Approaches to Education for Sustainable Development (ESD) in Kesennuma, Japan

A qualitative case study of continuous challenges faced by educators pursuing sustainability in their teaching

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Abstract

In the face of growing environmental and social challenges today, issues in sustainability and how we approach those problems are increasingly important. Education for Sustainable Development (ESD) has been established as a key priority at the international level to work towards sustainability. However, the concept of ESD itself is ambiguous and contested, and approaches to environmental and developmental problems vary. Teachers working with ESD must make decisions and develop their understanding despite uncertainty. These decisions and understanding translate into reflective habits in teaching, which represent underlying goals or purposes that teachers have for ESD, and ways that they confront challenges in working towards sustainability.

This study examines teachers’ and leaders’ habits and approaches to ESD in the context of Kesennuma, Japan. The intention of the research was to gain insight into what educators working in ESD see as the purpose of their teaching, what they hope students will learn, and how they deal with and reflect on complex issues and the risk of uncertainty and unpredictability. Data was collected through semi-structured interviews based on reflective questions with two teacher supervisors from the City Board of Education (BOE) and six educators from local elementary and junior high schools. These teachers and leaders revealed their purposes and approaches to ESD, related to knowledge and content, capacity-building skills and abilities, and experiences in the local community and environment. In addition, teachers and leaders discussed how the continuous challenge of uncertainty was addressed in their teaching, specifically through the themes of responsibility, the future, complexity and hope. These findings show ways that educators pursue sustainability in their teaching, how ESD is presented to the students, and what they hope students will be able to contribute towards sustainability. Though there is inherent uncertainty in the process of teaching and learning in ESD, the teachers’ and leaders’ constant pursuit of sustainability and their reflective habits serve as a point of hope, for themselves as educators, their students and the community.

Keywords: Sustainable Development (SD), Education for Sustainable Development (ESD), Japan, teachers’ habits, uncertainty
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List of Abbreviations and Japanese Terms

Abbreviations:
ACCU  Asia-Pacific Cultural Centre for the United Nations Educational, Scientific and Cultural Organization (UNESCO)
BOE  Board of Education
CCE  Central Council for Education
CPR  Cardiopulmonary resuscitation
DRR  Disaster Risk Reduction
EE  Environmental Education
ESD  Education for Sustainable Development
ESD-J  Japan Council on the United Nations Decade of Education for Sustainable Development (UN DESD)
ICT  Information and Communications Technology
JMA  Japan Meteorological Agency
MEXT  Ministry of Education, Culture, Sports, Science and Technology (Japan)
MOE  Ministry of the Environment
MTP  Master Teacher Program
NIER  National Institute for Educational Policy Research
PISA  Programme for International Student Assessment
**Approaches to ESD in Kesennuma, Japan**

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<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>RCE</td>
<td>Regional Centre of Expertise</td>
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<td>SD</td>
<td>Sustainable Development</td>
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<td>SDGs</td>
<td>Sustainable Development Goals</td>
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<td>UN DESD</td>
<td>United Nations (UN) Decade of Education for Sustainable Development</td>
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<td>UN</td>
<td>United Nations</td>
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<td>UNCSD</td>
<td>United Nations (UN) Commission on Sustainable Development</td>
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<td>UNESCO ASPnet</td>
<td>United Nations Educational, Scientific and Cultural Organization (UNESCO) Associated Schools Project Network</td>
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<tr>
<td>UNESCO</td>
<td>United Nations Educational, Scientific and Cultural Organization</td>
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<td>WCED</td>
<td>World Commission on Environment and Development</td>
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**Japanese Terms:**

<table>
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<tr>
<th>Japanese Term</th>
<th>English Translation</th>
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<tr>
<td>Sōgō Gakushū no Jikan</td>
<td>Period of Integrated Studies</td>
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<tr>
<td>Yutori</td>
<td>Low-pressure (Education)</td>
</tr>
<tr>
<td>Gakushū Shidō Yoryō</td>
<td>Course of Study</td>
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<tr>
<td>Ikiru Chikara</td>
<td>Zest for Living</td>
</tr>
<tr>
<td>Machizukuri</td>
<td>Community-Building</td>
</tr>
<tr>
<td>Mori wa Umi no Koibito</td>
<td>The forest is longing for the sea, the sea is longing for the forest</td>
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1 Introduction

1.1 Background

The relationships between humans, society and the environment are complex and constantly changing. Historically, the way humans have approached the environment and development in society has varied, due to shifting vulnerabilities, advancing technology and industry, and diverse philosophical, ethical and political positions (Sandell et al. 2005). Today, in the face of growing environmental and social problems, issues in sustainability and how we approach those problems are increasingly important. The concept of sustainable development (SD), first introduced in 1987, has become an imperative part of the discussion about attempts to address challenges and ensure a secure future (WCED, p. 11). At the international level, SD has been established as a priority goal by organizations such as the United Nations (UN), their latest agenda plan for 2030 named the Sustainable Development Goals (SDGs). One avenue for approaching SD is through education.

Education for Sustainable Development (ESD) represents an attempt to ameliorate the unsustainability of modern society through schools, training and informal education. It has been a key initiative at the international level, especially through the United Nations Educational, Scientific and Cultural Organization’s (UNESCO’s) promotion of the UN Decade of Education for Sustainable Development (UN DESD). In Japan, ESD has been promoted at the national level and recognized by the Ministry of Education, Culture, Sports, Science and Technology (MEXT), through policy, curriculum guides and recommendations to local level actors. This activity at the national level has translated into several local Boards of Education (BOEs), schools and teachers to implement ESD in their communities.

However, there is ambiguity about what SD is, how it should be achieved, and what a sustainable future should look like. Likewise, ESD lacks consensus about how to approach working towards sustainability and what its goals are, though it is widely agreed that the pursuit of sustainability should be intimately linked to education, and that education can be useful in approaching sustainability problems. ESD is contested, debated and complex concept, evident in vague international rhetoric and discussions at academic and policy levels. The implementation is irregular, and usually depends on the dedication of individuals to drive the process of ESD forward in schools or communities.

Together with the human-environment relationship and SD, ESD represents uncertainty, as there is no agreement on what constitutes sustainable actions, and outcomes of working towards sustainability are unknown. Ultimately, the outcomes of teaching in ESD are unknown. Furthermore, there is debate about the appropriateness of referring to sustainability as a goal, or something that can be achieved at all, rather than a process.

From this uncertainty, and through experience, educators must make decisions and develop habits in their approaches to ESD. They work towards building sustainability through teaching, though this is a process that is unpredictable. In other words, it is impossible to assume that educators, or other actors, can be in control of future sustainability. Teaching takes various forms, from disseminating scientific knowledge, encouraging sustainable-friendly behaviors and norms, or creating opportunities and building capacity for democratic problem-solving (see Scott & Gough 2003; Sandell et al. 2005; Vare & Scott 2007). The approaches teachers take often connect
to wider implications of their purposes of what ESD is or should be, and in this way educators convey implicit meanings to their students (see Sund 2008).

This study is an investigation into how some teachers and leaders approach ESD in the city of Kesennuma, in the Miyagi prefecture in northeastern Japan. ESD teaching in the city’s schools has developed over several years, and has been recognized as a leading example in Japan of systemic implementation in a community (see Oikawa 2014a). The case of ESD and approaching the environment in Kesennuma is complex, drawing on several international, national and local influences. Furthermore, the city sustained massive damage in the March 3, 2011 Tohoku earthquake and tsunami, which has influenced the community and ESD. The educators interviewed represent ways that teachers might choose to work towards sustainability through their teaching, and develop reflective habits, despite uncertainty. Their descriptions of ESD and its purposes are important, and give insight into valid approaches to pursuing sustainability in schools.

1.2 Aims and Objectives

The intention of this study is to investigate teachers’ and leaders’ habits in teaching ESD, and what they hold as purposes in ESD, in the context of formal education in Kesennuma, Japan (the use of the terms ‘teachers and leaders,’ ‘educators,’ and ‘teachers’ alone are used in this research interchangeably, and represent all the participants, even though some are no longer teachers). Educators’ habits can be conceptualized as underlying, complex actions, though they may be either unreflective, as subconscious actions and reactions, or reflective, which requires educators to think deeply and critically about their actions (see Dewey 1922) (more discussion on habits follows in section 3.1). The aim of the study is to gain a deeper understanding of how these educators teach, what they want their students to learn, and what they hope to accomplish through pursuing sustainability in their teaching. These actors’ reflective habits and approaches to ESD represent decisions in the face of various challenges, uncertainties, unpredictability and a lack of control over numerous factors. Through understanding their perspectives, possibilities for working towards sustainability through education can be identified. The specific objectives of this study are the following:

1. Examine the policy, international and national discourses in SD and ESD, their purposes and conceptual definitions
2. Identify how ESD is uniquely approached in Kesennuma by teachers and leaders, in the context of larger traditions, discourses and approaches in ESD
3. Critically assess and discuss the results of the above objectives and of the findings

1.3 Research Questions

The research is guided by the following specific research questions, designed as focused points of inquiry, which act as the basis for methodology, data collection, analysis and discussion (Bryman 2012, pp. 85-90):

1. What do teachers and leaders see as purposes or goals for their teaching in ESD, described as what students should learn from ESD in school?
2. How do educators confront the reality of uncertainty in pursuing sustainability, through developing reflective habits?
1.4 Significance

Although SD and ESD have become increasingly visible at all levels of education, due largely to promotion from international organizations such as the UN and UNESCO, these are still developing concepts. There is little consensus on how ESD should be implemented, despite an apparent agreement that sustainability is something that should be pursued through education. Furthermore, sustainability represents complex, difficult issues. Approaches to environmental and developmental problems are rooted in uncertainty, though the inevitability of uncertainty and unpredictability are rarely acknowledged by international and national institutions, such as the UN and UNESCO. Therefore, as educators at the local level work towards sustainability, their approaches to ESD are varied. Implementation is sporadic, largely depending on the efforts of individual actors or local institutions (Nikel 2007). It is significant to gain deeper insight about what these experienced teachers and leaders are doing in ESD and how they pursue sustainability, despite challenges.

Formal education in Kesennuma, in northeastern Japan, is regarded nationally as a leading community in ESD due to the systematic implementation and participation of all schools. Schools in the city have been implementing ESD activities and practices for several years, and the teachers there have developed their understanding and habits through years of experience and reflection (see Oikawa 2009; 2014a). As a unique local context, where ESD is an important part of formal education, Kesennuma may offer insights for researchers and educators to apply in their own work.

This study aims to investigate these teachers’ and leaders’ habits in teaching and approaching sustainability through ESD in Kesennuma. Through examining teachers’ reflections, a practical understanding of the implementation of ESD at a local level is revealed. Their unique practices and beliefs represent valuable examples of how educators might approach sustainability and ESD, despite uncertainty and myriad influences.

Bray described the importance of academic work in comparative education to gain deeper understanding of the forces and processes of education (2014, pp. 15-38). By examining the approaches and processes that teachers employ in ESD in a specific context, we may be able to see more clearly those underlying processes and gain valuable insight. Noah and Eckstein highlighted the importance of qualitative case studies in the field of international and comparative education, as the depth of these inquiries allow us to make connections at various levels (1998, p. 54). The subject of this research is of interest internationally to other teachers, educators and researchers working in ESD and in the field of international and comparative education. In other words, the micro-level focus of this study can contribute to wider understandings in education through the discussion of individual habits, purposes and approaches (Noah & Eckstein 1998). In thoroughly examining the case of teachers’ approaches to ESD in a specific context, other researchers and educators can make comparisons with approaches in other contexts or their own local education. The attempt to uncover these types of intangible processes in education, especially in a humanistic approach to research, is well-established in the field of international and comparative education (see Sadler 1900 (reprinted 1964); Kandel 1933; also Mattheou 2009; Bray 2014). It is with these intentions that this study was carried out, to investigate and compare the discourses and approaches to ESD with local implementation and teachers’ habits, and to
contribute to a deeper understanding of the underlying purposes and processes in the pursuit of sustainability through education.

There is a growing body of literature and research concerning ESD and sustainability education, which focuses specifically on teachers. Hart has contributed to the growing interest in teachers’ thinking as a subject of study, especially in the fields of Environmental Education (EE) and ESD. His research, through narrative inquiry and reflective questioning, has helped to build a basis for further studies, including this investigation (1996; 2003). Nikel’s research into teachers’ notions of responsibility provided a valuable framework and raised interesting questions with regards to how teachers approach ESD (2007). Sund and Wickman’s, and Sund’s independent work, researching EE teachers in Sweden, linked traditions in teaching to individual teachers’ habits and practices, revealing key anchor points of teachers working in ESD (Sund & Wickman 2008; Sund 2008; 2015). Other authors have written extensively to develop the concepts of SD and ESD (see Scott & Gough 2003; Sandell et al. 2005; Vare & Scott 2007). Furthermore, the substantial debate at the international level, from various perspectives, has added to the discourses in ESD and sustainability education, and provide a useful point of departure for present and future studies (see Jickling 1992; 2013; 2016; Irwin 2007; Jickling & Wals 2008; Van Poeck & Vandenabeele 2012; Huckle & Wals 2015; Hoffman 2015; McKenzie et al. 2015). This study attempts to build on the work of these authors and studies, using their valuable insights to examine a unique case of teachers and leaders in Kesennuma.

1.5 Limitations and Delimitations

The design of this research as qualitative is limiting, as described by Bryman, in that the decision to follow a qualitative design poses the risks of subjectivity, qualitative studies can be difficult to replicate and generalize, and transparency can be difficult to establish (2012, pp. 405-406). However, the choice of qualitative methodology also represents an opportunity to collect deep, rich data about a specific context, without the purpose of generalization. An attempt has been made to balance the limitations of methodology by thoroughly detailing the decisions and process of research, and by building on existing literature and research.

Practical limitations of collecting data arose during the research. A limited number of respondents and limited time allowed for interviews represent a narrow perspective on ESD in the chosen context. Furthermore, the use of joint interviews could have influenced the outcome of the data collected. These limitations could not be ameliorated with an increased number of interviews or more time with the participants. However, an attempt was made to reduce the impact of the small sample size by additionally interviewing teacher supervisors at the City BOE, and allowing for follow-up from individual respondents.

The selection of the case as schools in Japan represents a limitation based on the perspective of the researcher as a foreigner, and furthermore the use of a translator so that interviews could be conducted in Japanese limits the study. As an outside researcher studying teachers in a Japanese context, it is important to carefully consider the cultural, historical, social and complex political contexts, and avoid an over-simplification of issues in education. The researcher has some experience living and working in Japan, and has additionally collected extensive background and contextual information through literature and previous course studies. Most documents and
publications important to this research have been published in English, though there may be some additional Japanese-language articles or books that would have been useful for the researcher, though these represent a small limitation. The use of a translator was inevitable, though a second translator was used to confirm key sections of the transcript and add things that may have been missed initially.

The study is delimited by the selection of the sample. By choosing to interview experienced teachers and leaders working with ESD in Kesennuma, the study does not intend to represent broader views held by a larger population of teachers in the city, and may fail to include some alternative perspectives, although some of the respondents have only a few years of experience teaching or being in a leadership position.

1.6 Organization of Research

The research is organized according to academic standards and examples of research, utilizing Bryman’s framework for social research methods (2012). The first chapter has outlined the background, aims, objectives and research questions, the significance of the research including a brief examination of previous research studies, and limitations. Chapter 2 introduces the conceptual framework of the human-environment relationship, SD and ESD, which serve as a link to the findings of the research. Chapter 3 provides a theoretical framework for the research, which addresses teachers’ habits, traditions and approaches to ESD and companion meanings. Chapter 4 details the methodology of the research, including the research design, sampling, data collection and analysis methods, as well as addressing criteria of trustworthiness and ethical considerations. Chapter 5 provides contextual background, which adds to understandings of the individual teachers working within education and ESD in Japan and Kesennuma city. Chapter 6 presents the findings and analysis of the research, followed by a discussion in chapter 7, which refers to the objectives and research questions, and links between the findings and theory. Chapter 8 acts as a conclusion and suggests further research ideas.

2 Conceptual Framework

The concepts of SD and ESD are widely used; however, they are also highly contested and open to interpretation. The ambiguity of sustainability and its application in education contribute to varied practices and purposes in teaching, and the challenge of uncertainty that educators must face when teaching in ESD. This section provides an understanding of the development of sustainability discourses and uses in education, from perspectives on the relationship between society and the environment, and implications in environmental education and ESD. The understanding of these concepts is key to the research design and findings, as it provides a point of departure for reflection on teachers’ individual approaches and purposes for ESD.

2.1 The Human-Environmental Relationship

*Historical Perspective*

A historical understanding of sustainability and SD as concepts can be traced by examining the human-environmental relationship as it has developed over time. One possible framing of this issue is how society and environment interact. For example, how do humans respond to the environment or natural changes? How do societies adapt to environments and ecosystems, and in
turn how does the environment adapt to the spread of societies? Though conditions change, uncertainty and risk, inherent in our relationship with the environment, implies a continuous development of adaptations, which will be explained further in subsequent sections. These questions and our understanding of this relationship directs our approaches and discourses dealing with how to solve problems, or which problems are worth examining. This is essentially the concern of what actors in sustainability, SD and ESD do. These discussions reflect different perspectives of how we frame the concepts of SD and ESD, and how teachers work within these perspectives, as will be shown in chapter 3. However, even as various viewpoints on our relationship with the environment are adopted, it is not entirely clear what implications this holds for how to go about solving sustainability problems, and mixed approaches are apparent in the way teachers pursue sustainability in their teaching.

One way to begin to trace the human-environmental relationship is to examine the vulnerability of humans to the forces of the natural world, or the risks inherent in our interaction with the environment, and in turn society’s ability to expand and develop. Sandell et al. explored human interaction with the natural world beginning with the hunter-gatherer age, continuing through our modern understandings and approaches (2005). Human societies have grown in population, spreading out over the globe, and developed technologically, from early nomadic tribes to agricultural settlements, to industrial centers and the post-industrial world. Nature and natural resources have been important to human development at each stage, though the ways in which humans and the environment have interacted have varied. Human knowledge of the environment has evolved from early days to modern methods of manipulating natural resources to meet our needs and towards advanced ecological understanding. Throughout these periods of history, in one way human vulnerability to nature steadily decreased. However, risks remained and developed given the unpredictability of nature. This continuous state of risk and unpredictability, even today, holds important implications for ESD (discussed later in this section), but the discussion has also been taken up in other fields of social science (see Beck 1992; Bauman 2000). Human populations grew, technology and industry advanced, though different risks, through social inequality as well as effects of environmental destruction, emerged, representing vulnerabilities within humanity’s sphere of influence rather than previous risks like natural disasters. At the same time, the post-industrial age has seen technological and social advancements that could combat these vulnerabilities (Sandell et al. 2005). Much of these advancements and development of our approach to sustainability problems can be linked to changes in human understanding of the environment and ecosystems.

Throughout these historical developments, scientific discoveries and changing vulnerabilities, perspectives on the relationship between humans and nature became more complex and varied. The Enlightenment and Romanticism were significant in shaping the way human advancement and our relationship with the natural world is regarded, and many of the meanings and metaphors we understand today have their beginnings in these philosophical movements of the late 18th century. The anthropocentric ethical ideas of the Enlightenment, that humans can think and reason, and that therefore they have the ability to act morally, puts humans in a sphere separate from the rest of the natural world. It follows, then, that because only humans have these abilities, that it is our prerogative to use natural resources and the environment to fulfil our needs and advance
society (Sandell et al. 2005, pp. 97-103). The Romantic movement stood in contrast to the anthropocentric relationship espoused by Enlightenment thinkers, and from this movement the perspectives of biocentrism and ecocentrism have emerged. Where biocentrism values other organisms and emphasizes a moral obligation towards other lifeforms, ecocentrism places importance on the entire natural world, both living and non-living, as an ecosystem that should be maintained (Sandell et al. 2005, pp. 103-112). Sandell et al. traced these philosophical perspectives to modern ethical and values-based approaches to sustainability and what it should achieve, what should be protected or sustained, and how to approach specific sustainability problems. These ideas still exist today, though sometimes subtly, and lead to different perspectives on how to solve certain problems, based on the interests they prioritize. For example, when faced with a sustainability choice, such as protecting a species that may do damage to another part of the ecosystem or human developments, the perspectives of anthropocentrism, biocentrism and ecocentrism would lead to different outcomes (Sandell et al. 2005, pp. 93-113).

These perspectives on the relationship between humans and the environment, or ways in which humans have approached environmental problems, are significant. They provide an understanding that several views have existed and still exist. Our interpretations of reality, situated in historical, knowledge, or ethical perspectives are varied, and often ambiguous. In this way, the modern concepts of sustainability, SD and ESD also stem from various complex understandings and changing interpretations.

**Co-Evolutionary Theory of Society and Environment**

Another way to think about the relationship between society and nature lies in the questions of to what extent the environment determines human actions, and to what extent human actions determine our perception of the environment. Scott and Gough outlined various perspectives of how societies and the environment interact per biogeophysical and social factors (2003). Biogeophysical processes can be understood as the laws of nature and biology, outside of the human world and beyond human influence (Munasinghe & Shearer 1995 in Scott & Gough 2003, p. 4). Scott and Gough make a distinction here, however, that biogeophysical factors are often inconsistent with our idea of nature, as they can be used to describe any environment. The way we perceive our environment, around us, is constructed by our own meanings (2003, p. 4-5). In this way, social factors and our constructed meanings determine how we see the environment. Scott and Gough outlined possible views and combinations, which contributed to their co-evolutionary understanding of the relationship between society and environment (see figure 1; 2003).
The possible combinations indicated in this chart have been adopted by various perspectives in different fields of inquiry, such as sociobiology (Combination 1), deep ecology (Combination 3) and ecofeminism (Combination 9). Each of these views, argued Scott and Gough, offer limited understanding. Combination 1 (sociobiology), which presupposes that all human behavior is ultimately determined by biological factors, has been critiqued as reductionist in that it disregards diversity in human behavior and thought, and also limits what humans can learn and how we can adapt (Redclift 1987 in Scott & Gough 2003, p. 6). Deep ecology (Combination 3) asserts that social factors that determine human behavior work against the biogeophysical processes of the environment. This has implications for ESD, that implies a knowledge-based approach to learning and changing human behavior, explained further in section 3.2. However, Scott and Gough argued that this view is one-sided and simplifies the relationship of harmony between society and the environment. Combination 9, a view held by ecofeminists, has also been critiqued as naïve and limiting in that it ignores complexities of biogeophysical processes of the environment. This perspective implies that change must come only from social movements or activities (Scott & Gough 2003, pp. 7-8).

Combination 5 offers a co-evolutionary perspective on the relationship between human behavior, society and the environment. This view, first formulated by Norgaard (1984) proposed that both the environment and society initiate and react or adapt to changes in a sort of constant feedback between the two. Society and human social factors can influence the environment or ecosystems, though results are often uncertain, as biogeophysical factors in turn react, sometimes unexpectedly. Likewise, as environmental processes put pressure on social institutions, society adapts (Scott & Gough 2003). Acceptance of a co-evolutionary relationship recognizes the complexities of interactions between society and the environment, and indicates uncertainty in
approaching SD and ESD, which serves as useful links to the objectives and findings of this research.

The co-evolutionary perspective assumes that learning is a central process in the feedback loop, as both society and the environment constantly adapt to changes and take new approaches to threats or problems. In other words, these adaptations and methods require learning. In addition, Scott and Gough argued that linear predictions and assumptions about outcomes of environmental problems, taken as universal truths, “should be treated with extreme caution” (2003, p. 9). The idea of a complex and constantly changing relationship between the environment and society implies that outcomes are largely uncertain. At the same time, there is no single point in history that we can return to as a perfectly balanced equilibrium between nature and society, but rather that “all other times [are] points on a continuum of change” (Scott & Gough 2003, p. 9). Because of these changing aspects, a co-evolutionary approach indicates that a complete and certain understanding of environmental reality is impossible. However, human actions may be able to exert independent influence over society and the environment (Scott & Gough 2003).

Cultural theory, asserted Scott and Gough, provides a useful analytical framework of human and environmental interactions in line with a co-evolutionary approach (2003).

> “An approach from cultural theory starts from the observation that human knowledge, both of the natural environment and of human interactions with it, is imperfect and characterised by uncertainty and risk. In the face of this uncertainty and risk, social actors construct their interpretations of environmental reality.” (Scott & Gough 2003, p. 10).

In other words, as our understanding of the environment and the complexities of the human-environmental relationship is limited, human beings approach sustainability issues from a position of uncertainty and risk. From that uncertainty and risk, approaches to sustainability are characterized by constructed rationalities and perspectives of the reality of society and nature. To do this, actors must take calculated actions based on their understanding and interpretations, though this is complex, ever-changing and at times ambiguous. In turn, outcomes and reactions from the environment may be unknown. This is not straightforward or simple, and it is likely that actions may not achieve what was hoped; it is not so easy to gain control over the environment or adapt. Rather, there is room for interpretation and various possible courses of action.

Each decision, reaction and adaptation could represent learning that occurs during the process, allowing for the emergence of new theories and perspectives on the reality of social and environmental relationships.

A criticism of the co-evolutionary approach, articulated by Bonnet, addresses its limited understanding of social action or human behavior when approaching environmental problems (2013). Bonnet argued that a co-evolutionary approach treats human action as overly scientifically calculated, and implies that human beings weigh actions and make judgments in a rational way (2013). The reality is that human action is indeed not always rational or calculated, or that external and internal factors influence actors, such as teachers, to make irrational or emotional decisions, especially when faced with uncertainty and risk. On the other hand, through developing reflective
habits, actors can build capacity to think critically about how they approach issues and find ways to pursue sustainability (see section 3.1). For the purposes of this study, the co-evolutionary perspective as a lens does not necessarily imply rationality and such calculated action.

The co-evolutionary view of the relationship between society and the environment is adopted in this research, as it suitably explains the complexities of social-environmental interactions, as well as acts as a point of departure for the way in which we view sustainability problems and how they are addressed in ESD. From this understanding, human efforts in sustainability are a response to uncertainty and risk, whether these efforts are pursued through deep thought and reflection, or instinctive reactions. In other words, problems are interpreted by actors, who may react or make judgments and predictions, though the outcomes are largely ambiguous. This notion recognizes the importance of learning and adapting in order to address problems of unsustainability, a point that suggests the importance in developing reflective habits towards making judgments. It is worth noting, however, that the teachers in this study may adopt a view other than a co-evolutionary perspective of the human-environmental relationship, which would affect their approach to sustainability issues. It is not the purpose of this research to unearth these basic views, however. Rather, the co-evolutionary perspective is used as a lens through which we can explain and examine human actions in ESD.

2.2 Sustainable Development (SD)

The development of the global rhetoric of SD, and later ESD, is an important aspect of this research, as it indicates trends and discourses that influence teachers in their formation of habits and practices, and in turn the traditions that teachers are able to define through their habits and practices. Specifically, for the context of ESD in Kesennuma, Japan, UNESCO’s understanding of SD and ESD presumably plays a substantial role in defining the approaches taken at the school level, as local schools have all joined UNESCO’s Associated Schools Project Network (ASPnet) (Oikawa 2014a). However, the understanding that our relationship with nature and approaches to sustainability problems are ultimately ambiguous is reflected in the ambiguity of international discourses in SD and ESD.

A historical perspective on global approaches to environmental problems illustrates the basis for modern SD. However, the development of these concepts is not simply linear, as accompanying ideas and perspectives are multifaceted and interpretive, drawing on philosophical movements, ethical and political considerations and understandings of reality. It seems that throughout history and still today, actors react differently to the uncertainty of the environment and risk of unsustainability. General global movements led to an international understanding of SD promoted by the UN and UNESCO (Sandell et al. 2005).

In many parts of the world, national efforts to preserve parts of nature began in the late 19th century, after urbanization, the building of factories and the construction of widespread infrastructure in the industrial period. The establishment of national parks or protected areas in North America or Western Europe signified a reaction to industrialization. These efforts were associated with a preservation of humans’ connection to nature found in a pre-industrial era, or to tourism and recreation. This did little, however, to change the widely-held perception that development and societal advancement was ultimately positive. This idea was central to
Enlightenment thinking developed in the 17th and 18th centuries, though highly ingrained in the metaphors and meanings used by society even today (Sandell et al. 2005). Japan’s own national park system was established later, in 1931, though environmental trends to combat industrial pollution and the creation of a forest reserve system occurred earlier (MOE n.d.).

With democratic development, society’s role and participation in the preservation of the environment evolved. National and transnational organizations became more concerned with environmental policy, and perspectives critical of development emerged as environmental activism grew. At the same time, environmental issues were linked to social issues, especially in the decades following World War II. Particularly, the 1970s saw the emergence of activist groups, the introduction of environmental policy and the establishment of international and national organizations concerned with problems of the environment and their link to development. Environmental issues became globalized with the UN Conference on the Environment in Stockholm in 1972 (attended by Japan), and the modern concern of sustainable development became a key issue (Scott & Gough 2003; Sandell et al. 2005). Likewise, in Japan, the establishment of the Ministry of the Environment (MOE) in 1971 and Japan’s participation in the UN Conference in Stockholm in 1972 marked important advancement in the nation’s attention to sustainability issues (MOE n.d.; Kakuta 2014).

The trends of the 1970s moved the discourse on environmental protection to include deeper social issues. The 1987 Brundtland report, commissioned by the UN, marked a milestone in the development of SD as a concept and brought the term into mainstream use. The Brundtland report defined SD as “the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED 1987, p. 11). The Brundtland report also laid out framework for sustainability through the lens of environmental, economic, social and political concerns (WCED 1987).

The 1992 UN Conference on Environment and Development was another important milestone in the official policy and global position on SD. This conference paved the way for 1990s movements, discussions and discourses, and established the link between SD and education with chapter 36 of an action plan titled “Agenda 21.” Though the provisions of the plan were vague and broad, it is significant in promoting the discussion of education as a means to SD. The three goals were, “(i) reorienting education to sustainable development; (ii) increasing public awareness; and, (iii) promoting training.” In addition, the convention established the UN Commission on Sustainable Development (UNCSD), which would promote various aspects of SD throughout the decade, through agreements on biodiversity (the Convention on Biological Diversity, 1993) and climate change (the Framework Convention on Climate Change, 1994), as well as numerous conventions, and reviews of the progress of Agenda 21 and chapter 36 (Scott & Gough 2003, pp. 12-13).

These meetings, agreements and documents were formative in the UN and UNESCO’s approach towards SD and ESD. At the international level, the concept of SD has remained rather vague and ambiguous, framing some overarching themes and general rhetoric, though some would argue paradoxically and counterproductively (discussed later in this section). One widely-used conception of SD, adopted by the UN, UNESCO, the World Bank and various national bodies still
today, is that of the three pillars of SD: environmental, social and economic (see UN 2015; UNESCO 2015; World Bank 2017). Though some organizations may include cultural or political dimensions (including UNESCO in some publications; see UNESCO 2010), the three-dimension approach is most widely used and has the support of some leading SD and ESD actors at the international level. This approach represents a balance of growth and protection to achieve sustainability.

![Figure 2: Three Dimensions of SD (Scott & Gough 2003, p. 117)](image)

However, in practice the three pillars is a contested model, primarily due to its vagueness and proclivity to adaptation of SD to serve certain interests. For instance, actors working within SD usually represent, or lean towards, the interests of one of the three sectors. It is natural, then, for those actors to approach SD in a way that may, for example, emphasize economic impact at the expense of social and environmental issues. In addition, this arrangement makes it difficult for things to change, and becomes institutionalized (Scott & Gough 2003, pp. 117-118).

Critics have specifically voiced concerns over the pillar of economy. Some have argued that this aspect of SD has made it easy for policy-makers, politicians and businesses to advance neoliberal rhetoric in the discourse of SD, and focus on SD as economic growth to the effect of environmental degradation and social inequality. In other words, the economic aspect has allowed some to appropriate the concept of SD in a way that not only gives preference to neoliberalism and growth, but actively works against the concepts of environmental and social sustainability (see Irwin 2007; Jickling & Wals 2008; Huckle & Wals 2015). For these authors, the vagueness and ambiguity of SD represents a paradox. On the other hand, Nikel argued that “given that SD has become as contestable as other political ideas such as liberty, democracy and justice, it may actually be important to continue to celebrate its vagueness,” and “work with the assumption of an evolving field rather than a static conceptual framework” (2007, pp. 547-548), which recognizes potential for developing the concept and defining new forms of SD. These are important debates and discourses, as they directly relate to educational policy and how SD translates to understandings at various levels of action in ESD.

If Scott and Gough’s model of sustainability as uncertain and ambiguous is applied, the question of SD becomes one of how specific actors react and assess the situation. A vague and ambiguous framework at the international level makes these decisions and reactions additionally important. That is not to say that the UN and UNESCO do not provide a framework of
understanding, and there are other facets of knowledge, politics and ethics that guide our conception. Furthermore, the promotion of sustainability as a positive norm at the international level is significant, though what the goal is (if there is one), and how to get there, is ambiguous. In other words, there is an “absence of agreement about a process which almost everybody thinks is desirable” (Redclift 2014, p. 481). Though we may not be able to know how or point to specific actions, and there may be many ways to pursue sustainability, it nevertheless is worth pursuing, and is promoted as something that people should strive towards. Ultimately, the decisions and perspectives of actors working with their own conceptions of SD are significant, though their actions face challenges of uncertainty and unpredictability. Furthermore, the way that individuals develop their habits and purposes in working towards SD is unpredictable.

2.3 Education for Sustainable Development (ESD)

The concept of ESD, like SD, is a contested combination of discourses and approaches to sustainability through learning or education. As sustainability has become a priority as a positive norm at a global level, as described previously, and often at the local level, education has emerged as an appropriate channel to promote and achieve sustainability. This link has several implications, some of which are highly debatable. Questions remain, it seems, about what it actually means to achieve sustainability, if it is something to be achieved at all or merely worked towards, and by who, and what ESD actually looks like or should look like.

Historically, the foundations of ESD can be explained as a continuation of forms of environmental education (EE). Particularly, as the environmental movement of the 1970s became important, so too did EE in formal education (Sandell et al. 2005). At the policy level, the link between SD and education was made a priority in Chapter 36 of the 1992 action plan, “Agenda 21” (see section 2.2; Scott & Gough 2003, p. 12-13). Throughout the 1990s, the action plan and Chapter 36 were reviewed and revised, and international organizations, such as UNESCO, continued to promote ESD, though the message of SD seemed to change little (Scott & Gough 2003, pp. 12-15).

Following the 2002 Rio Plus Ten World Summit on Sustainable Development in Johannesburg, South Africa, the UN established the Decade of Education for Sustainable Development (UN DESD), which would last from 2005 to 2014. UNESCO was named the lead organization in the promotion of the UN DESD. The official aim of the initiative was to provide that “everyone has the opportunity to benefit from education and learn the values, behaviour and lifestyles required for a sustainable future and for positive societal transformation” (UNESCO 2005). The implication is that ESD is beneficial for all students to achieve a “sustainable future,” though what that future looks like is not clear. The goal also represents a normative approach to education (see section 3.2 for a further discussion of theoretical approaches to ESD), focused on changing behavior, though again it does not seem clear which values or behaviors are desirable in order to create a sustainable society. Some authors echo these concerns, as will be presented later in this section (see Huckle & Wals 2015; Hoffman 2015).

The final report on the UN DESD in 2014 presented a more complex and challenging picture of SD and ESD, recognizing the difficulty in defining the concepts and acknowledging the importance of various perspectives. It also identified that actors working in ESD approached
problems differently (UNESCO 2014a). The follow-up initiative to the UN DESD, UNESCO’s Global Action Programme (GAP) on ESD, similarly cites the need to recognize and learn from alternative perspectives, and highlighted the importance of critical thinking and capacity-building, which constitutes a different approach from the initial UN DESD’s values-based, or normative, conception of ESD (see section 3.2 for a further discussion of theoretical approaches to ESD) (UNESCO 2014b). These publications return to vague conceptions of SD and ESD, but continue to emphasize the importance of teachers and students working with the concepts towards the goal of a sustainable future. It seems, though, that UNESCO may also recognize the uncertainty of what that future may be, and acknowledges that actors may have different, valid ideas about how to work towards sustainability.

ESD at the international level results in some paradoxes and uncertainty, due to the vagueness of the conceptual definition, and because it is difficult to say what constitutes teaching or learning in sustainability, or what it is to achieve. Primarily, the meanings that are conveyed by the term ESD, and the appropriation of ESD by various ideologies and political movements are problematic. Early in ESD discourses, Jickling wrote a short but significant article, which critiqued ESD as “a vague slogan susceptible to manipulation” (Jickling 1992). Jickling cited a lack of philosophical analysis and consensus on the concept, and had reservations about the appropriateness of education for anything, as a normative tool for altering thinking and behaviors (Jickling 1992). Van Poeck and Vandenabeele echoed Jickling’s concerns, arguing that the perspective of education as a normative tool frames sustainability issues as “learning problems of individuals,” rather than (more desirably) public questions of democratic discourse (2012).

McKenzie et al. described sustainability education as a ‘vehicular idea’ (2015, p. 320). In other words, its ambiguity allows actors, such as policy makers, to appropriate the concept of ESD for political agendas or purposes, notably neoliberal policy, or marketization and standardization, an economic-like approach to education (McKenzie et al. 2015, pp. 320-326). Jickling also referenced the problem of neoliberal rhetoric contaminating the purposes of ESD (Jickling 2013; 2016). These authors argue that ESD as mainstream rhetoric has little capacity to change the status quo, which is largely unsustainable (see also Hoffman 2015). Rather, sustainability education must confront hegemony, especially the hegemonic power of neoliberalism (Huckle & Wals 2015). Jickling argued, “Good education that can enable change, and that can transcend the status quo, requires non-conformism and risk” (2013, p. 174).

As the paradox, ambiguity and uncertainty of ESD at the international level grows, the question of how individual actors pursue sustainability in education becomes increasingly significant. Though several authors seem to argue against the UN and UNESCO’s conception of ESD, or the mainstream rhetoric that surrounds the term, they also suggest that sustainability is something that can be pursued through education, and it is something that we all can and should work on. However, it appears necessary to be cautious about how ESD is approached and why certain actions are being taken. This critical perspective adds to the discussion that actors inevitably approach ESD from a point of uncertainty, and that it is important to confront this uncertainty through habitual reflection.
The explanation of the formation of ESD at the policy level and the discussion of critical perspectives show that the discourses and approaches to ESD at the international level are ambiguous, in that there is not a clear consensus on what sustainable actions are, what should be sustained, how sustainability might be achieved through education, or if the perception of education as a tool to achieve anything is appropriate. Though policy and ESD rhetoric, and even critical authors, sometimes reference a sustainable future, it is uncertain what, exactly, that future would look like. On the other hand, it is generally agreed that education is a fitting avenue by which to pursue sustainability. That is not to say that sustainability is necessarily an end goal, or that education is a tool to achieve it, though some actors may hold this perspective. Teachers and leaders approach ESD in diverse ways, and must make decisions about how to pursue sustainability from a point of uncertainty and ambiguity, which is evident in the rhetoric and international discourses on ESD.

3 Theoretical Framework

The theories outlined in this section serve as a base from which the study was designed and carried out. The framework has been helpful as a lens through which to approach the aims, objectives and research questions. Theoretical questions raised in work by previous authors are examined as a point of connection to the findings of the research without constricting the analysis, and indicate implications for the implementation of ESD on a larger scale. The basis for theory used in this research, primarily concerned with the habits and purposes of teachers, along with companion meanings, as they connect to approaches in ESD, has been closely articulated by recent authors Sund (2008; 2015), and Sund and Wickman (2008), but builds on work by Hart (1996; 2003), Sandell et al. (2005), Nikel (2007), and further derives from the pragmatist tradition constructed by John Dewey (1922). In addition, categorization of approaches to ESD, notably work by Scott and Gough (2003) and Vare and Scott (2007), add to the theoretical lens of traditions and companion meanings in teaching and ESD.

An examination of the concepts of perceptions of society and environment, SD and ESD indicates an ambiguous and complex field, filled with various views and purposes. Ultimately, teachers are charged with the application of ESD in classrooms through engagement with students and the community, and in turn must interpret, develop habits and make judgments about the best way forward for sustainability. In turn, their actual teaching practices can convey meanings beyond the content, of their beliefs and purposes. Therefore, a better understanding of the habits teachers develop in their practice through interaction and reflection can reveal these meanings and purposes given to students beyond teaching. This in turn can be linked to general traditions in teaching ESD.

3.1 Teachers’ Habits

The theoretical framework of using teachers’ habits as an object of study builds on John Dewey’s discussion in Human Nature and Conduct: an introduction to social psychology (1922). Habits, in this sense, are not simply actions repeated by teachers, but rather deep and complex activities. Teachers habits are shaped contextually through interaction and argumentation in their practice, and socially through understanding purposes of education and customs, which are a sort of collective habit. Teachers shape their practice based on their idea of the best way to reach
students and encourage learning. As Dewey stated, this shaping occurs through interaction and teachers’ own construction, but also through social context. Teachers’ habits are largely influenced by traditions and philosophies in education, and what are considered best practices (Dewey 1922).

Dewey makes a distinction between subconscious, unreflective habits, such as instinct or reaction, and reflective action. Teachers’ habits may operate sometimes in the subconscious, as unreflective habits. In this way, the teachers themselves may be unaware of why they make certain decisions, and they may not be able to articulate the deeper meanings of their habits. In ESD, the uncertainty and unpredictability of working towards sustainability may be ignored. Developing reflective habits necessitates that educators think deeply and critically about their teaching, both in its purposes and the uncertainty of its outcomes (Dewey 1922). In the context of ESD, the understanding of educators’ reflective habits is useful, and represents an apt approach to the reality of pursuing sustainability despite challenges.

As has been outlined in the chapter 2, the concepts of SD and ESD are complex and ambiguous, in that the discourses and approaches are varied and contested, and actors make decisions based on diverse viewpoints. Furthermore, nature can be unpredictable and may present risks, as conditions constantly change and react, which complicate sustainability problems independent of individual actors’ approaches. There is inherent uncertainty and unpredictability, though educators may not confront these realities without developing reflective habits. In this way, reflective teachers and actors approach sustainability problems from a point of uncertainty, without being able to predict outcomes. However, uncertainty and risk do not necessarily discourage people from pursuing sustainability, nor should they. Rather, the cultivation of reflective habits helps teachers deal with uncertainty and risk, which are an important part of the pursuit of sustainability in ESD. Reflective questioning as a method of research could be useful for teachers, as it helps them acknowledge their underlying habits and purposes in education, as well as uncertainty. In this way, research can help teachers develop and adjust their approaches in ESD (Sund 2015).

Even if we assume that SD and ESD are desirable, we cannot say for certain what the process of working towards sustainability looks like (see Jickling 1992; Scott & Gough 2003; Sandell et al. 2005; Vare & Scott 2007; Van Poeck & Vandenabeele 2012). SD and ESD represent a positive norm, in which they are things teachers are told or feel they should do. However, we may not be able to say for certain which actions lead to sustainability. So, teachers make decisions and develop understanding and practices based on uncertainty, in the ways that they present problems to students, place emphases on social and environmental relationships, and convey ideas to students about how to solve sustainability problems (Scott & Gough 2003). Furthermore, as a developing undertaking in schools, there is not a wealth of established and empirically developed practices. That is not to say that there is not a diverse discourse on approaches to ESD, and teachers probably have some understanding when they start teaching of their own purposes in ESD. However, while teachers are influenced by traditions in teaching, philosophies of education and ESD discourses, they also help shape the approaches to teaching ESD through their collective practice and habits (Sund 2015). In this way, teachers help to develop the evolving discourses in ESD teaching. Experienced teachers of ESD as the object of this research represent actors that
have developed reflective habits over time and throughout the changing discourses in ESD, which are looked to as models of good practices.

The focus of this study is specifically on habits and descriptions of the purposes and goals they hold in ESD, which represent how teachers choose to work to pursue sustainability. Teachers’ habits differ from teacher thinking, in that habits are deep-rooted and complex, as explained by Sund (2008; 2015), though research in teacher thinking is also an important point of departure for understanding how teachers develop their purposes and practice in ESD (see Hart 1996; 2003; Nikel 2007; also section 1.4).

Teachers’ reflective habits and approaches suggest their personal ideas about education and ESD, and reveal purposes beyond teaching, or ultimate goals for student learning and sustainable change. In other words, these habits guide teachers in how they present topics and decide what themes and concepts are important for student learning, based on what they hope teaching ESD will achieve, and what students will learn, which will allow them to enact change. For example, teachers may select content and present topics that emphasize critical thinking and analytical skills, or their methods may be rooted in scientific fact and inquiry. Both habits represent approaches to ESD, and show what the teacher hopes their students ultimately take away and can do to work towards sustainability. The themes that emerge from reflective questioning in research point to perspectives or approaches to ESD that can be linked to larger traditions in teaching and in ESD, or collective habits, which change and evolve with the teachers themselves (Sund 2008).

3.2 Traditions and Approaches in Teaching ESD

Teachers’ habits are developed within a larger context of education and ESD discourses. Individual teachers form their habits based on ideas at various levels about appropriate ways to teach ESD, though these ideas are numerous and often conflicting, which accounts for variation and interpretation, and adoption of a certain line of reasoning or technique. Habits of serious reflection are necessary to deal with the challenge of interpreting and selecting approaches to ESD. Collectively, these habits can be understood as traditions in teaching ESD, though they might also be called ‘approaches,’ ‘types of teaching in ESD,’ or ‘educational philosophies.’ These traditions form the discourse of how to approach education, teaching and learning, as well as how we understand ESD.

Sandell et al. explored “selective traditions in environmental education,” specifically in Sweden, but similar traditions or approaches are found elsewhere (2005). Their research found that since the 1960s, three distinct traditions have emerged. These traditions can be explained as collective habits for selecting content and methods that teachers regard as best practices, and in the case of EE and ESD, how environmental issues are approached. They offer a “frame of reference” for teachers, who decide what they believe to be the best approaches to education, the environment and ESD (Sandell et al. 2005; Sund 2015). Sandell et al. created a framework for understanding the selective traditions found in EE and ESD in Sweden by looking first at two aspects of EE and ESD that they found to be significant: approach to environmental issues and general educational philosophy. An approach to environmental issues refers to which ethical, political, ecological or economical perspectives are most important. A general educational philosophy can be revealed by asking three questions of teaching: “why? – the motives of
education; *what?* – the content of education; and *how?* – the method used in education” (italics in original, 2005, p. 156). These two understandings combined to form precise traditions in education, with agreements in subject and content selection, teaching methods, and the role of students (Sandell et al. 2005, pp. 156-168).

Through this framework, the three traditions that emerged were, “Fact-based Environmental Education,” “Normative Environmental Education,” and “Education for Sustainable Development (ESD).” Though these traditions developed during certain historical periods, and are primarily related to EE, all three can be found in aspects of teachers’ habits and practices within ESD teaching today. The authors also note that these may be somewhat simplified descriptions of the three traditions (Sandell et al. 2005, p. 156). The fact-based tradition values scientific knowledge and research to solve environmental problems, where “[t]here is an assumption that if teachers teach scientific knowledge to everyone in schools then environmental problems caused by human activities will disappear more or less automatically” (Sund & Wickman 2008, p. 148). Scientists and experts seem to have a larger responsibility to solve environmental problems. This approach aligns with an anthropocentric ethical standpoint, rather than biocentric or ecocentric. The normative tradition frames environmental problems in terms of “conflict between humans and nature,” solved by values and behavior (Sandell et al. 2005, p. 162). The goal of EE, or ESD, is to transmit environmentally-conscientious behavior norms or values to students, which are based on our scientific knowledge. Often, this involves experiential learning and an emphasis on application of what students have learned in the real world. The third tradition, somewhat confusingly referred to as ESD, represents a pluralistic tradition. Sandell et al. also note that this tradition has received more influence from international debate about ESD and sustainability than the other two traditions. In this tradition, the conflict is not between humans and nature, but rather between different human aims. In other words, “environmental problems are seen as political and moral issues” (Sandell et al. 2005, p. 164). There are a variety of opinions about what environmental or developmental problems there are, how to solve them, or which are even worth solving. The ESD or pluralistic tradition considers these differing opinions as appropriate, and places emphasis on the democratic value of education. In other words, the goal for students in this approach is to develop democratic skills, such as critical thinking and a capacity to recognize, discuss, debate and evaluate different perspectives, to help create a sustainable world. This tradition also recognizes the complexity of sustainability as an issue in both the local and global community, as well as between generations and the past, present and future (see also table 1 for the authors’ descriptions) (Sandell et al. 2005, pp. 160-168; Sund & Wickman 2008, pp. 148-149).
The descriptions of the three traditions above also have implications for companion meanings conveyed by teachers working within these traditions. For example, teachers working within a certain tradition may not explicitly express their understanding of human and nature relationships, but imply a certain perspective when teaching (see section 3.3 for detailed discussion of companion meanings).

Scott and Gough similarly described three distinct approaches in ESD, through theory development focused on how “learning leads to social change” (2003, p. 111). These approaches also developed within a historical timeline, and elements of each approach could be found in initiatives today. They argued that the first two existing approaches are both inadequate to explain the complexities of sustainability, nor do they represent a model that connects meaningful learning to sustainable change. They also stated, however, that each type contains valuable considerations and practices for sustainability, and in certain instances can be useful for helping students work through sustainability problems. The authors argued, however, that type one and type two approaches are not adequate as ideologies, to approach every issue (Scott & Gough 2003, pp. 111-114).

Type one theories are described as simplistic and linear (see figure 3). Environmental and social problems can be understood by knowledge and awareness. These types of theories are similar to Sandell et al.’s fact-based tradition. More than knowledge acquisition, though, Scott
and Gough argued that this type of theory also emphasizes that “people should be instructed, or manipulated, into doing what is ‘good’ for ‘them,’” thus leaving little room for education (Wilson, 1975; Ehrlich, 1968; Goodland, 2002 in Scott & Gough 2003, p. 113; Vare & Scott 2007).

Type two theories frame the issues of SD as social problems, with environmental degradation as a “symptom” of social conflict. These theories are associated with educational models of critical social theories (see Freire 1971; Habernas 1978; Carr & Kemmis 1986; Kemmis & Fitzclarence 1986; Pepper 1989; Fien 1993 all in Scott & Gough 2003, p. 113) and “emancipatory curriculum.” Through social and environmental justice, approaches of this type seek to empower students to solve problems of unsustainability. However, Scott and Gough argued that these approaches also oversimplify SD and can be contradictory, without a clear path to implementation (Scott & Gough 2003, pp. 113-114). Like the type one approach, type two theories place an emphasis on listening to expert voices rather than representing a more democratic approach to ESD (Vare & Scott 2007).

Type three theories are described as “co-evolving problems and adaptive solutions.” Type three utilizes cultural theory’s understanding of multiple rationalities heuristic, which Scott and Gough found useful as an explanation for reaction to uncertainty and complexity. Individuals may hold contradictory or confused perceptions based on which rationality they adopt at any given moment: fatalistic, hierarchical, individualistic, egalitarian (see table 2). These rationalities are adapted from James and Thompson (1989 in Scott & Gough 2003). Each category assumes a position on or has expectations of competition and equality in the natural world and social organizations. For example, an individualist sees the world as competitive and equal, while a fatalistic position views the world as competitive but unequal. Each of these rationalities is also associated with a “myth” or interpretation of nature. The learning process for type three theories is described as fluid and reflexive, with a focus on providing students with multiple competing perspectives and definitions. However, what is supposed to be achieved, or an end-goal, is unknowable. Rather, ESD is treated as a process of learning, complete with uncertainty and complexity (Scott & Gough 2003, pp. 114-116; Vare & Scott 2007, p. 193).
<table>
<thead>
<tr>
<th>Rationality</th>
<th>Description</th>
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| **Fatalistic** (competition/inequality) | • nature seen as capricious  
• trust to luck  
• what will be will be |
| **Hierarchal** (no competition/inequality) | • nature seen as tolerant if properly managed – but otherwise perverse  
• trust established organizations  
• institutions should regulate behaviour in relation to the environment by making social rules |
| **Individualistic** (competition/equality) | • nature seen as benign  
• trust successful individuals  
• markets should regulate behaviour in relation to the environment |
| **Egalitarian** (no competition/equality) | • nature seen as fragile and ephemeral  
• trust local participatory organisations  
• considerations of equity and justice should regulate behaviour in relation to the environment |

Table 2: Multiple Rationalities of Cultural Theory (adapted from Scott & Gough 2003, p. 10)

Vare and Scott described two approaches to ESD, which build on the theories outlined earlier by Scott and Gough, called ESD 1, “Learning for sustainable development” and ESD 2, “Learning as sustainable development” (emphasis in original; see table 3). ESD 1 is similar to Scott and Gough’s type one and type two theories of ESD, where ESD 2 more closely resembles type three theories. Vare and Scott explained that ESD 1 and ESD 2 are complementary, using Yin and Yang as a heuristic to describe the two approaches (Vare & Scott 2007).

| ESD 1                          | • Promoting/facilitating changes in what we do  
• Promoting (informed, skilled) behaviours and ways of thinking, where the need for this is clearly identified and agreed  
• Learning for sustainable development |
| ESD 2                          | • Building capacity to think critically about [and beyond] what experts say and to test sustainable development ideas  
• Exploring the contradictions inherent in sustainable living  
• Learning as sustainable development |

Table 3: Two sides of ESD (adapted from Vare & Scott 2007, pp.193-194)

ESD 1, or “learning for sustainable development,” represents a model of ESD found at the national and international organizational levels like UNESCO and the UN DESD. In this sense, ESD is a top-down initiative, driven by expert knowledge and clear values. If people do what they should, or what is rational, sustainability will follow, and we can make improvements easily and quickly. Vare and Scott argued that for some simple issues, there are obvious solutions that can be promoted by ESD 1. However, problems are not always simple, and people are not always rational. There is an additional problem that this type of ESD actually limits our capacity to react to changes and plan for the long-term future (Vare & Scott 2007).
ESD 2, or “learning as sustainable development” implies that learning and SD are synonymous, and that ESD is an ongoing, reflective process. Learning, in this sense, is about building capacity to think deeply and critically about problems, to better make decisions for the future. It follows, however, that ESD 2 is not directly measurable, as success is open-ended, and “outcomes will depend on people’s unforeseen decisions in future, unforeseeable circumstances.” Rather than sustainability as an end result, learning is emphasized as the outcome (Vare & Scott 2007).

These two approaches to ESD are complementary, argued Vare and Scott. ESD 1 has value in that knowledge and training can solve some problems. However, it is only meaningful if ESD 2 can build capacity to analyze, to challenge, to negotiate and to consider alternative perspectives and options. In this way, people can make choices for the future. The goal would not be SD, but rather we could see SD through people’s learning (Scott & Gough 2003, p. 147 in Vare & Scott 2007). Nevertheless, in formal education, it is often ESD 1 that is dominant, though Vare and Scott argued for rebalancing. Through the example of Yin and Yang, they explained that both types are located in the other, ESD 1 could easily become ESD 2 and vice-versa, and the two types are interdependent (Vare & Scott 2007).

These traditions and approaches to ESD represent the way that individual teachers’ habits, as discussed in section 3.1, work at a collective level to form discourses in teaching and education. Teachers are both influenced by larger traditions and influence them through their practice and what they convey as important to students.

### 3.3 Companion Meanings

As discussed previously, teachers develop their habits and practices through interaction, experiences and influences from teaching traditions, approaches or philosophies. In theory, teachers take these experiences and habits, and then reflect on the best way to teach and what is important for students to learn, though sometimes this is done unreflectively. Through this, they “do not only explicitly communicate a certain intended content, but through speech and other actions also communicate a number of other unintended, implicit messages. These tell the students what is to be regarded as important, what is being aimed at, or how the content might be related to the world at large” (Sund 2008, p. 3).

In other words, teachers convey their own reflective habits and approaches to uncertainty as **companion meanings**, or those implicit messages or understandings offered to students in addition to the educational content. Sund stated that companion meanings can also be thought of as “socialization content,” though the distinction here is that the object of this study (and Sund’s) is not the socialization content that is deliberate to maintain societal rules, but rather the offerings of meanings for students by individual teachers, based on their own reflections and habits (Sund 2008).

Though the content of education, for example within ESD, may be quite similar across schools and between different teachers, individual teachers also make choices daily within their practice that reflect their personal habits and ideas, and they can be distinguished by the companion meanings that are delivered to students. Their practices may generally correspond to traditions or approaches in teaching, and often convey companion meanings about the subject (Sund 2008;
Roberts & Östman 1998 in Sund 2008). Subtle choices based on values and purposes made by teachers also come through in their practice, though the underlying habits are not always explicit (Hart 2003 in Sund 2008). These companion meanings act as “points of departure” for teachers, and represent underlying purposes, goals and ideas that shape their approach to education and ESD (Sund 2008).

In ESD, the conceptual ambiguities allow for interpretation by teachers on various levels, and thus teachers’ habits and their companion meanings are important objects of study. How individual teachers’ personal values and habits are conveyed as companion meanings to students has the potential to shape the future discourses on ESD (Sund 2008; 2015). This study identified certain themes that represent points of departure for teachers’ approaches to ESD, which are offered to students through companion meanings during their teaching.

The purpose or goals of learning in ESD, or education in general, though sometimes explicitly stated by teachers, are also conveyed through companion meanings about what it is that is important for students to learn. This point of what teachers hope their students will learn reveals related meanings about teachers’ approaches to individual and collective capacity-building, knowledge and abilities, and collaboration through democratic activities or capacities in education (Nikel 2007; Sund 2008). This has also been discussed as an object of responsibility, or a point that teachers believe to be the most vital aspect of ESD learning (Sund 2015). Teachers’ reflective habits are conveyed in companion meanings about how certain aspects of sustainability and ESD are dealt with. The traditions and approaches, explored in section 3.2, are also conveyed to students through companion meanings, and have an impact on what students learn, whether teachers value fact-based, normative or pluralistic approaches.

The relationship between society and nature, as discussed in section 2.1, also represents a critical point of departure for teachers, and an issue of complexity. This is especially important considering the uncertainties and risks inherent in ESD teaching. Questions about how teachers relate students to the environment may not be explicit in content delivery, but are apparent in companion meanings conveyed to students. The meanings made by teachers and students influence how ESD looks and develops as a practice in a place. The implications of teachers’ understanding of this relationship, and how it is presented to the students, connects to themes of responsibility, how complex issues are confronted, and what teachers and students can be hopeful for the future.

Likewise, how teachers present interaction between the school and outside communities convey companion meanings. From the selection of content and activities that value interaction, students are given companion meanings about the importance of sustainability issues and continuous work on these issues outside of their school lives. Interactions with the local community convey messages about how students can work on sustainability issues in society, who is responsible, what might future work in sustainability look like, and what teachers are hopeful for. One way to look at these companion meanings is by gaining an understanding of how teachers value these interactions and the knowledge that can be gained in school, or how that may benefit students’ interactions in the outside world (Sund 2008).
This is closely related to the role that students have in ESD in school. Teachers address this not only explicitly, but implicitly by conveying meanings about student citizenship and how students can contribute to ESD and education in general. This is related to the issue of responsibility for sustainability. Teachers’ ideas about power relations between students and teachers shape the ways that they present how students can contribute to solving problems or directing their own learning (Sund 2008). In other words, autonomy given to students in ESD in school can translate to a sense of responsibility outside of school. The extent that teachers give students autonomy in school reveals their underlying approach to students’ roles and the responsibility of sustainability.

Issues of hope, responsibility, the future and complexity are important in understanding how teachers feel students should learn, what they can contribute and what the purposes of ESD are. Hope that teachers have for students or ESD, beyond what happens in the classroom, is an anchor point for teachers’ practices or habits, though perhaps something that they rarely reflect on. Questions about what teachers are hopeful for, in the face of uncertainties and complexities, can show how teachers build capacity in students, what they regard as useful, and why their teaching and ESD are important. Likewise, how the complexities and uncertainties are presented to students (or not presented), give students opportunities to develop certain skills, send messages about what kind of knowledge is useful, and convey meanings about how teachers view the reality of the world (see Sund 2015).

Some companion meanings and themes were used as a starting point for constructing the methodology of this study, while others emerged during interviews with teachers.

4 Methodology of Study

The methodology of the research informs data collection and analysis in line with research questions, aims, objectives and theoretical foundations. The methodology is organized in alignment with considerations outlined by Bryman (2012), and is organized through the following considerations. Epistemological and ontological alignments help to define a framework for understanding phenomena. The research design, a qualitative case study with an inductive approach, establishes an approach to the specific case. Sampling design, data collection methods and data analysis methods outline in detail the process of the research project. Criteria of trustworthiness demonstrate how the researcher has responded to the requirements of academic research practices. Finally, ethical considerations show how the research has taken care to ensure that the participants and the data collection were handled carefully and correctly.

4.1 Epistemological and Ontological Considerations

Epistemology is an important orienting factor for any research project, concerned with “the question of what is (or what should be) regarded as acceptable knowledge in a discipline.” The epistemological alignment adopted by this research aligns with pragmatic interpretivism. In other words, the focus of the study is concerned with teachers’ perspectives and interpretations of reality, rather than an approach that values positivistic scientific methods (Bryman 2012, pp.27-32). Teachers’ reflective habits demonstrate their underlying beliefs about how the world is and how that reality should be represented in teaching. These are constructed through interaction and
experience, and in turn, these beliefs and habits inform teaching practice. Companion meanings that are given to students are also important, as they can influence student interpretations of reality. How teachers describe and reflect on their own habits in working towards sustainability, and how their own understandings have been constructed are significant and valid objects of study.

Ontology considers how social entities are either constructed or confront social actors. The research assumes a constructionist ontology, giving importance to the meanings and social phenomena as they are constructed by actors, in this case educators (Bryman 2012, pp. 33-35). In this way, their understanding of sustainability and the meaning given ESD efforts is constructed by the teachers and leaders that practice ESD. The underlying uncertainty inherent in ESD, represented by various purposes, responsibility, complexity, the relationship with nature, and the future are intricate social constructs, created by the teachers who practice and educate young people. These perspectives are important to understanding how educators themselves stretch and create the social framework for ESD in their community and schools.

4.2 Qualitative Research Design

The research is designed as a qualitative case study of ESD teachers’ and leaders’ approaches and habits in Kesennuma, Japan. The qualitative design provides the framework for sampling, data collection and analysis methods. The purpose of this study is to gain insight on the individual perceptions of teachers and leaders, and therefore does not make an attempt to quantify or generalize results to a larger population. Nor does the study aim to test a hypothesis. Rather, the focus of the study through qualitative research aims to uncover the complexities of the unique case, and provide a rich understanding of these teachers’ approaches to ESD, in the hope that these insights can be useful and connect with other cases and academic work (Noah & Eckstein 1998; Bryman 2012).

As such, the design as a qualitative case study allows the research to approach the perspectives of local actors in ESD openly through an inductive approach, in which theory is generated and built from the data collection and analysis of a specific context. This method is used to limit preconceptions and obstacles to uncovering the genuine perspectives of the actors. However, the qualitative, inductive approach potentially increases the risk of subjectivity, and thus considerations of criteria of trustworthiness are important to acknowledge (see section 4.6).

4.3 Sampling Design

The selection of a sample of teachers was based on purposive sampling, in which participants were strategically selected due to their relevance to the research questions and aims and objectives, rather than at random. This is a non-probability sample, without the purpose of generalization or testing a hypothesis. First, a location was chosen with relevance to the aims, objectives and research questions of the study, followed by criteria for respondents (Bryman 2012). The Kesennuma City Board of Education (BOE) made suggestions of specific respondents and arranged the meetings with educators, though the availability of educators was limited. Considerations for the selection of a sample were based on the criteria of teachers working at an elementary or junior high school in Kesennuma, and having experience teaching ESD. Additionally, the opportunity arose to interview two teacher supervisors working in the BOE,
though both had previously been highly experienced teachers working with ESD at Kesennuma schools.

Kesennuma was selected as a location for this research as a unique case of local implementation of ESD. The situation in the city and in Kesennuma schools provides a multifaceted confluence of influences from UNESCO and the national ministry of education, a long tradition and history of environmental education and ESD activities, and an interesting case of environmental concern as a location rich in natural spaces and a city heavily affected by the Great East Japan Earthquake and Tsunami. In particular, Kesennuma schools’ promotion of ESD and development of school activities represents a model of ESD that has been recognized throughout Japan, and teachers and leaders have been regarded as highly experienced in ESD (see Oikawa 2009; 2014a; Kesennuma City BOE 2013; ACCU 2014; Interministerial Meeting 2014; MEXT 2016). A 2013 report by the National Institute for Educational Policy Research (NIER) recognized Kesennuma as one of a few cities in Japan where “systematic teacher training programs… [were implemented] and developed many good practices for ESD” (Kadoya & Goto 2013, p. 56). In other words, as leaders in ESD in Japan, Kesennuma schools and the City BOE represent an ideal opportunity to learn about the practices, habits and understandings of teachers working with these concepts.

The criterion of elementary or junior high school teachers in Kesennuma was selected as a representation of compulsory education at a local level. Originally, elementary schools were chosen as the main object of focus for the research, as the City BOE’s ESD promotion and activities programs started at this level (Oikawa 2014a). In addition, research has shown that teachers of lower grades in Japanese schools feel they have more autonomy to focus on community projects, rather than teach for entrance exams and national standards tests (Cave 2011; 2016; Bjork 2016). It was assumed, then, that ESD programs in elementary schools could be further developed than those in junior high schools and high schools. Through the course of the research, junior high schools were also included in requests for participation to increase the number of respondents. The inclusion of junior high schools also offers a deeper look at the progression of ESD activities in schools throughout a students’ academic career, and suggests comparisons between elementary and junior high teachers’ habits and perspectives, though the intention is not to draw direct comparisons based on this grouping. It is also worth noting that many ESD activities are part of a subject in Japanese schools called integrated studies (sōgō gakushū no jikan), introduced in 2002 only at the elementary and junior high levels.

Teachers experienced with ESD were considered as a source of deep understanding, and capable of reflecting on ESD and their habits over several years of teaching, though the years of experience between teachers varied somewhat. Several studies point to a lack of teacher knowledge or developed understanding in the concepts of ESD (see Hicks & Bord 2001; Sund & Wickman 2008; Sund 2008; 2015; Borg et al. 2014.). However, this research attempts to build on studies of experienced teachers in ESD, with well-developed ideas, understandings and habits, as an opportunity to compare and learn from these perspectives (see Sund 2008; 2015). The choice of reflective questions and the attempt to find companion meanings requires that teachers have practiced ESD and built their personal habits and ideas about education and ESD. Therefore, a
choice was made to interview teachers and leaders in Kesennuma with several years of experience teaching and promoting ESD.

Below is a table showing the details of the respondents of this research. Both the names of the respondents and names of the schools have been changed to protect anonymity (see section 4.7).

<table>
<thead>
<tr>
<th>Respondents</th>
<th>School</th>
<th>Position</th>
<th>Interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yamada</td>
<td>BOE</td>
<td>Teacher Supervisor, previously junior high school</td>
<td>Individual</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Science teacher (23 years teaching)</td>
<td>Interview</td>
</tr>
<tr>
<td>Takahashi</td>
<td>BOE</td>
<td>Deputy Associate Director and Coordinator of ESD</td>
<td>Individual</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(34 years teaching)</td>
<td>Interview</td>
</tr>
<tr>
<td>Ito</td>
<td>Ogawa Elementary School</td>
<td>Principal (34 years teaching)</td>
<td>Joint</td>
</tr>
<tr>
<td>Sasaki</td>
<td>Ogawa Elementary School</td>
<td>Grade 5 Mathematics teacher and school ESD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>organizer (22 years)</td>
<td></td>
</tr>
<tr>
<td>Tanaka</td>
<td>Kanda Elementary School</td>
<td>Grade 5 Science teacher (4 years)</td>
<td>Joint</td>
</tr>
<tr>
<td>Nakamura</td>
<td>Kanda Elementary School</td>
<td>Primary ESD coordinator (30 years teaching)</td>
<td></td>
</tr>
<tr>
<td>Shimizu</td>
<td>Mogami Junior High School</td>
<td>Chair of Disaster Risk Reduction (DRR) Education,</td>
<td>Joint</td>
</tr>
<tr>
<td></td>
<td></td>
<td>previously Science teacher (15 years)</td>
<td>Interview</td>
</tr>
<tr>
<td>Hirose</td>
<td>Mogami Junior High School</td>
<td>Teacher (12 years)</td>
<td></td>
</tr>
</tbody>
</table>

Table 4: Respondents of Interviews

4.4 Data Collection Methods

Semi-structured interviews, and analysis of presentations given at two of the three schools, were used as methods for collecting data. The use of semi-structured interviews allowed for conversations with teachers to develop naturally, and let teachers give deep and thoughtful answers. The complexity of the concepts and themes explored in the research required the respondents to develop their answers thoughtfully and freely through open-ended responses. The purpose of the interviews was to allow teachers to reflect on their own habits and approaches, allowing themes and concepts to emerge from the data (Bryman 2012).

Before interviewing teachers, an interview guide was developed in alignment with the theoretical foundations of this study, and considering various themes important to the research questions, aims and objectives. Questions were designed based on previous research in the field, drawing on studies conducted by Sund and Wickman (2008), Sund (2008) and Sund (2015). These studies provided useful interview guides and considerations of looking for answers to questions carefully aligned to the theoretical position adopted by those authors, which is also similar to the theoretical considerations of this study. The interview guide was translated beforehand into Japanese and made available to participants (the guide, in English, is attached as Appendix A).
All interviews were conducted with the help of a translator, a professor at Miyagi Education University who is familiar with schools in Kesennuma and ESD efforts in the city. Interviews were conducted with two teacher supervisors at the City Board of Education office. These interviews took between 30 and 45 minutes. Joint interviews were also conducted at three schools, with two respondents answering questions in one session at each school. These interviews were conducted with teachers, ESD leaders and one principal. In addition, two schools gave presentations on ESD activities at their respective schools. Though not directly related to the interview questions, these presentations were also utilized as data and as a link to the teachers’ discussion of important themes and concepts. The presentation and interview sessions at the schools lasted between 45 and 80 minutes. All interview sessions were recorded for transcription and analysis.

4.5 Data Analysis Methods

The use of semi-structured interviews with deep, reflective, open-ended questions, and the subsequent analysis emphasized an attempt to “extract a coherent story from the data rather than imposing one on it” (Howley et al. 2011, p. 231). In this way, theoretical considerations are used as a lens through which to examine the data, though they are not intended to be a rigid framework for analysis. The purpose of the interviews and analysis is to allow the perspectives of the participants to be represented genuinely.

The interviews were recorded and subsequently transcribed, then edited for clarity and any grammatical errors. During the process of analysis, a second translator was also asked to listen to key quotes from the interviews to confirm the accuracy and catch anything missed in the initial translation.

The method of analysis can be generally described as thematic analysis, in which the transcripts of the interviews were read multiple times with the object of uncovering themes and sub-themes from the text. In other words, the analysis searched for codes, primarily in repetitions both within and between interviews, metaphors and analogies, anecdotes and perspectives related to the theoretical foundation of the study, noting each code as it appeared in the text. Those codes were then referred back to the research questions and clarified into a list of themes and sub-themes of the study, which resulted in the final list of seven themes as they relate to the research questions (see chapter 6) (Bryman 2012, pp. 578-581).

4.6 Criteria of Trustworthiness

In assessing qualitative research, criteria of trustworthiness are established, as opposed to reliability, replication and validity, which are commonly used in quantitative studies (Lincoln & Guba 1985; 1994 in Bryman 2012, p. 390). Through the aspects of credibility, transferability, dependability and confirmability, assessment criterion equivalent to those found in quantitative research are used, though trustworthiness is a critique on the implications of a positivist, quantitative perspective that there is one social reality and absolute truth (Bryman 2012, p. 390).

Credibility is established in research using “good practice and submitting research findings to the members of the social world who were studied for confirmation that the investigator has correctly understood that social world” (Bryman 2012, p. 390). In other words, if we hold that
there can be multiple social realities and perspectives, it is important that the research capture those views and constructions of the social world accurately. This is also known as “respondent validation” (Bryman 2012, p. 390). Throughout contact with the participants of this study, the objectives and purposes of the research were made clear and continuously confirmed. Additionally, interview transcripts were made available to respondents for commenting, editing and confirming their validity.

Transferability in qualitative research is not about generalizations of the findings, but rather about creating “thick” descriptions of the specific context, rich in detail and depth. In this way, readers of a study can judge and compare for themselves the findings and analysis to another context (Geertz 1973a in Bryman 2012, p. 392; Lincoln & Guba 1985 in Bryman 2012, p. 392). This case study intends to describe in detail the perceptions and habits of some experienced teachers and leaders working in ESD, in the specific context of Kesennuma, a small city in northeastern Japan. Though the findings are not intended to be generalized, nor are they directly compared with data in a different context, the rich, thick descriptions and perspectives provided by these educators allows for greater understanding by the reader.

Dependability, much like reliability, is established by conveying a full and detailed account of the research process and methodology. In this way, peers could easily “audit” the research account and decide if the process warrants dependability (Bryman 2012, p. 392). Through the course of this research, including previous coursework, notes and procedures have been documented. The methodology of this study has been thoroughly detailed in this paper, and materials used for data collection and analysis, notes, transcripts and recordings have been kept for future review if necessary.

The criteria of confirmability can be described as ensuring that the research has been carried out in a mostly objective manner, and that decisions regarding course of the research are explained adequately. This shows that personal values or theoretical leanings of the researcher have not altered the research and findings (Bryman 2012, pp. 392-393). An attempt has been made throughout the course of the research to explain decisions made by the researcher, acknowledge limitations and thoroughly describe methodology, analysis and findings, in an attempt to address the criterion of confirmability.

4.7 Ethical Considerations

Throughout the course of the research project, certain ethical considerations informed decisions by the researcher with regards to informed consent, participant anonymity and transparency of the aims and purposes of the research project. Although an ethics committee was not involved in approving the research, ethical decisions were made with the guidance of established literature on social research methods. In conducting social research, it is important that 1) the welfare of participants is considered and that they do not come to harm; 2) that their confidentiality and privacy are protected; 3) that informed consent is agreed for the use of data collected from respondents; 4) that correct communication about the purposes and objectives of the research is established between the researcher and participants, and that no deception occurs (Diener & Crandall 1978 in Bryman 2012, pp. 130-152). Data was collected from the participants for use only within this research thesis.
Through the following explanation of the process of contact with respondents, it can be established that the researcher made no attempt to deceive respondents, that their confidentiality and privacy were protected, and that informed consent was obtained from each participant. Contact was initially made through e-mail with a professor at Miyagi University of Education, on the recommendation of a senior officer of the Japanese National Commission for UNESCO (JNCU). The initial contact explained general aims and objectives of the research, as well as reason for specific interest in Kesennuma teachers. Subsequently, these two contacts acted as liaisons between the researcher and a member of the Kesennuma City BOE, who was responsible for arranging the interviews and presentations at the local schools, and participated as a respondent.

Participants in interviews were given written information in English explaining the purpose of the research and use of their words, which was translated verbally in Japanese. An interview guide and translation were made available to the translator and participants as needed for clarification during the interviews. Prior to the interviews, the participants were asked for permission to use a recording device. It was made clear to all participants that answering questions was optional, and they were free to end the interview at any time. Participants were assured their anonymity would be protected, and that their names nor the names of schools would be used, and that the information would be used only for this study, ensuring confidentiality and privacy. All participants acknowledged verbally that they understood the objectives and uses of the research and granted consent for their interviews to be used for this study. Follow-up e-mails containing the transcribed interviews were sent to the schools and participants at the BOE to confirm and give respondents a chance to add or clarify anything they had conveyed during the interviews, as an additional measure to ensure that participants were represented accurately and confirm their consent.

5 Context of the Case Study

The context of the study, in Japan and Kesennuma City, is important in that the research examines a unique case providing multiple layers of understanding and development in ESD. Japan has been active in its collaboration with the UN and UNESCO to promote ESD, as is evidenced by various conferences held in Japan, the establishment of Regional Centres of Expertise (RCEs) in Japan and the promotion of UNESCO ASPnet schools, as well as the initiative taken by UNESCO-Japan to suggest and promote the UN DESD (Nomura & Abe 2009; JNCU 2015; MEXT 2016; MEXT 2017). The following sections provide a brief overview of education in Japan and recent reforms, particularly those that affect ESD in Japanese schools, then a more in-depth look at ESD in Japan, followed by an explanation of Kesennuma City and ESD efforts at the local level. The discussion of these contexts adds to the understanding of the findings of the research.

5.1 Education in Japan

The national constitution and Fundamental Law of Education, written in 1947, provide the structure for the modern education system in Japan. Basic education is divided into six years of compulsory elementary school, three years of compulsory junior high school and three years of non-compulsory high school (see figure 4 for overview of all Japanese school systems). Japan sees high enrollment rates (near 100%) for compulsory education with few students repeating
grades. Those students that graduate from junior high schools are very likely to go on to non-compulsory high school (97%) (Watanabe 2010; UNESCO 2016).

**Japanese School systems**

![Japanese School Systems](MEXT_2016)

Figure 4: Japanese School Systems (MEXT 2016)

The national ministry, MEXT, oversees the provision of education with the help of prefectural BOEs and city BOEs. The model represents a top-down, centralized approach to education, though municipal BOEs are given a good deal of autonomy to direct local schools. A national “Course of Study” (gakushū shidō yoryō) guideline, provided by MEXT, sets textbooks and curricular standards, and outlines the subjects to be taught and hours allocated to each subject. The Course of Study is revised approximately every ten years, after recommendations from an advisory body, the Central Council for Education (CCE). The most recent Course of Study was revised in 2008-2009 (Watanabe 2010; MEXT 2017).

In recent decades, Japanese educational reforms have gradually shifted to address problems of stress, bullying and violence and low motivation. Continually, politicians and policy-makers described Japanese education in terms of crisis rhetoric, which has resulted in several changes (see Takayama 2009; Hensley 2016). Throughout the 1990s, yutori (low-pressure) education was
gradually implemented through policy changes, such as the change from a six to five-day school week, a reduction of curricular content, and an academic shift in language from promoting knowledge acquisition to broader critical thinking skills and expression (Law 2009). The CCE report in 1997 and subsequent reforms by MEXT introduced the concept of “zest for living” (ikiru chikara) as an approach to education in response to perceived low motivation and lack of morality in Japanese youth, with a specific focus on “solid academic prowess,” “health and fitness,” and “to be rich in humanity.” The “zest for living” campaign has also called for increased collaboration between schools, families and communities, as well as a focus on traditional values and moral education (Takayama 2009, p. 135, MEXT 2017). Provisions for individualization, such as choice of electives, have also gradually increased in recent years (Watanabe 2010, p. 230-231; Takayama 2009, p. 134). These changes are significant to this research, in that they represent shifts that have allowed space for ESD in formal schooling, and broadly provide guidelines for teachers and BOEs to think about ESD.

In 2002, the period of integrated studies was introduced in elementary and junior high schools in Japan, an attempt to “emphasize experiential and problem-solving learning in cross-curricular topics” (Watanabe 2010, p. 231). Integrated studies offered teachers autonomy to use new pedagogical methods and a chance to engage in community activities through experiential learning. This period is the primary vehicle for ESD activities in Kesennuma (Kesennuma City BOE 2013a). Following poor PISA results, the 2008-2009 revision of the Course of Study saw the reduction of integrated studies hours in favor of more traditional subjects (Kakuta 2015, p. 8; MEXT 2017).

Through the Basic Plan for the Provision of Education, approved in 2008, national promotion for the implementation of ESD in Japanese schools was introduced. The changes to the Course of Study in the same year also included measures for ESD through basic objectives in elementary education and geography, civics and science education in junior high schools. The 2008 plan also used rhetoric of cultivating love for Japan and a respect for culture (Law 2009, p. 268; Watanabe 2010, p. 235). The plan was revised again in 2013, with greater emphasis on “independence, creativity and collaboration” (MEXT 2013). Plans are currently being discussed (since April 2016) to introduce the Third Basic Plan for the Provision of Education, which could see increased emphasis on individuals’ skills and academic achievement standards, plus the introduction of more classes teaching English and information and communications technology (ICT) skills and a new pedagogical approach referred to as “active learning” (Keidanren 2016; McCrostie 2017). These reforms represent national level approaches and thinking towards ESD and education in general, which influence and, at times, constrain local BOEs and teachers.

5.2 ESD in Japan

As mentioned in the previous section, ESD has grown in prominence at the national level of Japanese education, notably through revisions to the Course of Study and the Basic Plan for the Provision of Education, but also through influence and collaboration with UNESCO, the National Institute for Educational Policy Research (NIER) and various governmental and non-governmental bodies. MEXT and its partners continue to promote ESD in schools and drive the process forward through various avenues, and have made it clear that ESD is an important part of Japanese
education for the future (Nomura & Abe 2009), though exactly how it is to be implemented is left to local actors at times.

At the 2002 Johannesburg World Summit on Sustainable Development, the Japanese government and NGOs jointly proposed the adoption of the UN DESD, from 2005-2014, later established and headed by UNESCO (Nomura & Abe 2009, pp. 483-484). As a key member in establishing the DESD, the Japanese government together with the JNCU and other ministries were active in following through on the proposed plan of action for ESD promotion. Though the decade’s efforts were met with criticism (see Huckle & Wals 2015), the initiative in Japan was utilized to establish new ESD activities, governance and policy, which could be argued were successful outcomes of the UN DESD (see Nomura & Abe 2009; UNESCO 2014a; Iwamoto 2014).

In the Japanese action plan for the DESD, established in March 2006 at the Interministerial Meeting on DESD, called for “programmes leading to community building, diverse places of education and implementing actors, integrated approaches under various agendas, learning from participation, and communication and collaboration between diverse actors” (Iwamoto 2014, p. 90), with specific goals of “bring[ing] about a change in behavior so that a sustainable future can be realized in the areas of the environment, the economy, and society” (Liaison Council of Ministries and Agencies, 2006, p. 3, in Nakayama et al. 2015).

Through national guidelines and educational reforms to address ESD in schools, MEXT and the JNCU have further developed the Japanese approach to sustainability education. The Basic Plan for the Provision of Education and its subsequent revision prioritized the need “to promote an education (ESD) that enables individuals to undertake the building of sustainable societies, by thinking about modern and social issues with a global perspective, seeing them as their own problems, and approaching them at a grassroots level”. The “basic policy directions” of the plan also reflect a consideration towards ESD, citing attention to “developing social competencies… human resources… and vibrant communities.” Furthermore, the plan promotes the use of UNESCO ASPnet schools as key local actors in ESD. (Iwamoto 2014; MEXT 2017).

The latest national Course of Study revisions (2008-2009) also addressed ESD, specifically through guidelines for moral education, social studies, integrated studies and science. Overall objectives in elementary-level moral education include fostering in students a respect for life, culture and society. The guidelines for social studies in both elementary and junior high schools focus on citizenship education and capabilities to build sustainability through democracy. Science classes in both elementary and junior high school contain objectives for students to learn through experiential inquiry and investigations in nature. Though the period of integrated studies is designed to give teachers more autonomy to choose their own content and methods, recommendations through the Course of Study highlight the importance of community involvement, critical thinking and experiential learning (MEXT 2017). These guidelines, though not always explicitly linked to ESD, offer teachers a framework to think about sustainability education, and are used as context for designing ESD activities in schools.

The NIER studied the implementation of ESD in Japan from 2009 to 2012, and developed a list of objective abilities and skills for students to take away from ESD activities. The Japan
Council on the UN DESD (ESD-J) and Japan’s Action Plan for ESD (2008) were important conceptual tools for the NIER research, which also drew on practical case examples from schools in Japan (Kadoya & Goto 2013; Okamoto et al. 2013).

The findings of the research in the final report focused on six concepts found to be key examples found in a sustainable society and seven abilities and attitudes to be emphasized in learning. The six concepts found recognized as important for building sustainable societies were: “I Diversity, II Interdependence, III Limitation, IV Fairness, V Cooperation and VI Responsibility,” where the first three concepts are related to environmental concerns, and the last three with social issues (see figure 5 and table 5) (NIER 2012 in Kadoya & Goto 2013; Okamoto et al. 2013).

The report and subsequent publication designated the following seven abilities and attitudes as important characteristics to develop in learners in order to build a sustainable society: “1) Critical thinking ability, 2) Ability to forecast the future plan, 3) Ability to think in a multifaceted and comprehensive way, 4) Ability to communicate, 5) Attitude to cooperate with other people, 6) Attitude to respect connections and 7) Attitude to participate willingly” (see figure 5 and table 6) (NIER 2012 in Kadoya & Gogo 2013; Okamoto et al. 2013). These concepts, abilities and attitudes are significant in that they clearly outline goals for ESD in Japan, and have been adopted by approaches at the national and local level.

![Figure 5: Framework to design and develop learning instruction processes of ESD (NIER 2012 in Okamoto et al. 2013, p. 61)](image-url)
These six concepts were found to be important for building a sustainable society, and therefore, are important issues to address in the process of ESD learning, according to the NIER report. Diversity refers to not only to a mix of living things in a place, but also differences between regions, environmentally, culturally and economically. Interdependence emphasizes the world as systems in which energy, such as electricity or food, moves and connects living things. Limitations recognizes limited resources, but also natural changes to the environment. Fairness was described simply as “respect for every individual.” Cooperation recognizes the conflict of different perspectives, and gives weight to the need to overcome differences and collaborate through “humility” and “ingenuity.” Responsibility can be a complex concept (see Nikel 2007). The concept, as outlined by NIER, placed emphasis on individual responsibility and for people to do their share as a part of society (Kadoya & Goto 2013, p. 52).

<table>
<thead>
<tr>
<th>I</th>
<th>Diversity</th>
<th>Nature, culture, society and economy are comprised of a diversity of components whose origins, quality and status vary, and a diversity of phenomena (events) occur among them.</th>
</tr>
</thead>
<tbody>
<tr>
<td>II</td>
<td>Interdependence</td>
<td>Nature, culture, society and economy work with each other, and material objects and energy move and circulate and information is transmitted and distributed among them.</td>
</tr>
<tr>
<td>III</td>
<td>Limitation</td>
<td>While nature, culture, society and economy are supported by limited environment factors and resources (material objects and energy), they irreversibly change.</td>
</tr>
<tr>
<td>IV</td>
<td>Fairness</td>
<td>A sustainable society is based on equity, fairness and equality of the security of the basic rights and enjoyment of benefits from nature, etc. among regions and generations.</td>
</tr>
<tr>
<td>V</td>
<td>Cooperation</td>
<td>A sustainable society is built while various subjects adopt and harmonize in accordance with circumstances and interrelationship and the subjects cooperate and collaborate with each other.</td>
</tr>
<tr>
<td>VI</td>
<td>Responsibility</td>
<td>A sustainable society is built by changes and improvement of various subjects toward future images while having a responsible vision of an ideal future.</td>
</tr>
</tbody>
</table>

Table 5: Concepts for building a sustainable society (NIER 2012 in Okamoto et al. 2013, p. 62)

<table>
<thead>
<tr>
<th>Abilities and attitudes emphasized in learning instructions from ESD viewpoints (NIER 2012 in Okamoto et al. 2013, p. 62)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Critical thinking ability</td>
</tr>
<tr>
<td>Ability to see the essence based on reasonable and objective information and fair judgment, and to think and judge things in constructive, cooperative and alternative ways.</td>
</tr>
<tr>
<td>2. Ability to forecast the future plan</td>
</tr>
<tr>
<td>Ability to predict and expect ideal future images (visions) based on the past and future, and to plan things by sharing the ideal future.</td>
</tr>
<tr>
<td>3. Ability to think in multifaceted and comprehensive ways</td>
</tr>
<tr>
<td>Ability to understand connections, involvement and systems of humans, things, events, society and nature, and think of them in multifaceted and comprehensive ways.</td>
</tr>
<tr>
<td>4. Ability to communicate</td>
</tr>
<tr>
<td>Ability to communicate one’s own feelings and thought as well as respect feelings and thoughts of others and proactively communicate with others.</td>
</tr>
<tr>
<td>5. Attitude to cooperate with other people</td>
</tr>
<tr>
<td>Attitude to hold the same position as others and sympathize with ideas and actions of others as well as to do things in cooperation and in collaboration with others.</td>
</tr>
<tr>
<td>6. Attitude to respect for connections</td>
</tr>
<tr>
<td>Attitude to have interest in own connections and involvement in humans, things, events, society and nature and to respect and value them.</td>
</tr>
<tr>
<td>7. Attitude to participate willingly</td>
</tr>
<tr>
<td>Attitude to take responsibility for our words and deeds in groups and society and to participate in things voluntary and independently, based on understanding of one's own roles.</td>
</tr>
</tbody>
</table>

Table 6: Abilities and attitudes emphasized in learning instructions from ESD viewpoints (NIER 2012 in Okamoto et al. 2013, p. 62)
The seven abilities and attitudes designated by NIER are more specific learning goals for students to achieve through ESD. Critical thinking is obviously important for students working to solve such complex problems as issues in sustainability, with a need to be “proactive and constructive.” “The ability to forecast the future plan” deals with connecting the past, present and future to ESD, and to think thoroughly about consequences. Thinking in “multifaceted and comprehensive ways” is similar to the first two abilities, with a focus on creative solutions. These first three abilities are connected to the key competency of using tools interactively. The next ability (4) and attitude (5) emphasize expression and teamwork through developing the key competency of “interacting in heterogeneous group[s].” Lastly, the “attitude to respect for connections” and the “attitude to participate willingly” emphasize the key competency of “acting autonomously” to understand and recognize interconnectedness and responsibility to others (Kadoya & Goto 2013, p. 54). These abilities and attitudes represent an approach to ESD that focuses on capacity-building for students. Though the future, or a vision of sustainability, is uncertain, these specific skills and values were highlighted at the national level as appropriate in the pursuit of sustainability. Issues in sustainability, between societies and the environment, may change unpredictably, and ESD, or more specifically fostering these specific skills and abilities, represents one way that teachers and students confront the uncertainty of sustainability and the future. More discussion of skills and attitudes as purposes of ESD held by teachers will follow in chapter 6.

MEXT, the JNCU and UNESCO have also identified UNESCO Associated Schools (ASPnet) as another avenue to promote and stimulate ESD activities at the local level. The program of Associated Schools began in 1953 with 33 schools in 15 countries, though it has since spread to 182 countries, with 10,442 member schools worldwide (as of June 2015) (Oikawa 2014b; MEXT – JNCU 2016, p. 37). In May 2015, there were 939 UNESCO ASPnet schools in Japan, the highest number of schools in any country, the majority being elementary and junior high schools. Furthermore, most of the ASPnet schools in Japan joined after 2005 and the launch of the UN DESD (see figure 6) (MEXT – JNCU 2016, p. 37).
UNESCO Associated Schools represents a network of schools working in initiatives aligned with UNESCO, and collaborating both within their communities and with other associated schools at national and international levels through exchange and communication. ASPnet schools work across various themes of international education, such as “World concerns and the role of the United Nation system”, “Education for Sustainable Development”, “Peace and Human Rights”, and “Intercultural learning” (Oikawa 2014b, p. 29). Association with UNESCO is designed to benefit local schools through interaction and guidance from UNESCO, while promoting UNESCO’s global education agenda, and encouraging local collaboration.

Since 2008, in coordination with the UN DESD, the JNCU and MEXT identified UNESCO ASPnet schools as key locations of ESD promotion in formal education, resulting in the increase of UNESCO schools in Japan. From the national-level recommendation, municipal BOEs encouraged local schools to become UNESCO schools as part of their plan of action in ESD, with particular success in Kesennuma, Nara, Tama, Kanazawa and Omuta. Many schools and BOEs that were already practicing ESD transitioned to become UNESCO schools as a way of enhancing existing activities (Oikawa 2014b, p. 32). The JNCU established guidelines for UNESCO schools in Japan, with ESD as the focus. The guidelines place an emphasis on establishing clear curricular goals of student abilities and qualities, especially in allowing students to find and solve problems on their own, as well as utilizing the period of integrated studies to deliver ESD content (JNCU 2012 in MEXT – JNCU 2016, p. 39).

The Asia-Pacific Cultural Centre for UNESCO (ACCU) expanded on purposes and methods used by ASPnet schools to promote ESD, which emphasized collaboration and communication within the community, across the world and between generations, as well as reflection on fundamental questions of the environment, society and human beings. Through the development of various educational materials and examples of case studies in Japan, the website publication acts as another resource for teachers and leaders in Japan to reflect and conceptualize ESD and its approaches (ACCU 2009).

5.3 Kesennuma City

Kesennuma City is in Miyagi prefecture in the Tohoku region of northeastern Japan, on the Pacific coast (see figure 7). The city is an important fishing port, and in the past also benefitted economically from tourism. Kesennuma is surrounded by abundant nature – mountains, forests and the sea – and is located at the southern tip of the Rikuchu-Kaigan national park. Activities in sustainability take various forms in the city, and have developed over several years. For example, an organization to promote reforestation and environmental sustainability in the area, Mori wa Umi no Koibito (The forest is longing for the sea, the sea is longing for the forest) has been active in Kesennuma for more than 20 years. Kesennuma has also made a declaration as a “Slow Food City” (the first in Japan) and as an “International Cultural Fisheries Industry City” to promote sustainability and learning about the natural resources in the local area (Oikawa 2014a; Shao et al. 2016). Similarly, schools put an emphasis on local nature, food and industry in their ESD programs.
Figure 7: Kesennuma City (Shao et al. 2016, p. 125)

The city faces a problem of a declining population, which has decreased by 27.1% since its peak in 1980 to 2014. The aging population has also increased from 9.2% in 1980 to 34.2% in 2014, while the youth population has declined from 23.9% to 10.3% from 1980 to 2014 (Shao et al. 2016). These issues are addressed through community-building efforts, both by the municipal government and also by ESD programs in schools.

Kesennuma was also heavily affected by the Great East Japan Earthquake and Tsunami in March 2011. At 14:46 on Friday, March 11, a 9.0 magnitude earthquake shook Japan, occurring off the coast of Miyagi prefecture (see figure 8). Approximately 30 minutes later, tsunami waves reached the eastern coast of Japan. The disaster was called a “once-in-one-thousand-years” event.
The proximity of Kesennuma to the epicenter of the earthquake resulted in tsunami waves that submerged large portions of the city, and swept away thousands of homes. The coastal areas and harbor were severely damaged by the tsunami. In addition, oil tanks and propane gas near the harbor caught fire and spread throughout nearby districts (Oikawa 2013, p. 7). The losses in Kesennuma were immense. The latest figures show that 1,358 people in the city lost their lives or are missing as a result of the disaster. More than 15,000 homes were damaged or destroyed (as of March 31, 2014), and approximately 9,500 households were affected (as of April 27, 2011) (Kesennuma City 2017). Additionally, approximately 80% of Kesennuma’s business offices were damaged and 25,236 workers initially lost their jobs (83.5% of the workforce). Six schools in the city were damaged by the tsunami, and a further 2 schools were severely damaged by the earthquake. Two schools would close due to the destruction (Oikawa 2013, pp. 7-8).

“Thanks to their [teachers’] quick-thinking efforts, no children in Kesennuma who were at school that day lost their lives. Sadly, however, more than 10 children who were absent from school that day, or who had left school early or gone home before the tsunami hit did lose their lives” (Oikawa 2013, pp. 8-9).

Furthermore, many students lost parents, grandparents and other family members, and no school community was left untouched (Kesennuma City Board of Education 2013b).

Obviously, such a devastating disaster deeply affected the city, which is still recovering and rebuilding six years later. The effects of the earthquake and tsunami are reflected in Kesennuma’s recovery plan, as well as in changes to ESD programs in local schools, which put greater emphasis on disaster risk reduction (DRR) education and community-(re)building education after the disaster (Kesennuma City Board of Education 2013a; 2013b).
5.4 ESD in Kesennuma Schools

ESD has been an important part of education in Kesennuma schools for several years, developing and growing over time. The city is regarded as a leader in ESD, and schools have collaborated with various universities and organizations, including UNESCO, to promote ESD. In 2002, Ogawa Elementary was selected for participation in the “Master Teacher Program (MTP) of the Japan Fulbright Memorial Fund, administered by Japan-U.S. Educational Commission,” which served as a catalyst for environmental education and an ESD project, which included an exchange with an elementary school in the United States. Miyagi University of Education also acted as a supervisor and began a partnership with the Kesennuma City BOE at that time. The original project designed for this exchange centered on local waterfront environments and global exchange (Oikawa 2009; 2014a).

The success of this program resulted in greater participation in ESD activities by other schools in Kesennuma. Furthermore, the United Nations University recognized Kesennuma as an important model for ESD in the Greater Sendai region, which is designated as an RCE by UNESCO. ESD in Kesennuma grew through various partnerships with local organizations, community centers, and regional universities. Recognitions at the national level and participation in or hosting of events linking efforts in the city to the JNCU, MEXT and the ACCU also contributed to the continuous promotion of ESD in Kesennuma (Oikawa 2009; 2014a).

Starting in 2008, the city BOE strongly promoted membership in the UNESCO ASPnet to further develop ESD activities in schools. Since then, all public elementary and junior high schools in the city have joined the ASPnet program (Oikawa 2009; 2014a).

Schools in Kesennuma systematically approach ESD as part of the school curriculum and connected projects, which highlight an attempt to make ESD a holistic school endeavor. Schools select a general theme in ESD and design schedules and programs for each grade as a progression of learning within the theme. The curriculum is reviewed and shared in workshops and documented with the help of Miyagi University of Education and UNESCO (Koganezawa 2013; Kesennuma City BOE 2013a; ASPUnivNet & ASPnet, n.d.).

The Kesennuma City BOE is a significant actor in promoting ESD, providing training opportunities to teachers, and fostering partnerships between schools, universities and local organizations. Throughout the history of ESD in Kesennuma, a growing number of seminars and training sessions have been held in coordination with schools, Miyagi University of Education and the city BOE. This has contributed to greater understanding by Kesennuma teachers of concepts in ESD, as shown by research carried out in Kesennuma (Oikawa 2009; 2014a).

The BOE has also worked to establish guidelines for implementing ESD systematically throughout the city’s schools. For example, the BOE published details of ESD implementation in Kesennuma schools in 2009, which included themes for systematic ESD from elementary schools to high schools (see figure 9). This publication also detailed the activities of Ogawa Elementary and other schools as models of successful ESD programs (Oikawa 2013; 2014b; Yoneda 2013).
Implementation and focus of ESD activities varies across schools and grades, though understanding of the local community and environment are widely emphasized, and disaster risk reduction has become another important focus after the earthquake and tsunami in 2011. Generally, the periods of integrated studies and life environmental studies are especially utilized (Kesennuma City BOE 2013), which may represent a challenge to holistic programs in ESD.

5.4.1 ESD in Case Study Schools

The activities and curriculum plans of the case study schools are documented in various publications made available by the City BOE (see Oikawa 2009; Kesennuma City BOE 2013; n.d.; ASPUnivNet & ASPnet, n.d.). In addition, at the time of research, the schools provided handouts and presentations on current activities, which added to the factual background of activities presented in this section.

Ogawa Elementary School

Ogawa Elementary School has been an important institution of ESD activities in Kesennuma, particularly since 2002 (see section 5.4). Early activities of the school included an exchange with an elementary school from the United States, with a theme centered on waterfront environments. The program focuses on environmental education, with the recent addition of disaster preparedness as a theme. The school makes use of a nearby river for many of their ESD activities, and it is often used as a link between nearby mountains, forests and the sea. In environmental ESD, students work on projects focused on seasons, growing food, organisms in the local environment, the relationship between society and the environment, particularly the sea, and electricity saving. The disaster preparedness ESD activities center on making maps and exploring safe places in the local community, as well as talking to local residents about their experiences with the Great East Japan Earthquake and Tsunami. The focus is on ESD in the local community. Recently, the students
have also undertaken the project of creating a farm in collaboration with community members. Activities are carried out in life environment studies classes for grades 1 and 2, and the period of integrated studies for grades 3 to 6. These issues and themes are explored through hands-on activities, interaction with experts and community members, and writing activities (Oikawa 2009; Kesennuma City BOE 2013a, pp. 60-64).

The school highlights the NIER seven abilities and attitudes as the most important goals of ESD at the school (see section 5.2; NIER 2012 in Okamoto et al. 2013; Kadoya & Goto 2013), focusing especially on independent thinking, expression and thinking about the future. Expression through writing is emphasized in activities in all grades. Disaster prevention awareness is cited as a key goal, and surveys in the school demonstrate increased awareness among students and teachers (Kesennuma City BOE 2013a, pp. 60-64).

Due to the impact of the earthquake and tsunami in 2011, disaster prevention was added as a secondary theme of ESD at the school, “from the perspectives of self-help and mutual-help.” The grade 6 theme of global warming was also changed, instead focusing on saving electricity and energy education, following the disaster. More recently, the creation and maintenance of a community farm has been the focus of grade 6 students. The school’s plans for ESD include working to improve connection of the program systematically, increasing collaboration with the local community and institutions, and reviewing the changing environment after the earthquake and Tsunami (Kesennuma City BOE 2013a, pp. 60-64).

**Kanda Elementary School**

Kanda Elementary School approaches ESD with a focus on food education, utilizing local resources and experts. The program, called “Slow-Food Learning,” concentrates on local food production and industries, ingredients and resources in the natural environment, with an aim of thinking about the future and preservation. Like other programs in Kesennuma, Kanda Elementary School’s ESD is rooted in the local community and attempts to highlight positive aspects of the district and the city. The decision for Kanda Elementary’s Slow-Food Learning ESD program was in conjunction with the city-wide declaration as a “Slow-Food City” in 2002. Activities include investigating local agricultural infrastructures and environments, like rice, strawberry or soybean fields and a local river that provides water, or projects focusing on the fishing industry in Kesennuma and its relationship with the environment and the people who work as fishermen (Kesennuma City BOE 2013a, pp. 53-55).

The program aims to primarily generate interest in the local area, people and food production to raise awareness, respect and pride for the students’ local community. Students are expected to “identify problems on their own and actively select information as well as be able to investigate and consider how to find solutions for those problems.” For example, 5th grade students work on a large research project and presentation, in which they should choose Kesennuma ESD topics and create a project on their own, though they are given the opportunity to communicate with experts, and the school has collaborated with Tokyo University to assist these students to select an appropriate project. Another goal is student empowerment to think about how to contribute to the future of their district and Kesennuma city. Interest in the local community, awareness of the
“merits of the district’s nature and food culture” and expression or communication skills with a respect for various perspectives are three qualities or attitudes highlighted by Kanda Elementary School (Kesennuma City BOE 2013a, pp. 53-55). Respondents from interviews at the school also highlighted the NIER 7 abilities and attitudes as aims of their ESD program (see section 5.2; NIER 2012 in Okamoto et al. 2013; Kadoya & Goto 2013).

The school’s program was reduced following the Great East Japan Earthquake and Tsunami, which damaged many of the local areas and industries used as locations for student projects and investigations. Since 2012, however, the school has been able to revive some activities conducted before the disaster, while adding others within the theme of “Slow-Food Learning.” In addition, the school has introduced DRR as another theme of ESD for students. Another challenge cited was the reduction in hours of the period of integrated studies with the most recent revision to the Course of Study by MEXT, and a need to restructure the school’s ESD program (Kesennuma City BOE 2013a, pp. 53-55).

*Mogami Junior High School*

Mogami Junior High School conducts its ESD program for students within the theme of disaster preparedness and DRR, and has served as a leader in DRR in the community since shifting the ESD efforts towards disaster preparedness in 2005. After a large earthquake off the coast of Miyagi prefecture and 2003, a destructive 2004 Indian earthquake and tsunami, and a warning from the Japan Meteorological Agency (JMA) that a large earthquake and tsunami could affect the area, Mogami Junior High launched a program in collaboration with the city’s Risk Management Division. The program developed over several years to focus on a three-year cycle of the themes “Self-Help,” “Mutual-Help,” and “Public-Help,” “as well as the importance of connections,” under the slogan “We are disaster prevention warriors of the future.” Student activities involve thinking about the local community and planning their involvement in cooperation in the event of a disaster, as well as training and conducting drills in DRR. Activities are carried out within the period of integrated studies (Kesennuma City BOE 2013a, pp. 100-102; n.d.).

As a part of the school’s ESD program, DRR aims to highlight relationships and connections with people of the community, society and the environment. Three key areas of student development are “knowledge and understanding” of earthquakes and tsunamis, and how they could affect the local district, “judgment and skills” focused on first-aid and Cardiopulmonary resuscitation (CPR), drills and preparation training, and “mutual help” in connecting DRR with the community and raising awareness. In other words, goals for student learning focus on “knowing, preparation and action” (Kesennuma City BOE 2013a, pp. 100-102; n.d.).

The 2011 earthquake and tsunami did, in fact, heavily affect the local district, where many homes were destroyed and over two hundred people died or were missing, including three students. The school served as an evacuation center and refugee camp, and students helped and communicated with refugees. The ESD activities at the school of the previous six years were useful, but still many people in the area died. Since the earthquake and tsunami, Mogami Junior High has re-evaluated its activities in ESD and DRR, with an increased focus on the theme of “Self-Help” as a foundation for students’ studies. The school has also made increasing public
awareness of disasters a priority, to make sure the community know how devastating and serious a disaster could be. The school continues to conduct drills and training in collaboration with the local community (Kesennuma City BOE 2013a, pp. 100-102; 2013b; n.d.).

6 Findings and Analysis

Chapter 6 presents the findings and analysis of the data collected through semi-structured interviews with teachers. These findings are designed to answer the two research questions initially identified in this study:

1. What do teachers and leaders see as purposes or goals for their teaching in ESD, described as what students should learn from ESD in school?
2. How do educators confront the reality of uncertainty in pursuing sustainability, through developing reflective habits?

The findings presented in this chapter, in relation to the above questions, will be critically discussed and assessed in chapter 7.

After conducting interviews, the transcripts were read and analyzed according to a thematic coding structure. Several codes were initially identified in the transcripts of the interviews, and subsequently combined into broader categories, which link to the research questions. From those categories, themes were developed, in connection to the central concepts and theories of this study.

Although various definitions and conceptual ideas about ESD exist at the international or national policy level (see chapter 2 and section 3.2), and it seems that sustainability should be a goal for all people, there does not seem to be a consensus or clear picture of which particular actions lead to sustainability, or what a sustainable society should be like. This uncertainty is reflected in the approaches ESD, which results in various examples of implementation. Teachers construct their own understanding, develop habits and choose to work towards the positive norm of ESD in diverse ways, pursuing different purposes and goals. Through identifying the main purposes or goals that teachers hold in ESD, we see how teachers reflect on and pursue sustainability, and which actions they see as appropriate in teaching ESD. The following themes were identified as teachers’ ultimate goals for ESD in their schools or classes, which correspond to the first research question:

- Content and Knowledge
- Skills and Abilities
- Experience in the Community and Environment

The three categories identified here emerged in the comments from educators in Kesennuma. Each theme may take a different form in teachers’ and leaders’ descriptions of their habits, their initial descriptions were grouped and judged to align with one of these three broad categories. Examples and excerpts from interviews, with explanations of their relation to these themes, are given in section 6.1.

Through teaching ESD, the teachers in this study have developed reflective habits that guide their approach. In developing these habits and reflecting, teachers not only think about purposes,
but must also confront the theme of uncertainty in how sustainability issues are approached. This is also reflected in how topics are presented to students. Various aspects of uncertainty emerged through reflective interviews with the participants. The following themes were found, which show how teachers view and approach uncertainty in teaching and ESD:

- Responsibility
- The Future
- Complexity
- Hope

These four themes were identified as central ways that educators in Kesennuma reflected the uncertainty and unpredictability of their pursuit of sustainability. They are broad categories, which were revealed through different aspects of teachers’ and leaders’ reflections and descriptions of how they teach ESD, then grouped according to the concern related to uncertainty.

In the following sections (section 6.1 and section 6.2), each of these seven themes (three purposes and four categories of uncertainty) are presented, with excerpts from interview transcripts and explanations of the categories. Each represents an answer to the two research questions. All the teachers interviewed revealed reflective habits and described their purposes in teaching, and many answers reflected aspects of all three purposes. Likewise, the teachers shared consideration for the four categories of uncertainty, though some presented these themes differently. Some themes were referred to explicitly by teachers, and others required some interpretation by the researcher, though an attempt was made to show clear links between responses and the themes that have been identified here. In the excerpts, the researcher is identified by NH (Nathan Hensley) and each interviewee by their (false) names.

6.1 Teachers’ Purposes and Goals for ESD

Teachers’ purposes and goals for ESD in their school or classrooms represent approaches that teachers value as appropriate to pursue sustainability and help students contribute. Though there are numerous influences, teachers form their habits and perceptions based on reflection, context and experience (see more in chapter 7). Certain individual themes emerged during the course of interviews and analysis, which show how teachers believe ESD should be pursued, and which outcomes of education will lead students to be able to contribute to sustainability, although teachers also expressed uncertainty about their own perceptions. Many teachers spoke directly of their purposes or goals, though other instances and themes were revealed through interpretation of answers to questions, for example about their understanding of ESD or motivation. These examples provide reasoning and description of how teachers habitually approach ESD and reflect, and what they hope to achieve through their teaching, or what students will learn in ESD in school. These categories represent a point of departure from theory described in chapter 3, in that teachers’ own reflective habits are formed within wider approaches and traditions in teaching, which are represented in these three categories, and are conveyed to students as goals for ESD. Following reading and analysis of the interview transcripts, the categories were chosen as reflections of the comments, and as links to the theoretical background.
Content and Knowledge

Content-learning, or specific knowledge about a subject, represents an important theme and purpose for some of the teachers working in ESD that were interviewed for this study. In teaching a subject such as Science, it is important for the students to learn facts and knowledge within the field. Teachers working within ESD in Kesennuma often emphasized the importance of this scientific knowledge and subject-matter, which represents an overall theme and purpose of ESD in their teaching. In other words, content-learning or knowledge acquisition was seen by some teachers as a key approach to sustainability issues and environmental or developmental problems.

An important aspect of content-learning and knowledge for some teachers involves learning from experts or knowledgeable members of the community. This sometimes overlaps with community linkage and collaboration, though also highlights the importance teachers give to students gaining knowledge and facts from expert sources. Takahashi (City BOE) explained that “for marine studies, we can learn from the fishermen.” Nakamura (Kanda Elementary) also recognized the contribution of local fishermen and farmers that contributed to student knowledge. Shimizu (Mogami Junior High) explained that a geology expert was brought into the school to talk to students about tsunamis as a part of ESD and DRR at his school.

Ito (Ogawa Elementary) explained that local knowledge as ESD content serves as an important base for students to work through sustainability issues:

Ito: The base is that the students recognize objectively about the nature, history and the life in this district – this is the base.

For Ito, a purpose or approach to ESD and teaching at his school is to give students a basis of knowledge and local content about history, the environment and people. From this foundation, other aspects of ESD can be addressed.

Tanaka (Kanda Elementary) described how knowledge can translate to normative changes in students:

Tanaka: What is the effect of these experiences (in ESD)? They (students) said that they know more about the sea, and sometimes they have a strong interest and concern, and would like to get in touch with the sea.

It seems that, for Tanaka, knowledge and content can be a significant approach to sustainability and change. Naturally, as students learn about the sea and gain scientific knowledge, they become concerned and interested about the sea, and develop their own desires to work towards sustainability.

Shimizu seemed to strongly emphasize the importance of knowledge in relation to ESD and DRR. In his comments, lack of knowledge was regarded as a source of sustainability problems, and the approach to ameliorate these problems involved students and community members gaining knowledge. His approach to ESD starts from a position of knowledge acquisition:
Shimizu: An additional reason (that the district had so many victims in the earthquake and tsunami disaster) is lack of knowledge. Some (residents) did not know the altitude of their place of residence… The first thing we thought we needed to do was to acquire correct knowledge about natural disasters… We cannot judge accurately in an emergency unless we have correct knowledge and skills… we must think how to prepare based on correct knowledge…

When discussing what students learn, Shimizu again referred to the importance of knowledge as a base:

Shimizu: To live, they (students) have to accrue knowledge, judgment skills and thinking skills, of course based on the knowledge.

Though skills and abilities are also important purposes of ESD for Shimizu, they start from a point of knowledge and content learning.

The category of content and knowledge represents an approach which is grounded in an assumption that people and the environment can be viewed as logical and rational. In this way, it may be possible to predict what a sustainable future should look like. For all the teachers, though, knowledge and content learning are not isolated in their approaches to ESD, but valued alongside skills, abilities and experience. However, the comments above emphasized how and why knowledge could be important, and serve as examples of teachers’ habits and purposes in teaching ESD.

Skills and Abilities

Another theme that represented an approach to ESD and goals for students was the theme of skills and abilities, or forms of building the capacities of students to work with and solve sustainability problems. All teachers interviewed recognized certain skills and abilities as important for students to learn in school, to have the capacity to make choices and resolve problems in sustainability, for the future. This theme, as well as experience, represents more uncertainty than the theme of content and knowledge, in that teachers expressed some ambiguity about what a future sustainable society might look like, but that students should have certain skills and abilities, or capacities, to create that future.

Some of the skills referred to by the teachers are related to the NIER framework’s abilities to be fostered by ESD: critical thinking, thinking in multifaceted and comprehensive ways, and communication (see section 5.2). Both Yamada (City BOE) and Nakamura referred specifically to NIER’s prescribed abilities as a framework for teaching students. For example:

Nakamura: As you know, NIER defined seven skills and abilities, and according to these seven skills, starting from critical
thinking and activity skills. We would like to realize these seven skills through ESD.

The outline of these abilities at the national level is used as a useful indicator for these teachers about which skills should specifically be taught for students to have the capacity to contribute to sustainability, though the vagueness of the framework allows for teachers to construct their own understandings and approaches. Both teachers have developed their habits and perceptions through reflection, in response to the context of their teaching in Kesennuma, the uncertainty that they confront at the local level, and as a condition of their experiences in education.

Critical thinking emerged as a key skill that teachers hoped to build through their approach to ESD, and that they saw as a legitimate tool for students to use in solving sustainability problems. Especially in the face of uncertainty, and in recognizing that students must also face uncertainty, teachers’ comments reflected the need for students to develop thinking skills. For example, Yamada saw the need for students to work through difficult, complex problems on their own, and use thinking skills to confront issues independently:

Yamada: I give students complexities and contradictions and uncertainty.
NH: Is that so students develop thinking?
Yamada: Yes. So, for students to solve these problems, they seek the right answer by themselves. I think this process is very important.

Critical thinking, in this sense, is described as being able to solve complex problems and confront uncertainty independently, and to work through things like contradictions and find answers on their own. The emphasis here is on ESD as a process of learning, and represents an open-ended approach that highlights uncertainty (more described in section 6.2).

Some teachers described a purpose of ESD as encouraging students to think about how they could contribute to the local society. This also represents critical thinking and aspects of creativity as purposes of ESD, overlapped with experience in the local community, which is described later in this section.

Shimizu explained the goal of critical thinking in terms of judgment skills, especially considering the earthquake and tsunami disaster:

Shimizu: (We needed to) be sure to have the judgment capability to respond to unexpected events.

It is significant that Shimizu refers to the need for this capacity based on the uncertainty of future disasters and problems with the environment. He later refers to judgment as flexible thinking, reinforced by communication and collaboration. This is another example of how teachers use the framework and vocabulary from NIER to approach ESD and uncertainty at the local level.
Communication skills were also mentioned as a purpose or goal for teachers through use of the terms creativity and expression. Teachers seem to approach building capacity in students to solve sustainability issues by developing their expression and creativity as important to solve problems when various voices, perspectives and ideas exist. Like critical thinking, creativity and expression may help students work together and independently to approach uncertainty and complexity.

These skills and abilities regarded by teachers as purposes of ESD and goals for their teaching signify a capacity-building approach to ESD and sustainability issues. Critical thinking and communication are viewed as appropriate skills for students to develop to solve future, perhaps unknown and unpredictable, problems in sustainability. Takahashi refers to this capacity-building as student and community “empowerment” to contribute through ESD.

The focus of this skill development is general, though several teachers link critical thinking, judgment, creativity and expression more specifically to students’ actions and contributions in the local community, described later in this section.

Experience in the Community and Environment

Experience in the community and environment emerged as a significant theme for the teachers in Kesennuma, and was referenced several times during the interviews. This is both a tool for teaching students and a goal for ESD in their school. In other words, the teachers utilize the local community and environment to teach ESD, and hope that this familiarity, collaboration with and attachment to the local area will lead to students’ behaving sustainably in Kesennuma, and that students will want to contribute to improve their communities. This theme emerged through teachers’ reflections about their approach to ESD as community-building, through links and collaboration with people or experience in nature, and the purpose of encouraging a love for the local area in students. Some of these purposes reflect the national level approach to ESD, shown in NIER’s selection of certain attitudes to be fostered through ESD: cooperation, respect and participation (see section 5.2).

The approach to ESD as community-building (machizukuri) was referenced by most teachers, usually specifically about rebuilding after the earthquake and tsunami, which had a devastating effect on the area (see section 5.3). In this sense, ESD is a vehicle to address a need to work towards rebuilding the community. Similar to the idea of a sustainable society, it does not seem clear what kind of community is to be built, but rather that it is important to the teachers that students think about and are motivated to contribute to rebuilding and building the local society, even if the outcome is unknown or varied. Some teachers related community-building to a skill or ability for students to gain specifically through ESD.

Yamada described the need to rebuild after the earthquake and tsunami, and recognized the uncertainty of the future and complexity related to the challenge of multiple and varying opinions (which will be addressed again in section 6.2):

Yamada: For the community, the condition has changed after the March 11, 2003 disaster, so it is important to create local society and create a new town. In this stage, it is very
difficult – important – that people, especially young people, have different kinds of opinions and different kinds of views.

Though the future situation is difficult, complex and uncertain, Yamada saw community-building as an appropriate aim and approach to teaching ESD. This comment also reflects the importance of communication skills, as described previously in this section. Sasaki (Ogawa Elementary) similarly described how her school’s approach to ESD changed after the earthquake and tsunami:

Sasaki: After the earthquake, this area had a lot of challenges and issues, so a new topic for this school was how to link together the local community and how to create a new town… Students reflect on their own life and they think about the linkage with the community, and this is the main point of ESD.

Neither example is specific about how to rebuild the community or link to local people, but both recognized the need for this approach to ESD in teaching, and revealed that the contributions and decisions of students seem to be important in deciding what that community-building and new society will look like. This emphasis was echoed in Ito’s comment:

Ito: … For the upper grade students, (an important issue is) for them to think, “What do you want the future to be in this district and in Kesennuma City?” So, to let them think about what they want to do, what they want to create in this local community… these skills and abilities are important to teach…

Later, Sasaki and Ito again referred to community-building and collaboration through ESD, with a specific example of how students contributed to the local area and directed the process of what sustainable action was, or what is important for a sustainable community:

Sasaki: In (6th) grade, students learn together and work together with people from the local community, and they created a farm, called Fureai Farm – this means “Familiar with Nature Farm” – the farm was opened by the students themselves. They made a farm and opened it with the aim to exchange between different generations. Different generations come together to play and work together in this farm. This is their final conclusion of the 6th Grade.

Ito: We were deeply affected by the tsunami and earthquake, and this area had lost a place where people, from kids to old people, gather and communicate with each other and think about challenges and topics. So, the students, by
themselves, thought about how they should (approach this issue), and their conclusion was to open the farm... This is one way that they can contribute to local society, and they realized their idea about what to do for the local community.

It seems that a large impetus for creating the farm came from the students’ own perceptions about what ESD is and what it should achieve, though this also reflects the teachers own conceptions and habits presented in ESD to their students. Through these comments, Sasaki and Ito convey their hope for students through ESD to build their capacity to contribute locally. This example represents a long-term purpose for ESD as a process rather than a means to an end (see section 3.2; also chapter 7 for more discussion). Nakamura also referenced this future hope for students to contribute, even though many will move away from Kesennuma.

Collaboration with the local community was an important aspect of ESD for teachers, as a way for students to gain experience and learn, but also represents an emphasis on collaboration for future sustainability. Described as collaboration or a link with the community, the goal was not necessarily student contribution or empowerment, but building a relationship. This is further exemplified by love for the local community and area, or place-attachment, as a point of departure for ESD, as reflected by teachers’ comments.

Takahashi highlighted collaboration with local people and the community as a key responsibility in ESD, and as vital to capacity-building and working towards sustainability:

Takahashi: Now ESD has a possibility. Before, ESD was isolated in the school society, with no connection to the real local society. After the earthquake and tsunami, human resource development in the local society was important, so we had to unite with local enterprises and the local community. We have a lot of possibility for ESD as human resource development here in Kesennuma.

This comment highlighted ESD’s role in rebuilding after the disaster, and described the necessary connection between schools and the wider community. In other words, the uncertainty of the future, of disasters and other environmental problems necessitates that community collaboration through ESD is used to develop human resources that will be used to confront problems. The link is seen as a way to promote communication and the resources to solve immediate problems as they arise, but also build capacity to work together towards wider sustainability. Ito also referenced “human resource building” as a purpose of community collaboration in ESD.

Nakamura referred to several student activities in ESD through learning about food that students collaborate or link to the local society. For him, this link represents an opportunity to learn from various perspectives tap into community knowledge. Similarly, Ito acknowledges the benefit of intergenerational knowledge that students gain from ESD. These activities in ESD represent a purpose of teachers to emphasize the connection of the past, present and future in sustainability, and acknowledge multiple perspectives, and also shows their reflective habits as
they consider carefully the complexities of their teaching. This extends responsibility to the community to construct a vision of a sustainable society.

Love for the local community, or developing place-attachment in students, is similarly seen as a means of working towards sustainability and a goal or purpose for students to take away from ESD. Most teachers are from the area, or have been working in Kesennuma for several years. They know the area well, and their own place-attachment is likely a basis for their habits in attempting to develop good feelings about Kesennuma in students. On the other hand, teachers may hold love for the community as a normative tool in developing sustainable behaviors in students. In other words, students that love their community will work to take care of it.

Sasaki explained that her motivation for teaching in ESD stemmed from the idea of love for the community:

NH: How did you start with ESD? Why were you interested in ESD?
Sasaki: Formerly, I was a teacher at (a different school in Kesennuma), and environmental education was very popular, and I was interested in how to create students who love this area – it is an important topic for me.

NH: Would you say that the love (for the area) is why ESD is important?
Sasaki: Yes.

NH: And still your motivation?
Sasaki: Yes.

Tanaka also cited love for the local community as the starting point of his ESD teaching, and the most important goal for students:

NH: If you could tell me, maybe, what’s the most important thing that students take away from Kanda Elementary – whether it’s during the process or at the end when they leave elementary.
Tanaka: Love to the local community and knowledge of the local community.

Takahashi regarded love for the community as especially important as motivation to rebuild Kesennuma following the earthquake and for students to contribute:

Takahashi: We have been deeply affected, but when we think about what is important now – the love to the local society and the love to family is important – now is the time to rebuild Kesennuma.

This example shows how place-attachment is seen as a natural motivation for students to contribute to the community and act in a sustainable way, as a normative approach. Other teachers
explained that highlighting the good points or merits of Kesennuma and the local area were a large part of their teaching practice, or a starting point in ESD. However, some recognized that this habit could result in oversimplification, as Ito commented:

Ito: So, it is important, especially for the lower grade students to teach – to tell them – what are the good points for them to recognize in this district. From this starting point, we can talk about complexity and uncertainty.

The merits or good points of Kesennuma alone do not seem to be adequate to approach ESD and the uncertainties and complexities inherent in sustainability issues. However, teachers see this as an appropriate starting point in their teaching to form a concrete basis for students to develop sustainable behaviors and capacities.

One way that teachers explained experience as an important purpose of ESD, and a significant part of their practice, was introducing students to the environment and local nature. This approach again represents a strategy used by teachers to build understanding of the environment and local community in students through experiential learning. It seems the knowledge that students can gain from these experiences is important, but even more central to the purposes of the teachers is that students gain an understanding of how people coexist with nature in their local area, and the importance of certain natural features to society. Ito’s comment on the selection of a nearby river as the theme of study for students highlights these two linked purposes:

Ito: As you know, the research topic of this school area is the (nearby) river. We chose this river for two points: one is the biological aspect – there are a lot of creatures that make up the environment here; but the other point is the history – the people used the river and made a small dam to cultivate rice fields…so it can be said that this river is the root of life.

In this way, the river and the topic of its use in rice cultivation is used to develop a sense of respect and responsibility for the local natural environment. This, Ito hopes, will translate to critical thinking about the relationship between society and the environment, and later action or local contribution. By developing an attitude of respect and recognizing human-environment relationships, students will hopefully act in a sustainable way.

The purposes revealed by participants in this section exemplify approaches that teachers adopt to work towards sustainability. All seem to agree that sustainability is something that should be pursued, but their comments reflect that it is indeed uncertain and complex. Various habits in teaching and goals for students are presented as appropriate ways to work towards sustainability, though none of the teachers give concrete aims or standards that should be reached. Rather, they seem to regard ESD as a learning process, ongoing and open-ended. The future is represented by uncertainty and complexity, and these purposes are ways that teachers in Kesennuma attempt to build capacity and develop students that will be able to construct their own understandings and approaches to ever-changing problems. As that uncertainty is recognized by the teachers, they
reflect on it and it becomes part of their underlying habits and purposes. Teachers revealed various points that uncertainty is confronted, or how it is presented to students, as explained in section 6.2.

6.2 Teachers’ Approaches to Uncertainty in ESD

The theme of uncertainty seems to be an inherent part of approaching ESD and pursuing sustainability, as actions or teaching represent a response to uncertainty and risk that issues in sustainability imply, and in ambiguity or lack of consensus in how ESD should be approached, or what the ultimate goal is. Educators must face this uncertainty in their teaching and through critical reflection. The way that uncertainty is presented to students is also an important indicator of how teachers perceive the means to work towards sustainability. Despite uncertainty and risk, however, all teachers seem positive that ESD is indeed worth teaching, and that sustainability is worth pursuing, even if a clear end does not exist. As such, these teachers have developed reflective habits to deal with uncertainty. Four themes of uncertainty emerged from educators’ comments, which were categorized as responsibility, the future, complexity and hope (see figure 10). These themes refer to how teachers reflect on uncertainty in their purposes and goals for ESD, as described in section 6.1, and how uncertainty is presented to students. In this way, they represent a point of departure for educators in teaching ESD.

![Figure 10: Uncertainty in teachers’ approaches to ESD](image)

The idea of uncertainty in ESD could refer to many related notions, and may be understood differently by individual teachers. The term is used by teachers as a descriptive concept. Generally, uncertainty for the teachers relates to difficult concepts in teaching ESD, not knowing the answer to a problem or being able to predict what will happen, uncertainty about how sustainability should be achieved and by who, and what students or teachers themselves might be able to contribute to sustainability. Again, some teachers’ answers show clearly how their habits and understanding
link to uncertainty, while others required interpretation by the researcher, though an attempt has been made to clearly show links.

Responsibility

The uncertainty of who is supposed to contribute to sustainability, how and to what extent, is conveyed by teachers’ comments on the idea of responsibility. Though the teachers agree that pursuing sustainability is a necessary endeavor, who it is that should or could contribute is an issue of ambiguity, that must be worked through in the process of ESD. Student and teacher roles in ESD are uncertain, or perhaps fluid. Teachers’ own habits and approaches to the issue of responsibility are reflected in the way that information is presented to students, what teachers hold as purposes for future sustainability, and how teachers’ see contribution from students, the community and themselves.

As discussed in section 6.1, local people and the community play an important role in ESD in Kesennuma, as several teachers discussed. In presenting ESD and approaching problems in sustainability, teachers emphasized the role of local society. Students may work through ESD in school, but it is clear that teachers feel the responsibility of working towards sustainability also lies with the community outside of school, in a balance. This balance, though, is uncertain, and could change. For example, Takahashi commented on the changing balance of responsibility as feedback between ESD in school and the community:

Takahashi: Local society and partners are important, with the City BOE, the schools and local communities; in each school district, they work together, and this is the most important… Until now, local people did not understand much about ESD… If the local people can understand, they will collaborate more with the schools, so we (the BOE) will make much more effort to show what has changed through ESD activities of practices.

In this instance, Takahashi revealed that he feels the City BOE has the capability to spread responsibility in the local community through showing the progress of ESD in schools. Though the contributions of the local community are uncertain, and the balance of responsibility is not fixed, this is a point that ESD in school is, or should be, constantly addressing.

Yamada described how the purpose of delivering knowledge to students is meant to translate to a more knowledgeable, and hopefully sustainable, community:

Yamada: … through the students, they (general citizens) get a lot of knowledge of ESD and science. Through the students, parents will understand what SD or what sustainability is, so it is… through the students, that people in the community get knowledge.

Responsibility for sustainability is shared indirectly from ESD in school to the community, and the concept of sustainability is constructed by students, parents and the community. In a way,
the uncertainty of sustainability, what sustainable actions should be and what a sustainable community should look like is also disseminated.

The purposes held by teachers also reveal their perceptions on the degree of responsibility that is presented to students. For example, stressing the good points of the area, or using a top-down, fact-based approach, or relying on expert knowledge, appears to reduce the responsibility that teachers place on students, and in some cases, themselves, by simplifying uncertainties about sustainability and relationships with the environment and between actors in the society. Teachers mention these approaches in conjunction with other purposes of ESD in Kesennuma, which may serve to confront uncertainty, which further demonstrates the fluidity of the idea of responsibility.

The purpose or goal of student participation in ESD and sustainability in the community reflect how teachers perceive responsibility. Ito mentioned that the “program is made for the kids to become familiar with and participate here in this district – to participate with the nature and the people in the district,” and later gives an example of students creating a local farm to contribute. Takahashi similarly described his hope to “empower” students and the community to work towards sustainability, and take more responsibility:

Takahashi: For ten years, we gave the students a lot of input, but now we need more output to the local society.

NH: From students?
Takahashi: Yes, from students to local society, but this process is not happening so much, so we want to give students more empowerment.

Like the positive norm of ESD communicated to schools from the national and international level, teachers convey responsibility to students as a positive norm. Though it is uncertain how students and the community might work towards sustainability, teachers see the goal of developing responsibility to participate and contribute as an outcome of ESD. Some teachers expressed that developing responsibility or willing participation and action in students was sometimes a challenge.

Responsibility towards sustainability seems to be something shared between all members of society, as described by the teachers’ approaches to ESD, though at times the balance shifts to allow those members with greater capacity to solve problems and direct sustainable actions. The responsibility established in teachers’ approaches to ESD is not static, but adapts to conditions of uncertainty and risk, which requires continuous reflection and thinking about challenges. This could also link to the knowledge and skills seen as goals for student learning. In other words, as students develop knowledge, critical thinking and communication skills, they would be considered to have a greater capacity, and therefore a greater responsibility to work towards sustainability. However, this link could not be established explicitly through these interviews.

The Future

The future represents a point of uncertainty in ESD in the sense that there is little consensus on the end goal of a sustainable society, what that might look like, whether it is achievable, or how to get there. Teachers seemed to agree that the future, and its relationship with the present and the past, were important concepts to explore with students in ESD, but also that the future is uncertain,
and would have to be constructed by the students themselves. A future sustainable society does not necessarily represent an end goal, but something to constantly pursue. The habits of the teachers in presenting the future this way is significant, in that it shows their understanding of ESD as an open-ended process (discussed further in chapter 7).

Tanaka explained the overall purpose of ESD and his teaching:

Tanaka: The goal is to create – to promote – students that can create a local sustainable future.

The “local sustainable future” is left undefined in this case, and rather the focus is put on students that will be able to construct the future. The comment might suggest, though, that an ideal sustainable future can exist, and that at some point students may be able to achieve this.

Ito described that the present experiences of students in ESD can help them construct future activities working towards sustainability:

Ito: This is not a fixed story, but they (students) think about what they should do for the future. Through these experiences (study of nature and people in Kesennuma), they can think about it.

Takahashi expressed his purpose as a teacher supervisor to push and expand the concept of ESD in Kesennuma, allowing for innovative approaches and new perspectives to emerge. He admitted that he does not necessarily have an answer for what the future conception of ESD might look like, but that it is important to work with this uncertainty and to allow students to construct their own understanding and approaches.

Similarly, Hirose (Mogami Junior High) described his opinion that change in ESD was necessary, and that their approach to the future must not become static:

Hirose: We have to change… So, for eleven years, the practices (DRR) became a tradition in this school, and in a big part, we cannot change these traditions… but on the other hand, now is the time to change… So, I cannot tell you exactly, but in my opinion, teachers have to create more chances for students to think or do by themselves.

In his comment, the future approach to ESD is left open-ended, but lies in the opportunity for the students to contribute to the consideration of sustainable practices and actions.

In most instances of the teachers’ comments, the future society is uncertain. Sustainability is a process that will be created by expanding conceptions of SD and ESD, both from teachers’ reflective habits and the actions taken to pursue sustainability that will be created by students. Teachers’ comments reveal that they present this uncertain future to the students, and that more than an end goal, a pursuit of sustainability is important.
Complexity

Another way teachers confront the uncertainty of sustainability is through acknowledging complexity in their approach and presenting complexities to students. Complexity is an important aspect of their habits in teaching ESD. Frequently, teachers addressed their concerns about the complexity of the human-environment relationship, nature itself, approaches to developmental and environmental issues, and the issue of how to present ESD. Most often, teachers connected uncertainty to complexity explicitly, or used the terms together.

Teachers agreed that complex problems, contradictions, uncertainty and issues without a clear answer were important for students to confront. For example:

Yamada: … in the process of teaching students, it is important to give them those uncertainties and contradictions on occasion, so I will usually give them those concepts and ideas and let them think…

Takahashi: … if we have uncertainty at this point it will… expand student viewpoints, so the uncertainty, if you ask me, is necessary… I love this uncertainty… I hope that I can give much more uncertainty and complexity to students. It’s better.

Ito: They need to get a lot of viewpoints that things are not so simple. Things are complicated, so we tell these stories.

Complexity is also reflected in the earlier discussion of critical thinking and expression as teachers’ purpose or goal for students in ESD, which require students to reflect on and work through complex problems and acknowledge various perspectives (see section 6.1).

On the other hand, Takahashi and Ito expressed hesitation about the timing of presenting complexity, fearing it could have an adverse effect on student understanding:

Takahashi: … it depends on the timing, how and when the students have uncertainty is an important point.

Ito: Especially for the elementary school education, if you stress this uncertainty or complexity a lot, students will be confused in the lower grades, so teachers will also be confused.

Experience with nature, and slowly becoming familiar with the environment, is one way that teachers seem to introduce the complexity of sustainability and the human-environment relationship. For example:

Sasaki: In the lower grades, at first the important thing is how to let them (students) think about how to approach nature and how to get familiar with nature…
Following the earthquake and tsunami, the complexity of the community’s relationship with the environment became even more apparent and significant to teachers’ approaches to ESD. The tsunami, and the sea, took so much from the community, that many people and students were and still are hesitant to approach the water. However, teachers expressed that it was important to confront the complexity, and focus on living together with the sea. For example:

Nakamura: Before now, we could not approach the sea – we were afraid to approach the sea, but actually, teachers want to learn lots about the sea (through ESD).

Takahashi: … students need much more contact with the sea and coast, but actually students are very much afraid to go to the sea because of the uncertainty (of a tsunami).

These comments acknowledge the complexity of approaching nature, though both agree that there is a need for teachers and students to actively study and learn from the sea through ESD. Another statement exemplified the notion of continuous complexity and uncertainty:

Hirose: Nature gives us flourishing prosperity and nature gives us lots of issues and disasters… “Living with the Sea” (one of the city’s educational topics) includes both of these two meanings.

The relationship between people and the sea, and that coexisting with the environment is an ongoing process that requires educators and students to continuously reflect, learn and assess how to approach the environment’s complexity and challenges.

For the most part, complexity seems to be an important part of teachers’ approaches to ESD in Kesennuma. This is expressed through challenging students directly with complex questions, but also through interacting with and acknowledging the complexity of the environment. Teachers were also cautious about this complexity, though, and seem to acknowledge that there may be certain times and situations that introducing students to complexity is more appropriate than others.

Hope

NH: What is the most important thing for you, about ESD?

Yamada: Hope is the most important.

In the face of uncertainty, the teachers of Kesennuma find hope in ESD. They have hope for the future, hope for their students, and hope that they are working towards sustainability and change. Hope is important to the teachers, precisely because of the uncertainty of nature, society and the problems of the future. Despite the reality that many issues are unknown, unpredictable, or out of our control, hope is something that helps drive educators to continue to reflect and work towards sustainability. It is also an important concept to convey to students and the community through teachers activities in ESD.
Particularly as teachers talked about the effects of the 2011 earthquake and tsunami, they referred to the importance to be hopeful of ESD, and for ESD to create hope. As ESD activities center on the community, and teachers hold community-building as a key purpose of ESD, the hope for students to be able to contribute and the hope for the vitality of the local community is apparent. Hirose described this hope in terms of resilience:

Hirose: Disaster is linked to uncertainty, and as I said before, judgment and thinking skills are to recover these uncertainties. In other words, it can be said that resilience links to uncertainties, and this resilience is a base of being human.

In this case, students can build skills to confront uncertainty, and it is in these abilities that teachers can have hope for the resilience of the students, and of the community. Ito explained how a research topic in his school’s ESD program can convey hope as it is related to the complexity of the situation to students:

Ito: This area was deeply affected by the tsunami, but if they (students) research in the river, they can find out which creatures are still alive after the earthquake, and the sea was damaged, but the cultivation of nori (seaweed) has already recovered, and the people’s lives have recovered. From this, they can get the viewpoint of hope, and they can understand the complex relationship between nature and life.

Tanaka and Nakamura described an activity in which students make DRR maps:

Tanaka: For the future hope, for example, they (students) make local DRR maps. But this map is revised every year, and each year this town has recovered, and students can show this map to the local community, and the local people will also be inspired to see the local map made by the students. This is a process to create hope.

Nakamura: So, the map is not only for the disaster prevention, but it is also a recovery map.

These two activities, studying the local river and making maps that show recovery, act as points of hope for the teachers, students and community.

In a way, all the teachers develop their habits in working towards sustainability with hope in the face of uncertainty in their minds. They have hope that their efforts and purposes in ESD make an impact in the students and the community. They also regard hope as an important aspect for students to experience through ESD, to feel that they can contribute to the local society.
6.3 Summary of the Findings

The findings of this study reveal how educators develop reflective habits and approach ESD in their teaching. The themes that emerged reflect the theoretical framework, in that reflective habits, especially in ESD, are important for teachers (Dewey 1922; see section 3.1). As educators work towards sustainability through ESD, they must think about and reflect not only on their purposes or goals, but also the uncertainty and unpredictability of their pursuit. Though they may not be in control of the outcomes, the findings show that teachers and leaders continue to think about the complexities of working towards sustainability, reflect on their habits, and maintain hope for the future.

The experienced teachers and leaders from Kesennuma interviewed for this study offered a comprehensive view of their approaches to ESD in their community. Purposes or goals of their teaching in ESD, habitually described and reflected on by the teachers, revealed that community experience and collaboration lie at the center of their efforts towards teaching students. The local community is used as a source of ESD, and participation in the local society and environment is considered an ultimate goal for students. Largely, capacity-building through developing skills, abilities and attitudes represents the means to help students pursue sustainability. At times, these abilities and attitudes were explicitly linked to NIER’s framework for ESD. Knowledge and content are also regarded as important tools for students and citizens.

Teachers describe ESD as an ongoing process, with an open-ended future. Responsibility for sustainability, complex relationships between the environment and the community, and the future represent uncertainty. At the same time, teachers have hope for their students to work with others in the local area to construct their own understanding and develop unique approaches to sustainability.

Some differences between participants also emerged. For instance, interviewees placed different emphases on the purposes of knowledge and skills. While some expressed a habit towards approaching ESD through helping students acquire knowledge, representing a fact-based approach, others emphasized more heavily the need to build capacity through critical thinking and communication skills. The issue of complexity revealed a mixture of feelings, as some teachers and leaders expressed doubts about the effect or capacity of students confronting complex problems from an early age. A more in-depth, comparative study may be useful to identify these differences more clearly and explore influences.

7 Discussion

The findings in chapter 6 were presented as initial answers to the research questions, which emerged in data collection and analysis. The discussion in chapter 7 expands on the findings, in relation to the objectives and research questions of this study (see section 1.2 and section 1.3), by further describing teachers’ purposes and approaches to ESD in connection with the conceptual and theoretical frameworks (see chapter 2 and chapter 3).

7.1 Habits and Purposes for ESD

The first research question aims to identify ways in which teachers work towards sustainability through understanding their purposes and goals for ESD. The teachers’ approaches
can be described as reflective habits towards ESD, developed over time through experience, in the context of their individual perceptions about appropriate ways to pursue sustainability, and influenced by their understanding of the concept and goals of ESD (see Dewey 1922; Sund & Wickman 2008; Sund 2008; 2015).

International organizations, such as UNESCO, promote and define ESD at the international level. The international discourse on ESD has been a significant driver for implementation at national and local levels (see WCED 1987; Scott & Gough 2003; UNESCO 2005; 2014a; 2014b). However, the global conception of ESD is contested and debated (see Jickling 1992; Jickling & Wals 2008; Huckle & Wals 2015; Hoffman 2015; McKenzie et al. 2015). At the national and local level, certain traditions and approaches, both towards education and ESD specifically, emerge and represent best practices, or collective habits of teachers (Sandell et al. 2005). Furthermore, the nature of the relationship between society and the environment denotes constant feedback and adaptations, which necessitates that actors make decisions from a point of reflecting on uncertainty or unpredictability (Scott & Gough 2003). From these influences at various levels and the assumption that actors must develop understanding and make personal decisions about how they approach ESD, despite uncertainty, we can gain a deeper understanding of what purposes and habits teachers hold for their teaching, and possibly why they work in a certain way towards sustainability through ESD at the local level.

7.1.1 International and National Policy and Discourses

Through the first objective of this study, international and national discourses and policy aims were examined and discussed (see chapter 2 and chapter 5). Though international educational bodies promote SD and ESD as a goal and worthwhile pursuit, their policy and discourses translate to the local level as a positive norm without clear and concrete conceptions of what is to be sustained, which actions lead to sustainability, or what the goal is. National discourse in Japan remains similarly vague, though offers a somewhat more structured framework through NIER.

From the findings, influences from the international level seem superficial, but remain an important driver. Schools have become affiliated with UNESCO, which represents an inclusion of rhetoric at the school level, and commitment to ESD. The UN DESD prompted a greater interest at the local level in ESD, and may have served as a motivator, though the implementation and conceptualization of ESD in Kesennuma seems to benefit more from national framework and teachers’ own understandings, rather than international direction. Through teachers’ and leaders’ comments, the international model of ESD as comprising three pillars of environment, economy and society remains somewhat relevant, though the economic sector appears to occupy a less-important place in teaching approaches. Local industry is occasionally mentioned as a resource, and teachers seem to understand that the local economy is an important part of the community, but place a larger emphasis on people and nature. Nevertheless, international organizations and discourse do seem to provide an impetus, or reasoning, for teachers to pursue sustainability.

At the national level, MEXT has been influential in creating a space for teachers and leaders to work in ESD, through the establishment of national ESD goals and integrated studies as an appropriate time during the school day to work towards sustainability. The schools in Kesennuma utilize this time to teach ESD. In addition, NIER research and the seven abilities and attitudes that
were identified as important in ESD represent a significant link to teachers’ habits and purposes. Throughout interviews with teachers and leaders, these seven abilities and attitudes were repeatedly referred to, both explicitly and implicitly. However, it is likely that the NIER abilities and attitudes reflect teachers’ habits developed prior to the NIER research, rather than acting as a direct influence.

International and national policy and discourses often lack discussion concerning the uncertainty or risk inherent in pursuing sustainability. There is little acknowledgement that the effects of educators’ efforts are unknown, or that there are too many unpredictable factors for us to be certain or in control of the future. However, as shown in the findings of this research and the subsequent discussion, this risk or uncertainty does not deter educators from confronting these questions and developing reflective habits in their teaching, as a way to continuously pursue sustainability through ESD (see section 3.1 for a discussion of reflective habits).

7.1.2 Teachers’ Approaches to ESD

Given the ambiguity of ESD, various definitions and debates at the international and national levels, and teachers’ own unique experiences at the local level, diverse approaches to ESD are developed by teachers and leaders. It is important that teachers develop reflective habits as a capacity to confront these ambiguities and adapt their approach towards sustainability (see section 3.1). Often, these individual approaches can be linked to larger traditions in ESD. Teachers share certain habits and common influences, resulting in approaches that can be categorized according to wider approaches in ESD (these approaches are discussed in detail in section 3.2). The examination of teachers’ approaches in relation to wider approaches and traditions, discussed in this section, fulfills the second objective of this study and relates to the first research question. Though these meanings are not always conveyed explicitly to students, they are often revealed in the form of companion meanings (see section 3.3). Likewise, companion meanings about teachers’ approaches, habits and purposes can be discerned from reflective interviews about motivation, student projects and goals, roles, and understanding of ESD (see Sund 2008; 2015).

The fact-based tradition, an approach that values scientific knowledge as the primary tool to solve sustainability problems (Sandell et al. 2005), emerged as a minor aspect of teachers’ and leaders’ habits and purposes in Kesennuma. Some teachers highlighted the importance of knowledge, and described the use of experts in their approaches to ESD. This implies a top-down approach to ESD, which reduces the students’ role as contributors and capacity to make decisions (Sandell et al. 2005). However, the purpose of knowledge acquisition for teachers was primarily regarded as a base, which would then encourage normative, or sustainable-friendly, behaviors, or participation in democratic contribution. Knowledge and content learning does not seem to be approached in isolation, but rather in conjunction with purposes of capacity-building and local experience. Like Vare and Scott’s discussion of ESD 1 and ESD 2 as complementary approaches, knowledge and content learning in Kesennuma represents a useful tool for teachers to approach sustainability issues, especially those that can be remedied in the short-term, with simple solutions (2007). For example, knowledge of the sea level in areas of the community, in relation to
evacuation maps and DRR, hardly represents a contentious, debatable issue in local sustainability, and could easily benefit the community and students. In addition to knowledge and content learning, the ESD 1 approach is complemented by ESD 2 and capacity-building to discuss and think critically about sustainability issues that are more complex and uncertain.

Capacity-building, specifically by developing critical thinking, expression and communication, was a significant approach to ESD taken by teachers and leaders in Kesennuma. Most teachers acknowledged the importance of critical thinking in some form, which is approached by giving students complex problems and confronting issues of uncertainty. All teachers cited student contribution to the community and environment as a purpose of ESD, which, according to teachers’ understandings, required students to learn certain skills, abilities and attitudes. This approach maps onto Vare and Scott’s conception of ESD 2, or learning as sustainable development. The implication is that the pursuit of sustainability through education is an open-ended process, and that it is necessary to discuss the complexities and contradictions of the environment and society (2007). Teachers’ purposes for developing critical thinking and expression seem to correspond with a pluralistic approach to ESD, which highlights capacity-building for democratic participation (Sandell et al. 2005). This is reflected in the hope that students will be able to contribute and make judgments with the help of these skills and abilities.

Several of the purposes described by teachers reflect the NIER’s seven abilities and attitudes (see section 5.2), either explicitly or implicitly. Approaching critical thinking, communication and collaboration from this direction, or within this framework, resembles a normative purpose for ESD (Sandell et al. 2005). In other words, the skills fostered by teachers reflect goals of altering students’ behavior towards adopting sustainable habits, in line with the national and international vision of ESD.

The purpose of providing and encouraging experiences in the community also represents an approach to ESD as a pluralistic process (Sandell et al. 2005; Vare & Scott 2007). Teachers expressed, through their descriptions of community activities and motivations for teaching ESD, that students would be able to solve future problems, with conditions that are perhaps unknown. These descriptions convey a co-evolutionary perspective of humans and nature (see section 2.1; Scott & Gough 2003). The students take an active role in contributing to the conception of ESD, and drive the process forward. This is exemplified by student projects like Fureai Farm, in which students themselves take the initiative to approach sustainability and collaborate with the community as a continuous, open-ended process.

The findings of this research build on research by Sund and Wickman (2008) and Sund (2015), approaching teachers’ reflective habits and purposes in a comparable way, though in a different context. Like these studies, teachers in Kesennuma described their approaches to ESD and revealed purposes corresponding to habits formed through their own experiences and reflection, within the context of larger educational and ESD traditions or approaches. The teachers interviewed in Kesennuma pursue sustainability by various means, though largely within the pluralistic tradition, and through local experiences and collaboration. Their approaches are unique, and represent a worthwhile object of study, as they add to understanding of how teachers in different contexts work in ESD, despite uncertainty and risk.
An approach to ESD revealed by teachers’ and leaders’ purposes of local experience throughout students’ education, grounded in understanding of the immediate environment and society, perhaps represents an approach to ESD not adequately represented by Scott and Gough (2003), Sandell et al. (2005), or Vare and Scott (2007). The habits and actions described by the teachers suggest that place-attachment is regarded as an important purpose for teachers. That students care about and understand their community and the local environment seemed to be a shared goal pursued through ESD in Kesennuma. This somewhat resembles a normative approach, where knowledge and understanding of the students’ community will lead them to behave in a more sustainable way towards the place where they live (see Sandell et al. 2005). Alternatively, ESD as place-based education, which emphasizes learning that takes place in and with the local community and environment, seems to represent an approach that corresponds to how teachers work in Kesennuma (see Gruenewald 2003; Sobel 2004; Smith & Sobel 2010; Tippins et al. 2010; Greenwood 2013). Place-based education is a developing theory, and the number of schools and teachers using this approach are growing, though it likely does not represent a large tradition in ESD. Rather, the fact that teachers in Kesennuma take a very local approach is probably influenced mainly by their own experiences, but contributes to adding place-based ESD to the discourse in Japan, and influences the collective habits of teachers working in ESD, possibly shifting towards a new tradition, or at least representing an appropriate approach to ESD.

7.2 Approaches to Uncertainty in ESD

The way teachers approach uncertainty and present the concept in various forms to students are important indicators of what is important to them in their teaching, and represents a point of habitual reflection by teachers about the inherent challenges of ESD. These meanings and understandings relate to the second research question of how teachers and leaders approach uncertainty in ESD (see section 1.3). The findings of the research identified four categories of uncertainty, which lead to implications conveyed through companion meanings to students about how sustainability is or should be pursued, by whom, and what the future may hold. The reflective habits of teachers inevitably deal with the uncertainty and unpredictability of pursuing sustainability through ESD. The discussion of teachers’ approaches to uncertainty in ESD also relates to wider traditions, designated by the second objective of this research. This discussion directly relates to the second research question of this study.

All the teachers working in ESD in Kesennuma that were interviewed conveyed a certain responsibility to pursue sustainability, and that this was a worthwhile endeavor. Uncertainty emerges in different perspectives about the balance of responsibility, and how that responsibility is presented to students. Through descriptions of activities and students’ or teachers’ roles, the interviewees conveyed companion meanings about their understanding of responsibility. For example, the emphasis that some teachers placed on expert advice, be it from experts in the community or themselves as teachers, represents an approach to ESD that aligns with the fact-based or normative approaches described by Sandell et al. (2005; see also Sund & Wickman 2008). The idea is that if students gain scientific knowledge, or trust those that have expert knowledge, they will learn how to act in a sustainable way. However, teachers seemed to agree that the responsibility was more fluid, that the balance shifted and working towards sustainability was a process constantly changing, with an unknown future. They seemed to agree also that
responsibility was shared among students, teachers and community members, and in this way ESD is situated along a spectrum from normative to pluralistic (see Nikel 2007; Sund 2008; Sund & Wickman 2008). People living in Kesennuma appear to have some responsibility towards sustainability as citizens, but also can negotiate the approach to sustainability democratically. Furthermore, responsibility could shift towards those that have more capacity, or due to future uncertainty.

The future is an important notion in the concepts of SD and ESD. At the international level, a sustainable future is often presented as a goal or ideal, one that education could or should achieve. However, this understanding of sustainability is ambiguous and uncertain. The approaches to ESD described by teachers and leaders in Kesennuma reflect this uncertainty. Though teachers acknowledge that students should work to create a future society or community, they do not seem to assume that it can be sustainable, or that their work in ESD is a means to an end of achieved sustainability. This point could be explored further by future research. Rather, it is regarded as a process, one in which the students will contribute to and create, along with the community and the environment. This seems to suggest that the participants seem to favor a pluralistic approach to the uncertainty of the future, in which feedback and perspectives from various sources are regarded as legitimate and should be democratically approached to find a way to move forward.

Teachers and leaders in ESD in Kesennuma all seemed to find complexity in their work, whether in their own understanding, the relationship between the society and the environment, or in the activities and skills presented to students. Through discussions of their purposes for ESD, companion meanings of complexity as a point of departure for teachers emerged. Teachers were eager to push the conception of ESD and urge students to confront uncertainty with difficult, complex problems and dilemmas. This finding echoes that of Sund’s investigation of experienced EE teachers in Sweden, which showed complexity as a focal point for teachers’ purposes and teaching practice (Sund 2015). However, the same educators in Kesennuma that cited a need for complexity in teaching, at times expressed hesitation to always present complexity to all students. Overall, complexity for the teachers represents a pluralistic approach, with an emphasis on critical thinking and the ability to discuss, observe and analyze (Sandell et al. 2005; Sund & Wickman 2008). One apparent omission in teachers’ description of complexity, however, is with regards to acknowledging various perspectives from students and in the community. Teachers seemed to smooth over differences in opinions within the community, and present a more homogenous picture than is likely the case of collaboration between teachers, the schools and the local society.

As described by Scott and Gough (2003), cultural theory’s notion of multiple rationalities indicate that actors could adopt different, even contradictory, views about the nature of the relationship between society and the environment, depending on the context of specific issues. This implies uncertainty with regards to the approaches and pursuits of people working within ESD. In Kesennuma, the teachers and leaders conveyed varying perspectives and approaches, consistent with Scott and Gough’s description, from their representations of complexity and a fluid, open-ended future, although the teachers’ and leaders’ comments did not consistently reveal specific characteristics that mapped onto certain rationalities (see section 3.2) (2003).
Though the future, people, nature and the relationship between the three represent uncertainty, the teachers in Kesennuma expressed hope in ESD and their students. This represents an anchor point for the participants, or a point from which reflective habits are formed (see Sund & Wickman 2008). They believe in their approaches and actions that they take working in ESD, that it is something worth pursuing, and have hope that students will gain a deeper understanding and the capacity to solve future problems. Especially given the uncertainty of ESD, hope can be an important motivator, and teachers’ hope can convey significant meaning to students and others in the community. Perhaps hope is a natural part of human nature, and helps give meaning to any work that people do, including teachers working in ESD.

8 Conclusion

The purpose of this study has been to gain understanding of teachers’ and leaders’ purposes and approaches to ESD, within the specific context of formal education in Kesennuma, Japan. The implementation of SD, and its connection to education in ESD, has become an international priority, as evidenced by the promotion of the concept by the UN, UNESCO and national ministries. However, the concepts of SD and ESD are ambiguous. There are several definitions, and there is little consensus on how to approach sustainability, which actions should be taken, what a sustainable future looks like, or whether education as a tool to achieve sustainability is appropriate at all. Global debates and discourses on ESD have resulted in uncertainty, though the challenges of educators dealing with this risk and uncertainty are often unacknowledged. This uncertainty is compounded by the uncertainty and complexity inherent in the relationship between humans and nature, and how we approach sustainability issues. Still, despite these challenges, the pursuit of sustainability is valuable as a learning process, and education should play a key role in advancing sustainability through ESD. Furthermore, this is an international imperative, something that is vital for all schools to pursue and for all students to work through. The question of how that should happen, however, is more difficult to answer.

The teachers and leaders in Kesennuma have developed their habits and purposes for ESD through their own experiences, interactions and perspectives, drawing on various influences, and through reflection. They habitually make choices, contemplate and establish unique approaches to ESD in their schools and in their community. These approaches represent reasonable examples of how experienced educators have chosen to pursue sustainability, reflecting on their purposes and the challenges of uncertainty.

Through reflective interviews, these educators discussed their individual thoughts on ESD, their habits and their approaches to teaching ESD and working through problems. Three categories of purposes were identified, showing what the teachers and leaders worked for in ESD, or what they hoped students would learn from their classes. These purposes, teachers revealed, are sought in combination, and imply a balance of approaches. However, it was clear from the findings that capacity-building thinking and communication skills, as well as experience in the local community and environment were particularly important. The participants build their ESD teaching around these goals, and present ESD to students as an ongoing learning process. They show adaptation to uncertainty in their reflections on their approaches.
Uncertainty inevitably accompanies the process of teaching in ESD. Teachers and leaders must confront uncertainty in their goals for ESD, and in their teaching or presentation of topics to students, though this can only happen through developing deep, contemplative and reflective habits. Four themes of uncertainty were identified as important points of departure for teachers to work with sustainability in their teaching. The ways in which teachers and leaders address these forms of uncertainty help to shape the ways that ESD develops in schools, the students and in the community. Particularly important to the participants of this study was the need to offer complexity and uncertainty to the students, and to present complicated and difficult problems to the students without simplifying the issues. Teachers did this to develop understanding, thinking, communication and collaboration. The teachers also emphasized the importance of students directing the future efforts towards sustainability. In the end, the teachers and leaders acknowledged that although there is uncertainty, and many challenges, hope is important for ESD. These educators also represent a point of hope for ESD elsewhere, that through reflection and facing challenges directly, we can find meaningful ways to pursue sustainability.

8.1 Further Research

This research represents a small-scale case study, in which the purposes and approaches of a few teachers and leaders were examined. The potential remains for further inquiry into the case of teachers and leaders in ESD in Kesennuma, perhaps compared with another case, and could reveal deeper insights into how experienced educators feel they can work towards sustainability in their teaching. The findings have revealed certain approaches and purposes for ESD, as well as how some teachers and leaders address uncertainty. However, further investigation could reveal additional or different findings, equally valid and insightful.

Some additional questions have been raised in the course of this study. Further research could add to deeper understanding of the specific influences that may affect how teachers formed their habits and approaches to ESD. This could be linked with national and international agendas towards ESD to determine how international policy and discourses might affect local ESD implementation.

The findings and discussion of this research outline teachers’ and leaders’ purpose of providing students with experiences in the local community and environment. A further exploration of ESD educators’ purposes and habits within the framework of place-based education theory could provide a deeper understanding of how teachers use and approach the local area in teaching ESD.

Though questions remain, and work in ESD and pursuing sustainability through education is to confront uncertainty, this study adds to the understanding of how some experienced educators choose to approach ESD. Their task is difficult, though their efforts are valuable, and represent a significant topic of inquiry for future research in international and comparative education.
9 References


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Appendix A: Interview Guide

Introduction
- How long have you been a teacher? In Kesennuma?
- What is your role in the school? Which subjects do you teach?
- How did you get involved in teaching sustainability? When?
- Follow-up: Tohoku earthquake – impact of involvement in ESD, change of perspective?
- Why are sustainability issues important?

What do you teach?
- What does ESD mean in your school? What do you teach students?
- What are students supposed to learn? Knowledge, skills, values? How does this translate into sustainability or change?
- What are the goals of your teaching in ESD?
- What is the most important thing for students to take away?
- What are you trying to change, or can you change? (responsibility, hope)
- How do humans, society and the environment fit together? What does that mean for ESD?
- How do you address uncertainty?

Why do you teach sustainability?
- Follow-up on first two sections – purpose, intentions, expectations, curriculum, change and hope
- What can you be hopeful about in ESD? Why? (follow-up: uncertainty, responsibility)
- How are different perspectives or aims addressed? (complexity)

How do you teach sustainability?
- Which teaching methods do you use to teach sustainability? Why? (responsibility)
- What is the role of students? How are they involved? What can they contribute? (responsibility)
- How is school knowledge useful? Where do students connect ESD issues? (complexity)
- Who drives the process forward in your school or community? Who keeps ESD going? (responsibility, hope)