete (1999) argues that SE should ask students to analyze environmental knowledge that might have been marginalized by western culture's rise to dominance in the last 150 years. He said, "an eco-education would draw from the knowledge, understanding, and creative thinking of past and present in order to prepare for a sustainable future. These sources are multidimensional, multicultural, multisituational" (p. 63).

To involve social studies students in an issues- centered discussion about the importance of non- westernized environmental knowledge, Bowers (2004a) recommended that teachers "engage students in a discussion of the nature of tradition (p. 60)." Namely, he wanted students to analyze their usefulness and determine which ones should never have been established. With this strategy, he aimed for students to learn about which cultural traditions might free Americans from consumer- driven norms. Thus, the learning goals of an economics or government class might challenge students to realize that the typical dismissal of more sustainable cultures often arises from western arrogance, not logical reasoning (Bowers, 2002, 2004a). An end result of such a discussion could include students questioning the idea that a western, capitalist, consumer- centric perspective is the only acceptable way of addressing environmental issues.

Perhaps more importantly, Bowers (2002) suggests students answer questions about the meaning and significance of traditions. Thus, an issues- centered approach to indigenous sustainability knowledge seems logical. Based on the discussed literature above, possible starting points for an issues- centered discussion on the role of indigenous knowledge might include: "When one group defeats another group, what should happen to the knowledge and traditions of the defeated group?" and "If you are stronger militarily, are your ideas better, too?"

Similarly, education researchers argue that another alternative to Western-style consumer habits is to dialogue about "biomimicry," defined as:

> Nature demonstrates that sustainable systems are possible… It is up to us to learn to apply these principles and to create systems of education through which coming generations can learn the principles and learn to design societies that honor and complement them. (Capra, 2005, p. 29)

Biomimicry addresses the fact that most humans behave in a way contrary to how all other members of the natural world operate. For example, he Capra (2005) pointed out that "an ecosystem generates no waste… The lesson for human communities is obvious" (p. 26).

The key component of learning about biomimicry is for students to consider behaving as every other living thing does -- as a part of the natural world, not a separate entity. Cronon (1996) wrote that "any way of looking at nature that encourages us to believe we are separate from nature -- as [a belief in] wilderness tends to do -- is likely to reinforce environmentally irresponsible behavior" (p. 87). Thus, a SIS approach could ask why humans do not live like all other living things? -- and should they act differently?

Such an approach holds promise for social studies classrooms for a few reasons. First, *not* asking students to carefully examine their preconceived understandings of their "place" in the

world may cause them to think no problem exists. Humans are *not* living within the natural capacities of the world (Earle, 2010; Fagan, 2008; Steinberg, 2009). Yet, that is not the only problem. Another matter consists of teachers' reluctance to engage students with these issues because it might overwhelm them or might invite parental or administrative complaints. However, some in the social studies field argue that students find value in such discussions. For example, Kahne & Westheimer (2006) said that "The sense that something is wrong is *compelling*, especially to adolescents who are already developing their own critiques of the world… Simply discussing themes in the classroom contexts recognizes their importance…" (p. 307). So, the connection to social studies here may have little specifically to do with an indigenous perspective and more about preparing students to consider the complexity of a social issue. As Hess (2009) wrote, "Successful controversial issues discussions are intricately planned…These discussions are not *ad hoc*…" (p. 71). In this way, providing students with opportunities to consider indigenous perspectives attempts to prepare students to answer the broader SIS questions about tradition and why a culture chooses to act the way it does. Yet for most associated with the SE field, *doing* something with one's knowledge is of paramount interest.

Problem- solving, action- orientation

Indeed, the long- range learning goal of teaching SIS may be to get students to "engage in personal behaviors or contribute to public policy decisions in the best interest of the environmental commons and future generations" (Nolet, 2009, p. 418). Education researchers articulate this learning goal as preparing students with the ability to mitigate effects of environmental degradation (Lidstone, 2007). Özden (2008) said that a goal includes preparing

students "for playing active roles in preventing environmental problems" (p. 41). Lidstone & Stoltman (2008) say that when preparing learning goals, teachers should ask themselves, "Are we adequately educating a generation of students… for future global change issues that will be faced by individuals and societies… during their lifetime?" (p. 90). A possible response to such an inquiry might ask how shall teachers get students to take action, especially if such action likely occurs off- campus and after school hours?

Indeed, education researchers ponder *how* to get students to take action on behalf of what they learned about SE. They readily agree that a major challenge with teaching SIS rests with how to bridge the gap between knowledge and willingness to act (Hicks & Holden, 2007; Stevenson, 1987; Juker, 2002; Yencken, Fien, & Sykes, 2000; Connell, et al., 1999). For example, Taylor, et al. (2007) reported that even when students are knowledgeable about environmental issues and exhibit concern about them, they typically are ambivalent toward taking action. Nolet (2009) wrote, "simply telling people about the negative impacts of their behaviors is not necessarily going to result in changes in those behaviors" (p. 418). Thus, *learning* information about environmental may only be a first step (Gratz, 1971; Nolet, 2009; Anderson, 1970). The implication appears to be that those in the SE field desire action as an end-learning goal.

Once students learn about environmental issues, SE researchers postulated that their teachers should have opportunities to focus on taking action (Fisher, 1971; Anderson, 1970; Orr, 2004). In doing so, one presumes that teachers assist students in lessons on how to solve these or other sustainability issues once out of the classroom (Fersh, 1971; Louv, 2008; Nolet, 2009). Summers, Corney, & Childs (2003) reported that teachers felt a key learning goal was to get

students “to take some action themselves” and “actually [try] to do something about it” (p. 334). Simply, “students should be encouraged to act,” writes Orr (2004, p. 92).

Perhaps most importantly, SE advocates encourage learning goals that go beyond a personally-responsible stance and embrace aesthetic and ethical evaluations of their proposed solutions. Palmer (1998) described an aesthetic learning goal by writing:

> Of the many aspects of the environment, perhaps the most important are qualitative than quantitative… The aesthetic elements… can help a pupil to realize that there is no right or wrong answer in absolute terms to aesthetic questions and that the answer to environmental issues is frequently a compromise. (p. 141)

Thus, a learning goal with aesthetic elements suggests that students need to be informed on the art of compromising, and especially, that their proposed solutions can be as diverse as the open-ended nature of the issue’s question.

Palmer (1998) distinguished the learning goals of sustainability education from those of earlier modes of learning about the environment (like conservation studies or nature studies) by emphasizing an “ethical element.” He wrote, “a programme of environmental education aims at introducing pupils to the idea of personal responsibility for the environment and the concept of stewardship. It trains pupils to ask if the criteria of proposed actions are based on morally justifiable values” (p. 141). With this explanation, the importance of an intergenerational perspective and general consideration of others emerges. However, after discussing possible learning goals here and earlier in this chapter, the task now focuses on lining up those objectives with how they could be implemented in the classroom.

Pedagogy

After I examined what affiliates of the SE and social studies field say about what could be learning goals for an SIS framework, the next step involves examining what they say about how those issues could be taught in the classroom. I organized this section into several sub-categories. It begins with a review of recommendations for general pedagogical strategies. From there, it reviews suggestions for how SE could be integrated into existing school structures. Next, I examine a large body of research that discusses challenges to teaching about environmental issues. I then discuss the role of place- based education and the debate over whether local or global topics should be emphasized. Finally, I end this section by examining how teaching with an SIS framework could look if done properly and how it could look if it followed different pathways.

Teaching strategies

Many discuss how the social issues of sustainability could be taught through a constructivist approach. In this way, students consider multiple perspectives to issues, propose solutions, and ideally, take action on such proposals. For example, relative to an SIS framework, Jickling (1992) said that "we must enable students to debate, evaluate, and judge for themselves the relative merits of contesting positions" (p. 137). This viewpoint suggests that students go beyond the retention of knowledge about environmental issues. Through a constructivist classroom, they can come up with their own solutions (Firth & Winter, 2007, p. 613). Such an approach relies significantly on developing students' literacy of the issue before they begin propose solutions.

Integration into existing school structures

If a SIS model emphasizes that students are to take action, then knowing how that desired action should be explained to them is an important detail. Palmer (1998) recommended using what he calls an "action competence" model. She defined action competence's pedagogical goals as: "The ultimate aim is for every citizen to have formulated for him or herself a responsible attitude towards the sustainable development of the Earth, and appreciation of its resources and beauty, and an assumption of an environmental ethic" (p. 143). She continues by outlining four teaching goals for teachers:

1. Their pupils have adequate knowledge and understanding of an issue.
2. They are given time and opportunities to work out their values and take up a stance.
3. They are exposed to 'vision' of what the future could be like
4. They are exposed to some alternative action strategies relevant to the issue, which they can explore and evaluate. (p. 157)

I have several observations about Palmer's recommendations. First, it outlines a deliberate, scaffolded instructional approach. Its procedural vision encourages teachers who may be eager to immediately begin critically-oriented discussions with their students to first make the students are adequately prepared (steps 1 and 2). Second, it points out that if students are expected at some point to pose their own solutions, they may need to see samples of what they could look like (steps 3 and 4). Third: however, it does not aim for students to have experience actually implementing action on behalf of an issue

Palmer (1998) recommended that her four- step action competence model develop within an inquiry approach (steps 1 and 2) and at times, a social-issues framework (steps 3 and 4). She

expands the four steps outlined above and attaches questions to each that students and teachers should consider regarding a sustainability issue:

1. Knowledge/Insight
What is this issue about?

Why is it important to us?

What caused it?

How have things changed as a result of it?

How can we better find out about it?

What solutions do experts offer?

2. Commitment
What's my position on this?

What do I think should happen?

What could be difficult for me -- even frightening?

Nevertheless, what I intend to say/do is…

3. Visions
How could this issue affect the future quality of life -- for me and others?

What type of lifestyle/environment do we want?

What could/should happen in ten years' time?

4. Action Experiences
What could I do to change things for the better?

What are the difficulties/barriers to changing things?

What is a workable range of possibilities?

I have decided to take *this* action… (p. 158)

The supporting questions in steps 1 and 2 are important because they remind teachers that their students might have little or no prior knowledge of a sustainability issue; they should prepare

ample instructional time to prepare students in this area. The detail in steps 1 and 2 are also important because, as noted in my earlier study of a teacher whose learning goals leaned heavily on steps 3 and 4 (Shuttleworth, 2011), instruction not properly scaffolded along all four steps may cause students to give weak responses. Findings by Hess (2009) strengthened this assertion. In her study of a teacher who had students dialogue about the "Pentagon Papers" in the Supreme Court case, *New York Times Co. v. United States*, students beforehand spent a "significant amount of time" "extensively" studying the details of the case, general issues associated with the case, and the format for discussion (p. 71). She did not specify how much time makes sense, but the emphasis here poses a reminder for teachers not to prematurely press students into dialogue.

The action competence model signals an inclusion of an intergenerational perspective (step 3) as well as emphasizing analysis of personal habits (step 4). The second and third questions of step 4 also seem intentioned to get students to ponder the on-going gap between knowledge and willingness to take action. Perhaps encouraging students to reflect on this problem as they deliberate may provide some new understandings.

Yet, how could this kind of instruction be implemented into existing school structures? After all, teachers and researchers of sustainability report numerous obstacles to the inclusion of this kind of teaching. Among these impediments include a lack of extra time in the school year (Summers, Corney, & Childs, 2003), not enough space for new subjects in the social studies curriculum (Remy, 1990), and pressures to focus instruction toward standards-based content (Gruenewald & Manteaw, 2007; Firth & Winter, 2007). While the findings section of this study (Chapter IV) investigates how social studies teachers overcame (and in some cases, succumbed to) these challenges, this section remains focused for how teachers *could* teach this subject -- not yet testing these theories.

One proposed way to teach the social issues of sustainability education includes three potential integrated models. In this case, integrated implies co-instruction on an issue by at least a science teacher and a social studies teacher. The "need for integrated curriculum," wrote Kirman & Nay (1975) occurs "since the outside world is not compartmentalized" (p. 78). Basing their potential pedagogical approach around the SIS question of "How can we solve the energy crisis?", they recommended three school-based teaching models: independent consecutive, independently concurrent, and joint concurrent. They defined each model as follows:

> **Independently consecutive**:
>
> The science unit is taught first followed by a modified social studies unit involving a review and reinforcement of some science elements as background information in the social studies lessons.
>
> **Independently concurrent:**
>
> The science unit begins first. At some logical point the social studies unit begins and is modified to take into account the students' background in the science components. Through careful monitoring it should be possible to have the social studies teaching lag slightly behind that of the science so that maximum advantage is gained from the students' background in science.
>
> **Joint concurrent:**
>
> Ideally this will involve team teaching of an integrated science and social studies unit. For a maximum integration of content and experiences it may be necessary to curtail coverage in one or both subjects and to restructure the sequence. (p. 78)

The authors assumed in this proposed pedagogical strategy that a) the school's climate was conducive to such cross-curricular efforts and b) the individual teachers were so-inclined and

developmentally able in their craft to construct such a strategy. Further elaboration might be helpful in understanding more about the joint concurrent strategy.

Kirman and Nay (1975) did not indicate if their ideal team- teaching occurred in the same classroom with both teachers present. Several questions arose as a result. Were they suggesting a team- teaching approach where they teachers are both in the same classroom, and thus their classes are merged? Or, were they merely jointly- preparing the curriculum and then delivering it singly? Was it prepared by teachers from science *and* social studies disciplines? Each vision was possible, but further studies might help in indicating how the application fared.

For teaching models not favoring an integrated approach, social studies researchers pose three strategies for involving instruction on the social issues of sustainability. For example, Remy (1990) suggested small changes (infusing it into existing daily courses), moderate changes (extending an existing unit), or more significant changes, like creating a separate course. He outlined the advantages and disadvantages of each solution:

Table 2-1
Three potential models for school implementation.

	advantage	disadvantage
1. infusion into existing courses	"…lessons can enhance the integrity and coherence of the existing curriculum and as a result become accepted as an ongoing part of the schools' mission" (Remy, 1990, pp. 205-206)	"… it can be difficult to select what will be omitted from standard courses to make room… Further, the infusion strategy does not allow for in-depth coverage… rather it can lead to spotty and uneven coverage of important topics" (Remy, (1990, pp. 205-206)
2. extension of existing unit	"An advantage of this approach is the chance to study [a]… topic in depth while retaining a lot of flexibility about how to present… content" (Remy, 1990, p. 206).	"A potential disadvantage is the chance that treatment of… topics could still be somewhat superficial" (Remy, 1990, p. 206).
3. creation of a separate course	"A big advantage of this approach is the opportunity to	"One disadvantage is that unless carefully constructed, such a

	develop an in-depth, sustained, coherent study of the various inter-relationships of science, technology, and society. Further… such courses can give high visibility and legitimacy to this new topic of study" (Remy, 1990, p. 206).	course can take valuable student time away from basic and important social studies concepts, skills and values learned in the traditional courses. A second potentially important disadvantage relates to the enormous complexity involved in organizing a course that draws content from various academic disciplines" (Remy, 1990, p. 206).

The advantages outlined in the first option signal a caveat, particularly the part discussing its more widespread acceptance on a school-wide level. For example, in a study by Shuttleworth (2010), pre-service teachers reported student skepticism to SIS if it was not introduced as a course- wide theme at the beginning of the year. For example, if broader themes like race, gender, economics, politics, etc. are some of the lenses that the teacher hopes the students will use when studying American history, then including sustainability among those themes seems to assist in its general acceptance as a part of the curriculum.

Remy (1990) also made a few assumptions regarding the advantages and disadvantages of option 3. Regarding the advantages, he assumed a social studies teacher could give appropriate attention and content-based understanding to subjects like technology and science -- both subjects outside of the immediate range of typical social studies expertise. Regarding these possible disadvantages (notably, that its complexity might detract from other social studies material), one might consider how student receptivity toward a new course might be influenced if other classes at the school do not similarly feature SE themes. Does this course lose traction if students perceive it as an "environmental" course that somehow doesn't carry similar academic

heft as other offerings (as mentioned previously in the theoretical framework section of Chapter 1)? Such questions are relevant and worth pursuing.

Additional considerations include how Palmer (1998) and Robottom & Hart (1993) emphasized the consideration of a range of pedagogical methods ranging from positivist to critical. They noted that an integrated approach might be most suited for an environmental education program. While an integrated approach can be also be described as employing two or more subjects like math, science, and social studies to teach about the social issues of sustainability education (Kirman & Nay, 1975; Chandler, 2009), these authors defined an integrated approach as one that scaffolds positivist, interpretivist, and critical learning goals. Palmer (1998) offered definitions for each of these descriptors:

Table 2-2
Positivist, interpretivist, and critical traditions in sustainability education

	Positivist Tradition	Interpretivist Tradition	Critical Tradition
goal	to establish generalizable "truths" and patterns from observable facts present in the natural and physical sciences, not internal conditions such as personal dispositions (Palmer, 1998, p. 103)	to understand the subjective world of human experience through the social sciences; to understand the human from within; seeks principles and themes instead of generalizability (Palmer, 1998, 108)	to ask how can students and practitioners be moved toward greater liberation, equity, and social studies (Robottom & Hart, 1993, p. 25)

However, as suggested by Martusewicz & Edmundson (2005) and Anand & Sen (2000), teaching an issues- based approach should emphasize learning strategies that get students to utilize mostly interpretivist and critical skills and perspectives. Consider the following adapted chart to visualize the desired learning goals when teaching with a sustainability framework:

Table 2-3

Sustainability Education: Pedagogical Goals

	positivist	interpretivist	critical
purpose of environmental education	knowledge 'about the environment'	activities 'in the environment'	action 'for the environment'
learning theory	behaviorist, sometimes	constructivist	reconstructive
teacher's role	authority-in-knowledge	organizer of experiences in the environment	collaborative participant/ inquirer
student's role	passive recipients of disciplinary knowledge	active learners through environmental experiences	collaborative participant/ inquirer
role of texts	pre-existing source of authoritative knowledge about the environment	pre-existing source of guidance about environmental experiences	emergent reports of outcomes of critical environmental inquiries

Note. This table appears in Palmer (1998), p. 147. It originally appeared in Robottom & Hart (1993), pp. 26-27).
Note. Shading added here for emphasis.

According to the authors, a teacher effectively implements the goals of SE when emphasizing details described in the progressively shaded interpretivist and critical columns (with the latter considered ideal). Interestingly, the authors elevated the value of teacher-created texts. If emergent sustainability educators create their own curriculums, then that possibly explains why few studies exist on the subject. If these teachers create these curriculums mostly onsite, then their lack of broader exposure may contribute to why so few researchers know about them. Indeed, the relative anonymity of budding SIS curriculums may be a challenge to those wanting to learn more about them. However, teaching an SIS curriculum possesses numerous challenges to those hoping to *teach* the subject.

Challenges

With that concern in mind, this section acknowledges the challenges teachers may have when implementing SIS. It includes challenges that education researchers either predict will occur or actually occurred in classroom settings. These sub-headings include: 1) to teach sustainability issues as controversial or not, 2) how to avoid "doomsday" pedagogies, 3) how to address the gap between knowledge and willingness to act, and 4) how to teach it other than a token topic?

A debate certainly exists about whether to teach sustainability issues as controversial or ones closed off from further examination. Hess (2009) described a "closed" issue as one that "is no longer debatable" (p. 118). A problem arises in determining if all issues relevant to sustainability could be characterized as "open" (debatable, and thus, still truly controversial) -- so many topics exist. I am not going to consider all such issues. However, I will investigate the general nature of environmental degradation and a specific example of it, namely, climate change.

Education researchers and teachers have expressed willingness to present issues of sustainability as controversial topics. Summers, Corney, & Childs (2003) reported that several teachers felt students should be making up their minds, not told particular facts about the issues. One teacher in the study said,

> It's got to be balanced… I am here to impart knowledge, not necessarily to influence… I think you are trying to educate for a wider issue, for life in general… Teach them the skills about how they themselves can come to a decision [about an issue]. (p. 334)

Another teacher in the same study wrote: "[I] wouldn't want to influence [pupils] one way or the other… just to make them aware: 'Well this is one side of the argument and this is the other -- you make up your mind'" (p. 334). Summers, Childs, & Corney (2005) summarized that these

views are not outliers. In fact, they argued that "such issues… are almost always controversial, since people view their causes, impacts and management differently according to their own perspectives and values" (p. 630). However, this stance assumed that "perspectives" are at the center of the issues-oriented debate. If they are, then indeed, SIS might be forever controversial.

Yet, a contingent argues that issues of sustainability are inherently uncontroversial, but political factors can make them appear debatable. To teach the social issues of sustainability in a closed fashion requires teachers to abandon thinking of environmentalism as "a political choice" (Saylan & Blumstein, 2011, p. 31). As noted earlier, Saylan & Blumstein (2011) argued that promoting sustainable living practices is no more controversial than advocating "respect for American democracy" (p. 33). These authors argued to politicize social issues of sustainability -- and thus, present it in an impartial way -- diminished the realities of scientific truths. They wrote,

> We have been told education must provide the evaluative tools necessary for students to make informed decisions and become productive members of our society -- impartial tools that students can use to find their own way in the world. But strict adherence to an impartial approach to public education design does not consider the peril that an increasing rate of environmental degradation creates. This fundamental educational principle is urgently in need of modification. (Saylan & Blumstein, 2011, p. 28)

Here, the authors stressed that subscribing to the hard and fast rule of always presenting multiple perspectives rests on the faulty assumption that equally credible opposing views always exist.

Indeed, Hess (2009) argued that the seemingly innocuous "teach both sides" mandate can sink effective teaching of a sustainability social issue. For example, in the case of Federal Way School District near Seattle, WA, Hess noted that administrative decrees to teach impartially about climate change instruction seem more obstructionist than effective instruction. She wrote

that a school board requirement to ensure a "credible, legitimate opposing view be presented" to climate change appears intended to undermine instruction, rather than enhance it. If teachers are required to find alternative resources to films like *An Inconvenient Truth* (a 2006 film by Al Gore about climate change), such decrees may actually serve to nullify its inclusion, since "virtually all scientists now believe that global warming is a well-warranted reality" (Hess, 2009, p. 119). What appears to be at stake in this discussion about sustainability issues is that making everything a debate may blur real scientific truths from being the instructional take-away for students (Hess, 2009).

Other instructional challenges present similar obstacles to teaching this subject -- in teachers' drive to inform young people about environmental issues, they may actually be turning them off with too much negative information. Educational researchers call this problem by several terms: ecophobia, action-paralysis, and doomsday-instruction. "The crux of the issue is the developmental appropriateness of environmental education curricula," wrote David Sobel (1996, p. 4). Focusing on environmental degradation too early in children's development can lead to what Sobel calls "ecophobia." He described ecophobia as "a fear of ecological problems and the natural world" (Sobel, 1996, p. 5). He explained why avoiding this development is important: "If we prematurely ask children to deal with problems beyond their understanding and control, prematurely recruit them to solve the mammoth problems of an adult world, then I think we cut them off from the possible sources of their strength" (Sobel, 1996, p. 5). Getting students beyond "ecophobia" seems then to require what instructional strategies are most appropriate for kindergarten through fourth grade. Sobel suggested that getting students to be familiar and comfortable with natural things and natural settings is a critical first step.

Sobel asserted that teaching young people *knowledge* of the natural world before they have had a chance to become familiar with, to develop respect for, and possibly, to love natural things makes them less likely to effectively process such knowledge later in their lives. For example, consider a 1980s study analyzing the effects of curriculum intended to raise West German elementary students' consciousness about acid rain. The learning goal was that these students might become "empowered global citizens" (Sobel, 1996, p. 9). However, the study found that the opposite occurred. The elementary students reported feeling "hopeless" and "disempowered" by the curriculum because the problems "were seemingly so widespread," and the students "tended to turn away from, rather than face up to, participating in local attempts at problem solving" (Sobel, 1996, p. 9). Louv (2008) described this problem as "the natural world is being abused, and they just don't want to have to deal with it" (p. 135).

Other education researchers reported similar findings among young people, particularly when they had no prior experience with problem- solving in complex issues. Yencken, Fien, & Sykes (2000) noted that many young students show concern for the natural world, but they do not have the necessary skills, in this case, problem- solving, to effect change. When asked to solve environmental issue, but they hadn't problem-solved much on issues of any kind previously, Connell, et al. (1999) reported that young students exhibited "action paralysis"-- the belief that "the only things that they can do for the environment are small things such as recycling" (p. 13). Gooch, et al. (2008) noted that teachers need to ensure students' ability to problem-solve as a general skill set *before* asking them to apply such a skill to environmental issues. They wrote, "revealing information about the deteriorating state of the Earth's environment without facilitating change strategies is of little use, and can lead to feelings of helplessness, powerlessness, and despair among students" (Gooch, et al., 2008, p. 184).

Corney (2006) suggested that a counter to this kind of "doomsday" instruction is to focus on the positive actions students *can* do and feel *comfortable* doing. He admitted that without focusing instruction in this way, there exists a "potential for leaving people feeling quite negative that [environmental] problems are too big and there's nothing they can do…I'd rather they felt they could do something positive" (p. 233). Fisher (1971) emphasized that this sort of 'positive' approach reduces a large environmental issue into its component parts. In doing so, students may be more inclined to engage positively with the curriculum. He wrote, "We need to move rapidly from the general crying-of-alarm with all its doom-saying and exaggeration to bite-sized, manageable activities" (Fisher, 1971, p. 25).

In this way, an effective pedagogical strategy may establish ways for students to take action that has a high probability of having moderate success. Presenting environmental issues in a way that makes them seem too challenging is almost certainly a way to disengage students. Saylan & Blumstein (2011) wrote:

> There is increasing sentiment both within and outside the environmental-education community that taking a "doom and gloom" approach turns people off to any message that actions can make positive impacts on the world around us. Perhaps there is some truth to that, and we attempt herein to frame our argument in terms of hope will inspire thought and action, rather than leaving readers feeling hopeless and overwhelmed. (p. 6)

This belief confirms the findings of other educational researchers that, notably, a doom-oriented approach creates unreasonable pessimism among students, creates a sort of learned-helplessness, and simply, "doesn't work" in getting students engaged in problem-solving (Summers, Corney, & Childs, 2003; Taylor, Tamar, Jenkins, & Kennelly, 2007; Saylan & Blumstein, 2011, p. 6). Therefore, teachers about to embark on an SIS approach might want to ask themselves how they

plan to avoid a doomsday- pedagogical approach that doesn't then overcorrect and unnecessarily shield students from the reality of environmental issues. The importance of this challenge seems well- documented, but the un-addressed issue remains how to strike a balance between oversimplification of an environmental issue and a doom-and-gloom approach.

Another problem that seems to hamper this sort of instruction also focuses on how to get students to take action on environmental issues. In this case, however, the gap between students' knowledge of such issues and their willingness to change their behavior presents a problem (Hicks & Holden, 2007). Nolet (2009) said of this problem that:

> Sustainability education recognizes the paradox that has vexed the environmental education and public health communities for decades: There often seems to be little or no relationship between knowledge of environmental or health issues and changes in behaviors. (p. 418-419)

This problem seems to hinge on the idea that as the desired 'action' begins to impinge on the students' own habits, they become much less likely to implement it, even if they can identify it as necessary. Australian students in a study by Connell, et al. (1999) reported that they knew the recommended steps to addressing environmental issues but were reluctant to implicate their own behavior. On student from the study said, "Everybody says we have to do something about it and we recognize that its important, but we don't do anything about it" (para. 30). When they followed up on students' responses, they noted that they identified "negative human characteristics such as laziness, lack of care, greed and ignorance, and similar attitudes in government and industry" (para. 31). The researchers asked students why they felt this way. They summarized their answers by saying,

> The young people suggested that most people are lazy and unwilling to take

> responsibility for environmental care because it might have too great an impact on their personal ease and comfort. They said that these same human characteristics also inhibited positive action for the environment and that people would only change when faced with environmental disasters. (para. 30)

So, the issue had little relevance with what students had learned. Much of the challenge lay in reducing students' reluctance to do something with that knowledge. Other studies revealed similar "ambivalence toward making lifestyle changes" among students (Taylor, et al., 2007, p. 369). Therefore, the unresolved issue regarding this challenge remains, how to bridge the knowledge-action gap? Does the problem rest in similarly paradoxical problems reported by anti-smoking campaigns? (Chandler, 2009). Or, does it lie with the regional context students are asked to take action on? If students are asked to take action on a more local level, instead of the more-oft advocated global realm (Gruenewald, 2003), might this gap diminish?

However, all of these above-described problems might not matter much if the social-issues approach to sustainability is implemented as a curricular token. Because many of these issues are not explicitly named in state-content standards, they are either not taught at all or taught as a curricular afterthought, "Like Black History Month or even Earth Day" (Gruenewald & Manteaw, 2007, p. 184). Education researchers argue that teachers should teach these issues even if they're not in the content standards (Locke, 2009). Short of government mandates though, this sort of teaching may only occur in the near future because of "commitment by teachers" to the material (Nikkel, 2007, p. 548).

However, in a study of geography teachers who exhibited interest in teaching sustainability issues, they usually abandoned their own interests in favor of "existing curriculum frameworks" (Firth & Winter, 2007, p. 612). These researchers call this phenomenon

"suspending their geographical persuasion." Thus, examples of teachers who implemented SIS (despite an explicit call for such instruction from their mandated curriculum standards) appear to be lacking. However, for some teachers, the role of geography occupied an important place in how they crafted SE themes.

Place- based education: Local vs. global perspectives

Philosophically, education researchers argue that a sustainability pedagogy should focus on the cultural and ecological importance of valuing one's community. Van Kannell-Ray (2006) said:

> Environmentally sustainable pedagogy as a theory of teaching can inform how to hold the community together in a relationship. It can demonstrate how the individual is embedded in nature, is part of the process of a system's approach to life, is part of the cause and effect of what happens to the environment. (p. 122)

In reference to 'community,' should the curricular implementation focus just on the immediate surroundings of the school or the students' homes? Or, should it reach out more broadly to include global communities?

To ground instruction in a local or global perspective occupies contentious ground among those affiliated with SE. Some argue that a local-oriented teaching is a 'first-step' required before advancing to global-based instruction. For example, teaching with the aim of solving global problems makes sense only if students understand how to effect change in their immediate lives; Corney (2006) wrote, "How can you change the world unless you [can] change the school first?" (p. 236). Others emphasize that grounding students' learning experience in their "lived experience" is a necessary first step (Van Kannel-Ray, 2006, p. 117). Possible advantages for

focusing on a local perspective might help students understand how climate change is affecting them, *personally*, and not something that merely affects people living "far away" from their classroom (Mitchell, 2009, p. 144). Asking students to consider issues in a global context makes little sense if they are not even familiar with the needs of their own neighborhoods and its "nearby nature" (Louv, 2008, p. 211 & 218). More simply, locally- focused instruction may just be "more relevant") to students' needs and interests (Gruenewald, 2003, p. 620; Dewey, 1916; Steinberg, 2009).

However, teaching only in a local perspective may diminish students' understanding of the interconnectedness of sustainability issues. In support of this idea, Locke (2009) wrote, "…Critics have charged that the focus on local knowledge and ecological sustainability is problematic because it is often insulated from cultural conflicts and hegemonic relationships inherent in environmental degradation" (p. 98). Others argue that focusing solely in a local context might limit students' ability to understand the "extent their daily lives depend upon commoditized relationships and activities" (Bowers, 2001, pp. 413-414). So a problem emerges. If starting from a local perspective makes the most sense, how should a teacher craft instruction that still retains the scope and rigor inherent in a global view?

The answer to such a question may rest in instruction that is global in perspective but applied in a localized fashion. Such an instructional approach may rest significantly on what Snyder (1990) terms "bioregionalism." He described bioregionalism as a way of thinking where "nature is home, not a place to visit" (p. 7). In this way of thinking, teachers encourage students to apply broad, global sustainability issues to their immediate communities. An example of such behavior might include asking students to deliberate about how a proposed path might impact a wildlife habit near their New Hampshire school. (Sobel, 2005). Other examples could include

developing student understanding where their food comes from. In this way, Nolet (2009) linked "understanding of one's bioregion" with knowing about one's "foodshed" -- the interrelated natural and social systems that produce the food they eat (pp. 426-427). In this way, students may be able to learn about global issues involving diminishing knowledge about where food comes from (Pollan, 2006) and apply it to where the food they ate today came from. More importantly, students begin their foray into SE by looking at things that they may have stronger inclinations to care about or at least have a reasonable familiarity.

Also important in this global outlook/ local application pedagogy is the notion that instructional approaches might encourage students to identify their own bioregional connection. Berg (2005) stresses the importance of students being able to understand how they 'fit' into their community. He wrote,

> The concept of bioregion is uniquely useful for putting ourselves back into nature instead of on top of it. A bioregion is a way to describe the natural geography where one lives. It also defines a locale for carrying out activities that are appropriate for maintaining those natural characteristics. (Berg, 2005, p. 126)

This pedagogical possibility emphasizes that if students are more knowledgeable about their membership in a community, they may be more likely to seek ways to sustain rather than vandalize it (Orr, 2004). For example, consider how students could study a popular SIS topic, having access to safe drinking water, within the context of their own community instead of somewhere far away. Students from Bolivia could dialogue about plans to privatize the water supply in Cochabamba. Or, they could dialogue about the status of the water supply in their own community. If they live in Las Vegas, students could discuss who is responsible for the fact that their municipal intake pipes on the Colorado River are now nearly above water level. Or, if they

live in Nebraska, they could discuss who is responsible for keeping the Oglala Aquifer from being contaminated from a potential oil pipeline spill. Of course, studying any of the three issues would be appropriate regardless of where students lived. However, Orr's theory suggests that grounding pedagogy about students' "lived experiences" may not only be of more interest to them, it may make them more considerate of the things around them (Van Kannel-Ray, 2006, p. 116). In this way, instruction encourages students to see their communities as a place worthy of "honor" without automatically minimizing the complexity of the SIS issue (Steinberg, 2009, pp. 89-90). Nevertheless, the SE field shall likely debate the local vs. global focus for the foreseeable future. However, this final section of Chapter II offers a less controversial aspect of the SIS framework. In this section, I clarify what types of SIS questions represent dialogical options and which ones do not.

SIS framework: what it is *not*, what it *could be*

While debate does not swirl around what questions fit within a SIS framework, understanding the distinction may be its most important component. As discussed in Chapter I, an "SIS" assumes two components: a) an environmental issue and b) opportunities for student deliberation on a question aiming at a solution. This deliberation borrows from an ICDM framework: discussion focusing on "problematic questions" which "well-informed people may disagree" (Evans, Newmann, & Saxe, 1996, p. 2). And as a reminder, an environmental issue can be defined as topics about natural resources that pose an urgent need for human correction, for example, air and water pollution (Reilly, 1971), garbage production (Chalmers, et al., 2007), the vulnerability of poor to climate change (Livingston, 2007), and long-term loss of land devoted to growing food (Louv, 2008, Steinberg, 2009, Snyder, 1990).

what it is not

However, one must realize that simply posing questions about environmental issues does not imply loyalty to an SSI framework. For example, many questions about environmental issues do not present authentic options for dialogue. Few answers exist for these types of questions. Even among those answers, though, few well-informed students would really find much to disagree on. Instead, these questions are leading or so overly pessimistic as to stifle rich conversation. Also known as a "Doomsday" approach, overly pessimistic SE questions are *not* examples of a SIS instructional framework. Consider such questions posed by Reilly (1971) meant to spur discussion about environmental issues in New York City prior to the Clean Air Act of 1972. He proposed the following questions to guide such a lesson:

> Should people in New York City wear masks?
>
> Why might people in the city choke to death?"
>
> Why is water pollution a global threat?
>
> How might thermal pollution be more destructive to mankind than the atom bomb?"
>
> Should the United States have dumped 418 concrete "coffins" of nerve gas rockets into the Atlantic? (pp. 27, 28, 30)

Each question lacks dialogical potential. For the first question, potential answers involve "yes" and "no." Yet the idea itself seems overly pessimistic and provides few if any options for discussing how to improve air quality. For example, it does not ask something that might offer opportunity for extended dialogue and potential disagreement, like, "if New York City students have to wear gas masks to school, who is responsible for fixing this situation?" In fact, each of these five questions seems to merely re-emphasize the gravity of the issue of polluted air. None

of the questions encourage students to consider ways to present solutions. The author seemed to craft the questions in a way that discouraged dialogue. Their phrasing suggests that the students should feel badly about these issues instead of doing anything to remedy them.

Other proposed instructional strategies similarly pose questions about environmental issues avoiding SIS-oriented opportunities. In a proposed lesson about overpopulation, Anderson (1970) suggested asking students to "respond" to the following prompts:

> The current world "population explosion" is the most serious economic, social, or political problem confronting mankind today. It is even more significant than the continued possibility of thermonuclear war.
>
> [and]
>
> Due to widespread availability of antibiotics and other medical achievements, the only eventual answer to the global population crises is either full-scale nuclear war or worldwide famine. (p. 30)

Again, responding to such situations avoid dialogue. In fact, their overly pessimistic comparisons (that students will die from starvation or nuclear war) seem unlikely to spur any sort of meaningful discussion. Especially since they do not ask students to consider possible alternatives to those scenarios, these types of questions most likely will turn students off.

Another proposed instructional approach avoiding an SIS framework similarly avoids solving environmental issues raised by the teacher. For example, in a proposed lesson focusing on the gasoline shortages of the late 1970s and early 1980s, Lane (1980) suggested that an important question should be, "How do you think you will travel when you grow older?" (p. 269). While this question certainly had dialogical potential, it did not orient students toward addressing the energy crises itself. Perhaps students might answer that they will travel by

spaceships in the future. However, this question deters purposeful dialogue about where energy to fuel such vehicles would come from.

Similarly, Banaszak (1980) proposed a lesson comparing the origins of this gas shortage to lamp oil shortages in the mid 1700s. He recommended asking the question "In what ways are these two energy crises similar to the energy crisis we are in today?" (p. 284) Here, addressing sustainability issues did not automatically qualify the question as an SIS-framework. Banaszak's question did have potential to spur discussion. Perhaps students might notice that the causes of the two crises had significant overlap. However, the question did not have much potential to stir disagreement, ongoing dialogue, and most importantly, an examination of how to develop possible understandings for solution.

Education researchers admit that how teachers actually implemented an SIS pedagogical approach is poorly understood. Chalmers, et al. (2007) wrote that knowledge of how the "social debate on environmental issues [occurs] remains sparse, and lacks continuity as well as theoretical and methodological foundations" (p. 565). However, ideas of how it could be implemented draws on understanding from several education researchers.

what it could be

The strongest proposed SIS-oriented lessons may center on questions raising matters of personal responsibility (as described earlier in this chapter). In a proposed lesson on drinking water pollution, Hepburn, Shrum, and Simpson (1978) recommended an inquiry around what level of water quality was sufficient: "Who decides, and who is responsible?" (p. 74). Reilly (1971) suggested asking a similar SIS-oriented essential question for instruction on garbage: "Should people be fined for discarding materials which could be recycled?" (p. 31). Both

questions have the potential for broad dialogue and meaningful disagreement. The strengths of each question also rest on their grounding in issues that are of "interest to students' lives and experiences" (Corney, 2006, p. 237). Thus, questions like "Where does food come from?" has potential for dialogue along subjects because they are readily accessible and of potential interest to the students (Louv, 2008; Steinberg, 2009). Yet, understanding one's goals for an SE curriculum *and* crafting strong SIS questions represents only two of the three components of this study. How to assess SE curriculum centered on SIS questions represents the final link to the research question, "What are the curricular, pedagogical, and assessment practices of three social studies teachers when they teach the social issues of sustainability?"

Assessment

Among the three components of this study's research question: learning goals, instruction, and assessment, education researchers have written very little about the latter. At the very least, they acknowledge that assessing a SIS-oriented approach is challenging. Such difficulties exist, Win wrote (2001), because "its real value depends on human behavior, which is itself the product of complex social and psychological factors" (p. 100). So, if assessing human behavior in a class setting is considered unclear, then also problematic here is assessing the desired outcome of such instruction. How exactly should one assess a learning outcome that is psychological in nature? Also, how should one assess students if teaches expect that these psychological changes toward environmental issues might not occur until later in their life? (Nolet, 2009).

Exactly how teachers could assess students' work seems missing from education researchers postulations because they regularly suggest culminating projects without including

assessment criteria. For example, a social issues lesson about improving the fuel efficiency of automobiles asks students to "design or create new, energy-efficient products" (Otto, 1987, p. 1). Yet, how teachers could assess these new products is missing. Similarly, Wellnitz (1992) proposed instruction including a debate over air pollution's culprits. However, he did not mention how one should measure student outcomes.

The best example of how to assess students' efforts in an SIS framework rest in Palmer's (1998) and Jensen and Schnack's (1995) articulation of what students *and* teachers should be able to do. She noted that the following table was helpful in assessing instruction based on "issues based learning" (p. 157):

Table 2-4
Assessing student skills and teacher strategies

action competence	pupil skills	teachers' strategies
Knowledge/Insight	• identify the issue as a conflict of values • analyze issue and recognize 'players' in the conflict • identify research questions • use research sources • detect bias/opinion • learn to sample, survey and record data • share information with others • analyze alternative solutions to issue • evaluate 'completeness' of evidence	• clarify, by most appropriate means, the context of the issue • provide/evaluate experiences for co-operative working • ensure ability in 5-14 skills so that pupils can select and justify the best mode of enquiry • provide sources of information • be provocative, challenging views, solutions, strategies • be an active 'heckler' in the audience
Commitment and Vision	• use evidence • draw conclusions • listen, compare a range of solutions • make inferences	• pose the challenge of 'making up your own mind' about… • provide appropriate techniques to prove

	• formulate recommendations • communicate personal position/view • state and justify personal decision	perceptions/values, to justify, predict, explore 'what if…' alternatives • consider how best to participate • facilitate discussion, debate, decision-making and decision-taking. • reassure • challenge
Action Experiences	• analyze effective action to make a change • evaluate the feasibility of success (consider failure) • persuade others about chosen solution(s) • decide on best way forward • act alone and in a group	• facilitate reflection on action plan, i.e. ask awkward questions, ask to check, etc. • cause to think ahead and predict • ask to evaluate 'right' and 'wrong' • challenge 'ideas/strategies' • evaluate strategy

Note. This entire table appears in Palmer (1998), p. 158.

The most compelling component of this recommended assessment rests in the third row: "Action Experiences." This section asks students, 'would my solution work?'" It also identifies the teacher's responsibility to "cause to think ahead." On the surface, asking these questions may raise the issue of whether or not instruction should encourage student solutions to emphasize creativity or realistic application potential. However, this assessment strategy also suggests that creative or realistic solutions are not mutually exclusive.

Here, these questions hint at the goal of creating solutions that "would work," and creative or realistic ideas could both fit the criteria. Therefore, assessment of this kind of teaching may focus more on encouraging student responses that are indeed implementable. Of

course, does implementable imply something that can occur immediately, or is such a descriptor relativistic? Existing commentary in this regard avoids such detailed discussion.

To summarize, Palmer and others appear to emphasize the importance of assessing students' *process* in answering SIS questions. Exactly how they respond to the SIS question did not seem to be of singular significance. Therefore, the importance of scaffolded instruction hinted at in this section (and elsewhere in this chapter, for example, with Hess (2009)) may be a critical part of how teachers assess this kind of instruction. This observation elevates the cohesiveness of such a curriculum instead of focusing merely on the dialogical potential of its SIS questions.

Summary

In this literature review, I sought to use extant literature to assist in my inquiry, "What are the curricular, pedagogical, and assessment practices of three social studies teachers when they teach the social issues of sustainability?" I aimed to understand what people have written about a SIS teaching framework. More specifically, I focused on these researchers' postulations for how teachers' a) learning goals, b) pedagogical practices, and c) assessment strategies could look. My review helped to identify several useful unresolved issues. For example, how can teachers get students to bridge the gap between their understanding of environmental issues and their willingness to take action on them? Also, should instruction center on local or global-oriented contexts? Disagreement also existed on how to inform students about the scope of environmental issues without administering a curriculum that was either oversimplified or 'doomsday'-oriented. Along a similar spectrum, scanning the extant literature also revealed the debated the role of controversial issues in teaching about sustainability. Overall, I aimed to provide an

understanding into how teachers could plan, implement, and assess SIS instruction. This approach should provide a useful framework to consider how findings on the teachers in this study compared to what education researchers say it could be done.

III. Research methodology

Introduction

In this study, I sought to examine how three teachers prepare for, implement, and assess the effectiveness of teaching the social issues associated with sustainability education. I was interested in learning how an issues-centered decision making approach to sustainability education guided such learning goals. To achieve this aim, I used case studies as the organizational approach and qualitative research as the methodology.

Using qualitative research is desirable when one aims to study natural settings and understand the complexities of context (Marshall & Rossman, 2011). Denzin & Lincoln (2005) noted "qualitative research is a field of inquiry in its own right. It crosscuts disciplines, fields, and subject matters" (p. 2). Mishna (2004) noted that qualitative research is effective in capturing context, personal interpretation, and lived experiences. Also, a qualitative researcher studies in natural settings instead of in a laboratory and is "intrigued by the complexity of social interactions expressed in daily life and by the meanings that the participants work in and through interpretations – their own and others" (Marshall & Rossman, 2011, p. 2). Therefore, this study seeks to gather data about how social studies teachers taught a SIS framework, with myself acting as a beginning researcher.

Researchers often define case studies as a form of qualitative research strategy that employs multiple methods. These methods may include interviews, observations, historical and

document analyses, and surveys (Marshall & Rossman, 2011). More specifically, case studies are reports that describe research on a specific organization or process (Yin, 2003). Also, case studies aim to "take the reader into the setting with a vividness and detail not typically present in more analytic reporting formats" (Marshall & Rossman, 2011, p. 267). Thus, in this study, I seek to create three case studies about how teachers plan for, implement, and assess an SIS curriculum.

More specifically, I aim to draw upon ideas consistent to a constructivist theoretical framework (Guba & Lincoln, 2005). Specifically, my study's epistemological approach adopts a "transactional" and "subjectivist" understanding of how one comes to know things – the notion that knowledge is socially constructed and the product of "collective reconstructions coalescing around consensus" (Guba & Lincoln, 2005, p. 257-258). Ontologically, I seek to understand reality through a "local and specific" lens as well as a "constructed" and "co-constructed realities" (Guba & Lincoln, 2005, p. 257).

Therefore, I adopt an exploratory stance aiming to describe, interpret, and understand how teachers plan for, implement, and assesses the effectiveness an SIS curriculum. Additionally, I consider teachers' classroom efforts to be a social construction instead of a quality inherent in people (Marshall & Rossman, 2011). However, findings I describe in this study may not be evidence of a "best practice." Thus, data I gathered in this study may only inform the education field of what pedagogy *looks like* when teaching an SIS framework.

I designed this research model for a few reasons. First, I chose a qualitative study because I planned to study actions taking place in a classroom. Marshall & Rossman (2011) noted that a classroom is a complex setting where a qualitative approach is most appropriate. They defined a complex setting as a place where "multiple versions of reality can be collected" (p. 91). This

study seeks classroom-based research on the real planning, implementation, and assessment of learning goals. It does not focus on institutional objectives.

Research Design

Sources: Case selection and settings

I established several criteria when determining which schools and teachers would be participants in this study. First, I wanted to identify as many K-12 schools in my metropolitan area that a) featured sustainability as a general theme of their school-wide learning mission, and/or b) had a social studies course that similarly highlighted sustainability education. I searched for these schools in three ways. First, starting in the summer of 2009, I asked colleagues at a sustainability education conference if they knew of schools in my metropolitan area that fit the above-mentioned criteria. I did not learn of any specific schools, but I did learn that a so-called "Green Schools Network" existed in my city. Such a network loosely organized a selection of schools whose mission statements included a focus on sustainability education. From there, I found references to this network online, although a webpage going beyond a mere listing of participant schools did not exist.

From that list, I sought to determine if the schools had characteristic qualities that might indicate the potential for a sustainability-themed social studies course. I visited each school's webpage. Some schools indicated actual course offerings, like "Environmental Law," "Green Business," and "Sustainability and Citizenship." Other schools did not list their courses, but their names suggested potential for such courses. For example, one school called itself "The Green School," and so on.

I identified eight such schools that had these general characteristics. From there, I first determined the logistical practicality of visiting these campuses three or four times a week while maintaining a near full-time work schedule as a graduate student. I eliminated two schools from consideration in the study because of their physical inaccessibility. One of these potential schools was located almost two hours away from my residence. Another promising school sat on a 172-acre island not far from my home. A regular ferry service did visit the island from May until the end of September. However, that regular ferry ran almost exactly during the times that the school would be closed. Ironically, it did not run during the regular school year because the ferry service designated it as the island's visitor "off-season." I learned that a different, more limited service ferry catered to the regular schedules for national park staff and students and school staff. Unfortunately, this meant that I might spend up to an hour waiting for a trip. I made the journey in June and timed it at just less than two hours. However, I made this trip under the regular ferry schedule; taking the less frequently departing ferry service might make my regular visits even longer. Making almost daily trips to the island seemed prohibitive. I decided that the school on the island was not going to be part of the study.

With my list of potential participant schools down to six, I next sought input from community members and school administrators for recommendations of teachers who they thought were teaching this sort of subject as a part of their regular curriculum. Such a strategy seemed appropriate for this study because other researchers used a similar approach. For example, Ladson-Billings (1994) employed a complex strategy she termed, "community nomination" (p. 147). She described this concept as a multiple-step process designed to learn more about teachers in a district. For example, she first consulted parent groups to ask if teachers in the district met their own personal qualifications to be effective teachers of African-American

students. She then verified these nominations with administrators, and sometimes, with colleagues. My selection of teachers was not as sophisticated as the process Ladson-Billings' used. But, it did involve seeking an administrator's recommendation for teachers I would choose for the study. In a few of the schools, I was able to solicit the input of community members in this process.

In these interactions, I carefully considered how I described my research objectives. For example I usually told administrators and parents (and later on, the teacher(s)) that my research involved learning about "how the social issues of sustainability are taught." Marshall & Rossman (2011) termed this explanatory process as "revealedness." On one end of the spectrum the researcher may choose full disclosure, and at the opposite end of the spectrum, the researcher may choose secrecy (p. 113). Patton (2002) recommended "full and complete disclosure" because participants are rarely reassured by inaccurate details (p. 273). However, Taylor & Bogdan (1984) stressed that a "truthful but vague" approach does not equal dishonesty (p. 25). I chose an approach siding more with their logic. I wanted to learn how the social issues of sustainability education are taught, but I did not let them know I was most interested in how they formed their teaching around SIS questions. I believed that sharing my exact research question might possibly influence their instruction.

Through this initial interaction with administrators and parents, I achieved the "community nomination" I sought in two ways. First, I contacted administrators via email, and I gave them a general sense of what my study was about. From there, if administrators responded favorably, then I followed up with a request to either a) meet with them in person and/or b) have them suggest faculty members who they thought taught the kind of curriculum I was interested in studying. This process often took months, as I suspect that my inquiry may not have been a high

priority for them. Of my six email inquiries, I received five favorable messages back. One school's administrator did not return my messages.

Second, I hoped to gain a "community nomination" from parents or even students who were present at a "Green Schools Network" community fair in the spring of 2010. I aimed to learn about additional schools and potentially, specific teachers who might embrace an SIS curriculum. For three of the schools already on my list of potential sites, they had representatives hosting a table at the event. I had informal discussions about the school with these representatives (each were members of their school's parent-teacher organization). I let them know that I was a doctoral student interested in learning how social studies teachers taught about sustainability. I asked if they knew of any outstanding teachers who I should reach out to. Pleasantly, each of these conversations yielded multiple names for each school.

Before I reached out to the individual teachers, I needed to meet with the principals of each of these 5 sites to see if they were interested in permitting the study to take place on their campus. This was arguably the most important part of the study -- to gain access as a researcher (Marshall & Rossman, 2011). For four schools, this process started with me requesting a meeting with the school's principal to see if he/she would be interested in participating in this study. If the principal was interested, then I usually proceeded to discussing the Institutional Review Board (IRB) process. At this point, I explained that my research plan had been approved by the Teachers College, Columbia University IRB Office and the New York City Department of Education's IRB Office. I reviewed the paperwork with the administrators, and I especially highlighted what precautions would be taken to protect the school and participants' anonymity. By May 2011, three school principals agreed to participate in my study. We agreed that my study could begin in the fall of 2011.

Of the two school administrators who did not participate in this study, they were interested in their school being a part of my study. Yet, they felt that emphasizing environmental themes in their history courses was detracting from their students' ability to pass the annual state exams (which were also a graduation requirement). Each administrator explained that, while the schools' mission statement and school title indicated a strong commitment to sustainability education, all courses would no longer offer that sort of emphasis. Thus, assuming a sort of mutual exclusivity, the administrators said that teaching history courses without a sustainability perspective would help their students do better on their annual state exams.

Sadly, conversations with these administrators confirmed what many education researchers postulate: that accountability measures (e. g., the No Child Left Behind Act of 2001) make teaching sustainability education through any perspective prohibitive (Bowers, 2001; Disinger, 1999; Orr, 2004). In general, education researchers argue that "the grammar of schooling" (Tyack & Cuban, 1995) is at odds with the transformative proposals set forth by these researchers. And, at least from the beliefs of these two administrators, those arguments seemed accurate.

Of the remaining three schools that had approved my study, I proceeded to meet with teachers. These were teachers that I had already contacted by way of the community nomination process described previously. Or, they were teachers I met by way of the principal's recommendation. These recommendations included the principal saying that the individual was as a) an outstanding teacher, and b) as potentially being interested in participating. In these meetings, which usually occurred in the teacher's classroom or school conference room, I shared my interests in learning about how the environment is taught in a social studies setting. I often used the word "environment" and "sustainability" interchangeably, depending on the words the

teacher initially used. If they were interested in participating, we either discussed the IRB process right there. Or, we made an appointment to talk about the IRB process another time.

Also, we arranged a time for me to observe their teaching. All of the teachers agreed with this option, and I visited their class either that day or just after. In the observation at the high school, I met one of the participant's colleagues, who often co-taught the course with her. She and I exchanged emails on that day, and we made arrangements to meet to discuss her potential interest in being a part of the study. She was initially very interested, and after our meeting about a week later, we made her participation official through the IRB process. This visit allowed me to make a general verification that these social studies teachers indeed taught sustainability in a social issues context. When I visited the classroom, I wanted to learn two things through observation and a brief interview. One, I needed to see that SE occupied at least a part of the day or unit's learning objectives. Two, I looked to verify that SIS-oriented questions were a part of the observed lesson. At the very least, I scanned to be sure they were learning objectives in the unit's culminating project.

Of the four teacher participants, some general information about the subjects they teach and the schools they teach in may be useful. A more complete description of the participants will occur in the findings section of this study. Two of the participants, "Alana" and "Kari," co-taught a ninth and tenth grade social studies at The Westwood School, a public high school. The class I chose to focus on, "Sustainability and Citizenship," had two different sections, and each met every other day for 85 minutes. Another participant, "Samantha," taught sixth grade world history at "Kings School," a middle school ending in seventh grade (they did not have eighth-graders yet, as they were a relatively new school). This world history course she taught featured subject matter from ancient humans through the Enlightenment era. The other participant,

"Maya," taught third grade at "Parkside School," a site housing kindergarten through eighth grade students. The social studies part of the day varied in length. Typical in-class sessions averaged 40 minutes. Typical out-of-class sessions (almost always in the nearby park) averaged one hour. Each of these schools are located in a large east coast city.

Choosing schools representing three different age ranges had advantages and disadvantages. Its strength included the opportunity to see a potential progression of SIS instruction: elementary to middle school to high school. However, I am aware that these different sites dilute potential for clear case-study analysis on the basis of age group *and* subject matter.

Data collection protocol

Wilson (1977) suggested that researchers use many methods of data collection when studying social situations. Therefore, I utilized three types of data collection in this study. They included participant observations, interviews, and document collection/analysis. I outline the schedule of data collection below:

Table 3-1
Data collection time table

	observations	interviews	artifacts
Westwood School (Alana & Kari)	30 visits: April 16 to June 15, 2012	8 (tape-recorded); resultant transcript = 106 single-sided pages	worksheets used in class, links to videos shown in class, Powerpoint and Smartboard presentations by teacher, transcribed student answers to selected assignments, photos and/or photocopies taken by researcher of students' final projects.
Parkside School (Maya)	23 visits: January 9 to April 6, 2012	8 (tape-recorded); resultant transcript= 102 single-sided pages	copy of teacher's blog used for reflection on year's effort (as part of an M. A. she was working toward) worksheets used in class, links to videos shown in class, Powerpoint and Smartboard

			presentations by teacher, transcribed student answers to selected assignments, photos and/or photocopies taken by researcher of students' final projects
Kings School (Samantha)	28 visits: September 19 to December 16, 2011	11 (tape-recorded); resultant transcript = 156 single-spaced pages	copies of videos made by teacher and colleagues (and used in class as learning tools), worksheets used in class, links to videos shown in class, Powerpoint and Smartboard presentations by teacher, transcribed student answers to selected assignments, photos and/or photocopies taken by researcher of students' final projects

I based the timeframe for observation of each participant on the length of one of her units of instruction. Other researcher's studies conducted data gathering under similar situations. For example, in a study of three teachers, Chandler (2009) used similar reasoning for determining the duration of his observations.

observations

Marshall & Rossman (2011) found that observations are "central" and "fundamental" to qualitative research (p. 139-140). They defined observation as "the systematic noting and recording of events, behaviors, and artifacts (objects) in the social setting" (p. 139). For this study, I observed teachers at the three sites in consecutive fashion. Meaning, I observed Samantha at Kings School, then began observation of Maya at Parkside School, and finally, I observed Alana and Kari and The Westwood School.

I recorded my observations by keeping field notes. Field notes can be defined as "detailed, nonjudgmental (as much as possible), concrete descriptions of what has been observed" (Marshall & Rossman, 2011, p. 139). For this study, I used something known as

participant observation – a strategy that requires the researcher's immersion in the reality of the participants' social world (Marshall & Rossman, 2011). In this study, I initially followed a specific format and looked for pre-established criteria. This observation protocol (see Appendix A – Observation Protocol) builds upon the general protocol established by O' Hearn-Curran (1997). She recommended organizing observation notes to allow for descriptive and reflective comments. This study adapted her framework to encourage the use of codes. These codes and notes sought to identify classroom phenomenon that I felt assisted in the understanding of how teachers planned, taught, and assessed SIS.

However, I chose to make my notes either in brackets among the text for observations or at the end of each day's observation notes. I initially tried to use a two- column approach (observation on the left, notes on the right). But, since I usually recorded more about what I observed than I made notes about, the notes and the observed material rarely lined up, visually. For reference, consider examples of my classroom observation notes and memos, here in Table 3-2:

Table 3-2
Sample observation notes

Task #2
K:Why are we focusing on sustainable civilization? Why aren't I just asking you about civilizations in general? Everything that we do, we are talking about sustainability? Why do we keep coming back to it? Why do we care if something is a sust. civilz. or not?
S: They will be able to support themselves and keep themselves going.
S: That's what our school is about.
S: Because they are long-lasting, we are looking for one that is more specific.
S: Maybe to see how they created a sustainable community and to compare it to ours****

This above snapshot is an unedited view of my observational notes taken at Kings School in October. The "K" refers to the teacher, and the "S" refers to different students.

Table 3-3
Sample notes by the researcher at the end of an observation

Jay's observation
1. Is the purpose of the activity to determine the difference between what they need and what the average home looks like/contains?

2. Why do students draw homes (what they need) that do not resemble what they live in? Like an apartment in NYC? or like a multi-family home in Queens? They've all drawn single-family, detatched homes. But only one student lives outside of the city (one student commutes in from Westchester).

3. Get photographs of student's drawings for evidence of their conceptions.

This above snapshot is an example of my note-taking strategy at the end of observations. I felt the purpose of such note- taking was to record all of my thoughts, responses, and potential analyses as soon as possible. As one can see, these notes include questions to follow-up on with the teacher (in this case, Maya at Parkside School). It also includes reminders of "to-do" tasks for the next campus visit. This snapshot was from mid-March at Parkside School.

Table 3-4
Sample notes by the researcher interspersed in an observation

for cooking
for plants
swimming

A: some people are looking around the room for ideas. I think that's okay

[initial observations: almost none of the students saw the importance of water in making food; one group did say it was important to water plants; some groups did not say it was important to use for drinking.]

944am: On the board: "How do we use water in our daily lives?" Choices include: "fishing, building things, cleaning, bathing, drinking, playing, watering plants, cooking, washing, swimming."

This above snapshot from my observational notes (at Parkside School in late February) shows how I used bracketed interpolations to include my notes/reflections *as I recorded* what was going

on in the classroom. In this case, I felt I did not have enough time to click to the end of the document to record my thoughts -- the rapid pace of the class conversation was too brisk to allow for such movement around the document.

In establishing how I would organize observational data (as well as data from interview and document analysis), I adopted a design stance seeking a balance between efficiency and flexibility. For example, I felt that an overly efficient, or a "prefigured technical" approach (Crabtree & Miller, 1992, pp. 17-20), was too rigid. Not deviating from pre-established data categories might prevent me from identifying new data categories as emerging findings dictated such a need. Yet, I felt that an overly flexible, or "emergent intuitive" approach (Marshall & Rossman, 2011, pp. 208-209), where data categories were not prefigured even on a preliminary basis, was not a good strategy to guide a novice researcher. And, Schatzman & Strauss (1973) suggested that any qualitative analysis process needs refinement in even the earliest stage. With this thinking in mind, I was aware of the possible need to deviate from the initial data organization's proposal. Thus, I felt that starting with some categories would at least serve as a starting point to organize the data (or serve as an impetus to create newer categories).

This was a good strategy, as some of the most persistent findings for all three sites revolved around data that I did not initially plan to look for. For example, student responses to questions along what I have called "spectrums of teaching and learning" are examples of some of the methodologies I looked for more regularly once they first emerged. For example:

1) Preparation of and delivery of curriculum:

(how and where to strike the balance?)

"oversimplified" "doomsday"

|----------|

2) Preparation of and delivery of curriculum:

(how and where to strike the balance?)

“local” “global”

|----------|

3. Assessment of student work

(how and where to strike the balance?)

“Realistic Solution” “Creative Solution”

|----------|

4. Assessment of student work

(how and where to strike the balance?)

“Someone else is responsible via mandates” “I, myself is responsible via habit changes”

|----------|

5. Source of solutions:

(how and where to strike the balance?)

“Comes from technological advances” “Comes from habit changes”

|----------|

By resisting a rigid, pre-figured approach, I discovered rich opportunities for understanding beyond the ones I anticipated might exist.

documents

To supplement data from participant observation, I also gathered information from my three sites through document analysis. Documents are typically defined as objects "encoded in text" (Marshall & Rossman, 2011, p. 161). They may include writing samples, handouts, assignments, student work, and photographs. For this study, I gathered classroom-related documents to strengthen the contextual evidence of my observations. Of note, I focused more closely on gathering documents that were teacher-created. As noted early in the literature review, my reasoning for this strategy was because teacher-created texts with "emergent" aims (not pre-existing) are praised for their potential to establish critical learning goals, a quality considered most appropriate within an SIS framework (Palmer, 1998, p. 146-7; Robottom & Hart, 1993, p. 26-27).

I kept records of my document gathering and analysis through the completion of field notes. Like the protocol proposed for observation, the recommended format for document analysis adheres to a specific format and looks for some pre-established criteria. My observation protocol initially built on this observation protocol (see Appendix B – Document Protocol) and upon the generic protocol established by O' Hearn-Curran (1997). It aimed for descriptive and reflective/analytical note- taking. Using this protocol, I initially annotated document excerpts through the use of codes in the reflective note column (as noted earlier, these codes sought to identify classroom phenomenon blending social studies and sustainability objectives as outlined in Tables 3:1 and 3:2. I believe these codes assist in the subsequent analysis of completed observation documents.

interviews

Finally, in this study I rely on participant interviews to augment the range of data gathered. Kvale (1996) referred to qualitative interviews as " a construction site of knowledge" (p. 2) gathered along a "theme of mutual interest" (Kvale & Brinkman, 2009 p. 2). In this case, the topic of mutual interest was how each of the social studies teachers planned, implemented, and assessed the teaching of sustainability education as a social issue.

Patton (2002) noted that a qualitative interview generally takes the form of three types. They are 1) informal and conversational, 2) interview guide or topical approach, and 3) an open-ended interview. During the 27 total interviews I conducted for this study, I used the more common of the two (according to Marshall & Rossman, 2011, p. 144), a guided interview approach, only about one-third of the time.

When using the guided approach, I followed a protocol calling for scheduled interviews. These kinds of interviews attempt to ask questions from a prepared script (see Appendix C – Interview Protocol). I used guided interviews generally at the beginning of the unit, the middle of the unit, and at the end of the unit. My rationale for this timing was to see how teacher stated goals about planning, implementation, and assessment of learning goals evolved during the course of instruction.

Also, on as-needed basis, I used open-ended interviews to inform my understanding of the teacher's practice. I utilized a dialogic, conversational interview about how a lesson was planned, implemented, or assessed. This approach was more spontaneous (Marshall & Rossman, 2003) than scripted interview protocols, and I usually drew upon questions that I developed during observations, document analysis, or as I reflected upon the general trajectory of the instruction. These types of interviews made up about 2/3 of the 27 total interviews I conducted for this survey.

The process of recording and transcribing these interviews entailed a few steps. I recorded all of the interviews on either a tape recorder or a digital recorder. Often, I used both at the same time just in case one of the machines malfunctioned (fortunately, only the back-up tape recorder malfunctioned). Immediately after finishing these interviews, I made digital copies of the discussion. After I completed observations at all three schools, I began the nearly three-month long process of transcribing the interviews. The process involved listening to the audio transcript on headphones, and I usually played back the interview at about 75% speed. As I listened to the interview, I transcribed the dialogue using a program called "MacSpeech Dictate." It is a spoken word program that types what you speak. In this way, I was able to create more than 300 pages of transcribed interviews. Below is a sample of a transcribed interview:

Table 3-5
Sample transcribed interview

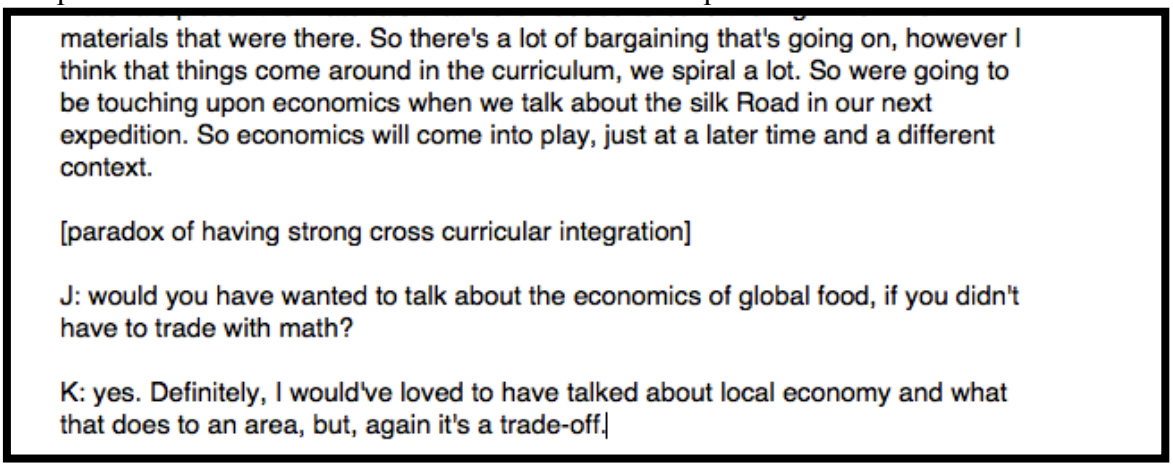
J: so for this final project, what are your goals? What you want them to do at the end?

Q: I want them to be able to do
1) think about how to fix a problem. Want them to be able to feel comfortable talking and organization, and NGO, on the phone, on their own time. When I was in high school, I did it, and I wasn't asked to do it; we had to make a magazine in my 10th grade class, my 11th grade class, I think. It was tense actually. A 'zine, which is actually like more of an underground newspaper. And mine was about sustainability issues. Everyone thought is a big dork but mine came out the best because I literally interviewed students around the school, I interviewed the heal the Bay foundation. For me, it was just because I loved it and I wanted to know, you know, what people were doing what people thought about things, I think it's

This shows a transcribed discussion between myself and one of the teachers at the Westwood School. "J" indicates words spoken by me, and "Q" indicates words spoken by a teacher. In this case, the original transcript was a digital recording of the conversation. The written version shown here I transcribed using Dragon Dictate/ MacSpeech. Below is another transcript I created from audio recordings; this one shows questions I raised during the transcription process:

Table 3-6

Sample transcribed interview with researcher's raised questions/notes in text



materials that were there. So there's a lot of bargaining that's going on, however I think that things come around in the curriculum, we spiral a lot. So were going to be touching upon economics when we talk about the silk Road in our next expedition. So economics will come into play, just at a later time and a different context.

[paradox of having strong cross curricular integration]

J: would you have wanted to talk about the economics of global food, if you didn't have to trade with math?

K: yes. Definitely, I would've loved to have talked about local economy and what that does to an area, but, again it's a trade-off.

The above snapshot also shows a transcript of an interview, but this time it is from an interview conducted at Kings School. An important difference here is that this snapshot shows my interpolated notes/memos to the responses given by the teacher. I did not record these notes during the interview. Instead, I recorded them as I re-listened to the interview and transcribed the conversation. I thought these notes/memos were useful because they helped to identify the exact part of the conversation where I saw new findings emerging in new ways.

For example, at this school, I observed a trend that I hadn't predicted in my initial research goals. I noticed a "cross-curricular paradox" occurred when an entire staff committed to teaching sustainability issues in their classrooms. Initially, I assumed that having all teachers at a school teach sustainability issues in their curriculum would be a universal enhancer for campus instruction. I assumed this, because at other sites (like at the Westwood School), the two social studies teachers reported student resistance to what some referred to as "the hippy class." Meaning, their course was a notable outlier among a school-wide curriculum that didn't regularly (or ever) address sustainability issues. These teachers said that they desired more cross-curricular participation in sustainability education (I will go into greater depth on this matter in Chapter V). Almost paradoxically, the teacher I studied at Kings School often had to compromise some of

her learning goals to accommodate other instructors' more narrow curricular options. For example, at Kings School, the math instructors felt that calculating "food miles" (how far certain foods travelled to get to neighborhood grocery stores) was their primary point of focus about sustainability education. Seeking to avoid repetition, Samantha didn't talk about "food miles" as a matter of economics or pollution -- it was a subject that she had agreed to give jurisdiction to her math colleagues.

For other instances where I noticed a new finding emerging, I also made notes orally to myself when walking home after the interview. When transcribing these recordings, I left these notes at the conclusion of the document:

Table 3-7
Sample transcribed interview with researcher's comments/notes at end of text:

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Jay's notes to self

What strikes me is that it seems like is that the purpose of this activity is just to create buy-in. To get students excited what they're talking about, to let them try sodas, to let them eat hamburgers but to me chips, and then I suppose in the coming weeks, then were going to unpack what are all the implications of my food choices.

[they're not going to say that all foods are all bad]

And implications of my food choices made outside of the classroom, just make a decision with no holds barred, no strings attached, what does that look like?

This above snapshot is a transcribed version of my notes immediately after an observation at Kings School. I made the original version as an audio recording while walking from the school to the city public transportation system. I usually recorded notes/reflections in this way after observations at Kings School, as I walked about 25-minutes to reach the station.

Methodology: Data collection and analysis

In this study, I utilized the following strategies for data analysis: coding, generating categories, offering interpretations through analytic memos and clustering, and searching for alternative understandings. Coding requires the researcher to assign words, symbols, numbers, or abbreviations to gathered data logs (Marshall & Rossman, 2011). The researcher could choose codes that represent important ideas appearing in the literature relevant to the study. During that process, the researcher uses analytic memos and data clustering to indicate how frequently certain topics appear. A memo is defined as a short writing effort recorded by the researcher for the duration of the study to assist in the shaping of the data analysis (Marshall & Rossman, 2011). Memos also seem important as stimuli for the analysis process ahead. Data clustering is defined as diagramming the relationships seen developing among the data (Marshall & Rossman, 2011, p. 213, 215).

When originally formulating my data-organizing strategy, I planned two significant technological strategies. Utilizing Dragon Dictate/ MacSpeech was one of them, and it was a key part of transcribing audio interview transcripts into document-based transcripts. I also planned to use NVivo, a coding- organizer computer program. I had experience working with the final product of such a program in other research projects (e. g., Riccio & Shuttleworth, 2013), and I was eager to use it for my own studies. I learned that NVivo was expensive -- about $800 for a per-person, annual license. However, I also learned that, through Teachers College, I could receive an annual, per-person license for free. I learned that NVivo only worked on a PC, and I owned a Mac. However, I learned that I could partition my hard drive and install a program called “Parallels” so I could simultaneously operate my computer as a Mac and a PC. I did this, and I began my self-tutorial in NVivo. However, I soon learned that mastering this coding program might require enrolling in a course or hiring a tutor -- something I did not have the time

for. So, I planned instead to rely on hand-coding my documents. Marshall & Rossman (2011) defined codes as phrases that are "likely to emerge in the real-life data" (p. 211).

Leading up to the data collection, I used memos to augment codes that I anticipated might be useful in determining how social studies teachers might plan, teach, and assess the learning goals of a social issues approach to sustainability education. For this study, using memos assisted my data analysis in at least two ways. First, it allowed an *inductive* analysis of the data – to *discover* new patterns that I hadn't predicted before the study began. Second, these memos helped *deductively* reason through the data – to discover if and how the data fit pre-established categories (Patton, 2002). To see these phrases, visit "Appendix D: Coding Phrases, Inductive-Orientation."

In searching for further understanding, I understood the importance of scrupulously managing my data collection and analysis. For example, I was conscious not to mold my to fit what I was looking for at the onset of data collection (Marshall & Rossman, 2011). For me, not fixating on data that bolstered only my initial goals allowed for other concepts to emerge that I had not anticipated.

Also, as a researcher, I needed to know at what point the study should end or when more data was needed. For example, Patton (2002) said the researcher must "impose order" (p. 480) and seek to establish conclusions that either explain, infer, and extrapolate at some point of the data gathering process. Patton (2002) referred to this action as offering interpretations. When I wondered about the thoroughness of my work (usually on those long walks to and from Kings School), I asked myself if more data (in this case, more observations, interviews and document gathering) would replicate current interpretations. However, I was aware that Marshall & Rossman (2011) argued that such data saturation is elusive; only "theoretical sufficiency" is

attainable (p. 220). They argue that no study can present a complete truth. I also recalled a conversation I had with J. S. Holliday in 1999 about his book, *The World Rushed In*. Since it had taken him over twenty years to complete, I asked him how he knew it was finished. In a Borders coffee shop in Roseville, CA, he asserted that no author ever "finishes" a book; they merely "abandon it." Using this logic, I am aware that I needed to adhere to the narrow aims of my research question and constantly evaluate it in a way that demonstrated a complete accounting of things and not just the items and words that represent the most effective examples of planning for, implementing, and assessing learning goals for sustainability education.

To visually assist in the understanding of this study's general data collection process and timeline, please refer to table 3-8 and table 3-9.

Table 3-8
Flow-chart of research process

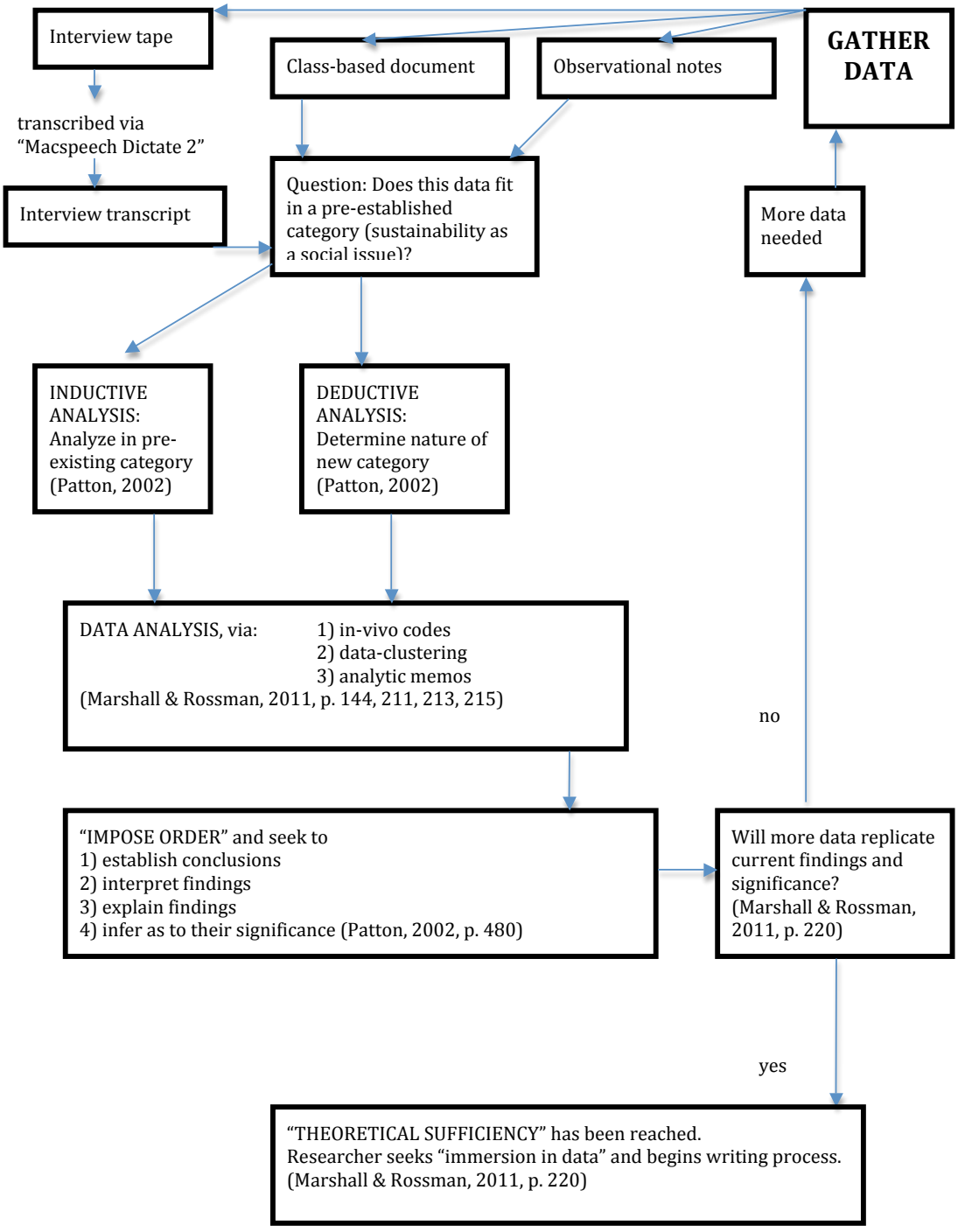


Table 3-9
Schedule of Work

	2011				2012									2013						
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Data gathering: Kings	x	x	x	x																
Data gathering: Westwood					x	x	x													
Data gathering: Parkside							x	x	x	x										
Transcribing interviews		x	x	x	x	x	x	x	x	x	x	x	x							
Analysis: deductive/inductive	x	x	x	x	x	x	x	x	x	x	x	x	x							
Analysis: clustering/memos/ notes		x	x	x	x	x	x	x	x	x	x	x	x	x	x					
Analysis: coding														x	x	x	x			
Analysis: interpret/explain														x	x	x	x	x	x	
Establish conclusions/ inferences															x	x	x	x	x	
Writing of final report																x	x	x	x	x
Preparation of findings for conference papers					x	x											x	x		

Note. This table adapted from Marshall and Rossman (2011)

Human Subjects in Research and Teachers College Institutional Review Board

I followed guidelines set forth by the Teachers College, Columbia University and New York City Department of Education Institutional Review Board (IRB) policies. These policies oversee research on human subjects and offer guidelines for these factors: selection of

participants, informed consent protocol, confidentiality, and the risks and benefits associated with participating in the study. I received permission from both institutions.

As I noted in my IRB application, I took care to consider participant consent as a process instead of merely as a form to be signed. For example, I informed the participants of the nature of the study (research in support of a doctoral dissertation), and the perceived risks and benefits they may encounter. Also, I advised them that they may choose to withdraw from the study at any point. I additionally let them know that, in any publication about this study, I will refer to them and their school by pseudonym. I let them know I will keep the interview recordings and typed transcriptions in a locked file cabinet accessible only by me.

Limitations

This study has at least three significant limitations. First, the sample size is small: it involves four teachers at three sites. So, the findings will not be generalizable to other schools. However, my study's purpose is to gather data that might illuminate how teachers planned for, implemented, and assessed learning goals for SIS. A second limitation of this study involves the limited time period for the study. I conducted observations, document gathering, and interviews over a period of ten months, roughly divided among each site. Thus, the depth of study is not expansive. A more desirable approach would have observations, interviews, and document collection to span the period of an entire school year. A third limitation of this study is its qualitative nature. This study seeks an in-depth understanding of a classroom phenomenon that may be valuable for providing rich details about the planning for, implementation, and assessment of a sustainability curriculum. However, such qualitative findings are not generalizable to other classrooms. Of course, these types of limitations are common for

qualitative research studies. Broadly speaking, all qualitative studies have limitations owing to the human nature of research inquiry. Patton (2002) said, "There are no perfect research designs. There are always trade-offs" (p. 223). More specifically, other qualitative case studies investigating environmental curriculums within the social studies reported similar limitations as forecast here. For example, Chandler (2009) reported his study's data was limited because it was gathered a) at three sites and b) for one semester (p. 98).

Researcher's Role

Qualitative researchers are responsible for interpreting gathered data. Because of this, the variations in their values, personal experiences, and expectations inevitably influence that process. Therefore, this potential for bias, often referred to as one's "positionality" should be clear to the reader (Marshall & Rossman, 2011, p. 63). Consider that my conceptions of teaching, in general, are shaped by my nine years as a high school history teacher and my five years of teaching at the graduate and undergraduate levels. My expectations for what this sort of teaching could look like are shaped by my critical conceptions of environmental topics gained from my experiences living in rural Northern California. Growing up, my family relied on alternative and renewable strategies for electricity and water access. For example, my parents shunned air conditioning and instead built "cool tubes" – a system of ceramic tunnels intended to draw colder air from the forest into the house during summer months [although it appeared to only accomplish making the house smell like the forest]. Also, my family and most of my friends' families got their water from non-municipal, often untreated sources. Some of my friends attended a nearby elementary school that was solar-powered. Thus, from an early age, I understood and valued the important role renewable energy sources and clean water had in many

people's lives. Later in life, I became much more involved in advocating for environmental causes. Recently, I was party to three environmental lawsuits regarding land use. Thus, on environmental topics, I typically adopt the critical viewpoints of SE. Therefore, I have been aware of my biases throughout this research process.

Assumptions

"Assumptions" are further elaboration on how a researcher's bias might influence a qualitative study. Brantlinger (1997) defined assumptions as how specific beliefs shape how research is conceived, implemented, and analyzed. Also, she notes that these beliefs, or "dimensions," are defined through seven continuums. For this study, consider how I oriented myself in this descriptive table.

Table 3-10
Dimensions of Assumptions in Qualitative Inquiry

Dimension	Assumptive Continua	My Research Stance
What is the nature of the research?	Technical and neutral ←→ controversial and critical	Technical and neutral.
What is the relationship with participants?	Distant and objective ←→ intimate and involved	Mostly distant and balanced. A truly distant stance is desirable but not possible: a researcher's "total integrity cannot be maintained" (Soloway & Walters, 1977, p. 166).
What is the "direction of the gaze"?	Outward, toward others ←→ inner contemplation and reflection	Balanced.
What is the purpose of the research?	Professional, private ←→ useful to participants/site	Balanced.
Who is the intended audience?	Scholarly community ←→ the participants	Scholarly community. Because of my status as novice researcher, I am trying to overcome a weakness as participant advocate. Therefore, my goal is to comment about my findings as if I were not trying to advocate for a sustainability framework, in general.
What is the researcher's	Neutral ←→explicitly political	Neutral: I am seeking to understand how teachers plan, implement, and assess the social issues of sustainability

political position?		education. My theoretical framework is not political
What are the researcher's views on agency?	Passive ←→ engaged in local praxis	Engaged in local praxis.

Note. Table adapted from Brantlinger (1997)

IV. FINDINGS

Introduction

In this chapter, I examine the findings of the case studies located at Parkside, Kings, and Westwood School. For each case study, I respond to the research question, "What are the curricular, pedagogical, and assessment practices of three teachers when they teach the social issues of sustainability?" Thus, as I describe findings from each case, I organize them under three headings: 1) SIS Learning Goals, 2) Teaching SIS, and 3) Assessing SIS. Within each of those headings, I organize the findings around evidence based in observations, document collection, and teacher interviews. I use this kind of evidence to support my assertions about how these teachers plan, teach, and assess an SIS curriculum. Importantly, realize that I selected two or three pieces of evidence to illustrate my stances. I avoided a more exhaustive approach to citing evidence for the sake of clarity and ease of understanding for the reader. For reference, the "evidence" I mention here combines data gleaned from classroom-used documents, classroom observations, or teacher interviews. In most cases, I rely on information from these interviews to provide further clarity for such documents or observations.

Going forward into this chapter, I sought a uniform organizational approach for each case study. In this chapter, I organize each case study in this way:

Case Study (either Parkside, Kings, or Westwood School)

- **School background**
- **Teacher background**
- **Unit of instruction description**
- **SIS learning goals**
- **Teaching SIS**

Assessing SIS

Summary

For each heading pertaining directly to the research question (the three relating to SIS), I provided further organization for the reader by using sub-headings. For example, consider the heading, "SIS learning goals" for each of the three cases. In the Kings School case, I identify some of its sub-headings as "Realistic or creative?" and Bioregionalist approach." For Parkside School, I chose "Systems-thinking" and "Perspective, empathy, and interdependence." For Westwood School, I identified "Agency" and "Justice-orientation" as appropriate sub-headings. I chose these sub-headings for a few reasons. First, and most simply, they represent important components of how the teacher articulated her learning goals. Second, they seek to assist the reader with a more incremental approach to understanding the findings from each sub-heading. Finally, they call one's attention to the confluent and divergent perspectives each teacher has regarding SIS.

The sub-headings are not uniform among the case studies, yet such a difference should not cause concern. The purpose of this study is inquiry-oriented. I aim to learn how teachers plan for, teach, and assess an SIS curriculum. So, I chose uniform *headings* for each case study. But, naturally since each teacher approached their pedagogy (and each heading) in unique ways, the sub-headings reflect that difference. My task includes making sense of these differences, but I will be making such conclusions in the next chapter, not here. Thus, going forward with this chapter, I aim to provide the reader with a sense of how each teacher taught a unit of instruction about SIS. I use specific examples -- my observation notes, information from class documents, and the teacher's own reflections (via interviews) to achieve that goal.

Case One -- Kings School

In this section, I describe the background of the school, the teacher (Samantha Schiller), outline the unit of instruction studied, and describe the findings emergent in how she planned, implemented, and assessed her curriculum of teaching SIS. For reference, I organize the case study by these headings and sub-headings:

School background

Teacher background

Overview of instructional unit

SIS learning goals

Bioregionalist approach

SIS questions

Realistic or creative?

Avoiding "doomsday"

Paradox of cross-disciplinary integration

Teaching SIS

Scaffolding: skills and knowledge

Scaffolding: historical significance

Assessing SIS

Agency and challenges

Informed decision-making

Summary

With this organization, I shall provide empirical evidence for how Samantha plans for, teaches, and assesses her SIS-oriented curriculum.

School Background

Kings School is located in a large school district (more than 250,000 students) in a large, east coast city (more than one million in population). It is a comprehensive public school serving grades 5th through 9th. Over the next three years, it will eventually accommodate grades 10, 11, and 12. The school district classifies it as a "limited unscreened" school. First, such a distinction signals that students must apply to attend this school. Living nearby Kings School does not automatically qualify them for enrollment. Also, this distinction means that any student living in their particular district may apply (the city's school district consists of dozens of regional, semi-autonomous "zones," but they refer to these regions also as "districts" (for example, "District 23")). Administrators at Kings School give priority to families who attend an open house session, and then afterwards compose their student body on a first-come, first-served basis. Unlike some comprehensive public schools in this district, Kings School does not consider test scores, grades, recommendations, nor does it require an academic or performance examination. Admitted students must wear a school uniform, and each student has access to an individual locker. After school clubs include yoga, gardening, and theater.

Like many of the schools in the city- wide district, Kings School has a diverse student body. Kings enrolls 342 students in grades six through nine. According to its latest district "report card," 61% of its students are eligible to receive free or reduced price lunch. Demographically, Asian or Native Hawaiian/ Other Pacific Islander makes up 18% of the student body. Black or African American students represent 31%. Hispanic or Latino equal 30% of the

school population, and students identifying as white equaled 21% (*Note:* data comes from Kings School's city-wide "report card"). The school facility was completed in Fall 2010, and the Kings students share the building with a high school and an elementary school. On their latest city-wide report card, city auditors gave Kings School an "A" rating (based on categories including "Academic Performance," "Student Progress," "Student Performance," "School Environment," and "Closing the Achievement Gap"). Relative to other middle schools in their city, this rating placed them in the top 84th percentile.

Teacher Background -- Samantha Schiller

Samantha teaches sixth grade social studies at Kings School. She previously taught social studies for two years in a private one-room schoolhouse setting in another large city near where she currently teaches. She possesses state teaching accreditation for middle and secondary social studies education in the state she currently teaches. In 2009, she received her master's degree in social studies education from a private university in this city.

She credited three experiences prior to completing her master's work as formative in developing her desire to teach sustainability issues. The first experience originated in the New England area. There, for a year she worked in a program called, "Worldwide Opportunities on Organic Farms" (WWOOF). In the USA alone, WWOOF has a host farm directory of over 1,600 farms in all 50 states, the U. S. Virgin Islands, and Puerto Rico. Through WWOOF, people can live and work on an organic farm in exchange for room, board, and education about sustainable agriculture. Participants typically assume a "part-time" work status of approximately 20 hours per week of actual farm labor (but they receive no wage). Of this experience, she said, "That's what got me so interested in all this farming and food topics. This farm that I was working on in

[New England] had a windmill, and it used a lot of wind energy for their farms, so that kind of got me thinking." Other experiences that seemed to influence this interest were the array of courses she took while in the WWOOF program. Officially sanctioned by the National Outdoor Leadership School, she took courses like backpacking to augment her knowledge of food resources as well as nurture her interest in outdoor education.

Spurred by her interest in out-of-doors learning, she pursued a second "pre-Kings School" learning opportunity at a post-baccalaureate university setting in the western U. S. This two-month opportunity offered instruction in what she termed "climate curriculum." Through their "Wilderness Awareness School," she enrolled in a two-month opportunity to learn "…how to build shelters, build fires, develop survival skills [like] foraging." She credits her enrollment at this school to at least two motivations. First, she "realized that I really wanted to get outdoors [to learn]." Second, she indicated that she sought build a teaching repertoire that included a strong basis in outdoor education. She said that she knew she "…didn't like the four walls of the classroom" that much. After her time at the Wilderness Awareness School ended, she decided to seek her first formal teaching job where she could apply these philosophies and skills.

She got her chance to do so when she accepted a job as an outdoor educator in another western state near a mountainous national park. She held this job for two years before returning to her home state to complete her master's degree. Her teaching assignment at this school included outdoor, sustainability-related education opportunities for middle and secondary students. Her curriculum included materials sanctioned by the National Park Service. It focused on an interdisciplinary approach to geography, natural science, and sustainable living. The physical environment of this national park served as the classroom setting for this instruction. In this way, she conducted much of her teaching through a "park-as-learning-lab" model. Students

attending this school typically did not live nearby. Many students lived far from the school, often out of state, and many lived in residence. As I observed her teaching, these experiences seemed to manifest themselves in how she designed her sustainability curriculum. In the nine- week unit I observed, she led students in learning opportunities outside of the classroom at least four different times.

Overview of instructional unit

For the unit I studied, its content-orientation adheres to her state's content standards and her school's chosen sustainability orientation. The content-orientation focuses on the Neolithic Revolution -- the transition of hunter-gatherer societies becoming more geographically- fixed. The time frame for this history begins about 45,000 B. C. E. and ends about 300 B. C. E. The beginning point represents the general start of studying hunter-gatherer societies in Europe and the Middle East. The end point defines the conclusion of Ancient Egypt, which generally spans from 3100 B. C. E. to 332 B. C. E. Broadly, the school's staff agreed on a thematic orientation for each of their instructional units. For this unit, the thematic orientation focused on "Food, Glorious, Food" as a lens in which to deliver the content. The unit spanned just over nine weeks. The students met daily for classes that varied slightly in length but were usually 50 minutes in length.

Learning goals for SIS

Bioregionalist approach
SIS questions

Realistic or creative?

Scaffolded instruction

Avoiding doomsday

Paradox of cross-disciplinary integration

This section begins by establishing the learning context Samantha aimed to create in support of her SIS questions. During this study, I realized that how (and in this case, where) she situated such instruction -- and how that influenced her learning goals -- was an important factor. Thus, examining her thought process for the kinds of instruction meant to facilitate student inquiry into these social issue questions is how I start this section. A complete examination of the actual, planned-for social issue questions follows. My next focus includes a description of how she framed her learning goals through consideration of others (including an intergenerational perspective). This section also examines what her learning expectations were for her students -- including her hopes that students emphasize creativity in their answers instead of posing merely realistic, readily implementable solutions. Finally, I describe what I have termed the "paradox of cross-curricular integration" -- an unexpected challenge she faced because all of her colleagues also implemented sustainability education themes.

bioregionalist approach

Although she did not specifically reference the term, a component of Samantha's goals drew from a bioregionalist perspective. Bioregionalism emphasizes an individual's awareness of global issues but stresses applying those understandings in an area encompassing a 15-mile

radius from one's home (Snyder, 1990). Samantha articulated that her learning goals would resonate with the landscape of the students' communities.

Reflecting back on her experience teaching in an outdoor education school, Samantha emphasized that teaching about sustainability education, in general, needed to focus on the transferability of learning to the students' lives. She said, "And one of the big things I think I learned in Wyoming is, if things aren't relevant, and things aren't transferable to students' own lives, then it's really not going to go anywhere." Another point she emphasized was the realization that learning about SIS does *not* rely on students interacting with any particular sort of natural environment -- be it in a scenic national park or a highly- urbanized landscape. Continuing her reflection on her initial experiences teaching in outdoor settings, she said,

> I was living in [a] national park. So, the environment is stupendous. And we would teach the students about the environment, about sustainability, about geography, about the natural world… But I got a lot of emails from students once they got back to their "real lives," and they didn't know what to do with this information. They weren't sure how to use it. I had one girl who was with me for a month backpacking, and it was a total transformation, and then she went back to [her home state] to this really urban area, and she emailed saying she feels like she should be hiking or outside, but I don't know what to do, I don't know how to do it.

Therefore, Samantha sought to teach a curriculum at Kings School focused on the spaces comprising her students' community. Regarding this unit (as well as others), she said "I would want them outdoors as much as possible, and when I take them outside and they hold worms for the first time, it's incredible to see how they react to that, knowing that they would not necessarily get this experience, otherwise." While she may have assumed that students had

uneven or generally limited experiences with their community's environment, she sought a pedagogy aiming for all of her students to develop basic skills and knowledge of their natural surroundings.

Samantha sought to ground her SIS approach in a local context. While much of her social studies content started with global issues and places (for example, in her hunter-gatherer lessons on cave painting and sustainable food supplies), she planned to give students opportunities to apply that knowledge to their neighborhood. She remarked that her desire to ground the curriculum in locally-experienced opportunities served as a "microcosm of the greater world, so they can see change just happening on a smaller scale." The philosophy of thinking about global issues but applying them locally manifested itself here and elsewhere in her teaching.

Samantha also stressed that building a curriculum based on a local perspective was developmentally appropriate for sixth graders. Focusing only on global locales, she noted, often presenting too many challenges. She stated, "I think their world is very small right now, so it's hard to see beyond themselves and to see maybe how their skills or understanding can apply to the bigger world in a concrete way. But again, I'm hoping that we're laying the foundations for something that will grow." This remark seemed a persistent theme in how she planned to situate the application components of her curriculum within a local framework.

Since her philosophy seemed bioregionalist in nature, she usually did not aim for instruction beyond local phenomenon. Simply, she desired that her students could apply global concepts to their local surroundings. For example, after studying about European hunter-gatherers, she planned to have a foraging expert teach her students about how they can (safely) forage for plants in a park behind the school. She also envisioned how students could study first-hand where food came from. Visits to local farmers' markets, and even a local chocolate factory

appeared prominently among her planned field studies. She even had plans to get students to a farm. She said, "I think that students should be working on a farm. So I've done a lot of research about trying to get kids onto a farm, and its feasible but its expensive and takes time." Samantha envisioned these opportunities, alongside more traditional in-class lessons, as the vehicle to prepare students to answer daily and unit-wide SIS questions. These SIS questions also possessed a distinctive local orientation.

questions

I grouped Samantha's SIS questions into two categories. They include a) overarching questions to be answered in a final assessment and b) questions that guided daily learning goals. Both types sought answers that well-informed students could disagree on.

Samantha originally planned for her overarching social issue question to be, "How can we make our school lunch more sustainable?" With this question, she wanted students to make proposals to the school governing board. This board's jurisdiction included the building's cafeteria (which also served two other schools in the building not relevant to this study). She hoped that students would ask for their food to come from more local sources and that the meals would not be served on single-use, disposable Styrofoam trays. She described her goals for how students might develop their answers in this way:

> …We are educating you to be responsible citizens. And what does that mean? It means that you can take action, you are making informed choices, and you're helping to inform the ideas behind the subject. So… you are taking an active role in the research, and you are taking an active role in presenting data. So that's what we hope to do with food. With GM foods, you know the information, you're taking an active role in presenting whatever information this is, to get a new school lunch. I think that the part of sustainability --

> creating a sustainable community in your area by becoming active citizens-- that's where social studies plays a huge role.

Specifically, Samantha outlined her goals for students' proposals:

> All of us are working toward this final product of a food lunch proposal. [Blue Bird] is one of the school lunch programs that offer organic or local lunches to schools, and right now they are working with private schools and charter schools… Their proposals will be as individuals. And then they will be read out loud to the class, and we will probably have experts come in and kind of give feedback and judge which ones are the best or most convincing proposals. Then we want a final night of presentations… [and] have parents come, and people from the DOE come, and local government officials come to hear the students' presentations on school lunch.

What was most striking about this learning goal was its emphasis on realistic outcomes. Her students would be making informed recommendations that could have immediate application in their daily lives. This goal appeared significant because it provided understanding to what may have be an ongoing philosophical struggle for Samantha -- should her students' responses to these SIS questions be realistic and immediately applicable -- or should they be very creative and representative of "out of the box" thinking (and perhaps, less immediately applicable)? More importantly, this struggle highlighted her efforts to reconcile such a false binary. Student solutions could be realistic and creative. She considered how to balance both characteristics presented an ongoing dilemma.

However, this social issue approach became derailed by factors beyond her control. The school lunch program she had been in negotiation with soon revealed that they were only accepting partnerships with elementary schools. Neither Kings School nor the other school in the

building had this demographic. When Samantha realized that "they weren't able to help us anymore," she said "it was very disappointing." Such news was puzzling, especially since one of Blue Bird's website mottos included the declaration, "we work with all types of schools and programs."

Samantha adjusted the overarching SIS questions to include an amended version of the original with an additional inquiry. The amended version asked, "How can we make [our city's] food supply more sustainable?" She included, "Has food improved?" The purpose of the latter's inclusion was for students to compare what they learned about ancient Middle Eastern cultures' food supplies with food supplies of their contemporary community. However, with the amended overarching question now focused on the city's food supply, the issue of whether or not she hoped for students' responses to emphasize creativity or stick conservatively to realistic solutions seemed back in play. However, before addressing how she articulated her learning goals in this way, I outline here the remainder of how she planned daily SIS questions.

Examples of these daily individual-lesson oriented questions focus on two general types of social issues. One kind involved food and the students' perceptions of its role in ancient societies as well as contemporary ones. An example of such a planned question was, "should restaurants penalize customers for leftover food?" Another type of SIS question asked students to analyze sustainability as a broader, philosophical concept. An example of this kind of planned question was, "what is good food?"

These two SIS questions, including several other planned for in-class inquiries, aimed at developing familiarity with five types of learning goals. These learning goals included, 1) personal responsibility, 2) thinking of others/intergenerational perspective, 3) considering why a gap exists between student knowledge of an issue and their willingness to take action on it, 4)

solution-making: should they emphasize creativity or realism?, and 5) developing an understanding of sustainability issues that avoids overwhelming students -- a "beyond ecophobia" approach instead of a "doomsday" vantage. Consider table 4:1 below on the relationship she hoped to deliver in her curriculum between the social issues of sustainability and learning goals:

Table 4:1
Sample SIS questions and learning goals

|---------- Learning Goals Sought----------|

social issue questions planned for the curriculum by Samantha	personal responsibility	thinking of others/ intergenerational perspective	gap between knowledge of issue and taking action on issue	solution orientation: realistic vs. creative	"beyond ecophobia" over "doomsday"
How can we make our school lunch more sustainable? [unit aim initially planned but withdrawn]	X	X	X	x	X
How can we make [our city's] food supply more sustainable? (unit aim)	X	X	X	x	X
Has food improved? (unit aim)					x
Do you believe that this is a solution that will create a sustainable food supply? [would it work?]	x	x	x	x	x
Who is responsible [for implementing the solution]?	x	x	x		
What is good food?	x	x	x	x	x
Is it important that you know what is in your food? Why or why not?	x	x	x	x	x

Where does your food come from?	x	x	x	x	x
Is it important that you know what is in your food? Why or why not?"	x	x	x	x	x
Should restaurants penalize customers for leftover food?	x	x	x	x	x
How does your food get to the supermarket? Please explain.	x	x	x	x	x
Who is making money on the food you eat from a super market?	x	x	x	x	x
How do my decisions affect the sustainability of my community?	x	x	x	x	x
How are you going to meet the needs of 7 billion people in the coming years?	x	x	x	x	x
content specific: Was Ancient Egypt a sustainable civilization?				x	
content specific: What are ancient cave paintings about?				x	

realistic vs. creative

Regarding what she hoped her students' responses to the overarching SIS questions would be, Samantha described a distinctive emphasis on creativity. She said:

> If I had to choose, I would say we are going for more of the creative. I don't think they get opportunities to be very creative in general in school. [I want the students to be] recognizing that in a lot of problems today, there is no right answer; you're coming up with the right answer. So, I think I'm encouraging them to be more creative.

Samantha also hinted that realistic solutions and creative solutions were not mutually exclusive. Yet, she favored creativity instead of something being merely implementable. For example,

when asked about what kind of solutions she was hoping students would propose, she described two desired outcomes. They emphasized a) creativity coupled with a sense of possibility, and b) creativity that seemed fictional. When asked about how she hoped students responded to "how can we make [our city's] food supply more sustainable?" she said, "they're going to be growing food on clouds. They are going to be shutting down all the streets in New York City and creating farms in urban areas. Whatever it is, they need to feel empowered to make a difference."

However, I noticed a tension between Samantha's goal of creative solutions and realistic outcomes. She clearly hoped that students proposed creative solutions to SIS. She said, "Their final product in social studies is going to be a design challenge where they will have to design a sustainable system, and we're going to let them do anything." This goal later became a sticking point for Samantha. She wanted this learning opportunity to also be an exercise in creative thinking. Yet, what seemed more important to her at the conclusion of the unit was that the proposals had potential "to work." However, with this later articulated goal, I realized that she did not have to limit creative thinking. She wanted students to come up with something that could work in their communities. Thus, creative or realistic solutions did not automatically take on the assumption of one being more or less desirable for her learning targets. If her later goal focused on a solution "working," then its creative or realistic underpinnings seemed less critical.

personal responsibility, empathy, and intergenerational responsibility

However, as she noted above, one of her key learning goals was that students develop a sense of empowerment as agents of change. She often linked such a goal to students answering these SIS questions with a sense of personal responsibility in mind. Regarding her original social issue aim of "how can we make our school lunch more sustainable?", she said, "empowerment

and ownership. That it's your responsibility to make these changes." She also alluded to the idea that she wanted her students to consider how they were also responsible for the well- being of other students. Of the planned (but later abandoned) dialogue about how to improve the school lunch, she said, "it's going to be a conversation about the foods they eat in the cafeteria, because that's eventually where we're going, and how we can make that change. I'm hoping they see themselves as active advocates for themselves and others in order to create a sustainable school community."

Coupled with developing a sense of responsibility, she hoped students would also begin to consider how their actions influenced other people. This goal seemed to take on two types -- 1) consideration of others that the student knows and 2) a development of an intergenerational perspective: a consideration of people who the student may or may not know in the future. Broadly, this learning goal seemed modeled after developing a sense of stewardship, a notion of passing along resources to someone else in at least the same state as one received them. Samantha articulated her learning goals for SIS dialogue for students as "being aware that your actions affect others." Also signaling how her learning goals had potential to overlap, she talked about her desire for students to consider their responsibility to themselves *and* to others: "They need to be informed about the choices they are making and how it affects them and they do have a responsibility, you know, to understand that their actions have repercussions. And it's our responsibility as teachers to show them that their actions have repercussions." For me, these goals coalesced around a single concept: making informed decisions. Her assumption was that when students made informed decisions, they would consider how it impacted others. For example, if she wanted students to consider others' needs, developing competency in that skill assumed another place in her learning goals.

plan for scaffolded instruction

Focused on how to teach dialogue toward this kind of learning, Samantha indicated that she planned to scaffold skills important to developing consideration of others. For example, she felt that understanding "perspective" was a necessary initial learning goal before students could consider how to empathize with someone else's perspective. Samantha described empathy when she stated: "The goal was this idea of being able to, we call it walking in someone else's shoes. And we talked at length about why it is important to understand different people's perspectives." Explaining this strategy, she said, "So, we're going to continue doing perspective work, which will be very important as we continue, and I think that students need to understand that now that they have all of this information they need to apply it." This insight about perspective lent support to another of her learning goals: simply knowing about an issue is not sufficient; an individual should consider ways to apply that knowledge. Of course, how she encouraged such application retained similar characteristics. If students felt that taking action on their proposal was either pointless or too difficult, then they might become turned off to the curriculum. She would consider how to engage the students in this way without incurring a pessimistic tone toward action- taking.

avoiding "doomsday"

Along these lines, Samantha expressed that she wondered how to provide students with enough information about SIS without overwhelming them. Yet at the same time, if she was trying to avoid a "doomsday" curriculum, then she also was aware that oversimplification should be avoided, too. On the first day of the unit/expedition, she remarked that her goal was that the

students “might be shocked a bit” to see how chickens are raised on farms. Yet, at the same time, she wanted students to feel confident that taking action on SIS was not daunting. She said that one of her goals was to help them “feel like they are making a difference even though they are 11 and 12 years old.” So, through social issues dialogue, Samantha wanted to reveal as much about the topic as possible while still providing opportunities for them to feel successful in the process. She was conscious of not letting the enormity of some SIS overwhelm them. How she would accomplish this goal would be a delicate process. If she wanted to give them information about how things “really are” -- like how farmers handled chicks in the movie, her discussion of that knowledge with her students would be critical. Yet, she needed to limit the level and frequency of such discussions so students might not feel despondent about SIS. I perceived that the interdisciplinary nature of SE at Kings School might assist with these kind of instructional challenges -- these topics appeared in almost all of their classes.

the paradox of cross-disciplinary integration

In fact, Samantha credited a strength of her learning goals with the extent her colleagues engaged in cross-disciplinary collaboration. For example, I learned that all sixth grade teachers planned a whole-grade learning event for the beginning of the unit/expedition (with the exception of the theater teacher). Also, as the unit progressed, Samantha and her colleagues regularly met to discuss their learning goals. Of the schools I observed in this study, I was only aware of the staff at Kings School engaging in this kind of his kind of regular, whole- school collaboration.

Such meetings had advantages. A benefit of this kind of cross-curricular integration proved that students could become more familiar with definitions of sustainability and be able to

focus more in-depth on a few key issues in just about every class they took at Kings School. For example, in planning a fieldwork trip to a farmer's market, representatives from social studies, English-language arts, math, and science negotiated the learning goals for all of the sixth graders. "Every single subject is represented except for P. E. and theater," remarked Samantha.

The product of this negotiation was a "fieldwork journal" where each teacher got to determine learning activities. The staff agreed on three guiding questions:

What is good food?

How can I make healthy and sustainable food choices?

Has food improved?

The staff also agreed on three learning targets:

I can identify techniques farmers use to grow food.

I can identify the food that is available in our region during winter months.

I can use persuasive language to convince an audience.

For Samantha's specific social studies page, she asked,

Where does your food come from?

How does your food get to the supermarket? Please explain the steps.

Who is making money on the food you eat from a super market?

The classroom applications of Samantha's questions included opportunities for students to interact with the distributors of food at a farmer's market and a grocery store across the street. Students asked these questions to some of the growers/owners at the farmers market; they did the same of the workers/managers at the grocery store (although I did not witness the latter). Students had to infer who was making money off their food purchases. For instance, the students interviewed several of the concessionaires, and almost all of them included a producer/owner. In

the case of the grocery store, students discovered that the owners/producers also profited, but how much of that profit went to the actual owners/producers remained uncertain.

Samantha explained several benefits to this sort of collaborative planning effort. She said that her students were much better situated to answer SIS questions because she did not have to set aside most of her curricular time on developing skills:

> One of the main reasons why we want there to be integration is so we're not constantly building background knowledge… It takes a while for them to learn material and then be able to apply it. So if they are learning [the same thing] in one subject, it is easier for them to transfer the material in different subjects.

She also noted that students needed to be able to discuss the subject matter as it related to a broad range of ideas not necessarily found in social studies. She said,

> Because we are all in the same expedition, students need to be able to make connections between different subject areas. Social studies does not exist in isolation from science. Science does not exist in isolation to ELA… you can use information from all of these walks of life to inform decisions.

These planning meetings also unexpectedly limited Samantha's curriculum. The faculty agreed that they had to be careful about too much cross-curricular integration of sustainability topics. These concerns seemed to come from the previous year when teachers did not exactly articulate how they would be covering the subjects, and they often inadvertently overlapped each other's curriculum. Samantha recalled that she and her colleagues worried that too much discussion about food across all subjects might cause a student rebellion. She said,

> I think there's a fine balance… I think the problem with it is that sometimes kids are thinking oh my goodness, we're learning about food again! Oh, my goodness, it's

> something else about food! So, it's about making sure you're keeping the food issues interesting and engaging… But I think this year we're doing a good job of not being repetitive for the students.

Thus, compromising on which SIS she was going to include created a sort of paradox of cross-curricular integration. In one of my previous studies (Shuttleworth, 2010), I noted teaching a SE course with little or no cross-curricular integration caused many students to resist it or treat it as an outlier within their academic day. So with Kings School highly organized across subjects, it seemed to provide a remedy to this problem. Yet for Samantha's curriculum, she omitted a focus on the economics of food, a SIS component that she reluctantly let the math department claim as their focus. Of this dilemma, she said,

> We had planned to do the economic component, and we were going to do an activity where we discussed why one would want to spend more money on different types of food, but we had to let that go, because math was doing the money issue. So, if you look at the journal, it shows that when we compared prices at Whole Foods versus prices at the farmer's market… they were doing fractions and decimals.

So, Samantha chose to steer her SIS focus toward inquiring into the origins of the food, how they got to market, and who made money off the process. Gone was her ability to establish a potential dialogue about the economic ramifications of food travelling from hundreds or even thousands of miles before reaching the consumer. In concluding a discussion about this phenomenon, she said, "I would've loved to have talked about local economy and what that does to an area, but, again, it's a trade-off." With that compromise, I realized that teaching at a school so supportive of SE did not automatically make the planning of one's curriculum easier. Thus, how Samantha envisioned her curriculum did not directly translate into her teaching. However, when I studied

how she delivered this curriculum, she made many calculated steps to ensure that students' skills and knowledge were well established before they applied them to her SIS learning goals.

Teaching SIS

In this section, I focus on how Samantha implemented instruction that was often centered on the social issues of sustainability. I include an examination of how she introduced these social issues questions into the daily curriculum and how she used them to guide the overall expedition/unit. I examine a few examples of how she used SIS questions in her daily lessons. I also examine a few specific lessons where she centered instruction on the overarching essential SIS questions. Most importantly, this section discusses how Samantha carefully scaffolded instruction for student dialogue. The sub-headings for "Teaching SIS" include:

scaffolding for skills and knowledge

scaffolding for historical significance

scaffolding for skills and knowledge

A critical finding of this study reveals that Samantha did not teach SIS questions as a daily battery where she posed one engaging set of inquires after another. Rather, she unfolded her instruction carefully and in a metered approach. This strategy ensured that her students had developed the skills and gained the knowledge necessary for use in a SIS inquiry. Therefore, before an examination can take place of how she engaged students in SIS questions, how she delivered instruction that *prepared* her students to ably dialogue around these questions assumes significance.

For her unit on food, she identified several broad purposes for scaffolding her instruction in a build up to the SIS. Regarding the lines of inquiry she planned to challenge her students with, she observed that some of them were "very abstract" for sixth graders. She also noted "I don't think they're out of reach; if the scaffolding is there, we can reach them." Recalling from previous years teaching this material, she noted that she often turned her instruction toward social issues without having devoted enough instruction to skill development and background knowledge. She said, "Without that initial data, I felt it was harder to build off of, so that they couldn't see the progression [that we had planned]." She seemed to define scaffolded instruction as adding gradual layers of understanding, with the aim of building toward social issue questioning: "[This] would be one way to scaffold it: How can we add layers? How can we make this more complex? [That's what we wanted] instead of just diving right into it."

Samantha identified five broad skills that she felt were critical for students to develop before they could progress to consideration of more challenging SIS. She identified them as:

1) understanding others' perspectives

2) making choices

3) making inferences

4) understanding cause and effect

5) understanding background knowledge

For example, she devoted one or more lessons to the development of a single skill on its own -- she did not initially link the skill to SE. In a lesson on developing inferences, she provided a scenario where students would learn about a scene where they found feathers and paw prints -- but no animals. Through a series of steps, students had to infer that a cat had caught a bird -- or at least attempted to catch a bird -- even though they were unable to observe the actual act. In a

lesson on making decisions, she presented students with several opportunities to choose one of two presented snacks. Some of the snacks were similar, and others were quite different. She stressed that students were free to make any choice so long as they wrote and shared their reflections on their thinking process (I will explore more examples of these strategies in the following pages). She organized her unit ("Food, Glorious Food") with an emphasis on developing these skills in the first half of instruction. In the second half of the instruction, she aimed for students to apply these skills toward the SIS questions.

Two important observations emerged with the teaching strategy. First, I noticed that she was addressing an ongoing challenge with teaching sustainability as a social issue: students' knowledge of an issue usually did not translate into their willingness to do something with it. She argued that students must apply this knowledge toward situations they are *interested* in. Otherwise, she said, students didn't see the purpose of learning the material:

> …they're absorbing all of this information, learning it, and then what? There's nowhere to go with it, and I think that can lead to frustration, or just, like 'what's the point of school?' So, [me] giving them an outlet to present their ideas and their learning [at the end of the unit] will be very important.

Second, she reflected on why she organized her unit in this way:

> I think it's very interesting because I think this is the challenge of social studies… the beginning of the expedition was less socially oriented just because it was based in the ancient past and more about building background knowledge about the importance of food and why it's been such an essential tenet in building civilizations and getting us where we are today.

A snapshot of this philosophy emerges in the lesson where she asked students to practice making basic decisions between several food choices. These food choices catered to those students who had an interest in fast food, cake, chips, soda, and other fare popular with pre-teenagers. Thus, her teaching strategy embraced the notion that students were eager to apply their knowledge in a range of learning opportunities. But, her long-range goal was to pique their interest in SE topics while also getting them to practice the skills she felt appropriate for SIS inquires.

For the broad, unit-wide social issue question about sustainability ("How can we make [our city's] food supply more sustainable?"], Samantha established several learning activities to assist students' later efforts in answering it richly. For example, in the first lesson (she referred to it as a "kick-off"), she began developing students' proficiency in understanding several skills necessary for answering this social issue question. She set up her instruction by giving students the opportunity to make food choices between several options. Some of the options presented very different options. Others included choosing between two types of the same food.

At each station, students had to choose if they wanted to eat one thing or another. In their kick-off answer booklet, the students had to answer why they chose what they did and answer the question, "Do you see a difference between the two food items at this station? What is it? The choices were:

Table 4:2
Scaffolded instruction for basic decision-making

apples	oranges
pizza	turkey sandwich on whole wheat bread
Doritos chips	Frito's corn chips
Big Mac	baked potato
chocolate cake with whipped cream	chocolate cake without whipped cream
fruit punch	water

Some of the choices, like Big Mac or baked potato, presented clear options. However, others did not -- like deciding between two kinds of chips. However, I felt that the purpose of this lesson was simply for students to make decisions and reflect upon those choices. Some of the choices had clear differences, and others presented less divergence. When I asked her about her objective for this lesson, she said:

> Our objective is to get them to think about why they eat certain foods. In their journal, if you open it up, there's two different choices. So for the dinner, it's either Big Mac or the potato. And it's [asking] why are you making that choice? One of our guiding questions is, "What is good food?" So, we're going to start exploring that today, and hopefully, this idea of 'good food' changes as students learn more and more… The objective is for them to record their choices, just so we have a sense of why they are making the choices they make.

Emphasizing that this activity sought scaffolded learning in advance of the SIS questions, she said, "So, yeah, hopefully all of these things will be revisited… and so a lot of what they are doing here will also be useful for their final product." Importantly, such an activity did not seem

to advocate that students should choose a 'healthier' option over another. Rather, it seemed aimed more at getting students to understand *why* they chose the things they did.

Samantha reflected on some students' verbal resistance to the lesson. For example, one student said that the teachers might be trying to get them to "eat healthy." Samantha noted that another student verbalized, "you're trying to make me a vegetarian." Another student wondered aloud if "you're trying to tell me to never go to McDonald's." However, for her, her objective involved "this idea of personal choice…" She explained, "I'm hoping that the conversation evolves throughout the day into a conversation about, "wow, I didn't know that Doritos had 22 ingredients -- half of which I can't pronounce… Maybe I'll think twice." While I did not observe this kind of discussion later on in the day or in subsequent lessons, I realized that such an event would be elusive. As I learned in the coming weeks, many of her learning goals could not be immediately measured. She shared with me that she expected some of these conversations to occur out of class after school and perhaps, even many years into the future. Like a civics instructor hoping that students use their knowledge and skill set to vote, actually observing or verifying the action would be challenging.

Evidence she was not trying to influence the students' decisions appeared in two key details: choice of options and the nature of follow-up questions. First, all of the choices she presented students did not automatically create a binary of healthy/not-healthy. The "apple or orange?" option or the "Doritos or Frito's?" are examples of that sort of decision. Of course, Samantha set-up some choices to meet her goal of *beginning* self-reflection on why certain choices were made (for example, "hamburger or baked potato?"). The nature of her follow-up question also asked a SIS question that avoided assumptions about how students should or did decide. She asked, "Is it important that you know what is in your food? Why or why not?" This

question allowed students to consider *if* they were interested in making decisions that required some self-reflection. She did not skip this initial inquiry and assume that students were interested in knowing about this process. She did not jump to the [hypothetical] question of "*Why* should you know what is in your food?" Thus, how she introduced social issue questioning reflected a consideration for scaffolded thinking. Importantly, as she planned to build students' skill sets in anticipation of SIS questions, she similarly established her curriculum to develop their understanding of food's historical significance.

scaffolding for historical significance

Since the final learning activity of the expedition/unit centered on proposing a solution to a SIS question ("How can we make [our city's] food supply more sustainable?"), Samantha sought introductory lessons support this inquiry. She felt students could not meaningfully dialogue about the importance of a sustainable food supply unless they had a basic understanding of where food came from. Also, she argued students might not understand the importance of knowing where their food comes from today if they did not actively experience why a sustainable food supply was important historically.

Since her overarching SIS questions was, "Has food improved?" and "How can we make [our city's] food supply more sustainable?", she started her curriculum by beginning with much more basic inquiries. For example, an early lesson featured her class thinking about where food actually comes from and why having a stable food supply was so critical to the establishment of stable civilizations. In one lesson, Samantha took her class to a park that was within a ten-minute walk from the school. Her SIS question for that lesson was, "Where does food come from?" This lesson had many components. It included opportunities for students to build shelters

from dead organic matter in the park, experiment with bringing water to these shelters with either a tablespoon or a network of pipes, and explore the foliage of the park to determine what parts were edible. As Samantha said, these learning experiences were "all building background knowledge" to prepare students for the more challenging overarching questions to be considered near the end of the unit. To guide the instruction about building shelters and contemplating the challenges of irritation, Samantha asked the students to discuss the social issue question, "How do hunter-gatherers sustain their lifestyle?"

For the social issue question, "Where does food come from?" a naturalist not affiliated with Kings School led the instruction. The naturalist, Mike Drill, gained notoriety in 1986 for being arrested and charged with criminal mischief. More specifically, police charged him with "eating" parts of a different park in the city during a nature hike he was hosting. Mike's strategy here was the same. It involved introducing students to edible items in their natural setting (but no police jumped out from behind trees to arrest him this time). For example, he reached up and pulled a leaf off of a branch and told the students it was a birch. Then he passed around a branch with many leaves and instructed them to chew it. He asked, "Who can tell me the flavor?" Ultimately, the students agreed that it was "winterfresh," a name popularly associated with chewing gum. Mike pointed out that chewing birch leaves may have been a strategy to help ancient babies cope with teething.

Mike showed students which plants, like clover and mustard seeds, could be eaten. He also pointed out that ancient peoples had vast knowledge of what plants were edible and which ones were not. When asked how ancient cultures knew how to avoid a poisonous plant in the park, like snake root, he said that it was like "going into a grocery store to buy cigarettes." Ancient people knew which items in the natural world were "safe" and which ones posed

hazards. Samantha pointed out that this kind of scaffolded experience -- aimed at getting students to develop understanding for where food comes from -- had at least two key learning goals. One was to get students to realize that "the main thing to create a civilization is a sustainable food supply." Another learning target initiated an opportunity "to simulate complex systems." By focusing on these learning goals first, Samantha argued that the students would be better equipped and better informed to contemplate the overarching SIS questions about the their own food sources.

Another example of scaffolded instruction centered on the notion of how ancient peoples might have expressed how they felt about a sustainable food supply. For a lesson examining cave drawings in Lascaux, France, she posed the question, "What are ancient cave paintings about?" By implementing a lesson mostly focusing on interpreting photos of these drawings (which were almost entirely depicting game animals), she had a consideration for diverse learning styles, notably, "students who don't necessarily have great reading comprehension." More importantly, she was using (ancient) art to emphasize the critical role of a sustainable food supply in the development of civilization. For example, she suggested those hunter-painters were preoccupied with animals, and thus, perhaps, similarly preoccupied about establishing a sustainable food supply.

However, when students examined art of ancient Egypt, she wanted the students to notice that the focus of art had changed. With a sustainable food supply now solidified, their art depicted "government," "taxes and laws," "technology," "mathematics," and others. Thus, her learning target was for students to understand that once people are less concerned about when their next meal shall occur, their art begins to focus on other aspects of civilization.

This approach also waded Samantha's students into a contemporary anthropological debate. Was cave art an expression about sustainable food supply? Or was it the work of shamans' spiritual expressions? Or was it something else, like perhaps something as mundane as 'art for art's sake?' Whatever the answer, the debate is ongoing (Curtis, 2006; Vialou, 1998), and Samantha postulated a provocative theory to engage her students about the importance of a sustainable food supply to ancient peoples -- and thus, attempted to get students to realize the topic's enduring historical significance. Yet, with such instruction, her task was not complete. Samantha's next step involved determining the efficacy of these efforts and how students responded to them.

Assessing SIS Instruction

Samantha acknowledged that assessing the learning outcomes of this curriculum was challenging. She said that the final goal was "having [the students] act on this information… [and] … are not letting their knowledge impinge on their consumer habits." This comment reinforced an ongoing challenge within sustainability education -- how to bridge the gap between what the students know and what they are willing to do? However, her reflection signaled a more practical challenge to assessing this sort of goal -- how exactly can a teacher observe this knowledge application? In light of this dilemma, she said that she hoped students would internalize what they learned in this unit (and in future units) and apply it once they approached adulthood. She said,

> I think a part of it is it's not going to change until they get older, until they get to be 18, 19, 20 years old. When they start caring about things in a different way is when it happened to me. When I was in sixth grade, I was also eating onion rings, and [eating]

> Twinkies, and not caring about what was in there… until I got older. So I think having this information will be great, so when they become mature enough to actually digest it and use it, they can do it.

Thus, an enduring challenge remained -- how to ever know if students apply this information later in their life? No matter how elusive a clear response remained, she did have in place more immediate strategies for assessing the curriculum and students' responses to those SIS questions.

In evaluating student responses in a lesson on contemporary food sustainability issues, Samantha revealed that one of her goals for student responses was to make informed decisions. Samantha posed the SIS question, "should restaurants penalize customers for leftover foods?" She used this question as an assessment for students after they read a 2011 news article where a Saudi Arabian restaurant owner tacked on a "fine" to patrons' bills if they did not eat all of their ordered food (Dolasia, 2011). When asked how she felt about her learning goals for the activity, she said, smiling,

> I think it's a phenomenal idea. I think he would force us to be really conscious and thoughtful about what we were ordering and what we consume. I think portions would shrink -- which we need to do in society anyway. I just think there would be a different mentality about food. All of a sudden, leftovers are going to cost us money. I think everything comes down to economics, anyway… like if you see me flush the toilet, if you know how much money you're wasting when you flush the toilet, you're going to think twice.

While she may have privately hoped that students saw this policy as a great idea, Samantha did not disclose her opinion to her students.

However, Samantha did not organize the activity so students could ultimately dialogue about this particular SIS. Instead, she wanted students to answer the question from both the perspective of someone who would oppose it and from the perspective of someone who would favor it. She did not press the students to summarize how they would personally answer the question after they posed possible answers for people on each side of the debate. In Table 4:3, I organized students' answers according to their perspective, and I **bolded** the response that Samantha specifically assessed:

Table 4:3
SIS: "Should restaurants fine customers for leftover food?" Samantha's assessment of sample student responses

"No" answer explained by student:	"Yes" answer explained by student:	Samantha's response to student's answer
"…the customers don't want to force themselves to eat the leftover food when they are full."	"Many people are dying of starvation. People waste food that the unfortunate people eat. He says that the extra fine will go to charities."	"Yeah, I'm sure that's a lot of people's perspective, that they don't want to be forced to eat, or they don't want to have to be thoughtful when they're in the social setting when they're paying for entertainment and enjoyment."
"… I don't want to think about the hungry when I go to it."	**"…people shouldn't waste food..."**	"I think that's something that they've heard since they were, like, two years old when their parents kept saying that. That's not a great answer."
"…customer one said I don't want to be forced to eat; I want to have a good time."	[no response]	"So, [the student said] this is the perspective of the customers and this is why they don't want you to leave over food. So I felt that this was clearer and better explained than, "people shouldn't waste food"."
"…some customers at the restaurant were not happy with this new policy."	**"Al Anzi [last name of restaurant owner] was happy with the new suggestion."**	"… I would love the student to have expanded, but I like that they used a specific person from the text [and] a specific perspective, which was what I was looking for."

This sample assessment of student responses to SIS dialogue revealed her emphasis on students making *informed decisions*. More simply, she looked to see if students could give

answers based on someone else's opinion. Also, she seemed interested in the students understanding opposing perspectives. Interestingly, she did not expand the conversation to include what the students' own answer may have been. It did not go beyond a response based based on others' opinions.

In a summative activity addressing the question, "Has food improved?", Samantha assessed student responses and highlighted ones she felt were "complete" or "incomplete." Although she hoped students understood that the quality of some food has declined over the course of history -- particularly as it pertained to processed food, artificial colors and sweeteners, foods high in fat, etc. -- she did *not* critique answers that decided in the affirmative.

Overall, Samantha felt that the students struggled with the abstract nature of the question. She observed that many of her students answered the question literally and did not consider it on more philosophical or moral grounds. She said,

> This was an interesting question because they had different perspectives than what I was asking for. And so, some of them would say, yes because [hunter gatherers], whenever they went to look for food, [with] whatever seeds they had, they planted them for food. Which is what I'm assuming they're saying is that it was hard for them to get food back then -- they had to really work hard. And now, we can just walk to the supermarket… which is not the angle I was trying to take but I think this goes back to what [her administrator] was saying about how abstract these concepts have been for them.

Consider student responses to this social issue of sustainability in Table 4:4:

Table 4:4
Student responses to "Has food improved?" with Samantha's assessment

"Yes" response and student explanation	"No" response and student explanation	Samantha's assessment
	"Food hasn't improved because our food today is less	"Again, it can always be expanded upon. But

	healthier, unorganic, and filled with chemicals and preservatives. Food now contain many fats and oils… Hunter-gatherers and old ancient civilizations had healthy organic fresh food that was good for them."	something like this showed an understanding [that] thy were making these connections between the past and present."
"I think yes because before the Egyptians had regular food, they looked around and had seeds, but today if we go in stores, we have foods that are GM and not healthy. The Egyptians had fresh foods."		"They are still thinking very concretely. Yes, food has improved because it's easier to get… [What I was hoping this student might say was] no. We use chemicals. It has improved, but not in a good way. Also, junk food, which most of us eat. So, I'm going to assume the student meant, you know, nope, it's gotten unhealthier in the long run."
"Food has improved a ton. Before, all we had was plants, and that was it."		"And so, there's this idea that before there was no variety in food, we didn't have much to eat, we barely ate anything before GM foods, but now we have so much more to eat. And again [this was] not what we were looking for in terms of, "has food improved?" I think you are looking more at the chemical makeup of the food: organic versus inorganic."
"Yes, because food nowadays are healthier and edible. The hunter-gatherers had to find food, unlike us. We can go to farmers market or [a] supermarket…"		"So this is the more concrete sixth-grader coming out and [was] not really what we were looking for as much. We weren't talking so much about the ease of getting food…"
	"Food has not improved because we use GM foods for some things, and that can cause death, and it's not healthy. But back then, hunters would get fresh and healthy food, now we do not	"[laughing] Okay, this is a bit extreme. I'm not quite sure what I was looking for, but it's more about the content of the food rather than where we get it from."

	eat healthy food; we eat genetically modified food which is going to kill us."	
"Yes, I think food has improved because hunters and gatherers hunted and gathered all day. Also, they didn't have a stable food supply. Today, we don't have to hunt, and gather because of the Neolithic Revolution, we can grow food. And so today we have GM foods, which can grow faster and better [and] get people the vitamins they lack."		"They talked about the Neolithic Revolution, hunter-gatherers, GM foods, and they kind of flipped back and forth between content of the food and the ease of getting the food."

Reflecting on the students' answers and her assessments of them, Samantha remarked at how many of the students struggled with the abstract nature of social-issue questions. This particular SIS question seems existential -- it had the potential to exasperate a student's ability to find a meaningful answer. She even hinted that more lessons focusing on background knowledge and skills might be needed if students were to give richer responses. Regarding the question, "Has food improved," she said:

> So, this is one that I think, was again, not scaffolded enough for them. They focus a lot on the ease of getting food… whereas I was thinking more about the social responsibility about where food comes from… It doesn't necessarily bring in this idea of either problem-solving or social responsibility for their role as consumers… Which again, is an abstract concept…

Samantha hoped that her students would answer this question in a way that signaled humans *do* eat food that is unhealthy for them. But in ancient cultures, food was not necessarily healthy for hygienic reasons, but at least it was unadulterated. Instead, many of the students' responses

emphasized that food *access* has improved. In Samantha's mind that was not a significant intellectual stretch for them.

Thus, after nearly ten weeks of instruction on where food comes from, the history of sustainable food supplies and their impact on growth of civilizations, contemporary concerns about genetically-modified foods (GM), investigations about where food at local farmer's markets come from (including opportunities to interview farmers about GM foods), and finally, proposing ways in which their city's food supply could be made more sustainable, Samantha observed many of her students still struggling with the abstract nature of SIS questions. As she reflected on her instruction building toward this question, she said, "So, I think this is what we have to work on for next year." However, since much of her instruction built toward this particular question, I wondered if adding scaffolded instruction was necessary.

Summary

Samantha's unit of instruction prioritized instructional scaffolding for skills and content knowledge. She designed this approach to assist students' ability to respond to SIS questions in the second half of the unit. While she initially fostered students' creative answers to this question, she later realized that she hoped for solutions that were more tangible and readily implementable. I also learned that some of her instructional goals aligned with SIS questions did not focus on dialogue. In several cases, other aims like developing perspective assumed priority. I will discus the implications of these understandings more fully in Chapter V.

Case Two - Parkside School

In this section, I describe the background of the school, teacher Maya Easton, outline the unit of instruction studied, and describe the findings emergent in how she planned, implemented, and assessed her SIS curriculum. For each of these parts, I use the research question as an organizational guide: "What are the curricular, pedagogical, and assessment practices of three teachers when they teach the social issues of sustainability?" Thus, the role of planning, teaching/implementation, and curricular assessment are of ongoing interest.

School background -- Parkside School

Parkside School is a private school whose stated mission includes sustainability education. It's website indicates, "our goals for students are academic excellence, intellectual freedom, social awareness, self-confidence, and first-hand knowledge of the natural world." Founded in 1966, Parkside School occupies a four-story converted home near a large city-maintained park. This school has a satellite campus located outside the city to augment its sustainability curricular goals. Administrators and staff affectionately refer to this campus as "The farm." This 180-acre working farm offers diverse learning opportunities for the students who visit it each year. The older students visit the farm for approximately two weeks per year. I did not include coursework delivered at the farm campus for this study. I would have needed to take residence at the farm to conduct such a study, and as valuable as that opportunity might have been, the time requirement was prohibitive because of prior teaching and work obligations.

Parkside has a diverse population and makes efforts to accommodate students who cannot afford its tuition. Parkside has 189 students in grades kindergarten through eight. 43% are white, 31% are African-American, 16% are Latino, and 10% identify as Asian. Administrators eliminated descriptors like "financial aid" and "full paying" families in favor of a sliding-scale

tuition system. The school website indicates that "sliding-scale tuition is based on the principle that a family's financial commitment should be in equitable proportion to its financial resources." Based on criteria in its "Family Financial Worksheet," 75% of the students' families pay a calculated portion of the annual $35,500 rate. Private schools in eight other states have adopted Parkside's model of sliding scale tuition.

Students wishing to attend Parkside School must go through a multi-step application process according to their age group. Youth aged 4-5-6 participate in small group interviews consisting of other prospective students. Students applying for grades 2 through 4 take the Early Childhood Admissions Assessment exam. Those seeking admission in grades 5 through 7 take the Independent Schools Entrance Exam. The school has no religious affiliation and faith does not factor into the screening process. The administration identified 21 students per grade level as a general target; two grade levels had 21 students; two had 17 students, and two other grades had 18 and 22, respectively.

Teacher background -- Maya Easton

Maya taught at Parkside School for 11 years. Maya's trajectory toward becoming a sustainability educator began when she moved to this east coast city to become a dancer. When she realized that she "wasn't earning an ample income" as a dancer, she branched out to become a part-time movement instructor for children. "Movement" includes curriculum that might also be found in courses called "physical education."

Maya credits the development of her interest in sustainability education to her dance background instead of early formative experiences with nature. She remarked that she did not grow up with many experiences with natural environments as a kid: "It wasn't something that

was a big part of my youth." However, she credits her experience as a dancer with providing her with a model of sustainable thinking. She said it helped her to "see how all the parts work together to create a whole. And that kind of became part of who I am and how I live. And now it's transposed with educating for sustainability… I feel that art was my entryway, rather than experiences with nature."

Also, her Parkside colleagues' interest in sustainability education further piqued her own interest in the subject. While working with a science peer, she was impressed with her focus on "making foods in the natural process." She said that she appreciated the focus on younger students learning "about things that were in their world and understanding where they came from."

Maya now considers herself a fully- immersed sustainability educator. She is conducting a self-study of how teaching in urban spaces affects learning outcomes, and she's "been doing a lot of thinking about how children and adults come into awareness of living or simply thinking about responsibility in terms of your resources and life choices." She defines her social studies teaching philosophy as "simply this exploration of how people live, in a very broad sense." She said that much of this kind of thinking grew out of her initial teaching of preschoolers -- much of the focus was on where things came from. She said that this early teaching influences how she teaches much older students. She explains,

> So when we start to investigate how people live, we really start to look at what are our basics, what are our fundamentals, and that comes right back into our resources -- how families interact with the resources, how do families and children and people in our city and in their neighborhood satisfy their human needs? Their biological needs? And the needs for community? And so that gets right back to how we use our natural resources.

> It also highlights the sense of interconnectedness and interdependence. And it comes back in a very social science-based way that is studying communities and how communities function, and how social systems function.

Thus, teaching sustainability education with a fundamental approach to where things come from appears to be her philosophical beginning point. For her, having students know where resources come from represents a critical understanding before they can consider needs of others in a broader sense. When I inquired how these experiences shaped the development of her learning goals, she stressed that developing empathy for one another and understanding basics of systems thinking to be key.

Overview of instructional unit

Maya's seven-and-a-half week- long unit hinged on developing her third-grade students' understanding of human and animal shelters. Her instruction occurred in the third floor classroom at Westwood School and in several pre-selected locations in a nearby park. Her unit-guiding SIS question was, "What do humans [in our city] need to thrive?" To build toward that inquiry, her curriculum focused on getting students to understand the difference between the concepts "thrive" and "survival." She also used SIS questions to guide student learning about where things "go" and come from." Such "things" included food, water, waste, and recyclables. Additionally, through exploring how animals and humans construct their shelters, a major learning goal of hers included getting students to realize their interconnected nature. She used SIS questions to get students to realize that the materials humans and animals needed to build their shelters came from the same place. She did not plan for students to compare the significant differences between animal and human shelters. In their final project, students would answer the

unit SIS question by constructing a human shelter. For this shelter, they would have to account for where their included things (like electricity, water, and food) "came from." They also needed to account for where things "went" (like waste, recyclables or discharged water).

Learning goals for SIS

Maya established two broad goals for her curriculum -- developing an understanding of systems- thinking and empathy. For systems- thinking, she considered students' awareness of the needs of their community to be a key component. For developing empathy, she listed interdependence, and perspective- building as complementary parts.

Maya pointed out that she was conducting a self-study of how she taught systems-thinking. She sought to analyze it as a sort of introduction to outdoor spaces in the students' community. The self-study was the subject of her thesis for a master's degree she was doing in sustainability education. She said her research question was, "How does using outdoor urban spaces impact student learning outcomes for students?" She said that her goal included linking natural systems with social systems (but not explicitly comparing them).

systems- thinking

She noted that developing an understanding of systems- thinking could be rooted first in understanding the interdependence of basic elements in the students' community. She focused on places within the community to accomplish a few things. First, she said, "I hope they will see themselves as part of the natural world… I'm aiming for them to see humans as part of the global system." Such thinking sought to ground students in a "beyond anthropocentrism" orientation.

Second, she articulated that a systems-based approach lent itself toward focusing toward understanding relationships. She said,

> I think the important aspect is looking at something, whether you're studying, in a way such that you're looking at the whole and you're contextualizing it, and you're thinking about the relationships within that, whatever your focus is, and how it relates to a student on a personal level, and the community in a broader level, so you're really looking at the connections between things and making sure to include all possible aspects that one can think of and explore, because ultimately the idea for me, that the biggest idea of sustainability is that understanding that everything is connected.

To ground this learning approach in a SIS framework, a key question she planned to use was "Where do things come from?" Variations of this question included, "Where does our water come from?" and "Where does our food come from?" Another question she planned to use was, "Where do things go?" Other variations included, "Where do things go when they go down the drain?" [both the drain in the classroom sink and the drain for the stream in a nearby park] and "Where do things go when we throw them away?" [or "…when we put them in the recycling bin?"].

For Maya, these SIS questions aimed to get students to consider their own consumption habits. She said,

> We happen to live in a society which is amazingly skilled at consumption and encourages [us] to consume and consume without hesitation or sense of guilt… So knowing where the things that you do consume and choose to consume come from empowers kids to then make choices about how they consume and what they consume, and then what they do with it once they are finished with consumption.

However, she said that she was not planning to overtly raise the issue of considering one's consumption habits. Rather she said, "[I hope] that they can connect the dots and then embrace those behaviors for themselves, not because the teacher told them to, but because it makes sense." This stance signaled a pattern for her philosophy. She resisted pressing students toward certain learning outcomes that might be considered more sustainability-oriented. She hoped that these were understandings that the students arrived at on their own -- either during the lesson or later on in life.

For me, I was almost paradoxically disappointed in such confidence. In part, I understood her reasoning -- perhaps challenging students on these issues now might present two problems. One, they could be developmentally inappropriate. Two, they could run counter to her more immediate goals, which was to focus on systems- thinking. Yet, I wondered how we would know if students *did* arrive at these conclusions later in life. Realizing that I observed this conundrum in all three classroom of this study, I will discuss the implications of assessing such "later-in-life" applications in Chapter V.

perspective, empathy, interdependence

As Samantha explained her learning goal of understanding interdependence, the relationship between developing the skills of perspective and empathy unfolded clearly. Some of the social issues guiding this kind of instruction include, "What are the needs of our class?" and "What are the needs of our school?" She explained that students are more likely to develop an understanding of interdependence if they develop awareness of their own needs before contemplating needs of others. To begin this process, she said her instruction should "include as many of the perspectives as possible when thinking about something."

She planned for this consideration of perspectives to develop in her curriculum in two ways -- through the "needs" of animals and the "needs" of humans. She said that by considering the needs of animals, "it would be a great step toward considering human needs." Thus, in almost every SIS situation, she aimed to first have students dialogue about how it applies to their understanding of animals. Thus, when she planned perspectives building, she planned to start with animals that they already had a general appreciation for. Such animals included pets or those that they see in the park near their school.

While she believes her students can develop perspective skills, she acknowledged that assessing empathy is tricky. She said, "Being responsible, being kind, building understanding, understanding the consequences of your actions, these are all things that children… need to consider on a daily basis." Yet, while she reported that previous years' instructions on this subject incurred "very little resistance," she simultaneously admitted that assessing this kind of learning is difficult. She said, "Hopefully as they get older, they can transfer it to larger and larger realms." Her perspective revealed that an ongoing challenge to teaching SIS was how to measure student learning, especially since she expected some of their action- taking to occur outside of the classroom at a much later date. Thus, I wondered, how could she -- or any SE instructor -- ever fully know the learning outcomes if they were not readily measurable.

Teaching SIS

In this section, I identify two themes that guided Maya's instructional delivery. One of these themes included a systems- thinking approach. Examples of this kind of teaching include variations of the questions "where do things go?" and "where do things come from?" A second teaching approach Maya employed was teaching SIS in a way that did not overwhelm students.

This strategy involved not pressing students on certain higher- ordered questions that they could possibly address in later school and life situations. I labeled this section as "getting beyond ecophobia." Sobel (1996) described "ecophobia" as akin to a doomsday- styled instruction delivered to elementary school students.

systems thinking: "where do things go?"

Maya taught several lessons that focused on the SIS question, "Where do things go?" Variations included where things went as they went downstream, down a drain, or into a garbage or recycling bin. For example, she often started instruction by asking students where things went after they go down the drain. The lesson involved the students hypothesizing and then following the pipes through the school and into the basement. They stopped only as the pipes exited the building. Similarly, she led a lesson in a nearby park based on the question, "Where do things go when they go downstream?" In this case, instruction halted once they followed the stream to a drain about 100 meters downstream.

Strikingly, Maya resisted posing a SIS question that built upon the knowledge the students now had for "where things went." For example, when asked if she planned to ask students where things went after that, or, perhaps, *why* they should know where things go, she said that she was consciously engaging in limiting the scope of the social issues. She said,

> I think that's about as far as I will take it this year… but I know in our school it will come back next year and again in fifth grade. So it will be spiraling, but right now I think it's important to really connect the flow of water and the water cycle to things that they can experience first-hand and concretely understand. This will give them a good rooting to think about that conversation later.

So, in this regard, her SIS approach had at least two components. First, it signaled that she was very interested in building skills that she was not able to directly assess. For example, she justified her strategy by explaining her objective as, "When they're older, and they're choosing to buy bottled water, what's happening downstream of that factory? And so in this very concrete example… now they have to consider what happens downstream."

Second, this approach represents an introduction to systems- thinking that students are either familiar with or have the ability to have direct experiences with. She said, "This first hand experience in nature [and] this self-directed exploration is laying the foundation… so that later when things become more abstract and more distant from their immediate lives, they will have something to connect all those thoughts to." Thus, Maya delivered her lessons with the understanding that this course was a sort of "Sustainability 101" course. Later experiences in the students life, whether in or out of the classroom, would be the "201" and "301" versions. She seemed reluctant to teach systems- thinking in a way that they either might a) not understand because it went beyond the scope of their maturity or b) feel overwhelmed by the complexity of a topic that they have little input on or control over.

getting "beyond Ecophobia"

For daily lessons structured around SIS questions, Maya first addressed animals (and/or plants) and then focused on humans. For example, consider table 4:5:

Table 4:5: SIS questions juxtaposed by animal/plant and human situations.

Social issue of sustainability question: plant/animal-based (asked first)	Social issue of sustainability question: human-based (asked second)
"Does nature have waste?"	"Where do things go when we throw them away?" and "Where do things go when we recycle them?"
"What do animals need to survive (thrive)?"	"What do humans need to survive (thrive)?"

"Do animals need humans?"	"Do humans need animals?"

Maya said that her goal with teaching questions in this order was for students to understand that plants, animals, and humans all get their resources from the *same place*. So once the conversation shifted from dialoguing about plants and animals toward humans, her goal aimed for the students to realize that "Ultimately, all of these resources come from these natural spaces that animals use…It's not necessarily a comparison." However, that strategy seemed potentially limiting for further social issue dialogue.

For example, consider that she could have continued the dialogue by asking students to consider the disparate responses to the plants/animals question and the human-oriented question. Consider the students' responses to each of these questions:

Table 4:6
Sample student responses to SIS questions

SIS question:	Student responses to each question
Plants/Animals: "Does nature have waste?"	"Nature doesn't really have waste," "…If it was a human product that came from nature, then it would probably be waste eventually."
Humans: "Where do things go when we throw them away?" and "Where do things go when we recycle them?"	"my dad says they go to Staten Island," "they go in the garbage chute," "they go to a landfill," "there's a pipe that goes to the ocean from the toilet,"
Plants/Animals: "What do animals need to survive (thrive)?"	"shelter," "water," "health," "oxygen," trees"
Humans: "What do humans need to survive (thrive)?"	"electricity," "markets," "homes," beds to sleep in," "water," "oxygen," "money," "the sun," "other people," "everything in the world needs water"
Plants/Animals: "Do animals need humans?"	"I don't think animals need humans because they could eat things from the trees and drink water."
Humans: "Do humans need animals?"	

Therefore, Maya could have asked a follow-up social issue of sustainability question that merely asked the students to compare the different responses. Consider such possible questions here:

Table 4:7
Potential "third" SIS question

Social issue of sustainability question: plant/animal-based	Social issue of sustainability question: human-based	Possible combination of two social issue of sustainability questions Maya could have asked but DID NOT
"Does nature have waste?"	"Where do things go when we throw them away?" and "Where do things go when we recycle them?	"Why are humans the only part of nature that makes waste?"
"What do animals need to survive (thrive)?"	"What do humans need to survive (thrive)?"	"Why are animals and humans' needs so different?"
"Do animals need humans?"	"Do humans need animals?"	"What are humans doing so differently than animals?"

Having students dialogue about the possible questions in the third column might have provided for richer discussion. However, Maya clearly articulated that she was not aiming for that kind of thought- process for her students.

For Maya, these plant/animal and human- oriented SIS questions intended to engage students in the understanding of *shared resources*, and thus, this learning goal perhaps involved systems-thinking and empathy. Also, she aimed to get students away from an anthropocentric bias. She said,

> We have this anthropocentric bias in our culture…We presume we are so important to everything that lives here. I think the intention was just to raise awareness of what a food system is comprised of, and not necessarily a comparison between animals and humans… [I wanted] to highlight that humans have an interconnectedness with animals and a dependency on animals…

As to posing comparison- oriented SIS questions, she said, “I hadn’t that intention.” Her goal appeared more to rest on the hope that students might notice the comparison themselves and raise their own inquiry. She said,

> I think I like to underscore the connectivity between things. Not necessarily having definitive answers but exploring what the connections are and uncovering them and getting in the habit of looking for connections and seeing connections… I think there will definitely be opportunities for them to draw those comparisons....

With this comment, Maya reinforced earlier findings. First, it solidified her pedagogical commitment to encouraging students to make connections on their own. Second, it made clear that she might have been initiating a “Beyond Ecophobia” stance by acknowledging that such potential questions may have been too difficult for them. She said, “I don’t think that they necessarily have to have the right answers at this point.” Importantly, she signaled her awareness of what the students may have been able to contemplate from a developmental perspective. Reflecting about these sorts of assessments, she wrote in her blog:

> Another aspect of good teaching that has repeatedly popped up in my observation and reflection upon my outdoor learning study is the core pillar of **developmental appropriateness**. One of the main reasons for success in teaching any grade is the developmental match of the task to the learners. If any activity honors and supports the natural development of the whole child in whatever phase they are in, then meaningful and successful learning is more likely to happen. Again, it’s so obvious, but it’s at the core of what works.

Finally, her learning goal with these types of social issue questions included achieving an understanding of systems- thinking and interconnectedness. By pursuing additional questions

that sought different aims may have diminished the focus of her objectives. Also, as evidenced by her written reflections, the additional questions I thought were a logical next step were simply not inquiries she thought they were ready for.

Assessing SIS

In this section, I describe three of Maya's assessment practices. The first section includes an overview of her assessment objectives. These criteria included wanting students to know how their actions influenced others and where things "came from." The second section reveals of how she assessed SIS dialogue occurring in a single lesson. This single lesson centered around the question, "Where do things go when we throw them away?" In the third section, I discuss how she analyzed student responses to SIS questions in a culminating end- of- unit project. The end of unit project focused on, "What do people in [our city] need to thrive." For Maya, much of the learning leading to students being able to answer these SIS questions centered on real situations that came up during students semi-structured play time.

goals and criteria

Maya stated her assessment goals for this unit as wanting students to understand a) how their choices influence others and b) where the things they wanted came from. In her own words, she said,

> Informally… how [do] students connect these pieces of human behavior and choice and need like the natural resources, [and[how are they making connections between these things? How are they drawing the connections between what they choose to do, and when they throw things away, and why?

While much of her daily instruction involved SIS inquiries, her articulated assessment goals pertained more to the end of unit project. This project asked students, "What do humans in [our city] need to thrive?" To respond to this question, Maya asked students to build a human shelter that physically embodied their answer. Regarding specific assessment plans for this "shelter project," she said,

> …When looking at the human habitat models, how are they solving these problems? [I hope that] they came up with a multitude of innovative things that have yet to be invented, like plants that could be generators of electricity from the sun, or they developed garbage systems that were limited…

Thus, her aim in assessing the unit- wide project emphasized creative solutions over realistic ones. Additionally, she sought an opportunity for students to blend these creative energies with knowledge of where the things they "need" for their shelter will have to come from.

a daily lesson

Maya often crafted SIS questions based on situations she saw arising out of the students' daily interactions. Most of these questions were not pre- planned. In fact, Maya hoped that many of her questions would come from social issues developing from this "play." For example, during daily opportunities for "play" in the park near the school, she sought to "collect stories" from the students regarding issues that occurred during them. For example, in meetings at the end of each play period, she asked herself:

> What is the content of the play?
>
> What challenges do they encounter as they play?
>
> What do they do about it?

How does the interaction with nature present opportunities to develop the skills to be more collaborative, more expressive, more adept at solving problems?

What are they doing and what types of learning does that imply?

Assisted by these self-reflective questions, Maya developed SIS questions based specifically on events transpiring during the students' less structured time in the park.

Students decided to use downed trees and wood debris to build a dam on a creek in the park; from this ongoing event, Maya asked the students, "How might our play affect the [park] gardener?" This question appeared to have an immediate aim of developing perspective and consideration of others. Another less readily apparent aim included the desire that students be aware of how their actions influenced natural cycles.

After weeks of constructing a dam that later became a bridge, the students found that their creation was completely gone. The next day in class, Maya asked the students, "How might our play affect the North Woods gardener?" [She later referred to him by name ("Bill") to "make it personal… like if you throw something away, there's a person at the end of the trash bag"). Student responses included:

I think he doesn't like us very much.

I thought his job was to keep the woods neat and clean.

Building a bridge is kind of helping him.

I think that when we built the bridge, if it was there for a couple of days, and the water would build up and wash away other things.

If they left the bridge there, it would dam up the water, and sometimes in the path. It's the same with the sticks -- then the water will get higher [and] come upon the path and get unsafe.

After these responses, Maya explained to the class that Bill's job was to make sure that the nature cycle was not stopped. For example, if trees fell where they did, they needed to decompose not be moved somewhere else. Also, the creek water needed to get to other places; if the dam stopped it, then some other persons, plants, or animals might not get the water they needed. Thus, Maya combined a consideration of others with an understanding of natural cycles. However, she did not explicitly assess their experiences or their answers; she was satisfied if students realized that their actions a) did affect other people immediately knowable to them and b) influenced how natural processes could be upset.

In other daily SIS opportunities, Maya aimed for students to consider where things went when they threw them in the garbage and/or in the recycling bin. The immediate context for the respective locations was in the classroom/school context. The curricular context was at the end of a series of lessons where the students had dialogued about other "Where do things go"-type lessons (like "Where does the creek in the park go?" or "Where does the water go in the street when it rains?" or "Where does water go when it goes down the drain?"). Student responses to the prompt included:

> They go into a landfill.
>
> They go into the garbage chute.
>
> They go to the garbage dump.
>
> My dad says the go to Staten Island.

Maya adjusted the conversation prompt, and she said, "If it goes in the scrap box, where does it go?" Selected responses included: "If it gets full, we can recycle it again" and "We could turn it into paper." She then engaged students in an activity where they had to determine which things could be recycled and which things had to be thrown away. At the conclusion of the activity,

Maya asked students, “Why do we want to put as few things as possible in the landfill?” Student responses included: “We shouldn’t put a lot of things in the landfill because it’s bad for the Earth.” and “Worms can’t even get in to decompose.” One student demonstrated putting waste in a landfill as putting things in a big plastic container. His point was both had finite space.

I was curious why she posed the question, “Why do we want to put as few things as possible in the landfill?” She explained:

> I like asking the question because it gives them the opportunity to take ownership for those good habits that we think people should have, like recycling as much as possible. And wasting less and reusing as much as possible. And it’s not just because mom or dad said so… because… it’s also very likely that those habits will be undone as something else becomes more convenient. So, kind of understanding of why we don’t want to put … and unending amount of things in the landfill will hopefully speak to that as a lifelong behavioral shift.

Following this response, I inquired why she didn’t ask, “*Why* do we separate things?” or “*Wh*y do we recycle?” or “*Should* we recycle?” Maya responded that she thought many students might respond matter-of-factly -- if you recycle something, then something new can be created from it. If it was discarded, that was the end of it.

She defended her choice not to press students on these kind of possible SIS questions. Maya reasoned that her goal of “deconstructing the mythical “away” [wa]s more effective learning than spending time with a question like, why do we recycle.” Thus, her assessment focused exclusively on if students could articulate how their choices influenced other people and places. She felt that the self- examination of why the students should or should not behave a certain way needed to come from their own exploration -- not from a SIS question initiated by

her. She said, “I hope they will be able to answer those kinds of questions on their own… I’m hoping that time spent deconstructing the mythical “away” is more effective learning than spending time with a question like “why do we recycle?”” Thus, Maya sensed that if students could contemplate their experience so far with the SIS questions she *did* raise, then the students might be able to more personally contemplate *why* they chose this course of action on their own, at a later time.

However, as mentioned before in this chapter, I wondered how Maya (and previously, Samantha) could assess such instruction effectively if they foresaw key parts of the learning process occurring outside the time and space of the classroom. Presumably, this view seemed analogous to a civics instructor who aimed for students to apply their skills and knowledge toward voting. For example, one might never know if a student ever voted or if such a decision was well informed. In this next section, I explore this kind of issue -- how did Maya assess her end of unit project and her students’ interaction with it? To what extent could she indeed gauge student responses, and which ones were out of her jurisdiction?

end of unit project

As a culmination to the unit, Maya asked the students, “What do humans need to thrive in [our city]?” She sought to assess their answer to this question through a multi-day effort to construct models of a hypothetical shelter and an open house event where students and their family members discussed their responses. Students could only use materials that they had saved in the class recycling box. They could not use new materials. She articulated her learning objectives as students demonstrating understanding for interconnectedness, community, and personal responsibility.

Consider how Maya defined each of these terms. For community, she explained it as students understanding what makes up their definition of "home." She said, "…it's about knowing their roots and knowing the place that they're in…. and learning a little slice of history through a very particular person connected to [that] place." She also stressed that knowledge of community included direct experiences with the spaces and people making up the areas in and near the student's home. For interconnectedness, she emphasized the term implied developing an understanding beyond self-centeredness. She said it focused on "understanding the connection between their actions and the impacts that they have on others, locally and globally." Similarly she defined personal responsibility as possessing knowledge of interconnectedness and applying it to their interactions with others. Once students became aware of their interconnectedness with others, she asked the students how they wanted to be treated. She said, "the kids all told me they wanted to be treated kindly, with respect, with consideration, a sense of fun and caring…" As students understand how they want to be treated, Maya asks them to compare it to how they might want to treat other students and other community members. Regarding these two pieces of knowledge, she asked the students: "I am saying if you know this, then what are you going to do?" Through this question, she defined personal responsibility. It was the confluence of knowing one's relationship with others and knowing that each student wanted to be treated a certain way. She indicated she did not require students to be responsible; it was a choice.

After about three days of construction, finished student shelter models included conceptions of teepees, a "Star Trek Chair," transparent roofs, underground reservoirs capable of storing rainfall, and energy- generating plants. When asked about the students' overly- creative solutions, she said, "Many of the solutions don't exist yet… [My hope is for them] to generate new ideas… I'm always hoping for that, [and] I think it's a wonderful outcome, in a way…You

don't need to replicate what we already have. Those aren't the only solutions that exist." Thus, in a way, Maya viewed her SIS question as an opportunity to pursue answers in broad ways. She noted that the students gravitated toward "really cool technology" and were "really, really far out there" or "went towards really, really simple living."

Although she hoped for students to emphasize creative solutions, Maya' primary goal involved assessing students' ability to synthesize skills that they had practiced throughout the unit. They had studied where food, water, and energy came from, and they had studied where waste, recyclables, and water from in-home use "went," as well. So, this project represented an opportunity for students to bring together those particular skills. However, Maya did not explicitly encourage students to answer her SIS question in ways that were "…very creative about communal ways of deciding" where their resources would be coming from.

Some students proposed shelters that shunned more spartan takes on living sustainably. Although all students eventually demonstrated and articulated where the energy needed to power their shelters would come from, some students did not see this as an opportunity to make any personal changes. So, when Maya noticed that one student said he needed a hookup for his "video games" and "LCD projector," her formative assessment involved asking him, "Well, okay, how are you going to get the energy for those video games? Find a solution for that." She explained this interaction by saying she did not want the shelter project to be a "limiting" experience and that she was much more interested in students knowing "exactly where everything comes from."

While she emphasized that her assessment criteria centered on students' ability to demonstrate where all of their needs and wants would come from -- for example, heat and food -- she said it was "amazing" when students solved the SIS question by choosing to "live really

simply." She said that she hoped students would voluntarily change their consumption habits, and she would "love" if students chose a "bare-bones" approach and "go live in the woods." Yet she also acknowledged that even for many ecologically- minded students, "it's just not going to work."

However, most of her students chose shelter solutions that were considerably different than their current living arrangements. For example, all students except one offered solutions to their food, water, and energy needs in a self- sufficient manner. They did not rely on external power grids, municipal resources, or off- site food options. Maya assessed these diverging responses by saying that her hope was the students might choose on their own to say, "Well, I could live simply. I could be independent. I could survive." She also pointed out that many of her students at this age have this hope of "living very simply out in the woods" and that such thinking doesn't need to die as they get older. "And in that way," she said, "we can change the message for future generations."

Summary

Maya's unit of instruction emphasized learning goals for systems- thinking, personal responsibility, and community understanding. She devoted a lot of her instruction to scaffolding for skills and content knowledge. For example, to assist students' ability to effectively answer the unit SIS question, she devoted lessons to understanding the interactive nature of humans and animals' needs. She often used SIS questions to assist in this learning process, but she resisted steering conversations toward the disparate needs of humans in comparison to needs of animals. She also alluded to the challenge of assessing students' understanding of these issues -- student action related to this instruction seemed almost certain to occur later in life and outside the

boundaries of her classroom. I discus the implications of these understandings more fully in Chapter V. Interestingly, the challenges Maya (and earlier, Samantha) report about assessing an SIS curriculum seemed present in my final case study, an examination of two high school teachers' practice.

Case Three -- Westwood School

In this section, I describe Westwood School, the background of the co-teachers, Alana and Kari, outline the unit of instruction studied, and describe the findings emergent in how they planned, implemented, and assessed their curriculum of teaching the social issues of sustainability. For each of these parts, I use the research question as an organizational guide. Thus, the role of planning, teaching/implementation, and curricular assessment guiding principles

School background

Westwood School is a comprehensive public high school located in the same city as Parkside School and Kings School. It occupies a four-story building in a highly- urbanized section of the city. Kings and Westwood School shared nearby borders with large, well-maintained parks, but Parkside School was significantly bounded by commercial and residential development. Its school comprised 5 classrooms and several other administrative spaces on the fourth floor of this campus. Four different schools occupy other levels of the building and are not a part of this case study. Limited physical space at the school presented ongoing administrative challenges. I heard from security personnel at the entrance to this school that the city district is

planning to enhance the basement level of this building and move Westwood School to this subterranean floor.

Westwood's mission includes statements emphasizing learning about sustainability-related issues. It also stresses that its students can receive instruction leading to certification in some sustainability- related careers. For example, it says,

> We understand that as our economy becomes increasingly more green, many of the future's most promising careers will focus on solving the challenges of environmental justice, and in ensuring equitable access to quality living and resources for all citizens. Our students will be able to activate this mission if they are equipped with… the knowledge of green industries and environmental issues.

Westwood's students represent a diverse racial and socio-economic cross-section of society. Because Westwood is in its third year of existence, it has students only in 9th, 10th, and 11th grade. 283 total students attend those grades. Administrators plan to add a 12th grade class next year. Schoolwide, 73% of students are eligible for free or reduced- cost school lunch. 25% of students are classified as English- Learners, and 22% qualify for Special Education assistance. Hispanic or Latino students make up 76% of the student body. Black or African- American students comprise 20% of the population, while Asian and White students compose fewer than 2%, respectively. 57% are male, and 43% are female. These statistics trend similarly over the past three years with the exception of those qualifying for free or reduced lunch (which has fluctuated substantially -- 60% in 2009-2010, 86% in 2010-2011, and then back down to 73% in 2011-2012). Students attending this school travel via public transit or walk. This school does not utilize district- owned school buses.

Westwood School's city- wide academic report is incomplete, but its scores indicate proficiency and relative comparability with similar schools. On its most recent "report card," the city school district issued them a "Proficient" score. Such a rating places them in the third highest of four rating tiers. Within this third tier, they are just slightly higher than the lowest possible score to qualify for such a rating (They are just above the border with a "Developing" distinction). The city school district assigned them a "peer index" score that put them just slightly above the average of school indexes with similar demographics.

Students at Westwood School must participate in key SE learning opportunities. Among these include specific courses and internships. During their final year of study at Westwood School, students participate in what the school's mission describes as an "industry-based internship." Students may choose to focus on "Green Buildings" or "Green Spaces, " and their work in this experience can lead to "industry certification, apprenticeship programs and entry-points for employment or pursuit of a two- or four- year college degree." I did not include this internship for my study of Westwood. What I chose to focus on was one of the required courses, "Citizenship and Sustainability." This year- long course "studies food, water, waste, land use, transportation, and energy in [our city] as a way to think about sustainability." For this course, I studied the teaching practice of co-teachers of this course, Kari Dokes and Alana Rutherford. I observed them in action during an eight- week unit plan devoted to posing solutions to environmental issues.

Teacher background -- Alana Dokes and Kari Rutherford

Kari Rutherford is a white female in her mid-20s. She traces her interest in sustainability education as a long process involving experiences in high school, college, and her professional

life. In high school, she said she became very interested in social justice issues. In college, she continued to explore her interest in this area, and she majored in peace and conflict studies. However, she felt that after becoming more involved in extracurricular opportunities linked to her major, she developed what she called "a savior complex." These opportunities included when she volunteered to build homes in Mexico and worked at an immigration rights center in the U. S. Of these experiences, she said, "It came from doing volunteer work and just getting really angry about disparities." She said that she developed an understanding that real work for restorative justice happens by seeing the issues as structures "that I am a part of… that I am a part of the system." In this way, Kari developed a strong interest in systems- thinking-- the notion that she and others were complicit in a system that perpetuated inequalities.

Kari also explained how a personal event about extending global inequalities influenced parts of her teaching philosophy. She said,

> It kind of led to this crisis in college, where I bought hardly anything, and that's when I became a vegetarian. And then I went to this extreme… [and] didn't buy any new clothes… and I felt like everything I did was perpetuating violence. And then I finally got to this point where I realized if I was going to live where I wasn't perpetuating any more systemic violence, I was not going to be able to live in normal society. And I wanted to live in normal society. So, I accepted the fact that sometimes I was going to make purchases that cause harm, and I'm going to continue to live a life that causes structural violence, but I am going to try to limit it in most of the ways that I can.

From this situation, she wanted to transfer to her students the idea "that their actions have consequences," too. She said that she wanted them to "just start the process that I was on, and they can take it in a different way." However, she was aware that the curriculum had potential

for creating a "lot of guilt" among the students, so the purpose of the unit I observed was so they could feel empowered and "problem-solve." "That's why we have the solutions unit at the end," she said.

For Kari, a way to engage students in problem solving was by posing SIS questions. She said it provided students with "reality" and an opportunity for "critical engagement." She said instruction centered around SIS questions offered more authentic learning opportunities than "just giving them stuff that they can be like, "I'm reading a textbook; now I understand the answer." That's not what it's about." Through these questions, she said that "we really tried to connect all the topics to their own lives."

For Kari, teaching at Westwood School was an opportunity for her to implement systems-oriented thinking via a pedagogy including an SIS framework. For her, "That's what drew me to this school… this feeling that I could [teach] environmental issues… [and] talk about system problems." Now in her second year at Westwood School, she said that she relished the opportunity to "[discuss] environmental justice" and looked forward to continue teaching about systems- thinking by employing "rigorous expectations."

For Alana Dokes, her pathway to teaching at Westwood School had similar experiential and philosophical origins. Also a white female in her mid-20s, Alana majored in international relations while in college. She described her studies as "political science with an environmental focus… [and] "learning about how culture and environment influences the other. Through these studies, she said "I just got so much deeper into issues about people and politics and how it relates to the natural world." Drawing upon these experiences, she joined the Peace Corps after graduating. During that experience in Eastern Europe, she also worked for an environmental NGO.

While working with this NGO, she developed her first sustainability-oriented curriculum. She described this material as "tailored to the local geography of the [omitted] Sea, because all the rivers flow to the [omitted] Sea there." This experience also built off an earlier experience post-college (but before the Peace Corps). She worked for a non- profit environmental organization focused on educating kids about "watershed issues" related to rivers of the west coast of the U. S.

Alana returned to the United States and sought to draw upon her issues- based environmental background. She began her graduate studies in education and also searched for a teaching job "where she could actually teach sustainability." She said that she and hoped for such a teaching opportunity like the one she ultimately found at Westwood School, but she "never thought it would be possible to teach something like this in a social studies class."

Also in her second year now at Westwood School, Alana aimed for dialogue opportunities where "I don't think there is one correct answer." When implementing an SIS approach, she said that her learning goals encouraged students to grasp a "spectrum" of ideas they can answer "in their own words." Based on experiences with water issues in her previous teaching and professional opportunities, she sought opportunities based on topics like water privatization and what it means to be a "personally responsible citizen."

Overview of instructional unit

The course that Alana and Kari co-teach is called "Citizenship and Sustainability" and is a required elective course for all ninth graders. Select unit topics of the overall curriculum focused on contemporary sustainability issues of food, water, transportation, affluenza, and energy. The culminating effort for this unit asked students to pick a subject of interest (many of

which they had already studied) and via a collaborative magazine project, address one of three pre- established SIS questions:

How can we move people and stuff around in [our city] without polluting the air?

Why should we eat organic food, and how can we make it more affordable?

How can New Yorkers create less trash in the first place?

Alana and Kari attached a sub- question to each of these options -- "Would it work?" This question served as an opportunity for students to dialogue about whether their proposed answer/solution to one of the above SIS questions could actually be implemented. I observed a key detail here: Alana and Kari did not specify if the question meant people would actually implement the solution based on its *possibility* or based on the influence *human nature* might have on its acceptance.

Learning goals for SIS

In this section, I describe how Alana and Kari articulated two of their learning goals. One of these learning goals included getting students to dialogue over selected SIS questions. For this goal, the teachers developed rubrics outlining their expectations. Their second goal aimed for students to consider a justice- orientation in their responses. For example, instead of merely analyzing ways to create less waste, they hoped that students would inquire how they could make less waste in the first place.

dialogue

The teachers had clear motivations about why they chose learning goals anchored by SIS-oriented questions. Kari noted that a dialogue had more potential than direct instruction to

possibly spur personal reflection and habit change. Broadly speaking about the role of a social-issues approach on her learning goals, he said,

> I don't think learning should be a place where you sit and say blah, blah, blah, blah, blah; what's the answer? Blah. Okay, moving on! I think it needs to be [laughing] lots of questions, and they're not all answerable… and hopefully, it plants seeds inside of the student and gets them to really investigate further on their own.

For Kari, "an informative project is regurgitation;" an issues-centered approach spurred more opportunities for student thought. She also justified a social issues learning approach because each of the SIS unit questions focused on topics that have already been discussed this year, and "they know enough about them" to think "more deeply about what the issues are…" Thus, she reasoned, students had already learned essential content information and useful skills helpful to thinking through answers to the unit SIS questions.

For the answers/proposals that would come from these SIS questions, Alana and Kari established several assessment targets centered on demonstrating proficiency in citizenship and sustainability. Consider the rubric they established for the magazine project in the following table:

Table 4:8
Selected learning targets for citizenship and sustainability: Magazine project

Learning targets	meets	exceeds
I can explain the causes and effects of affluenza.	*Define and give examples of affluenza. *I can explain the role of advertising in consumption.	*I can give suggestions that reduce/end affluenza. *I can explain how these solutions affect the environment, economy, and society.
I can evaluate the environmental impact of human choices.	*Can describe how human choices impact animals, air, water, and land.	*Makes valid suggestions for a change in human choices that would decrease harm to the environment. *I can explain how these solutions affect the environment, economy, society.

I can analyze the connection between human choices and health issues.	*Can identify what kinds of health issues are caused by a specific action. (ex: diabetes is caused by too much sugar, e. coli from eating contaminated food) *Can list symptoms related to a specific action.	*Give suggestions of which human actions/choices will increase human health. *Can explain how the choices made by companies and governments impact human health (ex: not giving animals space or proper foods to maximize profits increases risk of e.coli poisoning
I can explain what actions make a person a citizen.	*I can clearly identify and give valid examples of how a person or group of people worked to improve society. *I can practice being a citizen by taking action (letter writing to public officials, protests, sharing information with the community, etc.) on an issue.	*I can analyze how society will be changed -- either improved or damaged -- because of specific behaviors/solution[s]. *I can evaluate how taking an action on an issue will impact people outside my community (being [a] global citizen).

Perhaps signaling an alliance with the ICDM framework, Alana and Kari distinguished between meeting and exceeding the learning objectives as whether or not the student could move beyond definitional understandings and establish possibilities for action-taking and problem-solving.

justice- orientation

Regarding answers/proposals that exceed the learning targets, Alana indentified out her hopes that students would "think deeper about the issues" and perhaps even exhibit thinking that even went beyond the "exceeds" description. She said, "I want them to think more than we should recycle… ; why are we making so much trash now?" Thus, even though she hadn't described this goal in her official rubric, she was suggesting a skill set that resembled conceptualization inspired by Westheimer & Kahn (2004). With this understanding in mind, her hope for higher-ordered thinking resembled their "justice-oriented" stance. Thus, consider how

an expansion of Alana's *written* learning goals might look if it included a "superior" range to mimic goals set-forth by the authors:

Table 4:9
Revision of learning targets: Inclusion of a "justice-oriented" stance

Learning targets	meets	exceeds	superior (?) (justice-oriented?)
I can evaluate the environmental impact of human choices.	*Can describe how human choices impact animals, air, water, and land.	*Makes valid suggestions for a change in human choices that would decrease harm to the environment. *I can explain how these solutions affect the environment, economy, society.	*Can ask and offer answers to questions like "Why are we making so much trash now?"

Kari and Alana did not explicitly encourage students to aim for this hypothetical "superior" criteria. But, such expectations seemed in keeping with other learning goals that favored student creative thinking.

Similarly, Alana and Kari did not explicitly articulate that students should come up with answers/proposals that were exceptionally creative, but they were hopeful that their responses to SIS questions would be "outside the box." For example, in lessons leading up to the final project, she did not deter a student whose answers may have been so creative as to be unrealistic. This student recommended putting a microphone on garbage cans in an effort to get residents to rethink throwing things away. Of this interaction, Alana said, "I think he's on the right track… I didn't tell him it wasn't a good idea… I think more creative is fine…But I would appreciate more… where they really went into depth about how they changed people's thinking." With this remark, Alana signaled that she would encourage students to expand upon merely realistic or simply "valid" answers/solutions to the SIS questions.

Teaching SIS

The teachers established three strategies when implementing lessons guided by SIS questions. First, they indicated a need to scaffold instruction so students could be well- prepared. Otherwise, students might be in no position to effectively answer. Scaffolding in this case included content knowledge and skills. Also, they often guided such scaffolded instruction around SIS questions designed to accomplish two things: a) engage students in dialogue about contemporary sustainability topics and b) attempt for students to practice self-critique and self-reflection with social issue questions like "Would it work?" ["it" = the students' responses/proposals to the SIS questions]. Third, they developed strategies to assist students' responses lean more toward creativity than mere realism. Finally, the teachers clearly grappled with how to avoid a "doomsday" approach but still maintain content accuracy and academic rigor.

scaffolding instruction

The teachers developed a unit curriculum that aimed to support as many aspects of the final project -- a magazine-like essay that answered one of the pre-established SIS questions (1. "How can we move people and stuff around NYC without polluting the air?", 2. "Why should we eat organic food, and how can we make it more affordable?", and 3. "How can New Yorkers create less trash in the first place?"). However, they understood that simply presenting the students with the SIS question and sending them off to research and write was a shortsighted strategy. Regarding the importance of structuring instruction, she said,

> It's not enough to just give the kids stuff like that [SIS questions] and be like, okay, here, choose your topic, and then write about this… It ended up being like seven packets

> of information! But it's like, oh, you're writing an article -- here's an outline on how to create your article. Oh, you're writing to your NGO -- here's four things to help you.

Such a remark demonstrates at least two things. First, it suggests Alana's belief that instruction involving SIS questions was not merely a daily or semi-daily menu of incredibly engaging issues for the students to dialogue about. Rather, she recognized the challenge of answering abstract questions. She noted that, at least initially, many of her students were simply "not ready to go in that direction." Thus, a degree of scaffolding needed to be in place before any sort of dialogue took place. Second, it revealed a "frustrating" pedagogical situation -- she desired to encourage "creative" responses but was aware that "walking them through it" often produced similar responses, class-wide.

Kari and Alana often created a single day's instruction around a SIS question to get students to practice dialogue skills. For example, Kari and Alana constructed a day's lesson around the SIS question, "If recycled [waste] water is safe to drink, would you drink it?" While the day's curriculum focused on how students would respond to the question in a whole-class dialogue, the curriculum also aimed at supporting students' understanding of the elements needed to assist their responses. For this lesson, Alana said,

> We first want them to understand what wastewater is… and then they can move on to more specifically, how does wastewater affect the economy, the environment, and people's health? So, once they answer that, then finding out about what are people doing to stop this from happening? What is an NGO doing? What is a company doing? So once they answer that, then finding out what people are doing to stop this from happening. What are the businesses doing that is preventing or mitigating the problem? Then thinking of ways that people can get involved…[The lesson was constructed] in a way to

> scaffold their understanding of the problem and ways in which the problem can be solved.

Her remark suggests at least two significant issues. First, it reveals how carefully she built instruction toward getting students to answer the SIS question. Students did not have a class-long dialogue; it was something that occurred for about ten minutes at the very end of the 75-minute class. All of the time leading up to it was built around activities to prepare the students to be more informed and more skilled at answering the SIS question. Second, the pedagogical strategy used here was to let students know what barriers exist to cities adopting wastewater recycling programs, despite scientific assuredness that the water was safe to drink. For example, students learned about how a San Diego mayor rejected a water-recycling plan because it was "unlikely to win public acceptance." They also discussed the conundrum of why people would reject a solution that had sound scientific backing. Yet, in the whole class dialogue of this SIS question ("would you drink it?"), the students' answers were remarkably mixed. For example, in one class, most of the students' written responses were "less inclined to oppose" the wastewater plan. Yet, in the whole-class dialogue, Alana noted that "99% of them said no to the proposal. "On paper," the solution made sense to the students and had scientific backing. Yet, when having to defend being okay with drinking water that once got flushed down the toilet, their attitudes changed. So students' responses to the SIS question may have represented a microcosm to the challenges facing Southern California municipalities in the present. Thus, an ongoing pedagogical challenge was how to get students to elevate the significance of scientific findings (recycled waste water is safe to drink) ahead of irrational concerns (recycled waste water is still somehow associated with urine and feces) in an open discussion.

realistic vs. creative

Another ongoing pedagogical challenge for Alana and Kari emerged when students prepared their magazine projects in response to SIS questions like, "how can we move people and stuff around [our city] without polluting the air?" Two of these challenges included a familiar issue -- should the teachers encourage student answers/proposals to emphasize creativity but risk being completely unrealistic? Or, to the opposite -- should they emphasize "valid" proposals that could be immediately implemented but didn't necessarily engage out-of-the-box thinking? Also, the teachers also seemed to grapple with how to avoid an overly pessimistic, "Doomsday" approach to the content while still not diminishing the importance of the topics.

Regarding encouraging creative or realistic solutions or some combination of the two, Alana and Kari at different times of the unit emphasized all three. Such a distinction signals the complex process to answer to an SIS question about human habits. Of the possible responses to these SIS questions, Alana said, "For me, that's even a challenge. As a thinking adult, to break down why people do things they do, to really get down to the nitty- gritty of whether they're going to change their habits…I don't think that is an easy thing to answer." While she acknowledged the potential for a lack of consensus among the students, the purpose of these questions is not necessarily to discover the "answer;" rather it is to "discover interconnections" and to realize the complexity these SIS questions address.

Alana did acknowledge that answers/solutions leaning toward realistic solutions might actually be just as desirable as ones that were highly creative. Instead of labeling realistic solutions as mundane, she grouped these types of answers as ones that sought to address the role of human behaviors in sustainability issues. For example, she said,

> Does it have to be a solution that is practical?... Personally, I would love to push for them to go in the direction of human nature…That's just what sustainability is… changing people's mentality. Like, how to get people to be okay with the idea of drinking water that was formally, you know, treated at a sewage plant? [laughs]… It takes time to develop that kind of ability to think more about why we do the things we do.

Thus, Alana did not label a realistic solution as something that was "easy" or in some way limited in its critical thinking. Rather, she saw a "realistic" solution as something as simple as perhaps setting aside one's (irrational) human concerns about an issue in favor of proven scientific findings. She seemed to elevate "realistic" solutions to SIS questions as ones that "the culture would be able to support." While the terms "realistic" and "creative" seemed to blur with this explanation, Alana seemed to equate "realistic" solutions with those answers that addressed changing human habits.

Yet, in this way, highly- creative answers also appeared to fit that description -- the criteria hanging in the balance was how/if human habits might change in response to their proposal. Thus, if human habits might change, that allowed the solution to approach the "realistic" designation. For example, Alana described a student proposal for pedal-powered vehicles on elevated monorails as "…creative and out of the box, and it could be realistic." The key word choice here is that she said it *could* be realistic. Therefore, she indicated that a proposed solution to an SIS question was not necessarily realistic by *nature*. For her, a solution was realistic if people were likely to adjust their habits to accommodate it.

avoiding doomsday

Yet integral to the students' responses to the SIS questions was Alana and Kari's ability to maintain content rigor while not overwhelming them in the "doomsday" curricular tradition. Once again, a "doomsday" approach focused on content that nearly exclusively highlighted the negative side of environmental issues. So, then, how to keep the content from being oversimplified while still allowing students to feel that engaging with the material was not a pointless endeavor? For Alana, this question was a constant matter of self-reflection. She said,

> I feel it's the crucialness of the issue. That's what makes us not want to cut things out. This is not, oh, ha ha ha ha, Shakespeare, blah blah blah, no -- this is like, we are going to die, you're not going to have elephants, your kids are going to walk around wearing gas masks -- yeah, what do we cut out? …Being passionate about it, caring about that, and just hoping that that is a worst-case scenario… What do you cut out if you know that [mass extinctions are] a possibility?

So, Alana's self-reflection about what to include without overwhelming the students was personally- relevant. She grasped the enormity of possible outcomes to SIS question. Yet, since she chose to build a curriculum where students posed courses of corrective action, she also realized that she couldn't focus on every topic that she considered pressing (for example, she had mentioned she wanted to talk more about food deserts). Of course, she and Kari could have created a curriculum that operated more by direct instruction and almost ticked off one pending environmental disaster after another, but that was likely to repeat the doomsday-influenced student shut- downs first reported by Tydings (1971) and others. Instead, what they put forth was a curriculum centered on only a select few SIS questions. For them, the goal was to prepare students to give thoughtful and informed responses; they did not aim for a unit with ongoing

dialogue where students could become distressed about issues they were ill- informed to posit answers to.

Assessing SIS

When it came to assessing curriculum centered on SIS questions, Alana and Kari established both formative and summative criteria. The summative criteria, outlined earlier in Table 4:7, identified outcomes that would either "meet" or "exceed" several criteria. For their formative criteria, Alana and Kari described it as a two-step process: 1) the soundness of their claim, solution, or outlining of a problem and 2) the extent to which they use supporting evidence. Consider how these criteria applied in two daily lessons featuring a single SIS question, as well as in the final project where students could choose which SIS question to address.

In a lesson about whether or not their city should consider recycling waste water in times of drought, the SIS question asked, "Would you drink the recycled water?" [it was slightly reworded when it came time to dialogue about it.]. When they posed the question, seven students raised their hand. Notably, one student said, "I would believe them [the scientists], but I would be scared. I wouldn't try it. Maybe if it was the last water on earth." Alana acknowledged that the student had generally met the formative criteria for this answer, but it lacked "knowing the issue or how the water is actually cleaned." When other students on paper expressed similar reluctance, it was usually due to "not knowing the issue or how the water is actually cleaned;" the science was not challenged, it was often overlooked, instead.

In a lesson where Kate and Alana introduced the "Shweeb," a conceptualized pedal-powered transportation module that runs on an elevated monorail, she, "Would it work?" The

intention here was not if it could actually happen, since prototypes exist in New Zealand. Rather, their intention was for students to consider their own habits and their knowledge of others' habits in determining if this sort of proposal could be *accepted* as daily transportation. Alana articulated this goal as being "able to answer whether or not something is possible from [a] human nature standpoint." So, it was not a matter of whether the engineering was sound; it was a matter of whether the students thought they (and others) would be willing to adjust their current lifestyle to include travel on a Shweeb.

Student responses to the question featured more follow-up questions than actual affirmative or negative answers. For example, students wanted to know more about the idea before they committed:

> What do you do if you are claustrophobic?
>
> Are they air-conditioned?
>
> How much would it cost?
>
> [Does] it take up too much space?
>
> "What about the car companies? Will they go out of business?

Alana's assessment suggested that she was more interested in the students' ability to seek further data before answering, instead of merely providing a yea or nay. She said,

> I love it. That's why I'm in the class[room]… Those are great questions. I just think that's the whole point… They've never heard of a Shweeb; they're going to have a lot of questions, and their questions were stemming from a really good place of being curious… and that's exactly the sort of thing we mean, when we say, "would this work in [our city]?"

So, part of the unwritten assessment criteria for their SIS questions was *how* students went about making informed decisions. For projects guided by SIS questions where students had a longer time period to gather information, their ability to cite that information would be the evidence used to "inform" such decisions. Here, students seeking further information before making a decision was an indicator of making informed decisions.

For student responses to the end-of-unit SIS question(s), the teachers sought a mixture of summative and formative techniques. Consider student interactions during a student's defense of his answer/proposal:

> student in audience: "Are you saying that not even [riding] bikes are a good solution?"
>
> student presenting: "No, because bikes come from factories, too. Even the Shweeb comes from a factory."
>
> student in audience: "What about roller blades?"
>
> student presenting: "Those are bade because they come from factory."
>
> student in audience: "Because everything is made in a factory, what are we supposed to do, walk? I'm not going to walk all the way to [a nearby neighborhood]."

Kari noted that the summative assessment for the presenters "exceeds" [the standard]. Alana reflected on the formative and more subjective assessment of such a dialogue. She said, "I can see what they are thinking about, but the thing that is lacking is that the student could have said, "Well, don't they make metal and all of these things for cars, too? But now, you're getting rid of pollution [once it is being used for transportation." In this way, she wanted students to realize that, yes, all forms of transportation (minus walking) involves degrees of factory production. Yet, she wanted students to realize that *some* transportation options did not produce *further* pollution once they were put into use.

When classroom dialogue around "Would it work?" often singled out the minimal environmental impact of walking, at least one student disputed that option by saying that he "didn't want to walk all the way to [a nearby neighborhood]." For Alana, that "was the direction that I wanted them to go… The fact that they are talking about their personal desires, they are discovering, wait a minute, I do not want to walk." So, for Alana she seemed at least equally interested in assessing the students' ability to reflect upon their own consumer habits when considering if their answer(s) to an SIS question, "would work."

Summary

Kari and Alana set forth a unit of instruction that challenged students to answer one of several SIS questions. These questions included: "How can we move people and stuff around in [our city] without polluting the air?" and "How can New Yorkers create less trash in the first place?" The learning goals associated with such questions focused on creating student-student dialogue. They also aimed at students asking their own justice-oriented questions like, "Why do we make so much trash in the first place?" When they taught SIS, they carefully scaffolded skills and knowledge before asking students to respond to SIS questions. While they emphasized creative student responses to SIS questions, t8hey wrestled how to exactly situate their own perspectives on a realistic-creative spectrum. When they assessed student work, they examined the degree to which each student exhibited informed decision-making.

Chapter Summary

I began this chapter by reviewing my research question for this study, "What are the curricular, pedagogical, and assessment practices of three teachers when they teach the social issues of sustainability?" I proceeded by examining three cases, Kings School, Parkside School,

and Westwood School. For each case, I revealed information that I assembled from four social studies teachers. These teachers provided the foundation of understandings that I have analyzed thus far.

In this next chapter, I will examine the differences and similarities among the four teachers at each of the three schools. I especially focus on the extent to which teachers develop SIS questions for different learning purposes. I conclude this forthcoming chapter by discussing the implications, limitations, and significance of this study.

V -- DISCUSSION AND SIGNIFICANCE

In this section, I provide answers to the question, "What are the curricular, pedagogical, and assessment practices when teaching the social issues of sustainability?" For clarity's sake, I divided my answers into three sections -- a discussion of a) planning learning/curricular goals b) implementation strategies, and c) assessment strategies. My goal is to analyze findings from the three case studies juxtapose them with prevailing theories about teaching SIS. In some cases I offer new articulations for how to teach the subject (outlined below). In this chapter, I discuss the significance of these findings. In the following paragraphs, I outline the direction I take in this chapter. Here, consider an outline of the chapter:

Learning goals for SIS

- **Scaffolding**
- **Determining importance**
- **Making proposals**
- **Decision-making reflections**

Teaching SIS

Thematic lodging

SIS three- step

Assessing SIS

Challenges: Evaluating proposed action

Self-critique

Limitations

Researcher's Role

Assumptions

Significance

For teachers

For teacher educators

For education researchers

Next steps

I chose these above sub- headings based on two criteria. First, if I observed a confluence of the three case studies around a particular topic-- and the subject had support from previously published studies, then I chose to include it in this chapter. For example, I felt that teachers carefully planned a scaffolded approach toward SIS questions. However, I also included the above sub- headings if literature suggested a particular strategy, and all three of the case studies did not demonstrate it in their craft. In this case, I discussed whether this omission represented a meaningful or problematic departure from established views on the matter.

As noted above, I organized the Learning goals for SIS section into four parts. The first section discusses the role of scaffolded instruction for each teacher. In this section, I outline my

proposed "SIS Scaffolded Planning Approach." This approach suggests how to gradually build instruction toward summative SIS questions while also using ICDM and SIS-oriented inquiries along the way. Second, I discuss the role of determining an SIS' importance. Interestingly, I identified this section because researchers emphasize this strategy, but it was missing from each case study. Finally, in part three and four of this section, I analyze how each case study stressed making proposals and reflecting on that decision- making process.

For teaching SIS, I identified two topics for discussion. These topics come in the form of proposals. These proposals represent a cobbling together of how the teachers articulated their goals and how they taught it. I called each of these proposals "Thematic Lodging" and "SIS Three Step." In "Thematic Lodging," I offer insights about how the teachers incorporated a SIS pedagogy within existing educational structures. In the "SIS Three Step," I analyze the ways the teachers employed SIS questions to assist students' ability to make informed decisions. I also discuss in this section the importance of teaching about counterclaims.

In the section on assessing SIS, I discuss two topics for discussion. I analyze the challenges that the teachers expressed in assessing behavior that was essentially unobservable. For example, all three case studies revealed that students made proposals to SIS questions, but assessing *proposed* action presented a few challenges. For example, how could they know the nature of students' actions outside of the classroom, especially if it might occur years after being in their classroom? Also, each of the case studies exhibited a sense that a level of self- reflection or self- critique was essential to sculpting of their final proposals. For each case study, teachers exhibited varying degrees of student resistance to self-evaluation.

Learning goals for SIS

Scaffolding

Determining importance

Making proposals

Decision-making reflections

For at least the last forty years, education researchers have postulated what the learning goals for teaching sustainability as a social issue *could* or *should* look like in the classroom (Margolin, 1971; Firth & Winter, 2007; Steinbrink & Jones, 1980; Palmer, 1998). Among these goals include personal responsibility (Firth & Winter, 2007), consideration of others/intergenerational perspective (Van Kannel-Ray, 2006), problem solving (Özden, 2008), and systems thinking (Nolet, 2009). With the findings from this study, this discussion aims to clarify and update several of these pertinent theories.

scaffolding

Each of the three teachers crafted SIS questions to guide their unit's instruction, but emergent findings from their planning revealed the importance they placed on scaffolding instruction to support students' ability to answer the summative inquiry. Often, half or more of the unit's instructional time focused on building background knowledge or practicing using skills like inference. Palmer (1998) hinted at the importance or building students' content and skill-based competence in advance of these types of inquiries, but more recent studies (i.e., Martusiewicz & Edmundson, 2005), do not indicate much consideration for how little prepared some students may be to engage in sustainability -based dialogue.

Considering the planning strategies observed from each of the three case studies, I recommend a scaffolded instructional approach aimed at supporting student responses to SIS question(s). This approach is an update to thinking by Jensen & Schnack (1995) version, of which they identified as a component of their "action competence" framework. Jensen & Schnack's framework is an attempt to signal to teachers how they *might* proceed in teaching sustainability education issues. However, I have updated portions of her four-step process to reflect an issues-centered, *decision-making* framework. Some of Jensen & Schnack's framework indicates adherence to an ICDM framework, but at times, it suggests that students should respond as if they were merely *reporting* or *describing* a sustainability issue. My updates include reinforcing an ICDM and SIS focus. They also include opportunities for dialogue on personal responsibility, intergenerational perspective, and how to lessen the gap between knowledge and action. Consider this proposed update to Jensen & Schnack's framework (additions are in **bold**):

Table 5:1
Scaffolded SIS question framework (adapted from Jensen and Schnack, 1997)

1. Knowledge/ Insight	2. Commitment	3. Visions	4. Action Experiences
"What is this issue about?" 1	**"Considering others' perspectives**, what's my position on this? 7	"How could **my proposal to this issue** affect the future quality of life -- for me and others?" 11	"What could I do to **implement my proposal?**" 15
"What caused it?" 2	**"Should anything be done?"** "What do I think should happen?" **What is my proposal?** 8	"What type of lifestyle/ environment do we want?" 12	"What are the difficulties/ barriers to **implement my proposal? To what extent are the barriers based on a) what I can do and b) what others can do?** 16
"How have things changed as a result of it? 3	**"Who should be responsible for making it happen?"** 9	**"What kind of lifestyle/ environment do we want to pass on to future generations?** 13	**"Self-analysis/ counterargument: Would my proposal work?"** 17
"Is it [the issue] important?" 4	**"How do I feel about making personal changes to help it happen?"** 10	**"Could my proposal help people of today and the future live the lifestyle they want in the environment they want?"** 14	"**I believe the change necessary to fully implement my proposal includes this action, and I am comfortable in taking** *this* action…" 18
"How can we better find out about it?" 5			
"What solutions do experts offer? 6			

To analyze this proposed scaffolded instruction grid, consider that each column represents a basic step in the progression of the instruction, with "1" representing a starting point and "18"

representing an endpoint. Each question represents a possible inquiry for use in a single lesson. Of course, a teacher can choose to combine questions into single lessons or choose to expand focus on one question to over multiple lessons. However, all three teachers demonstrated carefully- considered steps to build toward the summative SIS question(s). Thus, Table 24 represents a consideration of what *kinds* of ICDM and SIS-type questions and *when* to introduce them in the curriculum. Let's consider why each of these additions and updates provides a more full- accounting for this type of scaffolded instruction.

determining importance

The third question in the first column (#3) was added ("Is this issue important?") as a response to all three of the teacher's desire that students take action on an issue from a sense of moral or personal motivation, not merely because the SIS question was a task for that class. In particular, consider that Maya argued her students were more likely to retain the importance of caring for the environment if they *chose* to do them, not because she or their parents directed them to. Thus, asking "Is this issue important?" allows for students to explore their own reasons for why a sustainability issue might or might not be important to *them*. Interestingly, despite all three of the teacher's clear articulations about the need for students to take action from a sense of personal responsibility, this kind of phrased question did not appear in their plans -- or elsewhere during the trajectory of their teaching For example, Maya felt students would be able to determine a personal understanding for the importance of recycling by actually doing it, and she thus chose to avoid such a question.

The presence of such a question in the curriculum seems paramount, especially since all three teachers articulated learning goals like problem-solving, systems-thinking, and

(intergenerational) perspectives as their learning goals. A question like that surely would have been productive, but it possibly could have torpedoed the entire purpose of the instruction -- to dialogue about sustainability issues and engage in problem- solving as a means to address them. The possibility of a few outspoken students responding "no" perhaps could have re-directed the focus toward a do-nothing stance. However, I favor having such an inquiry. Even if opposition to a particular issue is flimsy or politically- motivated, allowing students to deliberate about their strengths and weaknesses is a valuable process. For example, one cannot assume that students will understand the complex political motivations behind climate change denial unless they actually interact as a whole with the multi-faceted motivations behind such a stance. Simply "closing" the issue to students might make them suspicious of the teacher's motivations or possibly make students uninterested because a key decision has already been made on their behalf.

The presence in the scaffolding process of this SIS-framed question is tenuous. On one hand, it might help to reinforce student buy-in to an issue's importance by aiming for a dialogue where *students* determine if/why an issue is worthy of attention/action. (even though Maya explicitly said such a step may be unnecessary for younger students). On the other hand, using this question relatively early in the instructional process risks creating controversy about an environmental issue that does not exist (Hess, 2009).

The added question, "Should anything be done?" (#8) also had potential to steer the dialogue toward what might be perceived as an advocacy stance on behalf of the teacher. Yet, several of the teachers felt that skipping this sort of SIS question was no more "advocacy" than a United States government teacher skipping a question like, "Should we have a democracy?" Yet, since each of the teachers expressed the importance of students' identifying a personal

motivation to think deeply about SIS, giving them the opportunity to discuss such a question seems necessary. The critical step for teachers skeptical of using such questions would be for them to provide the most up-to-date and most broadly accepted scientific data about the particular SIS. Then, the wrinkle to such a discussion is that students will almost certainly be able to see the importance of an issue if it is truly "closed" (Hess, 2009). But, through a SIS model, the students may possibly assign more personal meaning to its "importance" than if one merely takes the teacher's word for it. At the very least, the inclusion of these two questions signals to educators and education researchers of an important planning matter: to what extent does assuming the importance or urgency of an SIS diminish students' buy-in?

If a given SIS is indeed "closed," then the teacher should not have to worry about students finding it "unimportant." However, American are notorious for disputing scientific facts about an array of SIS (Saylan & Blumstein, 2011), and people, in general, are also well-known for making choices that act against their best interest (Tuchman, 1984). How to move students past such dilemmas goes beyond the research goals of this study, but suggestions are offered in this regard toward the end of this chapter in the section titled, "Next Steps."

making proposals

While dialoguing about a SIS' importance may provide useful traction for establishing student buy-in -- setting students up for taking action on broader SIS-framed questions -- may be just as important. Ochoa-Becker (2007) noted that decision-making in an ICDM framework was not a singular pathway; it involved multiple steps: taking a stand, providing evidence, identifying alternative positions, and assessing risks of this decision (like asking, "Would it work?) (p 255).

After observing each of the teachers for this study, I realized that a weakness of Jensen & Schnack's Action-Competence model involved its inconsistent questioning for an SIS framework. For example, their original question # 8 asks, "What do I think should happen?" I recommended a mundane follow-up question-- "What is my proposal?" This addition affirms that students are not making passing observations; they are making a recommendation that will draw off of her earlier (and retained) inquiry in #6: "What solutions do experts offer? While the value of debating this change is not as great for #4 and #7 ("Is it important?" and "Should anything be done?"), establishing students' stance in a proposal format is critical if the problem-solving focus of a SIS framework is to be upheld. If the learning goals seek to establish students' commitment to a) its importance, and b) a proposal to address the SIS, then acknowledging "responsibility" as a theme is important. Thus, I eliminated Jensen & Schnack's original "What could be difficult for me -- even frightening?" in favor of two new questions:

"Who should be responsible for making it happen?" (#9) and

"How do I feel about making personal changes to help it happen?" (#10)

These SIS- oriented questions seem to more effectively address the three classrooms' learning goals of "responsibility" than did the vaguely worded question about what might be difficult for the students. Also, since understanding of the topic seemed to occur mostly in questions 1 through 6, the implied learning goals of "What could be difficult…" suggest personal struggles the student may have with the nature of the issue. However, the original question might allude to the parts of the SIS that students felt overwhelmed by, nodding a bit to studies identifying "ecophobia" or "doomsday" as legitimate obstacles to student engagement. However, while the teachers in this study agreed on the need to prevent students from feeling overwhelmed by the enormity of some SIS, none of them sought an explicit moment in their curriculum when they

would address such concerns. For them, this was an ongoing process of monitoring students' responses; it did not seem logical to include in a semi-linear model where question pacing was clearly laid out.

decision- making reflections

Therefore, adjusting the personally- reflective question to "How do I feel about making personal changes to help it happen?" was a more logical way to inquire about a persistent problem observed in Alana and Kari's classroom, and throughout the scope of recent sustainability education research: how to bridge the gap between what students know about an issue versus what they are actually willing to do about it (Hepburn, Shrum & Simpson, 1978; Hicks & Holden, 2007; Nolet, 2009; Stevenson, 1987; Juker, 2002 ; Taylor, et al., 2007; Yencken, Fien, & Sykes, 2000). In their class, students learned that treated sewage water was scientifically- verified as identical to other municipal sources of water, yet their personal feelings trumped all. They also learned that walking was probably the best way to reduce their city's air pollution, but they admitted in class dialogues that such a solution wouldn't work -- who would want to "walk all the way" to another neighborhood?!

Alana, Kari, and Samantha all established self- reflection on the way students' often unchanging personal habits likely impeded progress on meaningful outcomes to SIS. Yet, none of them included an explicit dialogue opportunity as to *how* or *why* students had such difficulty adjusting their current lifestyle. Thus, the question (#10), "How do I feel about making personal changes to help my proposal happen?" aimed to fill a need articulated by the teachers but not observed in their goals or teaching. Especially since the *nature* of students' decision making was in play, planning an opportunity for a bit of meta-reflection seemed appropriate.

Since so much of this study examined how student answers/proposals to SIS questions developed, my updated "SIS Scaffolded Planning Approach" included adjusting several questions to reflect that students are engaging in an *inquiry* involving their proposal -- not engaging in a descriptive endeavor. For example, #11 of Jensen & Schnack's original Action Competence Model asked, "How could this issue affect the future quality of life -- for me and for others." Such a question implies little potential for SIS dialogue. It suggests that students are relaying information about an environmental issue without an action-orientation attached. Thus, rephrasing the question to say, "How could **my proposal for this issue** affect the future quality of life…" kept the learning goals on personal responsibility -- not on knowledge learned about the issue.

I used similar logic when updating cell 14's question: "What could I do to change things for the better?" Again, to introduce the student's role in the issue at this stage of the instruction seems too late. This assertion seems especially true when considering that all three teachers emphasized the development of students' personal responsibility from the earliest stages of their curriculum. Here, Jensen & Schnack introduced the role of self in the final quartile of instruction. I recommend its rephrasing as: "What **could/should happen with my proposal** in ten years' time." Comparisons between the original question and this one yield few distinctive differences. Yet, the inclusion of the students' proposal helps to provide continuity with the problem-solving orientation established #6 (experts' proposals) and #8 and 9 (student proposal and who is responsible for implementing it).

The questions in #16 continue to strengthen the learning goal of thinking about others, but it introduces another objective -- taking action. It asks, "What are the difficulties/barriers to **implement my proposal? To what extent are the barriers based on a) what I can do and b)**

what others can do? This question builds off the teachers' expressed desire that the students take action on their answer/proposal to the SIS question(s). Each of the teachers provided opportunities for students to learn about the potential barriers to their proposals' implementation. However, they did not differentiate between obstacles that originated within the student and those impediments that were external. For example, students' expression of barriers to their proposals often hinted at their unwillingness to change their habits, but those findings were often comingled with external factors like cost, bureaucracy, or politics.

So, the purpose in asking a question where students have to differentiate the kinds of pitfalls (#16) aims to assist students in focusing more clearly on what they can do *themselves.* If the ongoing challenge to sustainability education is that students are reluctant to enlist their knowledge toward action of any kind, then the purpose of these SIS questions need to consider how students can better engage in self-reflection. Perhaps such focus might lead toward small steps that the students are willing to partake in.

With this aim in mind, the question in #17 ("Would my proposal work?") aims for students to differentiate from a) merely floating an answer/proposal to an SIS question as a means to complete the assignment and b) engaging in a significant self-reflection about their personal habits. In many ways, this question asks students to reflect on the habits of their classmates, other people they know, and their perception of society's habits, in general.

However, this question does not necessarily aim to head off answers/proposals to SIS questions that are fantastical and are unworkable. Rather, this question asks students to consider if what they are proposing is something that *they* would be willing to abide by if implemented. So, "would it work?" does not necessarily aim at a technical approach to the students' answer/proposal. It *could*. The focus should be on would it work from a personal habits'

perspective; would people adapt their lifestyle and integrate this change? If the answer is no, then the impetus rests on the teacher to engage the student to consider what might work. However, though, the entire class might want to dialogue about what the answers really imply. Is a "no" answer really a cop-out by individuals who do not want to walk anywhere? Is a "no" answer related more to laziness than to technological innovations not able to support proposal?

The purpose of this SIS question is for students to take responsibility for their answer/solution. All of the teachers in the study emphasized a form of "would it work?" into the dialogue, but instruction did not differentiate between workability due to human habit change or to other practical matters. Therefore, many students exhibited incredibly thoughtful, creative, and insightful answers/solutions to the SIS questions, but rarely did I observe them also affirming that their solution would "work" in the sense that they, as *individuals*, were willing to make it work.

Such a line of thinking reinforced the learning goals articulated in questions #8 and #9 of the framework -- who was responsible for implementing these solutions? So, "would it work?" was another way of returning to personal responsibility in a different context. The earlier personal responsibility questions let students know that *someone* needed to be a first mover, but question #17 implies a strong degree of self-responsibility. Ultimately, with "would it work?" the personal responsibility to choose a solution that they would be willing to engage with becomes a tangible goal. The key to ensuring that students indeed properly acknowledge this question is for teachers to check for their understanding in advance of the project's final completion date.

However, a worthwhile dilemma arises from this question -- *should* a desirable answer to "would it work" automatically be "yes"? Might a "no" response be useful if the student can then explain why a particular human habit likely impedes the acceptance of their answer/proposal?

Perhaps then their task would be to identify ways to diminish the significance of those habits? Since all of the teachers in this study elevated personal responsibility as a learning goal, then possibly engaging in deep reflection about the nature of human decision-making might be valuable.

The inquiry from the previous paragraph has two underlying motivations. First, coaching students how to answer "would it work?" possibly creates a dialogue that all of the teachers desired-- students talking amongst themselves about solutions to SIS and discussing how their personal habits might influence their acceptance. Second, the reluctance of students to genuinely answer "no" might make the entire SIS inquiry process nearly pointless. If students assume that a "yes" response validates their thought process and a "no" response somehow negates it, then one could reasonably intuit that students would lean toward a "yes" response (regardless of their deep reflection) because they perceived that upholding their reasoning might result in a strong grade. After all, who would want to tell a teacher, "No, my weeks- long effort really wouldn't work" if the students believed that doing so would hurt their score?

Therefore, a critical skill that teachers need to prepare instruction for is how to make counter-arguments. The teachers each offered opportunities for students to reflect upon *someone else*'s ideas, but I did not observe any explicit instruction for meta-reflection. Perhaps self-analysis is very challenging for young people. Whatever they are able to do, they certainly need coaching in understanding that self-critique does not equate to undermining the quality (read: grade) of their academic work. For example, Alana noted that her students were reluctant to engage in self-critique and actually found it counterintuitive. Ochoa-Becker (2007) identified the importance for students engaging with an ICDM curriculum to identify "alternative positions"

and be willing to "consider opposing views" (p. 255). For the students in these case studies, they may have assumed that their ideas needed to be unassailable to receive a high grade.

Finally, this scaffolded SIS approach suggests the students respond to the implementation of their action by indicating what they are *comfortable* doing. The question in cell 18 asks, "**I believe the change necessary to fully implement my proposal includes this, and I am comfortable in taking** *this* action…" Jensen & Schnack (1997) said encouraging students to initially take small steps toward personal limitation is appropriate because it serves as an entryway toward taking more significant steps later in their life.

Yet, by using the word "comfortable," advocates of eco- justice frameworks (i.e., Bowers, 2002) might object. After all, their goals elevate the importance of students taking transformative steps to society. An eco- justice perspective aims for students to consider radical ways to challenge societal structures, and encouraging students to only take actions they are "comfortable" with suggests a significant teacher cop-out on acknowledging the seriousness of most SIS.

However, this final question highlights what I perceive is wrong with an eco-justice framework. It assumes that students:

a) have the *confidence* to make such radical changes,

b) are *able* to make such radical changes,

c) will see value in even proposing transformative objectives that they know will likely require the help of adults, and

d) would prefer to propose changes that work in abstraction instead of small changes that they can readily.

Of course, encouraging students to think narrowly and locally about SIS may easily be critiqued as missing broader learning aims, especially understanding systems-thinking and intergenerational perspective. However, getting students to initially take action that could provide immediate, tangible results might be more meaningful. If students can see that their actions "matter" and made some sort of impact in their community, those qualities seem much more important than trying to get students to take transformative action. Yet, consider that researchers report that young Americans' confidence in their ability to "make a difference" is far lower than reported in any previous generations of the last 45 years (Twenge, 2006). In fact, these "Millenials" appear to be so pessimistic about the significance of a) their votes, b) their own actions on the course of their lives and c) their ability to affect civic change of any kind, that Twenge (2006) described them as "the new cynics" (p. 237). Such cynicism may have a correlation with young people's declining interest in SIS. A recent study noting that young Americans concern about the environment, and their willingness to do something about it, is declining (Twenge, Campbell, & Freeman, 2012). Causes of this trend are unclear. Some researchers suggested that young people are "overwhelmed" and "fatigued" by environmental issues (Irvine, 2012).

Thus, for a SIS curriculum to properly engage these challenges, asking students to take radical action is laudable but possibly missing the point. If students' interest in acting on behalf of the environment is dropping at a similar rate that their cynicism in "making a difference" increases, then a possible purpose of this scaffolded SIS question framework is to establish learning goals that seek to reverse those problems -- not engage in solely transformative objectives more likely to reinforce their belief that many problems are out of their control.

Indeed, the purpose of this SIS framework is to gain a metaphorical foothold in reinforcing the notion that students can be "in control" of their personal fate and their community.

Thus, focusing on how to build some sense of student confidence as change-agents seems paramount. Setting up opportunities that may have tangible outcomes may be much more useful to stemming these trends than asking students to only hypothetically alter the world they know. Of course, this statement rests on the assumption that small "difference making" opportunities related to SIS might build the confidence to indeed take more transformative measures later on. Yet, all of the teachers in this study admitted that their goals included getting students to take what they learned and apply it *outside* of the classroom, often at date many years in the future.

Interestingly, only one of the teachers set a learning goal where students could immediately see the influence of their actions. Samantha's goal of getting students to propose changes to their school lunch program fit that criteria. Unfortunately, as reported earlier in this study, she abandoned that goal when support from an external sponsor organization fell through.

Thus, I proposed this scaffolded SIS approach in partial response to the fact that I did not see these sort of small steps emphasized in the student outcomes. So much of it relied on getting students to think creatively that I wonder if any of them saw this as more than an exercise. More tellingly, almost none of the students exhibited strong convictions to implement their proposals, personally. Instead, these proposals may have been attempts that education researchers like Bowers, Martusiewicz, and Gruenewald would have appreciated: they included dramatic proposals to remake the world the students knew. However, did the students believe that these ideas could actually influence anything but a theoretical world? From my observations, the answer appears to be no.

I am proposing in this section that learning goals for SIS include connection between student answers/proposals and notions of "would it work" and what they are "comfortable" taking action on. My reasoning here is that I observed each of the teachers being interested in students being change agents in their community, but the students' projects resembled more speculation on change than actual action- taking. So, if students were genuinely comfortable with not drinking bottle water, then the teacher could actually engage them in an ongoing dialogue about the challenges and successes of trying to "make a difference" might look like. The teachers wouldn't have to scold students who weren't perfect environmentalists; they could instead praise them for their small successes while simultaneously acknowledging that real change is challenging. My assertion here relates back to the research question by identifying that teachers planned learning goals that were change-oriented. However, teaching realities like time constraints and impracticalities of observing students out of class time seemed to influence teachers to become less concerned with the actual workability of their proposals.

By asking students to transform transportation, housing, or food systems that they will have no influence on at this moment, it seems to risk adding to the problems described by Twenge (2006) and her colleagues (Twenge, Coleman, & Freeman, 2012). Instead, this section advocates an SIS question-based approach to engaging students in small changes that they can engage in a sort of present life-experiment. Making proposals that aim for very small changes, perhaps at the school site level, might be much more productive in creating a dialogue about SIS than would proposals that seek to transform the world in a way that disables their ability to indeed prove that they *can* take meaningful action on behalf of SIS.

Teaching SIS

In this section, I explain ways the teachers implemented SIS in their classrooms. It includes examples of what I have termed "Thematic Lodging," the idea of including sustainability alongside other broad, year- long themes like economics, religion, or technology. In this way, I investigate two approaches that sought to teach SIS within the content structure of state and site- mandated curriculum. Additionally, this section includes a discussion of SIS question strategies that teachers used to provide dialogue opportunities. Examples include SIS from a) current events and b) those developed as a result of issues arising from students' daily experiences at the school. Overall, I examine the extent these questions seek to place the dialogue within the sphere of interest of the students, be it via personal issues or personalizing historic or current events.

As mentioned earlier in Chapter II, an assumption about the challenges of integrating SIS included several obstacles. They included a lack of extra time in the school year (Summers, Corney, & Childs, 2003), limited space for new subjects (Remy, 1990), and pressures to focus more curricular time toward preparation for state content exams (Firth & Winter, 2007; Gruenewald & Manteaw, 2007). Yet, a relatively straightforward strategy by the three teachers appeared to alleviate these pressures, at least within the context of the academic year and particular unit of study I observed.

thematic lodging

What I observed was that the two of the classrooms used an "infusion" model of integrating curriculum (Remy, 1990, p. 205-206), while Kari and Alana's classroom featured a "separation" model (Remy, 1990, pp. 205-206). While they employed different models, I noticed that they all used what I shall term, "Thematic Lodging" -- a teaching strategy that initially

established the broad theme of "sustainability" as one of several year or unit-long aims. The goal of this strategy is to orient students that sustainability will be a learning theme throughout the year, not necessarily something that emerges in every lesson. So, when the teacher does initiate a lesson about SIS, they are less likely to experience the resistance reported by pre- service teachers (Shuttleworth, 2010).

In this study, pre-service teachers reported on the efforts to attempt sustainability-themed lessons in their history classes. The most common problem reported was that the pre-service teachers' students identified SIS- oriented lessons as outliers within the broader year of study. One pre- service teacher explained an experience teaching sustainability within a social studies context:

> I feel like my students are so used to getting the political, social, and economic aspect of history, but they don't get an environmental aspect, ever. So, this lesson, I felt, just stood alone. And, one student asked my cooperating teacher afterwards, "Wait, does this have anything to do with what we're studying?

One pre- service teacher suggested introducing sustainability as a theme for the *year* might allow students to receive the subject in a more accepting manner: "Maybe incorporating environmentalism or sustainability issues as the fourth leg of the big three – social, political, economic – I think that would be a great way to start all units." Another student commented, "That way, when it comes up in content… your students will have had the background knowledge to say, hey, this is a sustainability issue." The teachers in these three case studies had already put into action what these pre-service teachers had hoped for: they had established sustainability as one of many broad themes for the academic year. The teachers *did* innovate ways to include sustainability themes into their teaching. However, a more striking observation

was *how* they chose pedagogical strategies that seemed to place SIS questions at the center of the day or days' lessons.

What follows in this section are examples of how the teachers sought to teach SIS within existing class structures and/or regular teaching opportunities not by default SE in nature. I term this kind of teaching "thematic lodging." For example, Samantha taught SIS through cave painting and through components of ancient civilizations. For Maya, she taught SIS through daily opportunities for "play." For Alana and Kari, they taught SIS as one of many unit-wide objectives like analyzing the connection between human choices and health issues, and what actions make a person a citizen. The significance here is that the teachers sought ways to make SIS a theme that they could draw on throughout the year without raising resistance like that reported by the pre- service teachers in the study I did in 2010.

Consider Samantha's lesson on hunter-gatherers that sought to include SIS. It also waded into one of the most contentious areas of anthropological interpretations, cave paintings. Within the context of an academic unit about the rise of ancient civilizations, Samantha delivered a lesson asking students to dialogue about "What are ancient cave paintings about?" Such a question set up an opportunity for her students to delve into an ongoing dialogue among prehistorians, anthropologists, and archaeologists. The meanings behind well- known drawings at sites like Chauvet, Altamira, and Lascaux are debated among professionals tasked with interpreting these art works. Some of those studying these caves say that they could contain "sign language," evidence of a "classic story," work by "Shamans," "hallucinations," and recollections from a "trance" (Curtis, p. 2006, 196, 198, 218, 220, 225). However, what cave art scholars *have* been able to agree on is the likely impossibility of understanding their original meanings. French prehistorian Robert Bégouën summed up the debate over a painting at Les Trois-Frères by

saying, “We don’t know.” Another scholar, writing more generally, said, “Their meaning has been lost forever.” Whatever the case may be, cave art scholars seem to struggle most with the question of whether these animals were painted by “chance” or if the ancient artist(s) painted with some “hidden order” (Curtis, 2006, pp, 183, 226, 205).

Yet without an explicit attempt to thrust her students into a compelling contemporary scholarly debate, Samantha had sort of accomplished that by asking her SIS question, “What are ancient cave paintings about?” At first glance, though, such a question did not appear to have immediate relevance to sustainability education. However, she had placed the lesson amidst the context of other days, which had explored why ancient cultures were mostly nomadic: they did not have a sustainable food source and thus needed to move frequently.

Although the dialogue included student answers like “doodles” or “records that they were there,” some of the students indeed saw possibilities that these ancient drawings were inspired by preoccupations with food. Interestingly, Samantha chose to focus her curriculum on art that may have featured game animals over predators. For example, she chose samples for students to analyze from Lascaux, which contains depictions of mostly game animals and only seven potentially “dangerous” animals (according to Curtis, those were bears, rhinos, mammoths, or lions). In contrast, the artwork at Chauvet contains almost exclusively “dangerous” animals (280 in total) (Curtis, 2006, p. 210-211). Of course, reasons for these discrepancies are numerous, including the possibilities that these “dangerous” animals had been eliminated near Chauvet and were no longer a part of their stories or myths.

More recent scholarly interpretations of the Lascaux drawings may discount such suggestions. For example, a painting including a man, a spear, a bird and a large rhinoceros may have nothing to do with hunting. The presence of these items may does not mean they are linked;

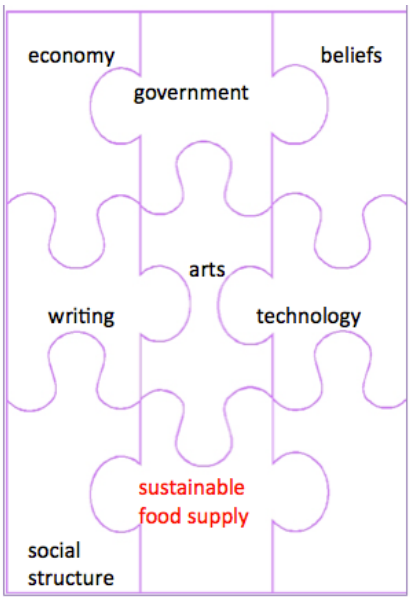
rather they may have only "coexisted." More importantly, Abrams (1998) wrote that the presence of such subjects is likely to be "more imaginary than realistic" (p. 35).

Nevertheless, Samantha's cave art pedagogy may have inadvertently detoured into contemporary debates about their meaning. For Samantha, her teaching goal was to present the significance of a sustainable food supply as an enduring theme for civilizations. For the cave drawings her students analyzed in class, it was an opportunity for them to ponder *why* a sustainable food supply was critical for humans as an enduring concept -- not just because their *teacher* said it was.

This kind of teaching represents an exceptional example of how teaching with an SIS framework can operates *within* existing school structures. Teaching about the rise of ancient civilizations is a common theme found in state history content standards (for example: in New York (Ancient World-- Civilizations and Religions (4000 BC - 500 AD): A. Early Peoples; B. Neolithic Revolution and early river civilizations), Virginia (Era I: Human Origins and Early Civilizations, Prehistory to 1000 B.C. (B.C.E.): WHI.1), and Nevada (Early Civilizations: H1.[6-8].19). So, if one concedes that no new space exists for the inclusion of SIS teaching (Remy, 1990), then Samantha appears to have found an engaging way to find space in *existing* content.

Samantha also taught the transition from these hunter-gatherer societies with a similar sustainable food supply focus. Although she did not explicitly center this instruction on an SIS question, the role a sustainable food supply might have played in the rise of ancient river valley civilizations spurred a dialogue opportunity between her and I. For example, she appeared to be teaching a sustainable food supply as an additional "puzzle piece" to the more typically accepted 7 "pieces," demonstrated below:

Figure 5:1 The eight "pieces" of ancient civilization



After we debriefed these lessons, Samantha remarks raised the possibility for her to ask a new SIS question about the simile of a sustainable food supply being like a piece of an ancient civilization "puzzle." From my observations, she seemed to elevate the puzzle piece of sustainable food supply to a special status over the other pieces. So, I asked her if a sustainable food supply was more like a key unlocking a box containing the seven puzzle pieces. In this way, then, it had more of an influence on the other pieces' potential, instead of just being another piece. After a long discussion, Samantha suggested that a sustainable food supply might be the box that the seven other pieces come in.

What came from this discussion reveals at least two interesting findings. First, it serves as another example of "thematic lodging" -- inserting sustainability as a concept into an existing curricular framework. Second, it raises the possibility of a future SIS question that Samantha might ask of her students when they begin to consider the typically rudimentary task of identifying the components contributing to an ancient civilization's success. Instead of merely getting her students to understand how these pieces represent the increasing sophistication of particular civilizations, she could ask students: "If civilizations could be thought of as a puzzle,

is sustainable food supply just one of the pieces, or is it something else?" Of course, such a question, especially the last segment, could have numerous variations (for example, "or the box holding the puzzle pieces?"). According to Samantha, the goal in such a dialogue could be to investigate the interplay of how a civilization works and an early look at systems- thinking. Importantly, I am not seeking to elevate Samantha's particular efforts here. Rather, I think they represent a broader trend among the three teachers to insert SIS themes into their curriculum. Both Kari, Alana, and Maya had their own examples. Such examples signal a broader understanding that the teachers sought to teach about SE in the context of other themes.

For Maya, she demonstrated thematic lodging through the use of SIS in context of "play." When in the park, Maya always allowed students to have some unstructured time for play. Especially when the students were in the woods section of the park, she sought time to debrief with them afterwards. This debrief often included opportunities to talk about issues that arose during the play. Sometimes this debrief based itself on prompts that Maya asked the students ahead of time, like for them to notice something about the landscape. Usually, though, she based the debrief on things that arose spontaneously.

For example, recall the situation that developed when students decided to build a bridge over the course of a few weeks. For me, a "wait and see" approach seemed risky; what if nothing worthy of discussion came up? However, after reflecting on the strategy, I can see that Maya's strategy played into what many argue an effective SIS approach should involve: discussions about situations of interest to the students (Dewey, 1916; Hess, 2009; Fleury & Sheldon, 1996). Here, Maya's thematic lodging was authentic. The students chose to do something, and Maya engaged them in an SIS dialogue. She was able to engage them in the intergenerational perspective- inspired question, "How might our play affect Bill [the gardener]?" She also asked

them how their play might interrupt the natural cycles of the forest. Initially, students understood their answers in context of consideration of others -- they realized that what they were doing was impeding the job duties of another person. In this case, the SIS dialogue arose naturally from student- chosen activities. However, such a knack for identifying such opportunities did not develop as clearly, from my perspective.

SIS three- step

Across the three case studies, I observed a trend where the teachers appeared to stop short of asking more challenging SIS questions. Interestingly, in each of the three cases, they asked SIS questions that suggested that they were scaffolding instruction toward another inquiry. In many cases across the three cases, I observed teachers asking two questions that suggested they were about to ask a question that was a sort- of integration of the preceding inquiries. Yet, almost always, they did not steer instruction in that way. As I examine the example, consider the rationale for asking such a "third" question from social studies education literature on teaching social issues.

Across the three cases, the teachers each indicated that not asking this "third" question did not represent a flaw. Rather, its omission merely signaled other goals. her goal for the unit studied was *not* necessarily to pose SIS questions seeking to compare humans' influence on others. For example, when I pressed Maya about omitting the "third" question in Table 5:2, she said that she was more interested in getting students to understand that resources essential for humans and animals' needs came from the same places. She suggested that this learning goal was sufficient, and it was, for her stated goals. However, I felt she missed an opportunity for some rich dialogue. After all, Stitzlein (2012) made clear that this kind of instruction should asks

students "how that order came to be" (p. 175). Thus, not pressing students toward this "third" question seemed problematic. In this process, the teacher asked, in succession, two SIS questions that sought to illustrate a comparison between two groups or phenomena. Consider Table 5:2:

Table 5:2
Part I: SIS Pedagogical Three-Step and its influence on informed decision-making

"step 1" (asked)	"step 2" (asked)	"step 3" (why not asked?)
Social issue of sustainability question: plant/animal-based	Social issue of sustainability question: human-based	Possible combination of two SIS questions could create this additional, summative-type SIS question:
"Does nature have waste?"	"Where do things go when we throw them away?" and "Where do things go when we recycle them?	"Why are humans the only part of nature that makes waste?"
"What do animals need to survive (thrive)?"	"What do humans need to survive (thrive)?"	"Why are animals and humans' needs so different?"
"Do animals need humans?"	"Do humans need animals?"	"What are humans doing so differently than animals?"

Here, Maya set her instruction up well for students to discuss why animals and humans behaved so differently. Yet, she chose to not ask the questions presented in "step 3." Stitzlein (2012) emphasized the importance of asking such questions. He said that this kind of instruction "needs to prepare children to participate in society as it currently exists, but also to question and change it, using approaches that may sometimes be outside the norm" (p. 175). In this next table, Samantha exhibited a similar pedagogical trait:

Table 5:3
Part II: SIS Pedagogical Three-Step and its influence on informed decision-making

"No" answer written from the perspective of a **customer**.	"Yes" answer written from the perspective of the **owner**.	**Potential** "informed decision" SIS question: "Based on how you responded to these two perspectives, how do *you* respond?"
"…the customers don't want to force themselves to eat the leftover food when	"Many people are dying of starvation. People waste food that the unfortunate	

they are full."	people eat. He says that the extra fine will go to charities."	
"… I don't want to think about the hungry when I go to it."	**"…people shouldn't waste food..."**	
"…customer one said I don't want to be forced to eat; I want to have a good time."	[no response]	
"…some customers at the restaurant were not happy with this new policy."	**"Al Anzi [last name of restaurant owner] was happy with the new suggestion."**	

Here, the larger trends include what appears to be the teachers' reluctance to press students into a dialogue over a question that does not appear to have a clear content-oriented objective. Here, the "third" question not asked dealt with applying their knowledge to a personally- reflective SIS question. Stitzlein (2012) calls this kind of inquiry "where students critically and collectively engage social questions and problems that are directly relevant to the students' lives…" (p. 175). In the cases I observed, the teachers effectively more frequently introduced SIS questions on topics not directly linked to the students' lives. However, such an observation seemed to run counter to what I gathered during interview with the teachers. In almost every case, I felt that the teachers wanted to create opportunities to make connections between the curriculum and their lives. Strangely, the teachers appeared to regularly set themselves up for this kind of opportunity but did not capitalize on their own well- situated planning.

Thus, I crafted this "three step" process in response to this unexpected finding. Teachers seemed to ask two SIS questions incorporating somewhat differing issues. Like a warm- up act at a performance, these two questions seemed to suggest that a third question, synthesizing the two ideas, was imminent. However, the teachers frequently ending the conversation there. Such a

conclusion seems to run counter to seeking the well- informed dialogue that Hess (2009) and others (e. g., Evans & Saxe, 1996) promote. Consider my descriptive formula for the kind of instruction I observed -- that the teachers described wanting to challenge the students with SIS relevant to their lives, but they frequently stopped just short of that goal:

Table 5:4
SIS Pedagogical Three-Step Formula

Step 1		Step 2		Step 3
question 1		question 2		question 3: *informed* SIS response
"Does nature have waste	+	"Where do things go when we throw them away?"	leads to	"Why are humans the only part of nature that makes waste?"
"What do animals need to thrive?"	+	"What do humans need to thrive?"	leads to	"Why are animals and humans' needs so different?"
"Do animals need humans?"	+	"Do humans need animals?"	leads to	"What are humans doing so differently than humans?
"Should restaurant owners fine customers for leftover food?" (from owner's perspective)	+	Should restaurant owners fine customers for leftover food?" (from customer's perspective)	leads to	"Should restaurant owners fine customers for leftover food?" (from student's perspective)

Consider that this proposed process for making informed decisions to SIS questions results from new understandings of the teachers' instruction (though not explicitly observed). For example, when observing the first two "steps" of this process, I assumed I was watching a formulaic process akin to listening to a comedian setting up a punch line. In this case, the punch line was the "informed decision" SIS question. However, for each of the "two step questions" referenced above, none of the teachers intended to steer their curriculum toward the "punch line" I anticipated. For Maya, her intended outcome was for students to understand that resources used by animals, plants, and humans came from the *same place*. For Samantha, her intention was to

develop her students' skill at understanding *different perspectives*. Yet, for the sake of further developing SIS questioning technique, their pedagogical strategies almost inadvertently created a straightforward procedure for students making informed responses to SIS questions.

Interestingly, the teachers reported that students participating in an introductory sustainability class might be unable to effectively critique their solutions to SIS questions if it was the first experience they had with the topic. So, all of the teachers in this study frequently alluded to learning that would occur later on, beyond the scope of this course. For Samantha and Maya, that learning would occur in the higher- grade levels. For Alana and Kari, that learning would happen in a yet- to- be- established course labeled "Sustainability Part II."

Assessing SIS

This section addresses ways that the teachers assessed SIS in their classrooms. It includes a discussion of the teachers' self-reflection during the assessment process about the role of creativity in students' responses to the SIS summative question. Notably, at first glance, they seemed to struggle about if they wanted to their students to emphasize creative or realistic solutions. However, upon closer examination, such a description seemed to be a false dichotomy. When some of the teachers appeared frustrated that student answers to the SIS question was too far-fetched to be implemented any time soon, I inferred that they were less frustrated about students' creativity and more concerned if their idea "would work." This section concludes by considering how to help students practice making general decisions that might uncomfortable with before asking them to make similarly uncomfortable decisions on behalf of the environment.

challenges: evaluating proposed action

To begin this section, acknowledging an inherent challenge to assessing student work with SIS it important. Education researchers assert that the desired outcome to this kind of instruction is that the students will take action on behalf of environmental issues (Nolet, 2009). Yet, if the criteria to be measured are essentially human behavior, how can one effectively grade "complex social and psychological factors"? (Win, 2001, p. 100). Practically, assessing student work in this area carries a high degree of difficulty.

However, grading behavior become far more difficult when students' summative projects to SIS is merely *proposed* behavior. The common framework for students' final effort is to answer a SIS question in the form of proposing solutions, like "new energy-efficient products" (Otto, 1987, p. 1). Each of the teachers in this study summed students' efforts in a solution-oriented project. But, if students are only putting forth proposals, then they may be falling short of the imperative within sustainability education: for students to take *action*. Proposing incredible solutions is great, but this standard within sustainability education (and exhibited by each of the teachers in this study) may worth re-examining.

As noted earlier in studies by Twenge (2006) and Twenge, Campbell & Freeman (2012), the current generation of young people feels less confident in their ability to affect change in their lives and in their community than the previous two generations. Yet, sustainability education seems to center itself on students making transformative proposals that they are unlikely to enact, as least not within the scope of the assignment. Thus, an important question arises regarding the assumptions of this assessment process: is making a proposal to an SIS that the students are not expected to implement reinforcing pessimism about their sense of agency?

Or, is it an intellectual exercise that has valuable, but un-testable, potential for students later in their lives?

Of course, having students actually take action on their proposals within the timeline of the school year might be unreasonable -- teachers already have enormous pressures on them for students to perform well on state content exams. Lengthy action-projects might simply take up too much classroom time. Yet, in a possible nod to the "comfortable" criteria suggested in Table 4:8, perhaps teachers should revisit action projects that a) actually entail student action and b) are feasible in the short-term for reasons of assessment. Of course, though, such a suggestion does not alleviate the pressure of how to actually assess students' behavior, be it in proposal or action format. Perhaps the most logical strategy is to uphold the emphasis on assessing students' *process*, regardless of the applicability of their proposal (Jensen & Schnack, 1995; Palmer, 1998).

self- critique

If the impetus emerging for assessment indeed gravitates toward "would it work?", then the tension between teacher expectations for creative or realistic student solutions might be a misidentified issue. For example, as discussed earlier in this chapter, such a question did not automatically imply answers about its practical feasibility. Samantha, Kari, and Alana, *did* use this kind of question to determine if human decision-making would allow these ideas to be implemented. And for clarification, Maya was more interested in students creating shelters based on this sense of systems-thinking, not actual application of students' proposals. So, assuming that realistic or creative proposals to SIS questions implied a direct correlation to their actual potential for "working" seems incorrect. What seems a better indicator of whether or not their

proposal "would work" was the degree of personal change the students were comfortable taking on, not proposing answers that the student knew they could not implement, even personally.

Assessing the SIS question, "Would it work?" involved a skill set that appeared to need further development. As Alana noted, "One of the things we really struggled with at this school is getting kids to make… a counterclaim…I have had discussions about it with kids in their writing, and the students [say], "Oh, why would I want to argue against myself?" So, if students were going to be able to effectively address a critical SIS question, they needed additional coaching in understanding that self-critique did not diminish the strength of their initial proposal/answer. They need to be coached to understand that a claim + counterclaim procedure does not negate the thought that went into claim. Rather, they might benefit from understanding that the *dialogue* spurring understanding of one's own bias is something that the teachers were interested in assessing, not merely their initial response. Such coaching seemed important given that Ochoa-Becker (2007) indicated that challenging one another and even arguing against one's self (pp. 255-256) was critical to the effectiveness of social-issue dialoguing.

Limitations

This study has at least two significant limitations. Note that the study's purpose has been to gather data that might illuminate how social studies teachers planned for, implemented, and assessed learning goals through an SIS approach. An apparent limitation of this study is that the sample size included only three schools and four teachers. So, the findings are not generalizable in ways that might be possible with a much larger sample size.

A primary limitation of this study involves its limited time period for data collection. Observations, document gathering, and interviews at each school usually occurred in a window

of eight to nine and a half weeks. Therefore, the depth of my understanding may be limited. Also, while I usually observed four out of five days each week, I appear to have missed *more* than 20% of the observable data. For example, Samantha and Alana and Kari taught multiple sections of their course, but I usually only observed one per day. While observing multiple sections of the same lesson may have likely yielded duplicated results, at times I heard after the fact from teachers about lessons that unfolded differently because student dynamics in other classes or because the teacher made adjustments to lessons taught after it was taught for the 2nd or 3rd time. A more desirable approach would have been for me to observe multiple sections of the same course each day, attend every day of instruction, and conduct interviews over the period of an entire school year.

A second limitation of this study is its qualitative nature. This study sought an in-depth understanding of a classroom phenomenon that might be valuable for providing rich details about the planning for, implementation, and assessment of a SIS-framed curriculum. However, such qualitative findings are not generalizable simply because of its site-specific nature and small target group. Broadly speaking, all qualitative studies have limitations owing to the human nature of research inquiry. Patton (2002) said, "There are no perfect research designs. There are always trade-offs" (p. 223). More specifically, other qualitative case studies investigating environmental curriculums within the social studies reported similar limitations as forecast here. For example, Chandler (2009) reported his study's data was limited because he gathered it a) at three sites and b) for one semester (p. 98).

Researcher's Role

Qualitative researchers are responsible for interpreting gathered data. Because of this, the variations in their values, personal experiences, and expectations inevitably influence that process. Therefore, this potential for bias, often referred to as one's "positionality" should be clear to the reader (Marshall & Rossman, 2011, p. 63).

Consider that my critical conceptions of environmental topics are shaped by my experiences living in rural Northern California. Growing up, my family relied on alternative and renewable sources for electricity and water. For example, my parents shunned air conditioning and instead built "cool tubes" – a system of ceramic tunnels intended to draw (supposedly) colder air from the forest into the house during summer months. Also, my family and most of my friends' families got their water from non-municipal, often untreated sources. Some of my friends attended a nearby elementary school that was solar-powered. Thus, from an early age, I understood and valued the important role renewable energy sources and clean water had in many people's lives.

Later in life, I became involved in advocating for environmental causes. Recently, I was party to three environmental lawsuits regarding land use. Thus, on environmental topics, I typically adopt the critical viewpoints of sustainability. I am aware of my biases toward the critical viewpoints of sustainability.

Assumptions

Further elaboration on how a researcher's bias might influence a qualitative study rests in what is termed a researcher's *assumptions*. Brantlinger (1997) defined assumptions as how specific beliefs shape how research is conceived, implemented, and analyzed. Also, she notes

that these beliefs, or "dimensions," are defined through seven continuums. For this study, consider how I orient myself in this descriptive table:

Table 5:5
Dimensions of Assumptions in Qualitative Inquiry

Dimension	Assumptive Continua	My Research Stance
What is the nature of the research?	Technical and neutral ←→ controversial and critical	Technical and neutral.
What is the relationship with participants?	Distant and objective ←→ intimate and involved	Mostly distant and balanced. A truly distant stance is desirable but not possible: a researcher's "total integrity cannot be maintained" (Soloway & Walters, 1977, p. 166).
What is the "direction of the gaze"?	Outward, toward others ←→ inner contemplation and reflection	Balanced.
What is the purpose of the research?	Professional and private ←→ useful to participants and the site	Balanced.
Who is the intended audience?	Scholarly community ←→ the participants themselves	Education community. My goal is two-fold; I hope to provide frameworks for teachers and teacher educators who hope to develop better understanding for how SIS could be taught. I also hope to offer initial understandings for how SIS is taught for education scholars who may want to seek their own classroom-based evidence to support their theories.
What is the researcher's political position?	Neutral ←→ explicitly political	Neutral. I am seeking to test the classroom influence of the SIS framework. This framework aims to create opportunities for dialogue for problem-solving purposes. However, the framework itself is not explicitly political.
What are the researcher's views on agency?	Passive ←→ engaged in local praxis	Engaged in local praxis.

Note. This table adapted from Brantlinger (1997)

Also, at least nominally, consider what potential impact my presence in the classroom and other learning environments had on the teachers' instruction and student performances. Did my presence somehow influence how the learning unfolded? Consider a somewhat humorous

interaction I had between several of Maya's students while we were all in the park. While Maya had introduced me to the class before, her students were curious about why I was there. On a Friday afternoon in the park, one student asked, "Are you a student teacher?" Before I could respond, a different student asked, "Are you a scientist?" Another student who was standing nearby said, "He's studying little kid's brains." At that point, all three students seemed satisfied by her remark, and they went on their way without waiting for me to respond. In later observations, some students asked were still curious about me. They asked: "What do we call you? Jay? Mr. Jay?" Contrastingly, students in Alana and Kari and Samantha's class never directly communicated with me or inquired in ways that Maya's students did. To what extent these interactions (or non-interactions) influenced the students and teachers and my interpretation of their actions appears to be minimal, but I cannot know for certain.

Significance

For teachers

The findings of this study have potentially useful implications for teachers who already teach an SIS framework or for teachers who are interested in teaching SE. For example, this study's findings reveal the detailed process of planning, implementation, and assessment of SIS-based curriculum *already in use* in three different classrooms. Such detailed findings are very rare in the social studies research literature as well as in the broader education research field. This approach also has the potential to inform teachers about how their peers are addressing the most well-documented challenge for sustainability education: the need to shrink the gap between student knowledge of SIS and changes in behavior or attitude (e. g. Morris, 1974; Nolet, 2009). Therefore, this study's detailed classroom offers insights about how teaching for action

competence (Jensen & Schnack, 1997) might look in the classroom and how that framework could be updated based on data gathered. This study also sets forth an argument that focusing on SIS questions like "Would it work?" might be one of the most important dialogues students can have regarding their answers/proposals to SIS. This question may have the potential to reframe SIS dialogues toward the crux of the matter -- the role of students' personal habits and their reluctance to adjust them no matter how much knowledge to the contrary emerges.

With the assumption that students should seek action on SIS questions that they are "comfortable" taking signals a modest and respectful challenge to the workability of the more transformative--minded Eco-justice framework (Gruenewald, 2003; Bowers, 2002). For SIS questions, an enduring question for now seems to be, "Should students be considering more radical solutions or engaging in ones that are more immediately implementable?" The answer seems less of an absolute assertion and more subjective to a teacher's knowledge of student capabilities and their prior experience with environmental issues.

For teacher educators

The findings from this study could be similarly informative for teacher educators. For example, most current research on teaching SIS centers on pre-service education and what learned *skills* constitute a new teacher becoming competent (Bowers, 2001; Orr, 2004; Nolet, 2009). These findings from this study has the potential to shift such "teacher literacy" frameworks to now include planning, teaching, and assessment strategies within an SIS framework.

Additionally, a study revealing how social studies teachers develop, implement, and assess goals for teaching the social issues of sustainability education could serve as an

opportunity for teacher educators to revise or update such skill sets. It also might inform teacher educators about gaps between goals and practice. Such data might reveal how "gate- keeping" (Thornton, 2008) or "defensive teaching" (McNeil, 2002) influenced the teaching of sustainability education's social issues.

For education researchers

For education researchers, the findings of this study might be useful for providing examples of how a SIS framework could work in social studies and other subjects, as well. The findings might also provide important insights about the connection between teaching SIS and the role of transformative educative practices. For example, education researchers disagree if teaching about SIS can be properly implemented unless existing school structures and curricula (like standardized testing) are *transformed* (Bowers, 2001; Louv, 2008; Orr, 2004; Sterling, 2004). For example, Gruenewald & Manteaw (2007), Nolet (2009), and Palmer (1998) argued that most educators are reluctant to transform their curriculum because of pressure to prepare students for existing accountability measures like the No Child Left Behind Act of 2001. Others say the predominance of state-based standards – instead of national standards – makes cross-curricular transformations difficult (Disinger, 1999). In general, researchers argue that "the grammar of schooling" (Tyack & Cuban, 1995) clashes with the notion of a transformative curriculum. However, some researchers argue that existing school structures do not impede successful implementation of a transformative, issues-centered sustainability curriculum (American Forest Foundation, 2010; Worldwide Water Education, 2010). Thus, since neither side has classroom-based evidence to influence the direction of education researchers, this study's classroom-based findings have the potential to spur further movement in this area.

Next Steps

All three of the teachers emphasized that some of the students' understanding stemming from SIS instruction was not assessable. They reached this conclusion because they understood that SIS instruction was meant to influence their students' *future* action on behalf of the environment. So, how to know if this sort of education influences student opinions in the short or long-term? For the long-term, a longitudinal study tracking students who had instruction in SIS might shed further understanding about whether their future behavior can be differentiated from students who did not have explicitly targeted SIS curriculum. Of course, the findings from such a survey might take a decade before meaningful data might emerge.

For the short-term, this study may provide helpful in developing an array of teaching and research opportunities. For example, the findings about the SIS framework might be useful in teacher education courses. From a research perspective, developing an agenda about how an SIS framework is taught outside the social studies may yield useful findings. For example, to what extent is an SIS framework truly cross-disciplinary? While an SIS framework finds its theoretical origins in social studies education, how it manifests itself in other subjects could be a subject of inquiry for many years.

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VII. APPENDICES

Appendix A—Observation Protocol: Deductive Approach

Date	Topic/Title of Lesson
Time	
School	# of students
Teacher	M___ F___
Class/Grade	

Question: Was sustainability taught in any of these ways?

As a social studies concept

	positivist code = (P)	**interpretivist** code = (I)	**critical** code = (C)
Economics Ed. code = (E)	code = PE	code = IE	code = CE
Global Diversity Ed. code = (GD)	code = PGD	code = IGD	code = CGD
Citizenship Ed. code = (C)	code = PC	code = IC	code = CC
Other code = (o) [specify]	code = PO	code = IO	code = CO

Time and Descriptive Notes	Code References and Reflective Notes

Appendix B—Document Protocol: Deductive Approach

Identifying Information

1. Name of resource
2. Author(s)
3. Publication info
4. Description (text, guide, standards, etc.)

General Information

1. What are the goals of this document?

2. What topics does it relate to?

3. How is it organized?

Content Analysis

1. Do the following sustainability conceptions appear in the document? If yes, circle code.

As a social studies concept

	positivist code = (P)	**interpretivist**	**critical** code = (C)
Economics Ed. code = (E)	code = PE	code = IE	code = CE
Global Diversity Ed. code = (GD)	code = PGD	code = IGD	code = CGD
Citizenship Ed. code = (C)	code = PC	code = IC	code = CC
Other code = (o) [specify]	code = PO	code = IO	code = CO

2. Of those that do appear, what are the excerpts that best represent these conceptions of sustainability education?

code of conception	excerpt (quoted)	theoretical reference (use code)	analysis corroboration (Marshall & Rossman, 2011, p. 161)

Appendix C—Interview Protocol: Deductive Approach

Beginning of Unit Interview

planning and learning goals
1. How did you plan the learning goals for this unit?
2. How did you plan what in-class documents to use?
3. If you could implement your ideal learning goals in *any* way, how might it look?

student outcomes and assessment
4. What will students be able to do if they have met your learning goals?
5. How will you assess if your students have met your learning goals?

influences on learning
6. Do you think your personal understanding of sustainability will influence your teaching of the subject? How?
7. Do you think the students personal understanding of sustainability (or lack of understanding) will influence your teaching of the subject?
8. Do other factors (either in or out of school) influence how you plan to teach sustainability education? How?
9. Do other factors (either in or out of school) influence how students respond to your learning goals for sustainability?

challenges
10. What challenges have you had in the past with this type of curriculum?
11. Social studies researchers report that students are less likely to consider limiting their behavior if it directly impinges on their lifestyle. Ideally, how could you get students to overcome this challenge?

Middle of Unit Interview

planning and learning goals
1. Have you adjusted any of the learning goals for this unit? Why?
2. Have you adjusted any of your plans for in-class documents? Why?
3. How has the implementation of your learning goals related to how you would like to implement them?

student outcomes and assessment
4. Can you choose one example so far that represents a good teaching experience you have had so far? How did it reflect your learning goals?
5. What have you noticed about students' progress? Do any students in particular stand out? (strong and weak examples).

influences on learning
6. Do you think your personal understanding of sustainability has influenced your teaching of the subject? How?

7. Have your colleagues influence how you have taught so far? Why?
8. Have other factors (either in or out of school)? How?

challenges
9. What challenges have you had so far?
10. Explain how you have tried to get students to consider a) the role their own habits may have had in contributing to environmental problems and b) how they could possibly limit themselves in light of environmental problems.

End-of-Unit Interview

planning and learning goals
1. How did your planning of the learning goals compare with their implementation?
2. How did your planning for use of classroom documents compare with their implementation?
3. Can you think of an example of how this comparison worked in your classroom?
4. In doing this unit again under *ideal* conditions, what would you do differently?

student outcomes and assessment
5. How did your goals for student learning compare with how students performed?
6. Can you think of a particular example that best illustrates this?

influences on learning
7. How do you think your personal understanding of sustainability affected your teaching of the subject?
8. Did your colleagues influence the learning outcomes of this unit?
9. Did other factors (either in or out of school) influence how you taught the unit?
10. Can you think of a particular example that illustrates this?

challenges
11. What were the biggest challenges to getting your learning goals accomplished?
12. Can you think of a particular example when students did not meet your goals? Why do you think this happened?
13. How would you explain the difference between your goals for the unit and how the unit unfolded in your classroom?

Appendix D: Coding Phrases, Inductive-Orientation

	learning goals L	implementation (teaching) T	assessment A
1. action competence -- the role of scaffolding toward critical thinking			
2. local vs global, global themes via local application/ place-based ed. (role of experts and community resources) (seeking role of "real world" application)			
3. oversimplification vs. doomsday/ecophobia/action paralysis [also: how to overcome ecophobia?]			
4. the gap: between what students know (should be done) and what students are willing to do [to what extent is 'buy-in' a part?] [consideration of one's own consumer role] ["could this work?"]			
5. cross-disciplinary coordination: paradox (or not?)			
6. solutions: realistic and immediately implementable vs. out of the box creative?			
7. use of everyday			

interactions to facilitate SSI (Central Park Gardener)			
8. SSI -- choice of issues			
9. teacher's personal beliefs: A. gap: teacher goals vs compromises teacher made with goals B. advocacy?			
10. "weak" sustainability (tech will solve all) vs. "strong" sustainability (change in human habits will change all)			
11. "needs" -- current generation or intergenerational?			
12. Researcher's Role			
13. Significance			
14. Teacher Background/Personal Influence			

15. Challenges			
16. SSI: What kind of discussion?			
17. Sustainability -- how manifested in social studies?			
18. Personal Responsibility			
19. Consideration of Other/Intergenerational Perspective			
20. Indig Persp, Biomimicry			
21. Problem-Soling, Action Orientation			

Appendix E: Informed Consent Forms

Teachers College, Columbia University
INFORMED CONSENT

DESCRIPTION OF THE RESEARCH: You are invited to participate in a research study about how secondary social studies teachers implement sustainability into their classrooms. You will be asked to allow the principal investigator to observe your classroom for one class period at a time, share documents used for instruction in your classroom, and participate in interviews lasting up to 15 minutes long. Interviews may be audio taped, but after this study is completed, these tapes will be destroyed. During the study, they will be stored in a locked file cabinet in 420B Zankel Building, Teachers College, Columbia University, 525 West 120th Street, New York , New York, 10027. The research will be conducted by Jay Shuttleworth. Mr. Shuttleworth is a doctoral student in the Program in Social Studies at Teachers College, Columbia University. The findings of this study will be used to satisfy his doctoral dissertation. Observations and document collection will be conducted in classrooms at three to five New York City schools. Interviews will take place at a location mutually agreeable to the participants.
An interpreter will be not be used in this study. All interviews shall take place in English.
RISKS AND BENEFITS: The risks associated with this study include the possibility that 100% confidentiality is not possible. To minimize any risks associated with this fact, the researcher will take the following steps:
a) Use of pseudonyms to protect the identity of participants and school sites.
b) Use of audio tapes for interviews that minimize digital hacking. These tapes will not be digitized or ever converted to a format that can be stored on a computer. Therefore, the probability that these tapes could be hacked or otherwise compromised via electronic means is low. During the duration of the study, these audio tapes will be stored in a locked cabinet in 420B Zankel, Teachers College, 525 West 120th Street, New York , New York, 10027 (The office phone for this location is 212-678-3173). When the research project is completed, these tapes will be destroyed. The researcher will create written transcripts from these audio-taped interviews. When the research project is completed, these transcripts will be destroyed.
c) Awareness of the importance of maintaining the participants' privacy and minimizing disruptions to their everyday world.
d) Interviews will be scheduled and guided by pre-planned questions. This strategy aims to minimize time constraints placed upon the participant. The researcher's goal in these interviews is to discuss themes of mutual interest that can be analyzed and discussed where the participant can adopt the role of co-researcher, if possible.

The potential benefit of this study is that the researcher and participant(s) can co-construct a strong understanding of how social studies teachers implement sustainability themes into their classrooms. The findings of this study may be have an indirect benefit to the participant(s), knowing that their participation may be used to inform other social studies researchers about their practice.

PAYMENTS: The participant(s) will not be financially compensated.
DATA STORAGE TO PROTECT CONFIDENTIALITY: All data will be used for professional purposes only. As noted above, these audio tapes, transcribed written transcripts of these tapes' contents, and any related coding transcripts created from them will be stored in a locked cabinet in 420B Zankel, Teachers College, 525 West 120th Street, New York , New York, 10027 (The office phone for this location is 212-678-3173). The room, 420B Zankel, is also locked when not in use by the researcher. When the research project is completed, these tapes, coding documents, and transcripts will be destroyed.
TIME INVOLVEMENT: For the duration of the study, your participation in interviews will take approximately one to two hours. The duration of the study for observation of your class will begin in May 2011 and end May 2012.
HOW WILL RESULTS BE USED: The results of the study will be used as a pilot study to meet the second part of the researcher's certification exam for the degree of Doctor of Philosophy at Teachers College, Columbia University. The findings of this study may be shared research conferences like the annual meeting of the National Council for the Social Studies (NCSS).

Teachers College, Columbia University
PARTICIPANT'S RIGHTS

Principal Investigator: Jay Shuttleworth
Research Title: Citizenship and sustainability: An inquiry into how secondary social studies teachers implement sustainability in their classrooms

- I have read and discussed the Research Description with the researcher. I have had the opportunity to ask questions about the purposes and procedures regarding this study.
- My participation in research is voluntary. I may refuse to participate or withdraw from participation at any time without jeopardy to future medical care, employment, student status or other entitlements.
- The researcher may withdraw me from the research at his/her professional discretion.
- If, during the course of the study, significant new information that has been developed becomes available which may relate to my willingness to continue to participate, the investigator will provide this information to me.
- Any information derived from the research project that personally identifies me will not be voluntarily released or disclosed without my separate consent, except as specifically required by law.
- If at any time I have any questions regarding the research or my participation, I can contact the investigator, who will answer my questions. The investigator's phone number is (530-400-6990).
- If at any time I have comments, or concerns regarding the conduct of the research or questions about my rights as a research subject, I should contact the Teachers College, Columbia University Institutional Review Board /IRB. The phone number for the IRB is (212) 678-4105. Or, I can write to the IRB at Teachers College, Columbia University, 525 W. 120th Street, New York, NY, 10027, Box 151.
- I should receive a copy of the Research Description and this Participant's Rights document.
- If video and/or audio taping is part of this research, I ( ) consent to be audio taped. I ( ) do NOT consent to being audio taped. The written and audio taped materials will be viewed only by the principal investigator and members of the research team.
- Written, and audio taped materials ( ) may be viewed in an educational setting outside the research

  ( ) may NOT be viewed in an educational setting outside the research.
- My signature means that I agree to participate in this study.

Participant's signature: _____ Date:____/____/____
Name: _____
Title:_____

Investigator's Verification of Explanation

I certify that I have carefully explained the purpose and nature of this research to _____ (participant's name) in age-appropriate language. He/She has had the opportunity to discuss it with me in detail. I have answered all his/her questions and he/she provided the affirmative agreement (i.e. assent) to participate in this research.
Investigator's Signature: _____
Date: _____